John Walton.

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ENCYCLOPÆDIA BRITANNICA.

AMERICA.

America. AMERICA (from *Americus Vesputius*, falsely said to be the first discoverer of the continent); one of the four quarters of the world, probably the largest of the whole, and from its late discovery frequently denominated the *New World*.

1 Boundaries. This vast country extends, so far as it is known, from the 80th degree of north, to the 56th degree of south latitude; and, from the 35th to the 165th degree west longitude from London; stretching between 8000 and 9000 miles in length, and in its greatest breadth 3690. It sees both hemispheres, has two summers and a double winter, and enjoys all the variety of climates which the earth affords. It is washed by the two great oceans. To the eastward it has the Atlantic, which divides it from Europe and Africa; to the west it has the Pacific or Great South sea, by which it is separated from Asia. By these seas it may, and does, carry on a direct commerce with the other three parts of the world.

2 North and South continent. America is not of equal breadth throughout its whole extent; but is divided into two great continents, called *North* and *South America*, by an isthmus 1500 miles long, and which at Darien, about Lat. 9° N. is only 60 miles over. This isthmus forms with the northern and southern continents, a vast gulf, in which lie a great number of islands, called the *West Indies*, in contradistinction to the eastern parts of Asia, which are called the *East Indies*.

3 Remarkable prevalence of cold. Between the New World and the Old, there are several very striking differences; but the most remarkable is the general predominance of cold throughout the whole extent of America. Though we cannot, in any country, determine the precise degree of heat merely by the distance of the equator, because the elevation above the sea, the nature of the soil, &c. affect the climate; yet, in the ancient continent, the heat is much more in proportion to the vicinity to the equator than in any part of America. Here the rigour of the frigid zone extends over half that which should be temperate by its position. Even in those latitudes where the winter is scarcely felt on the old continent, it reigns with great severity in America, though during a short period. Nor does this cold, prevalent in the new world, confine itself to the temperate zones; but extends its influence to the torrid zone also, considerably mitigating the excess of its heat. Along the eastern coast, the climate, though more similar to that of the torrid zone in other parts of the earth, is nevertheless considerably milder than in those countries of Asia and Africa which lie in the same latitude. From the southern tropic to the extremity of the American continent, the cold is said to be much greater than in parallel northern latitudes even of America itself.

For this so remarkable difference between the climate of the new continent and the old, various causes have been assigned by different authors. The following is the opinion of the learned Dr Robertson on this subject. "Though the utmost extent of America towards the north be not yet discovered, we know that it advances nearer to the pole than either Europe or Asia. The latter have large seas to the north, which are open during part of the year; and, even when covered with ice, the wind that blows over them is less intensely cold than that which blows over land in the same latitude. But, in America, the land stretches from the river St Lawrence towards the pole, and spreads out immensely to the west. A chain of enormous mountains, covered with snow and ice, runs through all this dreary region. The wind passing over such an extent of high and frozen land, becomes so impregnated with cold, that it acquires a piercing keenness, which it retains in its progress through warmer climates; and is not entirely mitigated until it reach the gulf of Mexico. Over all the continent of North America, a north-westerly wind and excessive cold are synonymous terms. Even in the most sultry weather, the moment that the wind veers to that quarter, its penetrating influence is felt in a transition from heat to cold no less violent than sudden. To this powerful cause we may ascribe the extraordinary dominion of cold, and its violent inroads into the southern provinces in that part of the globe.

4 Dr Robertson's reasons for this superior degree of cold. *History of America*, vol. i. p. 253.

"Other causes, no less remarkable, diminish the active power of heat in those parts of the American continent which lie between the tropics. In all that portion of the globe, the wind blows in an invariable direction from east to west. As this wind holds its course across the ancient continent, it arrives at the countries which stretch along the western shore of Africa, inflamed with all the fiery particles which it hath collected from the sultry plains of Asia, and the burning sands, in the African deserts. The coast of Africa is accordingly

America. ingly the region of the earth which feels the most fervent heat, and is exposed to the unmitigated ardour of the torrid zone. But this same wind, which brings such an accession of warmth to the countries lying between the river of Senegal and Caffraria, traverses the Atlantic ocean before it reaches the American shore. It is cooled in its passage over this vast body of water; and is felt as a refreshing gale along the coasts of Brasil and Guiana, rendering those countries, though amongst the warmest in America, temperate, when compared with those which lie opposite to them in Africa. As this wind advances in its course across America, it meets with immense plains covered with impenetrable forests; or occupied by large rivers, marshes, and stagnating waters, where it can recover no considerable degree of heat. At length it arrives at the Andes, which run from north to south through the whole continent. In passing over their elevated and frozen summits, it is so thoroughly cooled, that the greater part of the countries beyond them hardly feel the ardour to which they seem exposed by their situation. In the other provinces of America, from Terra Firma westward to the Mexican empire, the heat of the climate is tempered, in some places, by the elevation of the land above the sea; in others, by their extraordinary humidity; and in all, by the enormous mountains scattered over this tract. The islands of America in the torrid zone are either small or mountainous, and are fanned alternately by refreshing sea and land breezes.

"The causes of the extraordinary cold towards the southern limits of America, and in the seas beyond it, cannot be ascertained in a manner equally satisfying. It was long supposed, that a vast continent, distinguished by the name of *Terra Australis Incognita*, lay between the southern extremity of America and the antarctic pole. The same principles which account for the extraordinary degree of cold in the northern regions of America, were employed in order to explain that which is felt at Cape Horn and the adjacent countries. The immense extent of the southern continent, and the rivers which it poured into the ocean, were mentioned and admitted by philosophers as causes sufficient to occasion the unusual sensation of cold, and the still more uncommon appearances of frozen seas in that region of the globe. But the imaginary continent to which such influence was ascribed having been searched for in vain, and the space which it was supposed to occupy having been found to be an open sea, new conjectures must be formed with respect to the causes of a temperature of climate, so extremely different from that which we experience in countries removed at the same distance from the opposite pole.

Ibid. p. 451. note xxxi. "The most obvious and probable cause of this superior degree of cold towards the southern extremity of America, seems to be the form of the continent there. Its breadth gradually decreases as it stretches from St Antonio southwards; and from the bay of St Julian to the straits of Magellan its dimensions are much contracted. On the east and west sides, it is washed by the Atlantic and Pacific oceans. From its southern point, it is probable that an open sea stretches to the antarctic pole. In whichever of these directions the wind blows, it is cooled before it approaches the Magellanic regions, by passing over a vast body of water; nor is the land there of such extent, that it can recover any considerable degree of heat in its progress over it. These circumstances concur in rendering the temperature of the air in this district of America more similar to that of an insular, than to that of a continental climate; and hinder it from acquiring the same degree of summer heat with places in Europe and Asia, in a corresponding northern latitude. The north wind is the only one that reaches this part of America, after blowing over a great continent. But, from an attentive survey of its position, this will be found to have a tendency rather to diminish than augment the degree of heat. The southern extremity of America is properly the termination of the immense ridge of the Andes, which stretches nearly in a direct line from north to south, through the whole extent of the continent. The most sultry regions in South America, Guiana, Brasil, Paraguay, and Tucuman, lie many degrees to the east of the Magellanic regions. The level country of Peru, which enjoys the tropical heats, is situated considerably to the west of them. The north wind, then, though it blows over land, does not bring to the southern extremity of America an increase of heat collected in its passage ever torrid regions; but, before it arrives there, it must have swept along the summits of the Andes, and become impregnated with the cold of that frozen region."

America.

5 Extreme moisture of the American climate.

Another particularity in the climate of America, is its excessive moisture in general. In some places, indeed, on the western coast, rain is not known; but, in all other parts, the moistness of the climate is as remarkable as the cold. The forests wherewith it is everywhere covered, no doubt, partly occasion the moisture of its climate; but the most prevalent cause is the vast quantity of water in the Atlantic and Pacific oceans, with which America is environed on all sides. Hence those places where the continent is narrowest are deluged with almost perpetual rains, accompanied with violent thunder and lightning, by which some of them, particularly Porto Bello, are rendered in a manner uninhabitable.

6 Large rivers, and excessive luxuriance of vegetation.

This extreme moisture of the American climate is productive of much larger rivers there than in any other part of the world. The Danube, the Nile, the Indus, or the Ganges, are not comparable to the Mississippi, the river St Lawrence, or that of the Amazons; nor are such large lakes to be found anywhere as those which North America affords. To the same cause we are also partly to ascribe the excessive luxuriance of all kinds of vegetables in almost all parts of this country. In the southern provinces, where the moisture of the climate is aided by the warmth of the sun, the woods are almost impervious, and the surface of the ground is hid from the eye, under a thick covering of shrubs, herbs, and seeds. In the northern provinces, the forests are not encumbered with the same luxuriance of vegetation; nevertheless, they afford trees much larger of their kind than what are to be found anywhere else.

7 Malignity of climate unjustly ascribed to America.

From the coldness and the moisture of America, an extreme malignity of climate has been inferred, and asserted by M. de Paw, in his *Recherches Philosophiques*. Hence, according to his hypothesis, the smallness and irregularity of the nobler animals, and the size and enormous multiplication of reptiles and insects.

But the supposed smallness and less ferocity of the American

America.

American animals, the abbé Clavigero observes, instead of the malignity, demonstrate the mildness and bounty of the clime, if we give credit to Buffon, at whose fountain M. de Paw has drank, and of whose testimony he has availed himself against Don Pernetty: Buffon, who in many places of his Natural History produces the smallness of the American animals as a certain argument of the malignity of the climate of America, in treating afterwards of savage animals, in tom. ii. speaks thus: "As all things, even the most free creatures, are subject to natural laws, and animals as well as men are subjected to the influence of climate and soil, it appears that the same causes which have civilized and polished the human species in our climates, may have likewise produced similar effects upon other species. The wolf, which is perhaps the fiercest of all the quadrupeds of the temperate zone, is, however, incomparably less terrible than the tiger, the lion, and the panther, of the torrid zone, and the white bear and hyena of the frigid zone. In America, where the air and the earth are more mild than those of Africa, the tiger, the lion, and the panther, are not terrible but in the name. They have degenerated, if fierceness, joined to cruelty, made their nature; or, to speak more properly, they have only suffered the influence of the climate; under a milder sky, their nature also has become more mild. From climes which are immoderate in their temperature, are obtained drugs, perfumes, poisons, and all those plants whose qualities are strong. The temperate earth, on the contrary, produces only things which are temperate; the mildest herbs, the most wholesome pulse, the sweetest fruits, the most quiet animals, and the most humane men, are the natives of this happy clime. As the earth makes the plants, the earth and plants make animals; the earth, the plants, and the animals, make man. The physical qualities of man, and the animals which feed on other animals, depend, though more remotely, on the same causes which influence their dispositions and customs. This is the greatest proof and demonstration, that in temperate climes every thing becomes temperate, and that in intemperate climes every thing is excessive; and that size and form, which appear fixed and determinate qualities, depend, notwithstanding, like the relative qualities, on the influence of climate. The size of our quadrupeds cannot be compared with that of the elephant, the rhinoceros, or sea-horse. The largest of our birds are but small, if compared with the ostrich, the condore, and *casoare*." So far M. Buffon, whose text we have copied, because it is contrary to what M. de Paw writes against the climate of America, and to Buffon himself in many other places.

History of America, vol. ii. p. 255.

If the large and fierce animals are natives of intemperate climes, and small and tranquil animals of temperate climes, as M. Buffon has here established; if mildness of climate influences the disposition and customs of animals, M. de Paw does not well deduce the malignity of the climate of America from the smaller size and less fierceness of its animals; he ought rather to have deduced the gentleness and sweetness of its climate from this antecedent. If, on the contrary, the smaller size and less fierceness of the American animals, with respect to those of the old continent, are a proof of their degeneracy, arising from the malignity of the clime, as M. de Paw would have it, we ought in like manner to argue the malignity of the climate of Europe from the smaller size and less fierceness of its animals, compared with those of Africa. If a philosopher of the country of Guinea should undertake a work in imitation of M. de Paw, with this title, *Recherches Philosophiques sur les Européens*, he might avail himself of the same argument which M. de Paw uses, to demonstrate the malignity of the climate of Europe, and the advantages of that of Africa. The climate of Europe, he would say, is very unfavourable to the production of quadrupeds, which are found incomparably smaller and more cowardly than ours. What are the horse and the ox, the largest of its animals, compared with our elephants, our rhinoceroses, our sea-horses, and our camels? What are its lizards, either in size or intrepidity, compared with our crocodiles? its wolves, its bears, the most dreadful of its wild beasts, when beside our lions and tigers? Its eagles, its vultures, and cranes, if compared with our ostriches, appear only like hens.

America.

8 America not more infested than other countries with insects and noxious animals.

As to the enormous size and prodigious multiplication of the insects and other little noxious animals, "The surface of the earth (says M. de Paw), infected by putrefaction, was overrun wish lizards, serpents, reptiles, and insects, monstrous for size, and the activity of their poison, which they drew from the copious juices of this uncultivated soil, that was corrupted and abandoned to itself, where the nutritive juice became sharp, like the milk in the breast of animals which do not exercise the virtue of propagation. Caterpillars, crabs, butterflies, beetles, spiders, frogs, and toads, were, for the most part, of an enormous corpulence in the species, and multiplied beyond what can be imagined. Panama is infested with serpents, Carthagena with clouds of enormous bats, Porto Bello with toads, Surinam with *kakerlacas*, or *cucarachas*, Guadaloupe, and the other colonies of the islands, with beetles, Quito, with niguas or chegoes, and Lima with lice and bugs. The ancient kings of Mexico, and the emperors of Peru, found no other means of ridding their subjects of those insects which fed upon them, than the imposition of an annual tribute of a certain quantity of lice. Ferdinand Cortes found bags full of them in the palace of Montezuma." But this argument, exaggerated as it is, proves nothing against the climate of America in general, much less against that of Mexico. There being some lands in America, in which, on account of their heat, humidity, or want of inhabitants, large insects are found, and excessively multiplied, will prove at most, that in some places the surface of the earth is infected, as he says, with putrefaction; but not that the soil of Mexico, or that of all America, is stinking, uncultivated, vitiated, and abandoned to itself. If such a deduction were just, M. de Paw might also say, that the soil of the old continent is barren, and stinks; as in many countries of it there are prodigious multitudes of monstrous insects, noxious reptiles, and vile animals, as in the Philippine isles, in many of those of the Indian archipelago, in several countries of the south of Asia, in many of Africa, and even in some of Europe. The Philippine isles are infested with enormous ants and monstrous butterflies, Japan with scorpions, the south of Asia and Africa with serpents, Egypt with asps, Guinea and Ethiopia with armies of ants, Holland with field rats, Ukrania with toads,

America. as M. de Paw himself affirms; in Italy, the Campagna di Roma (although peopled for so many ages) with vipers, Calabria with tarantulas, the shores of the Adriatic sea with clouds of gnats; and even in France, the population of which is so great and so ancient, whose lands are so well cultivated, and whose climate is so celebrated by the French, there appeared, a few years ago, according to M. Buffon, a new species of field mice, larger than the common kind, called by him *surmolots*, which have multiplied exceedingly, to the great damage of the fields. M. Bazin, in his Compendium of the History of Insects, numbers 77 species of bugs which are all found in Paris and its neighbourhood. That large capital, as M. Bomare says, swarms with those disgustful insects. It is true, that there are places in America, where the multitudes of insects and filthy vermine make life irksome; but we do not know that they have arrived to such excess of multiplication as to depopulate any place; at least there cannot be so many examples produced of this cause of depopulation in the new as in the old continent, which are attested by Theophrastus, Varro, Pliny, and other authors. The frogs depopulated one place in Gaul, and the locusts another in Africa. One of the Cyclades was depopulated by mice; Amiclas, near to Taracina, by serpents; another place, near to Ethiopia, by scorpions and poisonous ants; and another by scolopendras: and not so distant from our own times, the Mauritius was going to have been abandoned on account of the extraordinary multiplication of rats, as we can remember to have read in a French author.

With respect to the size of the insects, reptiles, and such animals, M. de Paw makes use of the testimony of M. Dumont, who, in his Memoirs on Louisiana, says, that the frogs are so large there that they weigh 37 French pounds, and their horrid croaking imitates the bellowing of cows. But M. de Paw himself says (in his answer to Don Pernetty, cap. 17.), that all those who have written about Louisiana, from Henepin, Le Clerc, and Cav. Tonti, to Dumont, have contradicted each other, sometimes on one and sometimes on another subject. In fact, neither in the old or the new continent are there frogs of 37 pounds in weight; but there are in Asia and Africa, serpents, butterflies, ants, and other animals, of such monstrous size, that they exceed all those which have been discovered in the new world. We know very well, that some American historians say, that a certain gigantic species of serpents is to be found in the woods, which attract men with their breath, and swallow them up; but we know also, that several historians both ancient and modern, report the same thing of the serpents of Asia, and even something more. Megasthenes, cited by Pliny, said, that there were serpents found in Asia, so large, that they swallowed entire stags and bulls. Metrodorus, cited by the same author, affirms, that in Asia there were serpents which, by their breath, attracted birds, however high they were, or quick their flight. Among the moderns, Gemelli, in vol. v. of his Tour of the World, when he treats of the animals of the Philippine isles, speaks thus: "There are serpents in these islands of immoderate size; there is one called *ibitin*, very long, which suspending itself by the tail from the trunk of a tree, waits, till stags, bears, and also men pass by, in order to attract them with its breath, and devour them at once entirely:" From whence it is evident that this very ancient fable has been common to both continents. America.

Further, it may be asked, In what country of America could M. de Paw find ants to equal those of the Philippine islands, called *sulum*, respecting which Hernandez affirms, that they were six fingers breadth in length, and one in breadth? Who has ever seen in America butterflies so large as those of Bourbon, Ternate, the Philippine isles, and all the Indian archipelago? The largest bat of America (native of hot shady countries), which is that called by Buffon *vampiro*, is, according to him, of the size of a pigeon. *La rougette*, one of the species of Asia, is as large as a raven; and the *rousette*, another species of Asia, is as big as a large hen. Its wings, when extended, measure from tip to tip three Parisian feet, and according to Gemelli, who measured it in the Philippine isles, six palms. M. Buffon acknowledges the excess in size of the Asiatic bat over the American species, but denies it as to number. Gemelli says, that those of the island of Luzon were so numerous that they darkened the air, and that the noise which they made with their teeth, in eating the fruits of the woods, was heard at the distance of two miles. M. de Paw says, in talking of serpents, "It cannot be affirmed that the new world has shewn any serpents larger than those which Mr Adanson saw in the deserts of Africa." The greatest serpent found in Mexico, after a diligent search made by Hernandez, was 18 feet long; but this is not to be compared with that of the Moluccas, which Bomare says is 33 feet in length: nor with the *anacondaja* of Ceylon, which the same author says is more than 33 feet long; nor with others of Asia and Africa mentioned by the same author. Lastly, The argument drawn from the multitude and size of the American insects is fully as weighty as the argument drawn from the smallness and scarcity of quadrupeds, and both detect the same ignorance, or rather the same voluntary and studied forgetfulness, of the things of the old continent.

With respect to what M. de Paw has said of the tribute of lice in Mexico, in that as well as in many other things he discovers his ridiculous credulity. It is true that Cortes found bags of lice in the magazines of the palace of King Axajacatil. It is also true, that Montezuma imposed such a tribute, not on all his subjects, however, but only on those who were beggars; not on account of the extraordinary multitude of those insects, as M. de Paw affirms, but because Montezuma, who could not suffer idleness in his subjects, resolved that that miserable set of people, who could not labour, should at least be occupied in lousing themselves. This was the true reason of such an extravagant tribute, as Torquemada, Betancourt, and other historians, relate; and nobody ever before thought of that which M. de Paw affirms, merely because it suited his preposterous system. Those disgusting insects possibly abound as much in the hair and clothes of American beggars as of any poor and uncleanly low people in the world; but there is not a doubt, that if any sovereign of Europe was to exact such a tribute from the poor in his dominions, not only bags but great vessels, might be filled with them.

At the time America was discovered, it was found inhabited.

inhabited by a race of men no less different from those in the other parts of the world, than the climate and natural productions of this continent are different from those of Europe, Asia, or Africa. One great peculiarity in the native Americans is their colour, and the identity of it throughout the whole extent of the continent. In Europe and Asia, the people who inhabit the northern countries are of a fairer complexion than those who dwell more to the southward. In the torrid zone, both in Africa and Asia, the natives are entirely black, or the next thing to it. This, however, must be understood with some limitation. The people of Lapland, who inhabit the most northerly part of Europe, are by no means so fair as the inhabitants of Britain; nor are the Tartars so fair as the inhabitants of Europe who lie under the same parallels of latitude. Nevertheless a Laplander is fair when compared with an Abyssinian, and a Tartar, if compared with a native of the Molucca islands. In America, this distinction of colour was not to be found. In the torrid zone there were no negroes, and in the temperate and frigid zones there were no white people. All of them were of a kind of red copper colour, which Mr Forster, observed, in the Pesserays of Terra del Fuego, to have something of a gloss resembling that metal. It doth not appear, however, that this matter hath ever been inquired into with sufficient accuracy. The inhabitants of the inland parts of South America, where the continent is widest, and consequently the influence of the sun the most powerful, have never been compared with those of Canada, or more northerly parts, at least by any person of credit. Yet this ought to have been done, and that in many instances too, before it could be asserted so positively as most authors do, that there is not the least difference of complexion among the natives of America. Indeed, so many systems have been formed concerning them, that it is very difficult to obtain a true knowledge of the most simple facts. If we may believe the Abbé Raynal, the Californians are swarthier than the Mexicans; and so positive is he in his opinion, that he gives a reason for it. "This difference of colour," says he, "proves, that the civilized life of society subverts, or totally changes, the order and laws of nature, since we find under the temperate zone, a savage people that are blacker than the civilized nations of the torrid zone." —On the other hand, Dr Robertson classes all the inhabitants of Spanish America together with regard to colour, whether they are civilized or uncivilized; and when he speaks of California, takes no notice of any peculiarity in their colour more than others. The general appearance of the indigenous Americans in various districts is thus described by the Chevalier Pinto: "They are all of a copper colour, with some diversity of shade, not in proportion to their distance from the equator, but according to the degree of elevation of the territory in which they reside. Those who live in a high country are fairer than those in the marshy low lands on the coast. Their face is round; farther removed, perhaps, than that of any people from an oval shape. Their forehead is small; the extremity of their ears far from the face; their lips thick; their nose flat; their eyes black, or of a chesnut colour, small, but capable of discerning objects at a great distance. Their hair is always thick and sleek, and without any tendency to curl, At the first aspect, a South American

9 General description of the natives.

appears to be mild and innocent: but, on a more attentive view, one discovers in his countenance something wild, distrustful, and sullen."

10 Don Ulloa's account.

The following account of the native Americans is given by Don Antonio Ulloa, in a work entitled *Memoires Philosophiques, Historiques, et Physiques, concernant la decouverte de l'Amerique*, lately published.

The American Indians are naturally of a colour bordering upon red. Their frequent exposure to the sun and wind changes it to their ordinary dusky hue. The temperature of the air appears to have little or no influence in this respect. There is no perceptible difference in complexion between the inhabitants of the high and those of the low parts of Peru; yet the climates are of extreme difference. Nay, the Indians who live as far as 40 degrees and upwards south or north of the equator, are not to be distinguished, in point of colour, from those immediately under it.

There is also a general conformation of features and person, which more or less characterizes them all. Their chief distinctions, in these respects, are a small forehead, partly covered with hair to the eyebrows, little eyes; the nose thin, pointed, and bent towards the upper lip; a broad face; large ears; black, thick, and lank hair; the legs well formed, the feet small, the body thick and muscular; little or no beard on the face, and that little never extending beyond a small part of the chin and upper lip. It may easily be supposed that this general description cannot apply, in all its parts, to every individual; but all of them partake so much of it, that they may be easily distinguished even from the mulattoes, who come nearest to them in point of colour.

The resemblance among all the American tribes is not less remarkable in respect to their genius, character, manners, and particular customs. The most distant tribes are, in these respects, as similar as though they formed but one nation.

All the Indian nations have a peculiar pleasure in painting their bodies of a red colour, with a certain species of earth. The mine of Guançavelica was formerly of no other use than to supply them with this material for dyeing their bodies; and the cinnabar extracted from it was applied entirely to this purpose. The tribes in Louisiana and Canada have the same passion; hence minium is the commodity most in demand there.

It may seem singular that these nations, whose natural colour is red, should affect the same colour as an artificial ornament. But it may be observed, that they do nothing in this respect but what corresponds to the practice of Europeans, who also study to heighten and display to advantage the natural red and white of their complexions. The Indians of Peru have now indeed abandoned the custom of painting their bodies: but it was common among them before they were conquered by the Spaniards; and it still remains the custom of all those tribes who have preserved their liberty. The northern nations of America, besides the red colour which is predominant, employ also black, white, blue, and green, in painting their bodies.

11 Peculiarities in regard to ornament and dress.

The adjustment of these colours is a matter of as great consideration with the Indians of Louisiana and the vast regions extending to the north, as the ornaments of dress among the most polished nations. The

business

America. business itself they call *mactacher*, and they do not fail to apply all their talents and assiduity to accomplish it in the most finished manner. No lady of the greatest fashion ever consulted her mirror with more anxiety, than the Indians do while painting their bodies. The colours are applied with the utmost accuracy and address. Upon the eyelids, precisely at the root of the eyelashes, they draw two lines as fine as the smallest thread; the same upon the lips, the openings of the nostrils, the eyebrows, and the ears; of which last they even follow all the inflexions and sinuosities. As to the rest of the face, they distribute various figures, in all which the red predominates, and the other colours are assorted so as to throw it out to the best advantage. The neck also receives its proper ornament; a thick coat of vermilion commonly distinguishes the cheeks. Five or six hours are requisite for accomplishing all this with the nicety which they affect. As their first attempts do not always succeed to their wish, they efface them, and begin anew upon a better plan. No coquette is more fastidious in her choice of ornament, none more vain when the important adjustment is finished. Their delight and self-satisfaction, are then so great, that the mirror is hardly ever laid down. An Indian *mactached* to his mind is the vainest of all the human species. The other parts of the body are left in their natural state, and, excepting what is called a *cachecul*, they go entirely naked.

Such of them as have made themselves eminent for bravery, or other qualifications, are distinguished by figures painted on their bodies. They introduce the colours by making punctures on their skin, and the extent of surface which this ornament covers is proportioned to the exploits they have performed. Some paint only their arms, others both their arms and legs, others again their thighs; while those who have attained the summit of warlike renown, have their bodies painted from the waist upwards. This is the heraldry of the Indians; the devices of which are probably more exactly adjusted to the merits of the persons who bear them than those of more civilized countries.

Besides these ornaments, the warriors also carry plumes of feathers on their heads, their arms, and ancles. These likewise are tokens of valour, and none but such as have been thus distinguished may wear them.

The propensity to indolence is equal among all the tribes of Indians, civilized or savage. The only employment of those who have preserved their independence is hunting and fishing. In some districts the women exercise a little agriculture in raising Indian corn and pompions, of which they form a species of aliment by bruising them together: they also prepare the ordinary beverage in use among them, taking care, at the same time, of the children, of whom the fathers take no charge.

The female Indians of all the conquered regions of South America practise what is called the *urcu* (a word which among them signifies *elevation*). It consists in throwing forward the hair from the crown of the head upon the brow, and cutting it round from the ears to above the eye; so that the forehead and eyebrows are entirely covered. The same custom takes place in the northern countries. The female inhabitants of both regions tie the rest of their hair behind, so exactly in the same fashion, that it might be supposed the effect of mutual imitation. This, however, being impossible, from the vast distance that separates them, America. is thought to countenance the supposition of the whole of America being originally planted with one race of people.

This custom does not take place among the males. Those of the higher parts of Peru wear long and flowing hair, which they reckon a great ornament. In the lower parts of the same country they cut it short, on account of the heat of the climate; a circumstance in which they imitate the Spaniards. The inhabitants of Louisiana pluck out their hair by the roots from the crown of the head forwards, in order to obtain a large forehead, otherwise denied them by nature. The rest of their hair they cut as short as possible, to prevent their enemies from seizing them by it in battle, and also to prevent them from easily getting their scalp, should they fall into their hands as prisoners.

12 Remarkable insensibility to pain,

The whole race of American Indians is distinguished by thickness of skin and hardness of fibres: circumstances which probably contribute to that insensibility to bodily pain for which they are remarkable. An instance of this insensibility occurred in an Indian who was under the necessity of submitting to be cut for the stone. This operation, in ordinary cases, seldom lasts above four or five minutes. Unfavourable circumstances in his case prolonged it to the uncommon period of 27 minutes. Yet all this time the patient gave no tokens of the extreme pain commonly attending this operation: he complained only as a person does who feels some slight uneasiness. At last the stone was extracted. Two days after, he expressed a desire for food, and on the eighth day from the operation, he quitted his bed, free from pain, although the wound was not yet thoroughly closed. The same want of sensibility is observed in cases of fractures, wounds, and other accidents of a similar nature. In all these cases their cure is easily effected, and they seem to suffer less present pain than any other race of men. The skulls that have been taken up in their ancient burying-grounds are of a greater thickness than that bone is commonly found, being from six to seven lines from the outer to the inner superficies. The same is remarked as to the thickness of their skins.

It is natural to infer from hence, that their comparative insensibility to pain is owing to a coarser and stronger organization than that of other nations. The

13 and to the inclemencies of weather.

ease with which they endure the severities of climate is another proof of this. The inhabitants of the higher parts of Peru live amidst perpetual frost and snow. Although their clothing is very slight, they support this inclement temperature without the least inconvenience. Habit, it is to be confessed, may contribute a good deal to this, but much also is to be ascribed to the compact texture of their skins, which defends them from the impression of cold through their pores.

The northern Indians resemble them in this respect. The utmost rigours of the winter season do not prevent them from following the chase almost naked. It is true, they wear a kind of woollen cloak, or sometimes the skin of a wild beast, upon their shoulders; but besides that it covers only a small part of their body, it would appear that they use it rather for ornament than warmth. In fact, they wear it indiscriminately, in the severities of winter and in the most sultry heats of summer,

America. summer, when neither Europeans nor negroes can suffer any but the slightest clothing. They even frequently throw aside this cloak when they go a hunting, that it may not embarrass them in traversing their forests, where they say the thorns and undergrowth would take hold of it; while, on the contrary, they slide smoothly over the surface of their naked bodies. At all times they go with their heads uncovered, without suffering the least inconvenience, either from the cold, or from those *coups de soleil*, which in Louisiana are so often fatal to the inhabitants of other climates.

The Indians of South America distinguish themselves by modern dresses, in which they affect various tastes. Those of the high country, and of the valleys in Peru, dress partly in the Spanish fashion. Instead of hats they wear bonnets of course double cloth, the weight of which neither seems to incommode them when they go to warmer climates, nor does the accidental want of them seem to be felt in situations where the most piercing cold reigns. Their legs and feet are always bare, if we except a sort of sandals made of the skins of oxen. The inhabitants of South America, compared with those of North America, are described as generally more feeble in their frame, less vigorous in the efforts of their mind, of gentler dispositions, more addicted to pleasure, and sunk in indolence.—This, however, is not universally the case. Many of their nations are as intrepid and enterprising as any others on the whole continent. Among the tribes on the banks of the Oroonoko, if a warrior aspires to the post of a captain, his probation begins with a long fast, more rigid than any ever observed by the most abstemious hermit. At the close of this the chiefs assemble; and each gives him three lashes with a large whip, applied so vigorously, that his body is almost flayed. If he betrays the least symptom of impatience, or even of sensibility, he is disgraced for ever, and rejected as unworthy of the honour. After some interval, his constancy is proved by a more excruciating trial. He is laid in his hammock with his hands bound fast; and an innumerable multitude of venomous ants, whose bite occasions violent pain and inflammation, are thrown upon him. The judges of his merit stand around the hammock; and whilst these cruel insects fasten upon the most sensible parts of his body, a sigh, a groan, or an involuntary motion expressive of what he suffers, would exclude him from the dignity of which he is ambitious. Even after this evidence, his fortitude is not deemed to be sufficiently ascertained, till he has stood another test more severe, if possible, than the former. He is again suspended in his hammock, and covered with the leaves of the palmetto. A fire of stinking herbs is kindled underneath, so as he may feel its heat, and be involved in smoke. Though scorched and almost suffocated, he must continue to endure this with the same patient insensibility. Many perish in this essay of their firmness and courage; but such as go through it with applause, receive the ensigns of their new dignity with much solemnity, and are ever after regarded as leaders of approved resolution, whose behaviour in the most trying situations, will do honour to their country. In North America, the previous trial of a warrior is neither so formal nor so severe: Though, even there, before a youth is permitted to bear arms, his patience and fortitude are proved by

14 Terrible trials undergone by their chiefs.

blows, by fire, and by insults, more intolerable to a haughty spirit than either.

America.

Of the manners and customs of the North Americans more particularly, the following is the most consistent account that can be collected from the best informed and most impartial writers.

15 Customs and dispositions of the North Americans more particularly.

When the Europeans first arrived in America, they found the Indians quite naked, except those parts which even the most uncultivated people usually conceal. Since that time, however, they generally use a coarse blanket, which they buy of the neighbouring planters.

Their huts or cabins are made of stakes of wood driven into the ground, and covered with branches of trees or reeds. They lie on the floor, either on mats or the skins of wild beasts. Their dishes are of timber; but their spoons are made of the skulls of wild oxen, and their knives of flint. A kettle and a large plate constitute almost the whole utensils of the family. Their diet consists chiefly in what they procure by hunting; and sagamite, or pottage, is likewise one of their most common kinds of food. The most honourable furniture among them are the scalps of their enemies; with these they ornament their huts, which are esteemed in proportion to the number of this sort of spoils.

The character of the Indians is altogether founded upon their circumstances and way of life. A people who are constantly employed in procuring the means of a precarious subsistence, who live by hunting the wild animals, and who are generally engaged in war with their neighbours, cannot be supposed to enjoy much gaiety of temper, or a high flow of spirits. The Indians therefore are in general grave even unto sadness: they have nothing of that giddy vivacity peculiar to some nations of Europe, and they despise it. Their behaviour to those about them is regular, modest, and respectful. Ignorant of the arts of amusement, of which that of saying trifles agreeably is one of the most considerable, they never speak, but when they have something important to observe; and all their actions, words, and even looks, are attended with some meaning. This is extremely natural to men who are almost continually engaged in pursuits which to them are of the highest importance. Their subsistence depends entirely on what they procure with their hands; and their lives, their honour, and every thing dear to them, may be lost by the smallest inattention to the designs of their enemies. As they have no particular object to attach them to one place rather than another, they fly wherever they expect to find the necessaries of life in greatest abundance. Cities, which are the effects of agriculture and arts, they have none. The different tribes or nations are for the same reason extremely small, when compared with civilized societies, in which industry, arts, agriculture, and commerce, have united a vast number of individuals whom a complicated luxury renders useful to one another, These small tribes live at an immense distance; they are separated by a desert frontier, and hid in the bosom of impenetrable and almost boundless forests.

16 Their remarkable pensiveness and taciturnity.

There is established in each society a certain species of government, which over the whole continent of America prevails with exceeding little variation; because over the whole of this continent the manners and way

17 Form of government among them.

of

America. of life are nearly similar and uniform. Without arts, riches, or luxury, the great instruments of subjection in polished societies, an American has no method by which he can render himself considerable among his companions, but by superiority in personal qualities of body or mind. But as Nature has not been very lavish in her personal distinctions, where all enjoy the same education, all are pretty much equal, and will desire to remain so. Liberty, therefore, is the prevailing passion of the Americans; and their government, under the influence of this sentiment, is better secured than by the wisest political regulations. They are very far, however, from despising all sort of authority; they are attentive to the voice of wisdom, which experience has conferred on the aged, and they enlist under the banners of the chief in whose valour and military address they have learned to repose their confidence. In every society, therefore, there is to be considered the power of the chief and of the elders; and, according as the government inclines more to the one or to the other, it may be regarded as monarchical, or as a species of aristocracy. Among those tribes which are most engaged in war, the power of the chief is naturally predominant; because the idea of having a military leader was the first source of his superiority, and the continual exigencies of the state requiring such a leader, will continue to support, and even to enhance it. His power, however, is rather persuasive than coercive; he is reverenced as a father, rather than feared as a monarch. He has no guards, no prisons, no officers of justice; and one act of ill-judged violence would pull him from the throne. The elders, in the other form of government, which may be considered as an aristocracy, have no more power. In some tribes, indeed, there are a kind of hereditary nobility, whose influence, being constantly augmented by time, is more considerable. (See the article NIAGARA). But this source of power which depends chiefly on the imagination, by which we annex to the merit of our contemporaries that of their forefathers, is too refined to be very common among the natives of America. In most countries, therefore, age alone is sufficient for acquiring respect, influence, and authority. It is age which

18 Their public assemblies.

teaches experience, and experience is the only source of knowledge among a barbarous people. Among those persons, business is conducted with the utmost simplicity, and which may recal to those who are acquainted with antiquity a picture of the most early ages. The heads of families meet together in a house or cabin appointed for the purpose. Here the business is discussed; and here those of the nation, distinguished for their eloquence or wisdom, have an opportunity of displaying those talents. Their orators, like those of Homer, express themselves in a bold figurative style, stronger than refined, or rather softened, nations can well bear, and with gestures equally violent, but often extremely natural and expressive. When the business is over, and they happen to be well provided with food, they appoint a feast upon the occasion, of which almost the whole nation partakes. The feast is accompanied with a song, in which the real or fabulous exploits of their forefathers are celebrated. They have dances too, though, like those of the Greeks and Romans, chiefly of the military kind; and their music and dancing accompany every feast.

America. To assist their memory, they have belts of small shells or beads, of different colours, each representing a particular object, which is marked by their colour and arrangement. At the conclusion of every subject on which they discourse, when they treat with a foreign state, they deliver one of those belts; for if this ceremony should be omitted, all that they have said passes for nothing. These belts are carefully deposited in each town, as the public records of the nation; and to them they occasionally have recourse, when any public contest happens with a neighbouring tribe. Of late, as the materials of which those belts are made have become scarce, they often give some skin in place of the wampum (the name of the beads), and receive in return presents of a more valuable kind from our commissioners; for they never consider a treaty as of any weight, unless every article in it be ratified by such a gratification.

19 Wampum or belts.

It often happens, that those different tribes or nations, scattered as they are at an immense distance from one another, meet in their excursions after prey. If there subsists no animosity between them, which seldom is the case, they behave in the most friendly and courteous manner; but if they happen to be in a state of war, or if there has been no previous intercourse between them, all who are not friends are deemed enemies, and they fight with the most savage fury.

20 Their wars.

War, if we except hunting, is the only employment of the men: as to every other concern, and even the little agriculture they enjoy, it is left to the women. Their most common motive for entering into war, when it does not arise from an accidental rencounter or interference, is either to revenge themselves for the death of some lost friends, or to acquire prisoners who may assist them in their hunting, and whom they adopt into their society. These wars are either undertaken by some private adventurers, or at the instance of the whole community. In the latter case, all the young men who are disposed to go out to battle (for no one is compelled contrary to his inclination), give a bit of wood to the chief, as a token of their design to accompany him; for every thing among those people is transacted with a great deal of ceremony and many forms. The chief who is to conduct them fasts several days, during which he converses with no one, and is particularly careful to observe his dreams; which the presumption natural to savages generally renders as favourable as he could desire. A variety of other superstitions and ceremonies are observed. One of the most hideous is setting the war-kettle on the fire, as an emblem that they are going out to devour their enemies; which among some nations must formerly have been the case, since they still continue to express it in clear terms, and use an emblem significant of the ancient usage. Then they dispatch a porcelain, or large shell, to their allies, inviting them to come along, and drink the blood of their enemies. For with the Americans, as with the Greeks of old,

21 Ceremonies before setting out.

"A generous friendship no cold medium knows;
"But with one love, with one resentment, glows."

They think that those in their alliance must not only adopt their enmities, but have their resentment wound up to the same pitch with themselves. And indeed no people carry their friendship or their resentment so

far

America. far as they do; and this is what should be expected from their peculiar circumstances; that principle in human nature which is the spring of the social affections, acts with so much the greater force the more it is restrained. The Americans, who live in small societies, who see few objects and few persons, become wonderfully attached to these objects and persons, and cannot be deprived of them without feeling themselves miserable. Their ideas are too confined to enable them to entertain just sentiments of humanity, or universal benevolence. But this very circumstance, while it makes them cruel and savage to an incredible degree towards those with whom they are at war, adds a new force to their particular friendships, and to the common tie which unites the members of the same tribe, or of those different tribes which are in alliance with one another. Without attending to this reflection, some facts we are going to relate would excite our wonder, without informing our reason; and we should be bewildered in a number of particulars, seemingly opposite to one another, without being sensible of the general cause from which they proceed.

Having finished all the ceremonies previous to the war, and the day appointed for their setting out on the expedition being arrived, they take leave of their friends, and exchange their clothes, or whatever moveables they have, in token of mutual friendship; after which they proceed from the town, their wives and female relations walking before, and attending them to some distance. The warriors march all dressed in their finest apparel and most showy ornaments, without any order. The chief walks slowly before them, singing the war-song, while the rest observe the most profound silence. When they come up to their women, they deliver them all their finery, and putting on their worst clothes, proceed on their expedition.

22 Ensigns. Every nation has its peculiar ensign or standard, which is generally some beast, bird, or fish. Those among the Five Nations are the bear, otter, wolf, tortoise, and eagle; and by these names the tribes are usually distinguished. They have the figures of those animals pricked and painted on several parts of their bodies; and when they march through the woods, they commonly, at every encampment, cut the representation of their ensign on trees, especially after a successful campaign; marking at the same time the number of

23 Military habits. scalps or prisoners they have taken. Their military dress is extremely singular. They cut off or pull out all their hair, except a spot about the breadth of two English crown pieces, near the top of their heads, and entirely destroy their eyebrows. The lock left upon their heads is divided into several parcels, each of which is stiffened and adorned with wampum, beads, and feathers of various kinds, the whole being twisted into a form much resembling the modern pompoon. Their heads are painted red down to the eyebrows, and sprinkled over with white down. The gristles of their ears are split almost quite round, and distended with wires or splinters so as to meet and tie together on the nape of the neck. These are also hung with ornaments, and generally bear the representation of some bird or beast. Their noses are likewise bored and hung with trinkets of beads, and their faces painted with various colours, so as to make an awful appearance. Their breasts are adorned with a gorget or medal, of brass, copper, or some other metal, and that dreadful weapon the scalping knife hangs by a string from their neck. America.

The great qualities in an Indian war are vigilance and attention, to give and to avoid a surprise; and indeed in these they are superior to all nations in the world. Accustomed to continual wandering in the forests, having their perceptions sharpened by keen necessity, and living in every respect according to nature, their external senses have a degree of acuteness which at first view appears incredible. They can trace out their enemies at an immense distance by the smoke of their fires, which they smell, and by the tracks of their feet on the ground, imperceptible to an European eye, but which they can count and distinguish with the utmost facility. They can even distinguish the different nations with whom they are acquainted, and can determine the precise time when they passed, where an European could not, with all his glasses, distinguish footsteps at all. These circumstances, however, are of small importance, because their enemies are no less acquainted with them. When they go out, therefore, they take care to avoid making use of any thing by which they might run the danger of a discovery. They light no fire to warm themselves or to prepare their victuals: they lie close to the ground all day, and travel only in the night; and marching along in files, he that closes the rear diligently covers with leaves the tracks of his own feet and of theirs who preceded him. When they halt to refresh themselves, scouts are sent out to reconnoitre the country, and beat up every place where they suspect an enemy to lie concealed. In this manner they enter unawares the villages of their foes; and, while the flower of the nation are engaged in hunting, massacre all the children, women, and helpless old men, or make prisoners of as many as they can manage, or have strength enough to be useful to their nation. But when the enemy is apprised of their design, and coming on in arms against them, they throw themselves flat on the ground among the withered herbs and leaves, which their faces are painted to resemble. Then they allow a part to pass unmolested, when all at once, with a tremendous shout, rising up from their ambush, they pour a storm of musket bullets on their foes. The party attacked returns the same cry. Every one shelters himself with a tree, and returns the fire of the adverse party, as soon as they raise themselves from the ground to give a second fire. Thus does the battle continue until the one party is so much weakened as to be incapable of farther resistance. But if the force on each side continues nearly equal, the fierce spirits of the savages, inflamed by the loss of their friends, can no longer be restrained. They abandon their distant war, they rush upon one another with clubs and hatchets in their hands, magnifying their own courage, and insulting their enemies with the bitterest reproaches. A cruel combat ensues, death appears in a thousand hideous forms, which would congeal the blood of civilized nations to behold, but which rouse the fury of savages. They trample, they insult over the dead bodies, tearing the scalp from the head, wallowing in their blood like wild beasts, and sometimes devouring their flesh. The flame rages on till it meets with no resistance; then the prisoners are secured, those unhappy men,

24 Quickness of their senses.

25 Vigilance and circumspection.

26 Manner of fighting.

America. whose fate is a thousand times more dreadful than theirs who have died in the field. The conquerors set up a hideous howling to lament the friends they have lost. They approach in a melancholy and severe gloom to their own village; a messenger is sent to announce their arrival, and the women, with frightful shrieks, come out to mourn their dead brothers or their husbands. When they are arrived, the chief relates in a low voice to the elders a circumstantial account of every particular of the expedition. The orator proclaims aloud this account to the people; and as he mentions the names of those who have fallen, the shrieks of the women are redoubled. The men too join in these cries, according as each is most connected with the deceased by blood or friendship. The last ceremony is the proclamation of the victory: each individual then forgets his private misfortunes, and joins in the triumph of his nation; all tears are wiped from their eyes, and by an unaccountable transition, they pass in a moment from the bitterness of sorrow to an extravagance of joy. But the treatment of the prisoners, whose fate all this time remains undecided, is what chiefly characterizes the savages.

We have already mentioned the strength of their affections or resentments. United as they are in small societies, connected within themselves by the firmest ties, their friendly affections, which glow with the most intense warmth within the walls of their own village, seldom extend beyond them. They feel nothing for the enemies of their nation; and their resentment is easily extended from the individual who has injured them to all others of the same tribe. The prisoners, who have themselves the same feelings, know the intentions of their conquerors, and are prepared for them.

27 Treatment of their prisoners. The person who has taken the captive attends him to the cottage, where, according to the distribution made by the elders, he is to be delivered to supply the loss of a citizen. If those who receive him have their family weakened by war or other accidents, they adopt the captive into the family, of which he becomes a member. But if they have no occasion for him, or their resentment for the loss of their friends be too high to endure the sight of any connected with those who were concerned in it, they sentence him to death. All those who have met with the same severe sentence being collected, the whole nation is assembled at the execution, as for some great solemnity. A scaffold is erected, and the prisoners are tied to the stake, where they commence their death-song, and prepare for the ensuing scene of cruelty with the most undaunted courage. Their enemies, on the other side, are determined to put it to the proof, by the most refined and exquisite tortures. They begin at the extremity of his body, and gradually approach the more vital parts. One plucks out his nails by the roots, one by one; another takes a finger into his mouth, and tears off the flesh with his teeth; a third thrusts the finger, mangled as it is, into the bowl of a pipe made red hot, which he smokes like tobacco; then they pound his toes and fingers to pieces between two stones; they cut circles about his joints, and gashes in the fleshy parts of his limbs, which they sear immediately with red-hot irons, cutting, burning, and piercing them alternately; they pull off his flesh, thus mangled and roasted, bit by bit, devouring it with greediness, and smearing their faces with the blood in an enthusiasm of horror and fury. When they have thus torn off the flesh, they twist the bare nerves and tendons about an iron, tearing and snapping them, whilst others are employed in pulling and extending their limbs in every way that can increase the torment. This continues often five or six hours; and sometimes, such is the strength of the savages, days together. Then they frequently unbind him, to give a breathing to their fury, to think what new torments they shall inflict, and to refresh the strength of the sufferer, who, wearied out with such a variety of unheard-of torments, often falls into so profound a sleep, that they are obliged to apply the fire to awake him, and renew his sufferings. He is again fastened to the stake, and again they renew their cruelty; they stick him all over with small matches of wood that easily takes fire, but burns slowly; they continually run sharp reeds into every part of his body; they drag out his teeth with pincers, and thrust out his eyes; and lastly after having burned his flesh from the bones with slow fires; after having so mangled the body that it is all but one wound; after having mutilated his face in such a manner as to carry nothing human in it; after having peeled the skin from the head, and poured a heap of red-hot coals or boiling water on the naked skull—they once more unbind the wretch; who, blind, and staggering with pain and weakness, assaulted and pelted upon every side with clubs and stones, now up, now down, falling into their fires at every step, runs, hither and thither, until one of the chiefs, whether out of compassion, or weary of cruelty, puts an end to his life with a club or dagger. The body is then put into a kettle, and this barbarous employment is succeeded by a a feast as barbarous.

28 Shocking tortures.

America.

The women, forgetting the human as well as the female nature, and transformed into something worse than furies, even outdo the men in this scene of horror; while the principal persons of the country sit round the stake, smoking and looking on without the least emotion. What is most extraordinary, the sufferer himself, in the little intervals of his torments, smokes too, appears unconcerned, and converses with his torturers about different matters. Indeed, during the whole time of his execution, there seems a contest which shall exceed, they in inflicting the most horrid pains, or he in enduring them with a firmness and constancy almost above human: not a groan, not a sigh, not a distortion of countenance escapes him; he possesses his mind entirely in the midst of his torments; he recounts his own exploits; he informs them what cruelties he has inflicted upon their countrymen, and threatens them with the revenge that will attend his death; and, though his reproaches exasperate them to a perfect madness of rage and fury, he continues his insults even of their ignorance of the art of tormenting, pointing out himself more exquisite methods, and more sensible parts of the body to be afflicted. The women have this part of courage as well as the men; and it is as rare for an Indian to behave otherwise, as it would be for any European to suffer as an Indian. Such is the wonderful power of an early institution, and a ferocious thirst of glory. "I am brave and intrepid (exclaims the savage in the face of his tormentors); I do not fear death, nor any kind of tortures; those who fear them are cowards; they are less than women;

29 Constancy of the sufferers.

women: life is nothing to those who have courage: May my enemies be confounded with despair and rage! Oh! that I could devour them, and drink their blood to the last drop."

30 Surprising contrast in the American character.

But neither the intrepidity on one side, nor the inflexibility on the other, are among themselves matter of astonishment: for vengeance, and fortitude in the midst of torment, are duties which they consider as sacred; they are the effects of their earliest education, and depend upon principles instilled into them from their infancy. On all other occasions they are humane and compassionate. Nothing can exceed the warmth of their affection toward their friends, who consist of all those who live in the same village, or are in alliance with it. Among these all things are common; and this, though it may in part arise from their not possessing very distinct notions of separate property, is chiefly to be attributed to the strength of their attachments; because in every thing else, with their lives as well as their fortunes, they are ready to serve their friends. Their houses, their provisions, even their young women, are not enough to oblige a guest. Has any one of these succeeded ill in his hunting; has his harvest failed; or is his house burned—he feels no other effect of his misfortune, than that it gives him an opportunity of experiencing the benevolence and regard of his fellow-citizens. On the other hand, to the enemies of his country, or to those who have privately offended, the American is implacable. He conceals his sentiments, he appears reconciled, until by some treachery or surprise he has an opportunity of executing a horrible revenge. No length of time is sufficient to allay his resentment; no distance of place great enough to protect the object: he crosses the steepest mountains, he pierces the most impracticable forests, and traverses the most hideous bogs and deserts for several hundreds of miles; bearing the inclemency of the seasons, the fatigue of the expedition, the extremes of hunger and thirst, with patience and cheerfulness, in hopes of surprising his enemy, on whom he exercises the most shocking barbarities, even to the eating of his flesh. To such extremes do the Indians push their friendship or their enmity; and such indeed, in general, is the character of all strong and uncultivated minds.

31 Treatment of their dead friends.

But what we have said respecting the Indians would be a faint picture, did we omit observing the force of their friendship, which principally appears by the treatment of their dead. When any one of the society is cut off, he is lamented by the whole. On this occasion a thousand ceremonies are practised, denoting the most lively sorrow. No business is transacted, however pressing, till all the pious ceremonies due to the dead are performed. The body is washed, anointed, and painted. Then the women lament the loss with hideous howlings, intermixed with songs which celebrate the great actions of the deceased and his ancestors. The men mourn in a less extravagant manner. The whole village is present at the interment, and the corpse is habited in the most sumptuous ornaments. Close to the body of the defunct are placed his bows and arrows, with whatever he valued most in his life, and a quantity of provisions for his subsistence on the journey which he is supposed to take. This solemnity, like every other, is attended with feasting. The funeral being ended, the relations of the deceased confine themselves to their hut for a considerable time to indulge their grief. After an interval of some weeks they visit the grave, repeat their sorrow, new clothe the remains of the body, and act over again all the solemnities of the funeral.

Among the various tokens of their regard for their deceased friends, the most remarkable is what they call the *feast of the dead*, or the *feast of souls*. The day for this ceremony is appointed in the council of their chiefs, who give orders for every thing which may enable them to celebrate it with pomp and magnificence; and the neighbouring nations are invited to partake of the entertainment. At this time all who have died since the preceding feast of the kind are taken out of their graves. Even those who have been interred at the greatest distance from the villages are diligently sought for, and conducted to this rendezvous of the dead, which exhibits a scene of horror beyond the power of description.—When the feast is concluded, the bodies are dressed in the finest skins which can be procured, and after being exposed for some time in this pomp, are again committed to the earth with great solemnity, which is succeeded by funeral games.

32 Superstitions.

Their taste for war, which forms the chief ingredient in their character, gives a strong bias to their religion. Areskoui, or the god of battle, is revered as the great god of the Indians. Him they invoke before they go into the field; and according as his disposition is more or less favourable to them, they conclude they will be more or less successful. Some nations worship the sun and moon; among others there are a number of traditions, relative to the creation of the world and the history of the gods: traditions which resemble the Grecian fables, but which are still more absurd and inconsistent. But religion is not the prevailing character of the Indians: and except when they have some immediate occasion for the assistance of their gods, they pay them no sort of worship. Like all rude nations, however, they are strongly addicted to superstition. They believe in the existence of a number of good and bad genii or spirits, who interfere in the affairs of mortals, and produce all our happiness or misery. It is from the evil genii, in particular, that our diseases proceed; and it is to the good genii we are indebted for a cure. The ministers of the genii are the jugglers, who are also the only physicians among the savages. These jugglers are supposed to be inspired by the good genii, most commonly in their dreams, with the knowledge of future events; they are called in to the assistance of the sick, and are supposed to be informed by the genii whether they will get over the disease, and in what way they must be treated. But these spirits are extremely simple in their system of physic, and, in almost every disease, direct the juggler to the same remedy. The patient is enclosed in a narrow cabin, in the midst of which is a stone red hot: on this they throw water, until he is well soaked with the warm vapour and his own sweat. Then they hurry him from this bagnio, and plunge him suddenly into the next river. This coarse method, which costs many their lives, often performs very extraordinary cures. The jugglers have likewise the use of some specifics of wonderful efficacy; and all the savages are dexterous in curing wounds by the application of herbs. But the power of these remedies is al-

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ways attributed to the magical ceremonies with which they are administered.

33 Condition of their women.

Though the women generally bear the laborious part of domestic economy, their condition is far from being so slavish as it appears. On the contrary, the greatest respect is paid by the men to the female sex. The women even hold their councils, and have their share in all deliberations which concern the state. Polygamy is practised by some nations, but is not general. In most, they content themselves with one wife; but a divorce is admitted in case of adultery. No nation of the Americans is without a regular marriage, in which there are many ceremonies; the principal of which is, the bride's presenting the bridegroom with a plate of their corn. The women, though before incontinent, are remarkable for chastity after marriage.

34 Their ardent love of liberty.

Liberty, in its full extent, being the darling passion of the Indians, their education is directed in such a manner as to cherish this disposition to the utmost. Hence children are never upon any account chastised with blows, and they are seldom even reprimanded. Reason, they say, will guide their children when they come to the use of it, and before that time their faults cannot be very great: but blows might damp their free and martial spirit, by the habit of a slavish motive to action. When grown up, they experience nothing like command, dependence, or subordination; even strong persuasion is industriously withheld by those who have influence among them.—No man is held in great esteem, unless he has increased the strength of his country with a captive, or adorned his hut with a scalp of one of his enemies.

35 Crimes and punishments.

Controversies among the Indians are few, and quickly decided. When any criminal matter is so flagrant as to become a national concern, it is brought under the jurisdiction of the great council: but in ordinary cases, the crime is either revenged or compromised by the parties concerned. If a murder be committed, the family which has lost a relation prepares to retaliate on that of the offender. They often kill the murderer; and when this happens, the kindred of the last person slain look upon themselves to be as much injured, and to have the same right to vengeance, as the other party. In general, however, the offender absents himself; the friends send compliments of condolence to those of the person that has been murdered. The head of the family at length appears with a number of presents, the delivery of which he accompanies with a formal speech. The whole ends, as usual, in mutual feastings, songs, and dances. If the murder is committed by one of the same family or cabin, that cabin has the full right of judgment within itself, either to punish the guilty with death, or to pardon him, or to oblige him to give some recompense to the wife or children of the slain. Instances of such a crime, however, very seldom happen; for their attachment to those of the same family is remarkably strong, and is said to produce such friendships as may vie with the most celebrated in fabulous antiquity.

36 Peculiar manners of different nations.

Such, in general, are the manners and customs of the Indian nations; but every tribe has something peculiar to itself. Among the Hurons and Natches, the dignity of the chief is hereditary, and the right of succession in the female line. When this happens to be extinct, the most respectable matron of the tribe makes choice of whom she pleases, to succeed.

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The Cherokees are governed by several sachems or chiefs, elected by the different villages; as are also the Creeks and Chactaws. The two latter punish adultery in a woman by cutting off her hair, which they will not suffer to grow till the corn is ripe the next season; but the Illinois, for the same crime, cut off the women's noses and ears.

The Indians on the lakes are formed into a sort of empire; and the emperor is elected from the eldest tribe, which is that of the Ottowawaws. He has the greatest authority of any chief that has appeared on the continent since our acquaintance with it. A few years ago, the person who held this rank formed a design of uniting all the Indian nations under his sovereignty; but he miscarried in the attempt.

37 Longevity of the Indians.

In general, the American Indians live to a great age, although it is not possible to know from themselves the exact number of their years. It was asked of an Indian, who appeared to be extremely old, what age he was of? I am above twenty, was his reply. Upon putting the question in a different form, by reminding him of certain circumstances in former times, My machu, said he, spoke to me when I was young of the Incas; and he had seen these princes. According to this reply, there must have elapsed, from the date of his machu's (his grandfather's) remembrance to that time, a period of at least 232 years. The man who made this reply appeared to be 120 years of age: for, besides the whiteness of his hair and beard, his body was almost bent to the ground; without, however, showing any other marks of debility or suffering. This happened in 1764. This longevity, attended in general with uninterrupted health, is probably the consequence in part of their vacancy from all serious thought and employment, joined also with the robust texture and conformation of their bodily organs. If the Indians did not destroy one another in their almost perpetual wars, and if their habits of intoxication were not so universal and incurable, they would be, of all the races of men who inhabit the globe, the most likely to prolong, not only the bounds, but the enjoyments, of animal life to their utmost duration.

38 Other pictures of the Americans.

LET us now attend to other pictures which have been given of the aboriginal inhabitants of the new world. The vices and defects of the American Indians have by several writers been most unaccountably aggravated, and every virtue and good quality denied them. Their cruelties have been already described and accounted for. The following anecdote of an Algonquin woman we find adduced as a remarkable proof of their innate thirst of blood. That nation being at war with the Iroquois, she happened to be made prisoner, and was carried to one of the villages belonging to them. Here she was stripped naked, and her hands and feet bound with ropes in one of their cabins. In this condition she remained ten days, the savages sleeping round her every night. The eleventh night, while they were asleep, she found means to disengage one of her hands, with which she immediately freed herself from the ropes, and went to the door. Though she had now an opportunity of escaping unperceived,

39 Anecdotes of an Algonquin woman.

America. ceived, her revengeful temper could not let slip so favourable an opportunity of killing one of her enemies. The attempt was manifestly at the hazard of her own life; yet, snatching up a hatchet, she killed the savage that lay next her; and, springing out of the cabin, concealed herself in a hollow tree which she had observed the day before. The groans of the dying person soon alarmed the other savages, and the young ones immediately set out in pursuit of her.—Perceiving from her tree, that they all directed their course one way, and that no savage was near her, she left her sanctuary, and, flying in an opposite direction, ran into a forest without being perceived. The second day after this happened, her footsteps were discovered, and they pursued her with such expedition, that the third day she discovered her enemies at her heels. Upon this she threw herself into a pond of water; and, diving among some weeds and bulrushes, she could just breath above water without being perceived. Her pursuers, after making the most diligent search, were forced to return.—For 35 days this woman held on her course through woods and deserts, without any other sustenance than roots and wild berries. When she came to the river St Lawrence, she made with her own hands a kind of a wicker raft, on which she crossed it. As she went by the French fort Trois Rivieres, without well knowing where she was, she perceived a canoe full of savages; and, fearing they might be Iroquois, run again into the woods, where she remained till sunset.—Continuing her course, soon after she saw the Trois Rivieres; and was then discovered by a party whom she knew to be Hurons, a nation in alliance with the Algonquins. She then squatted down behind a bush, calling out to them that she was not in a condition to be seen, because she was naked. They immediately threw her a blanket, and then conducted her to the fort, where she recounted her story.

40 Reproached with pusillanimity.

Personal courage has been denied them. In proof of their pusillanimity, the following incidents are quoted from Charlevoix by Lord Kames, in his Sketches of the History of Man. "The fort de Vercheres in Canada, belonging to the French, was, in the year 1690, attacked by some Iroquois. They approached silently, preparing to scale the palisade, when some musket shot made them retire. Advancing a second time, they were again repulsed, wondering that they should discover none but a woman who was seen everywhere. This was Madame de Vercheres, who appeared as resolute as if supported by a numerous garrison. The hopes of storming a place without men to defend it occasioned reiterated attacks. After two days siege, they retired, fearing to be intercepted in their retreat. Two years after, a party of the same nation appeared before the fort so unexpectedly, that a girl of fourteen, daughter of the proprietor, had but time to shut the gate. With the young woman there was not a soul but one raw soldier. She showed herself with her assistant, sometimes in one place and sometimes in another; changing her dress frequently, in order to give some appearance of a garrison; and always fired opportunely. The faint-hearted Iroquois decamped without success."

There is no instance, it is said, either of a single Indian facing an individual of any other nation in fair and open combat, or of their jointly venturing to try the fate of battle with an equal number of any foes. Even with the greatest superiority of numbers, they dare not meet an open attack. Yet, notwithstanding this want of courage, they are still formidable; nay, it has been known, that a small party of them has routed a much superior body of regular troops: but this can only happen when they have surprised them in the fastnesses of their forests, where the covert of the wood may conceal them until they take their aim with the utmost certainty. After one such discharge they immediately retreat, without leaving the smallest trace of their route. It may easily be supposed, that an onset of this kind must produce confusion even among the steadiest troops, when they can neither know the number of their enemies, nor perceive the place where they lie in ambush. America.

41 Accused of perfidy.

Perfidy combined with cruelty has been also made a part of their character. Don Ulloa relates, That the Indians of the country called *Natches*, in Louisiana, laid a plot for massacring in one night every individual belonging to the French colony established there. This plot they actually executed, notwithstanding the seeming good understanding that subsisted between them and these European neighbours. Such was the secrecy which they observed, that no person had the least suspicion of their design until the blow was struck. One Frenchman alone escaped, by favour of the darkness, to relate the disaster of his countrymen. The compassion of a female Indian contributed also in some measure to his exemption from the general massacre. The tribe of Natches had invited the Indians of other countries, even to a considerable distance, to join in the same conspiracy. The day, or rather the night, was fixed, on which they were to make an united attack on the French colonists. It was intimated by sending a parcel of rods, more or less numerous according to the local distance of each tribe, with an injunction to abstract one rod daily; the day on which the last fell to be taken away being that fixed for the execution of their plan. The women were partners of the bloody secret. The parcels of rods being thus distributed, that belonging to the tribe of Natches happened to remain in the custody of a female. This woman, either moved by her own feelings of compassion, or by the commiseration expressed by her female acquaintances in the view of the proposed scene of bloodshed, abstracted one day three or four of the rods, and thus anticipated the term of her tribe's proceeding to the execution of the general conspiracy. The consequence of this was, that the Natches were the only actors in this carnage; their distant associates having still several rods remaining at the time when the former made the attack. An opportunity was thereby given to the colonists in those quarters to take measures for their defence, and for preventing a more extensive execution of the design.

It was by conspiracies similar to this that the Indians of the province of Macas, in the kingdom of Quito, destroyed the opulent city of Logrogno, the colony of Guambaya, and its capital Sevilla del Oro; and that so completely, that it is no longer known in what place these settlements existed, or where that abundance of gold was found from which the last-mentioned city took the addition to its name. Like ravages have been committed upon l'Imperiale in Chili, the colonies of the Missions of Chuncas, those of Darien in Terra Firma, and

America. and many other places which have afforded scenes of this barbarous ferocity. These conspiracies are always carried on in the same manner. The secret is inviolably kept, the actors assemble at the precise hour appointed, and every individual is animated with the same sanguinary purposes. The males that fall into their hands are put to death with every shocking circumstance that can be suggested by a cool and determined cruelty. The females are carried off, and preserved as monuments of their victory, to be employed as their occasions require.

Nor can this odious cruelty and treachery, it is said, be justly ascribed to their subjection to a foreign yoke, seeing the same character belongs equally to all the original inhabitants of this vast continent, even those who have preserved their independence most completely. Certain it is, continues he, that these people, with the most limited capacities for every thing else, display an astonishing degree of penetration and subtlety with respect to every object that involves treachery, bloodshed, and rapine. As to these, they seem to have been all educated at one school; and a secret, referring to any such plan, no consideration on earth can extort from them.

42 Their understanding represented as weak.

Their understandings also have been represented as not less contemptible than their manners are gross and brutal. Many nations are neither capable of forming an arrangement for futurity; nor does their solicitude or foresight extend so far. They set no value upon those things of which they are not in some immediate want. In the evening, when a Carib is going to rest, no consideration will tempt him to sell his hammock; but in the morning he will part with it for the slightest trifle. At the close of winter, a North American, mindful of what he has suffered from the cold, sets himself with vigour to prepare materials for erecting a comfortable hut to protect him against the inclemency of the succeeding season: but as soon as the weather becomes mild, he abandons his work, and never thinks of it more till the return of the cold compels him to resume it.—In short, to be free from labour seems to be the utmost wish of an American. They will continue whole days stretched in their hammocks, or seated on the earth, without changing their posture, raising their eyes, or uttering a single word. They cannot compute the succession of days nor of weeks. The different aspects of the moon alone engage their attention as a measure of time. Of the year they have no other conception than what is suggested to them by the alternate heat of summer and cold of winter; nor have they the least idea of applying to this period the obvious computation of the months which it contains. When it is asked of any old man in Peru, even the most civilized, what age he is of; the only answer he can give is the number of caciques he has seen. It often happens, too, that they only recollect the most distant of these princes in whose time certain circumstances had happened peculiarly memorable, while of those that lived in a more recent period they have lost all remembrance.

43 Alleged indolence and stupidity.

The same gross stupidity is alleged to be observable in those Indians who have retained their original liberty. They are never known to fix the dates of any events in their minds, or to trace the succession of circumstances that have arisen from such events. Their imagination takes in only the present, and in that only what intimately concerns themselves. Nor can discipline or instruction overcome this natural defect of apprehension. In fact, the subjected Indians in Peru, who have a continual intercourse with the Spaniards, who are furnished with curates perpetually occupied in giving them lessons of religion and morality, and who mix with all ranks of the civilized society established among them, are almost as stupid and barbarous as their countrymen who have had no such advantages. The Peruvians, while they lived under the government of their Incas, preserved the records of certain remarkable events. They had also a kind of regular government, described by the historians of the conquest of Peru. This government originated entirely from the attention and abilities of their princes, and from the regulations enacted by them for directing the conduct of their subjects. This ancient degree of civilization among them gives ground to presume, that their legislators sprung from some race more enlightened than the other tribes of Indians; a race of which no individual seems to remain in the present times.

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44 Their vanity and conceit.

Vanity and conceit are said to be blended with their ignorance and treachery. Notwithstanding all they suffer from Europeans, they still, it is said, consider themselves as a race of men far superior to their conquerors. This proud belief, arising from their perverted ideas of excellence, is universal over the whole known continent of America. They do not think it possible that any people can be so intelligent as themselves. When they are detected in any of their plots, it is their common observation, that the Spaniards, or *Viracochas*, want to be as knowing as they are. Those of Louisiana, and the countries adjacent, are equally vain of their superior understanding, confounding that quality with the cunning which they themselves constantly practise. The whole object of their transactions is to overreach those with whom they deal. Yet, though faithless themselves, they never forgive the breach of promise on the part of others. While the Europeans seek their amity by presents, they give themselves no concern to secure a reciprocal friendship. Hence, probably, arises their idea, that they must be a superior race of men, in ability and intelligence, to those who are at such pains to court their alliance and avert their enmity.

45 Their eloquence disparaged.

Their natural eloquence has also been decried. The free tribes of savages who enter into conventions with the Europeans, it is observed, are accustomed to make long, pompous, and, according to their own notions, sublime harangues, but without any method or connection. The whole is a collection of disjointed metaphors and comparisons. The light, heat, and course of the sun, form the principal topic of their discourse; and these unintelligible reasonings are always accompanied with violent and ridiculous gestures. Numberless repetitions prolong the oration, which, if not interrupted, would last whole days: At the same time, they meditate very accurately beforehand, in order to avoid mentioning any thing but what they are desirous to obtain. This pompous faculty of making speeches is also one of the grounds on which they conceive themselves to be superior to the nations of Europe: They imagine that it is their eloquence that procures them the favours they ask. The subjected Indians converse precisely

America. precisely in the same style. Prolix and tedious, they never know when to stop; so that, excepting by the difference in language, it would be impossible, in this respect, to distinguish a civilized Peruvian from an inhabitant of the most savage districts to the northward.

46 All these views partial, and not free from misrepresentation.

But such partial and detached views as the above, were they even free from misrepresentation, are not the just ground upon which to form an estimate of their character. Their qualities, good and bad (for they certainly possess both), their way of life, the state of society among them, with all the circumstances of their condition, ought to be considered in connexion, and in regard to their mutual influence. Such a view has been given in the preceding part of this article: from which, it is hoped, their real character may be easily deduced.

Many of the disagreeable traits exhibited in the anecdotes just quoted, are indeed extracted from Don Ulloa, an author of credit and reputation, but a Spaniard, and evidently biassed in some degree by a desire to palliate the enormities of his countrymen in that quarter of the globe. And with regard to the worst and least equivocal parts of the American character, cruelty and revenge, it may be fairly questioned, whether the instances of these, either in respect of their cause or their atrocity, be at all comparable to those exhibited in European history, and staining the annals of Christendom:—to those, for instance, of the Spaniards themselves, at their first discovery of America; to those indicated by the engines found on board their mighty Armada; to those which, in cold blood, were perpetrated by the Dutch at Amboyna; to the dragoonings of the French; to their religious massacres; or even to the *tender mercies* of the Inquisition?

47 The physical descriptions of Buffon and De Paw refuted. *Hist. of Mexico*, vol. ii. p. 328.

Still harsher, however, are the descriptions given by Buffon and de Paw of the natives of this whole continent, in which the most mortifying degeneracy of the human race, as well as of all the inferor animals, is asserted to be conspicuous. Against those philosophers, or rather theorists, the Americans have found an able advocate in the abbé Clavigero; an historian whose situation and long residence in America afforded him the best means of information, and who, though himself a subject of Spain, appears superior to prejudice, and disdains in his description the glosses of policy.

Concerning the stature of the Americans, M. de Paw says in general, that although it is not equal to the stature of the Castilians, there is but little difference between them. But the abbé Clavigero evinces that the Indians who inhabit those countries lying between 9 and 40 degrees of north latitude, which are the limits of the discoveries of the Spaniards, are more than five Parisian feet in height, and that those who did not reach that stature are as few in number among the Indians as they are amongst the Spaniards. It is besides certain that many of those nations, as the *Apaches*, the *Hiaquese*, the *Pimese*, and *Cochimies*, are at least as tall as the tallest Europeans; and that, in all the vast extent of the new world, no race of people has been found, except the Esquimaux, so diminutive in stature as the Laplanders, the Samojeds, and Tartars, in the north of the old continent. In this respect, therefore, the inhabitants of the two continents are upon an equality. America.

48 Stature, shape, &c.

Of the shape and character of the Mexican Indians the abbé gives a most advantageous description; which he asserts no one who reads it in America will contradict, unless he views them with the eye of a prejudiced mind. It is true, that Ulloa says, in speaking of the Indians of Quito, he had observed, "that imperfect people abounded among them; that they were either irregularly diminutive, or monstrous in some other respect; that they became either insensible, dumb, or blind, or wanted some limb of their body." Having therefore made some inquiry respecting this singularity of the Quitans, the abbé found that such defects were neither caused by bad humours, nor by the climate, but by the mistaken and blind humanity of their parents, who, in order to free their children from the hardships and toils to which the healthy Indians are subjected by the Spaniards, fix some deformity or weakness upon them, that they may become useless: a circumstance of misery which does not happen in other countries of America, nor in those places of the same kingdom of Quito, where the Indians are under no such oppression. M. de Paw, and, in agreement with him, Dr Robertson, says, that no deformed persons are to be found among the savages of America; because like the ancient Lacedemonians, they put to death those children which are born hunch-backed, blind, or defective in any limb; but that in those countries where they are formed into societies, and the vigilance of their rulers prevents the murder of such infants, the number of their deformed individuals is greater than it is in any country of Europe. This would make an exceeding good solution of the difficulty if it were true; but if, possibly, there has been in America a tribe of savages who have imitated the barbarous example of the celebrated Lacedemonians, it is certain that those authors have no grounds to impute such inhumanity to the rest of the Americans; for that it has not been the practice, at least with the far greater part of those nations, is to be demonstrated from the attestations of authors the best acquainted with their customs.

49 Errors concerning their want of beard, &c.

No argument against the new world can be drawn from the colour of the Americans; for their colour is less distant from the white of the Europeans than it is from the black of the Africans, and a great part of the Asiatics. The hair of the Mexicans, and of the greater part of the Indians, is, as we have already said, coarse and thick; on their face they appear to have little, and in general none on their arms and legs: but it is an error to say, as M. de Paw does, that they are entirely destitute of hair on all the other parts of their body. This is one of the many passages of the Philosophical Researches, at which the Mexicans, and all the other nations, must smile to find an European philosopher so eager to divest them of the dress they had from nature. Don Ulloa, indeed, in the description which he gives of the Indians of Quito, says, that hair neither grows upon the men nor upon the women when they arrive at puberty, as it does on the rest of mankind; but, whatever singularity may attend the Quitans, or occasion this circumstance, there is no doubt that among the Americans in general, the period of puberty is accompanied with the same symptoms as it is among

other

America. other nations of the world. In fact, with the North Americans, it is disgraceful to be hairy on the body. They say it likens them to hogs. They therefore pluck out the hair as fast as it appears. But the traders who marry their women, and prevail on them to discontinue this practice, say, that nature is the same with them as with the whites. As to the beards of the men, had Buffon or De Paw known the pains and trouble it costs them to pluck out by the roots the hair that grows on their faces, they would have seen that nature had not been deficient in that respect. Every nation has its customs. "I have seen an Indian beau, with a looking-glass in his hand (says Mr Jefferson), examining his face for hours together, and plucking out by the roots every hair he could discover, with a kind of tweezer made out of a piece of brass wire, that had been twisted round a stick, and which he used with great dexterity."

50 Their form and aspect contrasted with those of some other nations.

The very aspect of an Angolan, Mandingan, or Congan, would have shocked M. de Paw, and made him recal that censure which he passes on the colour, the make, and hair, of the Americans. What can be imagined more contrary to the idea we have of beauty, and the perfection of the human frame, than a man whose body emits a rank smell, whose skin is as black as ink, whose head and face are covered with black wool instead of hair, whose eyes are yellow and bloody, whose lips are thick and blackish, and whose nose is flat? Such are the inhabitants of a very large portion of Africa, and of many islands of Asia. What men can be more imperfect than those who measure no more than four feet in stature, whose faces are long and flat, the nose compressed, the irides yellow-black, the eyelids turned back towards the temples, the cheeks extraordinarily elevated, their mouths monstrously large, their lips thick and prominent, and the lower part of their visages extremely narrow? Such, according to Count de Buffon, are the Laplanders, the Zemblans, the Borandines, the Samojeds, and Tartars in the east. What objects more deformed than men whose faces are too long and wrinkled even in their youth, their noses thick and compressed, their eyes small and sunk, their cheeks very much raised, their upper jaw low, their teeth long and disunited, eyebrows so thick that they shade the eyes; the eyelids thick, some bristles on their faces instead of beard, large thighs and small legs? Such is the picture Count de Buffon gives of the Tartars; that is, of those people who, as he says, inhabit a tract of land in Asia 1200 leagues long and upwards, and more than 750 broad. Among these the Calmucks are the most remarkable for their deformity; which is so great, that, according to Tavernier, they are the most brutal men of all the universe. Their faces are so broad, that there is a space of five or six inches between their eyes, according as Count de Buffon himself affirms. In Calicut, in Ceylon, and other countries of India, there is, say Pyrard and other writers on these regions, a race of men who have one or both of their legs as thick as the body of a man; and that this deformity among them is almost hereditary. The Hottentots, besides other gross imperfections, have that monstrous irregularity attending them, of a callous appendage extending from the os pubis downwards, according to the testimony of the historians of the Cape of Good Hope. Struys, Gemelli, and other travellers affirm, that in the kingdom of Lambry, in the islands of Formosa and of Mindoro, men have been found with tails. Bomare says, that a thing of this kind in men is nothing else than an elongation of the os coccygis; but what is a tail in quadrupeds but the elongation of that bone, though divided into distinct articulations? However it may be, it is certain, that that elongation renders those Asiatics fully as irregular as if it was a real tail. America.

If we were, in like manner, to go through the nations of Asia and Africa, we should hardly find any extensive country where the colour of men is not darker, where there are not stronger irregularities observed, and grosser defects to be found in them, than M. de Paw finds fault with in the Americans. The colour of the latter is a good deal clearer than that of almost all the Africans and the inhabitants of southern Asia. Even their alleged scantiness of beard is common to the inhabitants of the Philippine islands, and of all the Indian archipelago, to the famous Chinese, Japanese, Tartars, and many other nations of the old continent. The imperfections of the Americans, however great they may be represented to be, are certainly not comparable with the defects of that immense people, whose character we have sketched, and others whom we omit.

51 Their constitution and corporal abilities.

M. de Paw represents the Americans to be a feeble and diseased set of nations; and in order to demonstrate the weakness and disorder of their physical constitution, adduces several proofs equally ridiculous and ill-founded, and which it will not be expected we should enumerate. He alleges, among other particulars, that they were overcome in wrestling by all the Europeans, and that they sunk under a moderate burden; that by a computation made, 200,000 Americans were found to have perished in one year from carrying of baggage. With respect to the first point, the abbé Clavigero observes, it would be necessary that the experiment of wrestling was made between many individuals of each continent, and that the victory should be attested by the Americans as well as the Europeans. It is not, however, meant to insist, that the Americans are stronger than the Europeans. They may be less strong, without the human species having degenerated, in them. The Swiss are stronger than the Italians; and still we do not believe the Italians are degenerated, nor do we tax the climate of Italy. The instance of 200,000 Americans having died in one year under the weight of baggage, were it true, would not convince us so much of the weakness of the Americans, as of the inhumanity of the Europeans. In the same manner that those 200,000 Americans perished, 200,000 Prussians would also have perished, had they been obliged to make a journey of between 300 and 400 miles, with 100 pounds of burden upon their backs; if they had collars of iron about their necks, and were obliged to carry that load over rocks and mountains; if those who became exhausted with fatigue, or wounded their feet so as to impede their progress, had their heads cut off that they might not retard the pace of the rest; and if they were not allowed but a small morsel of bread to enable them to support so severe a toil. Las Casas, from whom M. de Paw got the account of the 200,000 Americans who died under the fatigue of carrying baggage, relates also all the above-mentioned circumstances. If

that

America. that author therefore is to be credited in the last, he is also to be credited in the first. But a philosopher who vaunts the physical and moral qualities of Europeans over those of the Americans, would have done better, we think, to have suppressed facts so opprobrious to the Europeans themselves.

52 Their labour and industry.

Nothing in fact demonstrates so clearly the robustness of the Americans, as those various and lasting fatigues in which they are continually engaged. M. de Paw says, that when the new world was discovered, nothing was to be seen but thick woods; that at present there are some lands cultivated, not by the Americans, however, but by the Africans and Europeans; and that the soil in cultivation is to the soil which is uncultivated as 2000 to 2,000,000. These three assertions the abbé demonstrates to be precisely as many errors. Since the conquest, the Americans alone have been the people who have supported all the fatigues of agriculture in all the vast countries of the continent of South America, and in the greater part of those of North America subject to the crown of Spain. No European is ever to be seen employed in the labours of the field. The Moors who, in comparison of the Americans, are very few in number in the kingdom of New Spain, are charged with the culture of the sugar cane and tobacco, and the making of sugar; but the soil destined for the cultivation of those plants is not, with respect to all the cultivated land of that country, in the proportion of one to two thousand. The Americans are the people who labour on the soil. They are the tillers, the sowers, the weeders, and the reapers of the wheat, of the maize, of the rice, of the beans, and other kinds of grain and pulse; of the cacao, of the vanilla, of the cotton, of the indigo, and all other plants useful to the sustenance, the clothing, and commerce of those provinces; and without them so little can be done, that in the year 1762, the harvest of wheat was abandoned in many places on account of a sickness which prevailed, and prevented the Indians from reaping it. But this is not all; the Americans are they who cut and transport all the necessary timber from the woods; who cut, transport, and work the stones; who make lime, plaster, and tiles; who construct all the buildings of that kingdom, except a few places where none of them inhabit: who open and repair all the roads; who make the canals and sluices, and clean the cities. They work in many mines of gold, of silver, of copper, &c.; they are the shepherds, herdsmen, weavers, potters, basket-makers, bakers, curriers, day-labourers, &c.; in a word, they are the persons who bear all the burden of public labours. These, says our justly indignant author, are the employments of the weak, dastardly, and useless Americans; while the vigorous M. de Paw, and other indefatigable Europeans, are occupied in writing invectives against them.

53 These a sufficient proof of their healthiness and strength.

These labours, in which the Indians, are continually employed, certainly attest their healthiness and strength; for if they are able to undergo such fatigues, they cannot be diseased, nor have an exhausted stream of blood in their veins, as M. de Paw insinuates. In order to make it be believed that their constitutions are vitiated, he copies whatever he finds written by historians of America, whether true or false, respecting the diseases which reign in some particular countries of that great continent. It is not to be denied, that in some countries in the wide compass of America, men are exposed more than elsewhere to the distempers which are occasioned by the intemperature of the air, or the pernicious quality of the aliments; but it is certain, according to the assertion of many respectable authors acquainted with the new world, that the American countries are for the most part healthy; and if the Americans were disposed to retaliate on M. de Paw, and other European authors who write as he does, they would have abundant subject of materials to throw discredit on the clime of the old continent, and the constitution of its inhabitants, in the endemic distempers which prevail there. America.

Lastly, The supposed feebleness and unsound bodily habit of the Americans do not correspond with the length of their lives. Among those Americans whose great fatigues and excessive toils do not anticipate their death, there are not a few who reach the age of 80, 90, and 100 or more years, as formerly mentioned; and what is more, without there being observed in them that decay which time commonly produces in the hair, in the teeth, in the skin, and in the muscles of the human body. This phenomenon, so much admired by the Spaniards who reside in Mexico, cannot be ascribed to any other cause than the vigour of their constitutions, the temperance of their diet, and the salubrity of their clime. Historians, and other persons who have sojourned there for many years, report the same thing of other countries of the new world.

54 Their mental qualities.

As to the mental qualities of the Americans, M. de Paw has not been able to discover any other characters than a memory so feeble, that to-day they do not remember what they did yesterday; a capacity so blunt, that they are incapable of thinking, or putting their ideas in order; a disposition so cold, that they feel no excitement of love; a dastardly spirit, and a genius that is torpid and indolent. Many other Europeans, indeed, and what is still more wonderful, many of those children or descendants of Europeans who are born in America, think as M. de Paw does; some from ignorance, some from want of reflection, and others from hereditary prejudice and prepossession. But all this and more would not be sufficient to invalidate the testimonies of other Europeans, whose authority has a great deal more weight, both because they were men of great judgment, learning, and knowledge of these countries, and because they gave their testimony in favour of strangers against their own countrymen. In particular, Acosta, whose natural and moral history even M. de Paw commends as *an excellent work*, employs the whole sixth book in demonstrating the good sense of the Americans, by an explanation of their ancient government, their laws, their histories in paintings and knots, kalendars, &c. M. de Paw thinks the Americans are bestial; Acosta, on the other hand, reputes those persons weak and presumptuous who think them so. M. de Paw says, that the most acute Americans were inferior in industry and sagacity to the rudest nations of the old continent; Acosta extols the civil government of the Mexicans above many republics of Europe. M. de Paw finds, in the moral and political conduct of the Americans, nothing but barbarity, extravagance,

travagance, and brutality; and Acosta finds there, laws that are admirable, and worthy of being preserved for ever.

55 M. de Paw's proofs of American cowardice.

M. de Paw denies them courage, and alleges the conquest of Mexico as a proof of their cowardice. "Cortes (he says) conquered the empire of Mexico with 450 vagabonds and 15 horses, badly armed; his miserable artillery consisted of six falconets, which would not at the present day be capable of exciting the fears of a fortress defended by invalids. During his absence the capital was held in awe by the half of his troops. What men! what events!—It is confirmed by the depositions of all historians, that the Spaniards entered the first time into Mexico without making one single discharge of their artillery. If the title of hero is applicable to him who has the disgrace to occasion the death of a great number of rational animals, Ferdinand Cortes might pretend to it; otherwise, I do not see what true glory he has acquired by the overthrow of a tottering monarchy, which might have been destroyed in the same manner by any other assassin of our continent."

56 Refuted.

These passages indicate either M. de Paw's ignorance of the history of the conquest of Mexico, or a wilful suppression of what would openly contradict his system; since all who have read that history know well, that the conquest of Mexico was not made with 450 men, but with more than 200,000. Cortes himself, to whom it was of more importance than to M. de Paw to make his bravery conspicuous, and his conquest appear glorious, confesses the excessive number of the allies who were under his command at the siege of the capital, and combated with more fury against the Mexicans than the Spaniards themselves. According to the account which Cortes gave to the emperor Charles V. the siege of Mexico began with 87 horses, 848 Spanish infantry, armed with guns, cross-bows, swords, and lances, and upwards of 75,000 allies, of Tlascala, Huexotzinco, Cholula, and Chalco, equipped with various sorts of arms; with three large pieces of iron cannon, 15 small of copper, and 13 brigantines. In the course of the siege were assembled the numerous nations of the Otomies, the Cohuixcas, and Matlazincas, and the troops of the populous cities of the lakes; so that the army of the besiegers not only exceeded 200,000, but amounted to 4,000,000, according to the letter from Cortes; and besides these, 3000 boats and canoes came to their assistance. Did it betray cowardice to have sustained, for full 75 days, the siege of an open city, engaging daily with an army so large, and in part provided with arms so superior, and at the same time having to withstand the ravages of famine? Can they merit the charge of cowardice, who, after having lost seven of the eight parts of their city, and about 50,000 citizens, part cut off by the sword, part by famine and sickness, continued to defend themselves until they were furiously assaulted in the last hold which was left them? See the article MEXICO.

57 Remarkable instances of calumny in M. de Paw.

According to M. de Paw, "The Americans at first were not believed to be men, but rather satyrs, or large apes, which might be murdered without remorse or reproach. At last, in order to add insult to the oppression of those times, a pope made an original bull, in which he declared, that being desirous of founding bishoprics in the richest countries of America, it pleased him and the Holy Spirit to acknowledge the Americans to be true men: in so far, that without this decision of an Italian, the inhabitants of the new world would have appeared, even at this day, to the eyes of the faithful, a race of equivocal men. There is no example of such a decision since this globe has been inhabited by men and apes." Upon this passage the abbé animadverts, as being a singular instance of calumny and misrepresentation; and gives the following history of the decision alluded to.

58 Occasion of the famous bull of Paul III.

"Some of the first Europeans who established themselves in America, not less powerful than avaricious, desirous of enriching themselves to the detriment of the Americans, kept them continually employed, and made use of them as slaves; and in order to avoid the reproaches which were made them by the bishops and missionaries who inculcated humanity, and the giving liberty to those people to get themselves instructed in religion, that they might do their duties towards the church and their families, alleged, that the Indians were by nature slaves, and incapable of being instructed; and many other falsehoods of which the chronicler Herrera makes mention against them. Those zealous ecclesiastics being unable, either by their authority or preaching, to free those unhappy converts from the tyranny of such misers, had recourse to their Catholic majesties, and at last obtained from their justice and clemency those laws, as favourable to the Americans as honourable to the court of Spain, that compose the Indian code, which were chiefly due to the indefatigable zeal of the bishop de las Casas. On another side, Garces bishop of Tlascala, knowing that those Spaniards bore, notwithstanding their perversity, a great respect to the decisions of the vicar of Jesus Christ, made application in the year 1586 to Pope Paul III. by that famous letter of which we have made mention; representing to him the evils which the Indians suffered from the wicked Christians, and praying him to interpose his authority in their behalf. The pope, moved by such heavy remonstrances, despatched the next year the original bull, a faithful copy of which we have here subjoined (A), which was not made, as is manifest, to declare the

(A) Paulus papa III. universis Christi Fidelibus presentes Literas inspecturis Salutem et Apostolicam Benedictionem—"Veritas ipsa, quæ nec falli nec fallere potest, cùm Prædicatores Fidei ad officium prædicationis destinaret, dixisse dignoscitur: *Euntes docete omnes gentes:* omnes, dixit, absque omni delectu, cum omnes Fidei disciplina capaces existant. Quod videns et invidens ipsius humani generis æmulus, qui bonis operibus, ut pereant, semper adversatur, modum excogitavit hactenus inauditum, quo impediret, ne Verbum Dei Gentibus, ut salvæ fierent, prædicaretur: ut quosdam suos satellites commovit, qui suam cupiditatem adimplere cupientes, Occidentales et Meridionales Indos, et alias Gentes, quæ temporibus istis ad nostram notitiam pervenerunt, sub prætextu quod Fidei Catholicæ expertes existant, uti bruta animalia, ad nostra obsequia redigendos esse, passim asserere præsumant, et eos in servitutem redigunt, tantis afflictionibus illos urgentes, quantis vix bruta animalia

illis

America

the Americans true men; for such a piece of weakness was very distant from that or any other pope: but solely to support the natural rights of the Americans against the attempts of their oppressors, and to condemn the injustice and inhumanity of those, who, under the pretence of supposing these people idolatrous, or incapable of being instructed, took from them their property and their liberty, and treated them as slaves and beasts."

59 Representation of Columbus.

If at first the Americans were deemed satyrs, nobody can better prove it than Christopher Columbus, their discoverer. Let us hear, therefore, how that celebrated admiral speaks, in his account to the Catholic sovereigns Ferdinand and Isabella, of the first satyrs he saw in the island of Hayti or Hispaniola. "I swear (he says), to your majesties, that there is not a better people in the world than these, more affectionate, affable, or mild. They love their neighbours as themselves; their language is the sweetest, the softest, and the most cheerful; for they always speak smiling; and although they go naked, let your majesties believe me, their customs are very becoming; and their king, who is served with great majesty, has such engaging manners, that it gives great pleasure to see him, and also to consider the retentive faculty of that people, and their desire of knowledge, which incites them to ask the causes and the effects of things."

60 Conclusions concerning the capacities of the Americans.

"We have had intimate commerce with the Americans (continues the abbé); have lived for some years in a seminary destined for their instruction; saw the erection and progress of the royal college of Guadaloupe, founded in Mexico by a Mexican Jesuit, for the education of Indian children; had afterwards some Indians among our pupils; had particular knowledge of many American rectors, many nobles, and numerous artists; attentively observed their character, their genius, their disposition, and manner of thinking; and having examined besides, with the utmost diligence, their ancient history, their religion, their government, their laws, and their customs: After such long experience and study of them, from which we imagine ourselves enabled to decide without danger of erring, we declare to M. de Paw, and to all Europe, that the mental qualities of the Americans are not in the least inferior to those of the Europeans; that they are capable of all, even the most abstract sciences; and that, if equal care was taken of their education, if they were brought up from childhood in seminaries under good masters, were protected and stimulated by rewards, we should see rise among the Americans, philosophers, mathematicians, and divines, who would rival the first in Europe."

But although we should suppose, that, in the torrid climates of the new world, as well as in those of the old, especially under the additional depression of slavery, there was an inferiority of the mental powers, the Chinese and the North Americans have discovered higher rudiments of human excellence and ingenuity than have ever been known among tribes in a similar state of society in any part of the world.

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61 Their ingenuity, &c. asserted.

M. de Paw affirms, that the Americans were unacquainted with the use of money, and quotes the following well-known passage from Montesquieu: "Imagine to yourself, that, by some accident, you are placed in an unknown country; if you find money there, do not doubt that you are arrived among a polished people." But if by money we are to understand a piece of metal with the stamp of the prince or the public, the want of it in a nation is no token of barbarity. The Athenians employed oxen for money, as the Romans did sheep. The Romans had no coined money till the time of Servius Tullius, nor the Persians until the reign of Darius Hystaspes. But if by money is understood a sign, representing the value of merchandise, the Mexicans, and other nations of Anahuac, employed money in their commerce. The cacao, of which they made constant use in the market to purchase whatever they wanted, was employed for this purpose, as salt is in Abyssinia.

It has been affirmed that stone bridges were unknown in America when it was first discovered; and that the natives did not know how to form arches. But these assertions are erroneous. The remains of the ancient palaces of Tezcuco, and still more their vapour baths, show the ancient use of arches and vaults among the Mexicans. But the ignorance of this art would have been no proof of barbarity. Neither the Egyptians nor Babylonians understood the construction of arches.

M. de Paw affirms, that the palace of Montezuma was nothing else than a hut. But it is certain, from the affirmation of all the historians of Mexico, that the army under Cortes, consisting of 6400 men, was all lodged in the palace; and there remained still sufficient room for Montezuma and his attendants.

62 Tokens of science.

The advances which the Mexicans had made in the study of astronomy is perhaps the most surprising proof of their attention and sagacity; for it appears from Abbé Clavigero's history, that they not only counted 365 days to the year, but also knew of the excess of about six hours in the solar over the civil year, and remedied the difference by means of intercalary days.

Of American morality, the following exhortation of

illis servientia urgeant. Nos igitur, qui ejusdem Domini nostri vices, licet indigni, gerimus in terris, et Oves gregis sui nobis commissas, quæ extra ejus Ovile sunt, ad ipsum Ovile toto nixu exquirimus, attendentes Indos ipsos, utpote veros homines, non solum Christianæ Fidei capaces existere, sed, ut nobis innotuit, ad Fidem ipsam promptissimè currere, ac volentes super his congruis remediis providere, prædictos Indos et omnes alias gentes ad notitiam Christianorum in posterum deventuras, licet extra fidem Christi existant, sua libertate et dominio hujusmodi uti, et potiri, et gaudere libere, et licite posse, nec in servitutem redigi debere, ac quicquid secus fieri contigerit irritum et inane, ipsosque Indos, et alias Gentes Verbi Dei prædicatione, et exemplo bonæ vitæ, ad dictam Fidem Christi invitandos fore. Auctoritate Apostolica per præsentes literas decernimus, et declaramus, non obstantibus premissis, cæterisque contrariis quibuscunque." Datum Romæ anno 1537. IV. Non. Iun. Pontificatus nostri anno III. Quæsta, è non altra è quella famosa bolla, per la quale s' è fatto un si grande schiamazzo.

America.

a Mexican to his son may serve as a specimen. "My son, who art come into the light from the womb of thy mother like a chicken from the egg, and like it art preparing to fly through the world, we know not how long Heaven will grant to us the enjoyment of that precious gem which we possess in thee; but however short the period, endeavour to live exactly, praying God continually to assist thee. He created thee: thou art his property. He is thy father, and loves thee still more than I do: repose in him thy thoughts, and day and night direct thy sighs to him. Reverence and salute thy elders, and hold no one in contempt. To the poor and distressed be not dumb, but rather use words of comfort. Honour all persons, particularly thy parents, to whom thou owest obedience, respect, and service. Guard against imitating the example of those wicked sons, who, like brutes that are deprived of reason, neither reverence their parents, listen to their instruction, nor submit to their correction: because whoever follows their steps will have an unhappy end, will die in a desperate or sudden manner, or will be killed and devoured by wild beasts.

63 Specimen of their morality.

"Mock not, my son, the aged or the imperfect. Scorn not him whom you see fall into some folly or transgression, nor make him reproaches; but restrain thyself, and beware lest thou fall into the same error which offends thee in another. Go not where thou are not called, nor interfere in that which does not concern thee. Endeavour to manifest thy good breeding in all thy words and actions. In conversation, do not lay thy hands upon another, nor speak too much, nor interrupt or disturb another's discourse. When any one discourses with thee, hear him attentively, and hold thyself in an easy attitude, neither playing with thy feet, nor putting thy mantle to thy mouth, nor spitting too often, nor looking about you here and there, nor rising up frequently, if thou art sitting; for such actions are indications of levity and low breeding."—He proceeds to mention several particular vices which are to be avoided, and concludes,—"Steal not, nor give thyself to gaming: otherwise thou wilt be a disgrace to thy parents, whom thou oughtest rather to honour for the education they have given thee. If thou wilt be virtuous, thy example will put the wicked to shame. No more, my son; enough has been said in discharge of the duties of a father. With these counsels I wish to fortify thy mind. Refuse them not, nor act in contradiction to them; for on them thy life and all thy happiness depend."

64 Notions of M. de Buffon concerning the degeneracy of animal nature in America.

As ranging on the same side with the abbé Clavigero, the ingenious Mr Jefferson deserves particular attention. This gentleman, in his Notes on the State of Virginia, &c. has taken occasion to combat the opinions of Buffon; and seems to have fully refuted them both by argument and facts. The French philosopher asserts, "That living nature is less active, less energetic, in the new world, than in the old." He affirms, 1. That the animals common to both continents are smaller in America. 2. That those peculiar to the new are on an inferior scale. 3. That those which have been domesticated in both have degenerated in America. And, 4. That it exhibits fewer species of living creatures. The cause of this he ascribes to the diminution of heat in America, and to the prevalence of humidity from the extension of its lakes and waters over a prodigious surface. In other words, he affirms, that *heat* is friendly and *moisture* adverse to the production and developement of the larger quadrupeds.

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65 The hypothesis, that moisture is unfriendly to animal growth considered.

The hypothesis, that moisture is unfriendly to animal growth, Mr Jefferson shows to be contradicted by observation and experience. It is by the assistance of heat and moisture that vegetables are elaborated from the elements. Accordingly we find, that the more humid climates produce plants in greater profusion than the dry. Vegetables are immediately or remotely the food of every animal; and, from the uniform operation of Nature's laws we discern, that, in proportion to the quantity of food, animals are not only multiplied in their numbers, but improved in their size. Of this last opinion is the count de Buffon himself, in another part of his work: "En general, il paroit que les pays un peu *froids* conviennent mieux à nos bœufs que les pays chauds, et qu'ils sont d'autant plus gros et plus grands que le climat est plus *humide* et plus abondans en paturages. Les bœufs de Danemarc, de la Podolie, de l'Ukraine, et de la Tartarie qu'habitent les Calmouques, sont les plus grands de tous."

66 The contrary maintained by Mr Jefferson.

Here, then, a race of animals, and one of the largest too, has been increased in its dimensions by cold and moisture, in direct opposition to the hypothesis, which supposes that these two circumstances diminish animal bulk, and that it is their contraries, heat and dryness, which enlarge it. But to try the question on more general ground, let us take two portions of the earth, Europe and America for instance, sufficiently extensive to give operation to general causes; let us consider the circumstances peculiar to each, and observe their effect on animal nature. America, running through the torrid as well as temperate zone, has more heat collectively taken, than Europe. But Europe, according to our hypothesis, is the driest. They are equally adapted then to animal production; each being endowed with one of those causes which befriend animal growth, and with one which opposes it. Let us, then, take a comparative view of the quadrupeds of Europe and America, presenting them to the eye in three different tables; in one of which shall be enumerated those found in both countries; in a second, those found in one only; in a third, those which have been domesticated in both. To facilitate the comparison, let those of each table be arranged in gradation, according to their sizes, from the greatest to the smallest, so far as their sizes can be conjectured. The weights of the large animals shall be expressed in the English avoirdupois pound and its decimals; those of the smaller in the ounce and its decimal. Those which are marked thus *, are actual weights of particular subjects, deemed among the largest of their species. Those marked thus †, are furnished by judicious persons, well acquainted with the species, and saying, from conjecture only, what the largest individual they had seen would probably have weighed. The other weights are taken from Messrs Buffon and D'Aubenton, and are of such subjects as came casually to their hands for dissection.

Comparative

America.

Comparative View of the Quadrupeds of Europe and of America.

TABLE I. *Aboriginals of both.*

	Europe.	America.
	lb.	lb.
Mammoth		
Buffalo. Bison		*1800
White bear. Ours blanc		
Caribou. Renne		
Bear. Ours	153.7	*410
Elk. Elan. Orignal, palmated		
Red deer. Cerf	288.8	*273
Fallow deer. Daim	167.8	
Wolf. Loup	69 8	
Roe. Chevreuil	56.7	
Glutton. Glouton. Carcajou		
Wild cat. Chat sauvage		†30
Lynx. Loup cervier	25.	
Beaver. Castor	18.5	*45
Badger. Blaireau	13.6	
Red fox. Renard	13.5	
Grey fox. Isatis		
Otter. Loutre	8.9	†12
Monax. Marmotte	6.5	
Vison. Fouine	2.8	
Hedgehog. Herisson	2.2	
Martin. Marte	1.9	†6
	oz.	
Water rat. Rat d'eau	7.5	
Weasel. Belette	2.2	oz.
Flying squirrel. Polatouche	2.2	†4
Shrew mouse. Musaraigne.	1.	

TABLE II. *Aboriginals of one only.*

EUROPE.		AMERICA.	
	lb.		lb.
Sanglier. Wild boar	280.	Tapir	534.
Mouflon. Wild sheep	56.	Elk, round-horned	†450.
Bouquetin. Wild goat		Puma	
Lievre. Hare	7.6	Jaguar	218.
Lapin. Rabbit	3.4	Cabiai	109.
Putois. Polecat	3.3	Tamanoir	109.
Genette	3.1	Tamandua	65.4
Desman. Musk rat	oz.	Cougar of N. Amer.	75.
Ecureuil. Squirrel	12.	Cougar of S. Amer.	59.4
Hermine. Ermine	8.2	Ocelot	
Rat. Rat	7.5	Pecari	46.3
Loirs	3.1	Jaguaret	43.6
Lerot. Dormouse	1.8	Alco	
Toupe. Mole	1.2	Lama	
Hamster	.9	Paco	
Zisel		Paca	32.7
Leming		Serval	
Souris. Mouse		Sloth. Unau	27¾
		Saricovienne	
		Kincajou	
		Tatou Kabassou	21.8
		Urson. Urchin	

America.

TABLE II. *continued.*

EUROPE.	AMERICA.	
		lb.
	Raccoon. Raton.	16.5
	Coati	
	Coendou	16.3
	Sloth. Aï.	13.
	Sapajou Ouarini	
	Sapajou Coaita	9.8
	Tatou Encubert	
	Tatou Apar	
	Tatou Cachica	7.
	Little Coendou	6.5
	Opossum. Sarigue	
	Tapeti	
	Margay	
	Crabier	
	Agouti	4.2
	Sapajou Saï	3.5
	Tatou Cirquinçon	
	Tatou Tatouate	3.3
	Mouffette Squash	
	Mouffette Chiche	
	Mouffette Conepate. Scunk	
	Mouffette. Zorilla	
	Whabus. Hare. Rabbit	
	Aperea	
	Akouchi	
	Ondatra. Musk rat	
	Pilori	
	Great gray squirrel	†2.7
	Fox squirrel of Virginia	†2.625
	Surikate	2.
	Mink	†2.
	Sapajou. Sajou	1.8
	Indian pig. Cochon d'Inde	1.6
	Sapajou. Saïmiri	1.5
	Phalanger	
	Coquallin	
	Lesser gray squirrel	1.5†
	Black squirrel	1.5†
	Red squirrel	10. oz.
	Sagoin Saki	
	Sagoin Pinche	
	Sagoin Tamarin	oz.
	Sagoin Onistiti	4.4
	Sagoin Marikine	
	Sagoin Mico	
	Cayopollin	
	Fourmillier	
	Marmose	
	Sarigue of Cayenne	
	Tucan	
	Red mole	oz.
	Ground squirrel	4.

TABLE

America.

TABLE III. *Domesticated in both.*

	Europe.	America.
	lb.	lb.
Cow	763	*2500
Horse		*1366
Ass		
Hog		*1200
Sheep		*125
Goat		*80
Dog	67.6	
Cat	7.	

67 Result of the first table.

The result of this view is, that of 26 quadrupeds common to both countries, seven are said to be larger in America, seven of equal size, and 12 not sufficiently examined. So that the first table impeaches the first member of the assertion, that of the animals common to both countries the American are smallest, " Et cela sans aucune exception." It shows it not just in all the latitude in which its author has advanced it, and probably not to such a degree as to found a distinction between the two countries.

68 Explanation and result of the second table.

Proceeding to the second table, which arranges the animals found in one of the two countries only, M. de Buffon observes, that the tapir, the elephant of America, is but of the size of a small cow. To preserve our comparison, Mr Jefferson states the wild boar, the elephant of Europe, as little more than half that size. He has made an elk with round or cylindrical horns an animal of America, and peculiar to it; because he has seen many of them himself, and more of their horns; and because, from the best information, it is certain that in Virginia this kind of elk has abounded much, and still exists in smaller numbers. He makes the American hare or rabbit peculiar, believing it to be different from both the European animals of these denominations, and calling it therefore by its Algonquin name *whabus*, to keep it distinct from these. Kalm is of the same opinion. The squirrels are denominated from a knowledge derived from daily sight of them, because with that the European appellations and descriptions seem irreconcilable. These are the only instances in which Mr Jefferson departs from the authority of M. de Buffon in the construction of this table; whom he takes for his groundwork, because he thinks him the best informed of any naturalist who has ever written. The result is, that there are 18 quadrupeds peculiar to Europe; more than four times as many, to wit, 74 peculiar to America; that the first of these 74, the tapir, the largest of the animals peculiar to America, weighs more than the whole column of Europeans; and consequently this second table disproves the second member of the assertion, that the animals peculiar to the new world are on a smaller scale, so far as that assertion relied on European animals for support: and it is in full opposition to the theory which makes the animal volume to depend on the circumstances of heat and moisture.

69 Of the third table.

The third table comprehends those quadrupeds only which are domestic in both countries. That some of these, in some parts of America, have become less than their original stock, is doubtless true; and the reason is very obvious. In a thinly peopled country, the spontaneous productions of the forests and waste fields are sufficient to support indifferently the domestic animals of the farmer, with a very little aid from him in the severest and scarcest season. He therefore finds it more convenient to receive them from the hand of Nature in that indifferent state, than to keep up their size by a care and nourishment which would cost him much labour. If, on this low fare, these animals dwindle, it is no more than they do in those parts of Europe where the poverty of the soil, or poverty of the owner, reduces them to the same subsistence. It is the uniform effect of one and the same cause, whether acting on this or that side of the globe. It would be erring, therefore, against that rule of philosophy, which teaches us to ascribe like effects to like causes, should we impute this diminution of size in America to any imbecility or want of uniformity in the operations of nature. It may be affirmed with truth, that in those countries, and with those individuals of America, where necessity or curiosity has produced equal attention as in Europe to the nourishment of animals, the horses, cattle, sheep, and hogs of the one continent, are as large as those of the other. There are particular instances, well attested, where individuals of America have imported good breeders from England, and have improved their size by care in the course of some years. And the weights actually known and stated in the third table, will suffice to show, that we may conclude, on probable grounds, that, with equal food and care, the climate of America will preserve the races of domestic animals as large as the European stock from which they are derived; and consequently that the third member of M. de Buffon's assertion, that the domestic animals are subject to degeneration from the climate of America, is as probably wrong as the first and second were certainly so.

America.

That the last part of it is erroneous, which affirms, that the species of American quadrupeds are comparatively few, is evident from the tables taken altogether; to which may be added the proof adduced by the abbé Clavigero. According to Buffon's latest calculation, in his *Epoques de la Nature*, there are 300 species of quadrupeds; and America, though it does not make more than a third part of the globe, contains, according to Clavigero, almost one half of the different species of its animals.

70 The human inhabitants comprehended in the same hypothesis of degeneracy.

Of the human inhabitants of America, to whom the same hypothesis of degeneracy is extended, M. Buffon gives the following description: " Though the American savage be nearly of the same stature with men in polished societies; yet this is not a sufficient exception to the general contraction of animated nature throughout the whole continent. In the savage, the organs of generation are small and feeble. He has no hair, no beard, no ardour for the female. Though nimbler than the European, because more accustomed to running, his strength is not so great. His sensations are less acute; and yet he is more timid and cowardly. He has no vivacity, no activity of mind. The activity of his body is not so much an exercise or spontaneous motion, as a necessary action produced by want. Destroy his appetite for victuals and drink, and you will at once annihilate the active principle of all his movements: He remains in stupid repose, on his limbs or couch, for whole days. It is easy to discover the cause of the

scattered

America. scattered life of savages, and of their estrangement from society. They have been refused the most precious sparks of Nature's fire: They have no ardour for women, and, of course, no love to mankind. Unacquainted with the most lively and most tender of all attachments, their other sensations of this nature are cold and languid. Their love to parents and children is extremely weak. The bonds of the most intimate of all societies, that of the same family, are feeble; and one family has no attachment to another. Hence no union, no republic, no social state, can take place among them. The physical cause of love gives rise to the morality of their manners. Their heart is frozen, their society cold, and their empire cruel. They regard their females as servants destined to labour, or as beasts of burden, whom they load unmercifully with the produce of their hunting, and oblige, without pity or gratitude, to perform labours which often exceed their strength. They have few children, and pay little attention to them. Every thing must be referred to the first cause: They are indifferent, because they are weak; and this indifference to the sex is the original stain which disgraces Nature, prevents her from expanding, and, by destroying the germs of life, cuts the root of society. Hence man makes no exception to what has been advanced. Nature, by denying him the faculty of love, has abased and contracted him more than any other animal."

71 Observations by Mr Jefferson.

A humiliating picture indeed! but than which, Mr Jefferson assures us, never one was more unlike the original. M. Buffon grants, that their stature is the same as that of the men of Europe; and he might have admitted, that the Iroquois were larger, and the Lenopi or Delawares taller, than people in Europe generally are: But he says their organs of generation are smaller and weaker than those of Europeans; which is not a fact. And as to their want of beard, this error has been already noticed (N° 49. *supra.*)

72 Seeming coldness of the Americans to the sex accounted for.

"They have no ardour for their females." It is true, they do not indulge those excesses, nor discover that fondness, which are customary in Europe; but this is not owing to a defect in nature, but to manners. Their soul is wholly bent upon war. This is what procures them glory among the men, and makes them the admiration of the women. To this they are educated from their earliest youth. When they pursue game with ardour, when they bear the fatigues of the chase, when they sustain and suffer patiently hunger and cold, it is not so much for the sake of the game they pursue, as to convince their parents and the council of the nation, that they are fit to be enrolled in the number of the warriors. The songs of the women, the dance of the warriors, the sage counsel of the chiefs, the tales of the old, the triumphant entry of the warriors returning with success from battle, and the respect paid to those who distinguish themselves in battle, and in subduing their enemies; in short, every thing they see or hear tends to inspire them with an ardent desire for military fame. If a young man were to discover a fondness for women before he has been to war, he would become the contempt of the men, and the scorn and ridicule of the women: or were he to indulge himself with a captive taken in war, and much more were he to offer violence in order to gratify his lust, he would incur indelible disgrace. The seeming frigidity of the men, therefore, is the effect of manners, and not a defect of nature. They are neither more defective in ardour, nor more impotent with the female, than are the whites reduced to the same diet and exercise. America.

73 Why they have few children.

"They raise few children."—They indeed raise fewer children than we do; the causes of which are to be found, not in a difference of nature, but of circumstance. The women very frequently attending the men in their parties of war and of hunting, childbearing becomes extremely inconvenient to them. It is said, therefore, that they have learned the practice of procuring abortion by the use of some vegetable; and that it even extends to prevent conception for a considerable time after. During these parties they are exposed to numerous hazards, to excessive exertions, to the greatest extremities of hunger. Even at their homes, the nation depends for food, through a certain part of every year, on the gleanings of the forest; that is, they experience a famine once in every year. With all animals, if the female be badly fed, or not fed at all, her young perish; and if both male and female be reduced to like want, generation becomes less active, less productive. To the obstacles, then, of want and hazard, which Nature has opposed to the multiplication of wild animals, for the purpose of restraining their numbers within certain bounds, those of labour and of voluntary abortion are added with the Indian. No wonder, then, if they multiply less than we do. Where food is regularly supplied, a single farm will show more of cattle than a whole country of forests can of buffaloes. The same Indian women, when married to white traders, who feed them and their children plentifully and regularly, who exempt them from excessive drudgery, who keep them stationary and unexposed to accident, produce and raise as many children as the white women. Instances are known, under these circumstances, of their rearing a dozen children.

74 Of their sensibility, &c.

Neither do they seem to be "deficient in natural affection." On the contrary their sensibility is keen, even the warriors weeping most bitterly on the loss of their children; though, in general, they endeavour to appear superior to human events.

Their friendships are strong and faithful to the uttermost extremity. A remarkable instance of this appeared in the case of the late Col. Byrd, who was sent to the Cherokee nation to transact some business with them. It happened that some of our disorderly people had just killed one or two of that nation. It was therefore proposed in the council of the Cherokees, that Col. Byrd should be put to death, in revenge for the loss of their countrymen. Among them was a chief, called *Silouee*, who, on some former occasion, had contracted an acquaintance and friendship with Col. Byrd. He came to him every night in his tent, and told him not to be afraid, they should not kill him. After many days deliberation, however, the determination was, contrary to Silouee's expectation, that Byrd should be put to death; and some warriors were despatched as executioners. Silouee attended them; and when they entered the tent, he threw himself between them and Byrd, and said to the warriors, "This man is my friend: before you get at him, you must kill

America. kill me." On which they returned; and the council respected the principle so much as to recede from their determination.

That "they are timorous and cowardly," is a character with which there is little reason to charge them, when we recollect the manner in which the Iroquois met Mons. ———, who marched into their country; in which the old men, who scorned to fly, or to survive the capture of their town, braved death like the old Romans in the time of the Gauls, and in which they soon after revenged themselves by sacking and destroying Montreal. In short, the Indian is brave, when an enterprise depends on bravery; education with him making the point of honour consist in the destruction of an enemy by stratagem, and in the preservation of his own person free from injury: or perhaps this is nature, while it is education that teaches us to honour force more than finesse. He will defend himself against an host of enemies, always choosing to be killed rather than to surrender, though it be to the whites, who he knows will treat him well. In some situations also, he meets death with more deliberation, and endures tortures with a firmness unknown almost to religious enthusiasm among us.

75 Of their courage. (See also Nos 54, 55 *supra.*)

Much less are they to be characterised as a people of no vivacity, and who are excited to action or motion only by the calls of hunger and thirst. Their dances, in which they so much delight, and which to a European would be the most severe exercise, fully contradict this; not to mention their fatiguing marches, and the toil they voluntarily and cheerfully undergo in their military expeditions. It is true, that when at home they do not employ themselves in labour or the culture of the soil: but this again is the effect of customs and manners, which have assigned that to the province of the women. But it is said "they are averse to society and a social life." Can any thing be more inapplicable than this to people who always live in towns or in clans? Or can they be said to have no *republique*, who conduct all their affairs in national councils; who pride themselves in their national character; who consider an insult or injury done to an individual by a stranger as done to the whole, and resent it accordingly?

To form a just estimate of their genius and mental powers, Mr Jefferson observes, more facts are wanting; and great allowance is to be made for those circumstances of their situation which call for a display of particular talents only. This done, we shall probably find that the Americans are formed, in mind as well as in body, on the same model with the *homo sapiens Europæus*. The principles of their society forbidding all compulsion, they are to be led to duty and to enterprise by personal influence and persuasion. Hence eloquence in council, bravery and address in war, become the foundations of all consequence with them. To these acquirements all their faculties are directed. Of their bravery and address in war we have multiplied proofs, because we have been the subjects on which they were exercised. Of their eminence in oratory we have fewer examples, because it is displayed chiefly in their own councils. Some, however, we have of very superior lustre. We may challenge the whole orations of Demosthenes and Cicero, and of any more eminent orator, if Europe has furnished more eminent, to produce a single passage superior to the speech of Logan, a Mingo chief, to Lord Dunmore when governor of this state. The story is as follows; of which, and of the speech, the authenticity is unquestionable. In the spring of the year 1774, a robbery and murder were committed on an inhabitant of the frontiers of Virginia by two Indians of the Shawanee tribe. The neighbouring whites, according to their custom, undertook to punish this outrage in a summary way. Colonel Cresap, a man infamous for the many murders he had committed on those much injured people, collected a party, and proceeded down the Kanhaway in quest of vengeance. Unfortunately a canoe of women and children, with one man only, was seen coming from the opposite shore, unarmed, and unsuspecting any hostile attack from the whites. Cresap and his party concealed themselves on the bank of the river; and the moment the canoe reached the shore, singled out their objects, and at one fire killed every person in it. This happened to be the family of Logan, who had long been distinguished as a friend of the whites. This unworthy return provoked his vengeance. He accordingly signalized himself in the war which ensued. In the autumn of the same year, a decisive battle was fought at the mouth of the Great Kanhaway, between the collected forces of the Shawanees, Mingoes, and Delawares, and a detachment of the Virginian militia. The Indians were defeated, and sued for peace; Logan, however, disdained to be seen among the suppliants: but, lest the sincerity of a treaty should be distrusted, from which so distinguished a chief absented himself, he sent by a messenger the following speech, to be delivered to Lord Dunmore:—"I appeal to any white man to say if ever he entered Logan's cabin hungry, and he gave him not meat: if ever he came cold and naked, and he clothed him not. During the course of the last long and bloody war, Logan remained idle in his cabin, an advocate for peace. Such was my love for the whites, that my countrymen pointed as they passed, and said, *Logan is the friend of white men.* I had even thought to have lived with you, but for the injuries of one man. Colonel Cresap, the last spring, in cold blood, and unprovoked, murdered all the relations of Logan, not sparing even my women and children. There runs not a drop of my blood in the veins of any living creature. This called on me for revenge. I have sought it; I have killed many; I have fully glutted my vengeance. For my country, I rejoice at the beams of peace; but do not harbour a thought that mine is the joy of fear. Logan never felt fear. He will not turn on his heel to save his life? Who is there to mourn for Logan? Not one."

America.

76 Story of Logan.

77 Specimen of Indian eloquence.

78 Other anecdotes.

To the preceding anecdotes, in favour of the American character, may be added the following by Dr Benjamin Franklin. The Indian men, when young, are hunters and warriors: when old, counsellors; for all their government is by the counsel or advice of the sages. Hence they generally study oratory; the best speaker having the most influence. The Indian women till the ground, dress the food, nurse and bring up the children, and preserve and hand down to posterity the memory of public transactions. These employments of men and women are accounted natural and honourable. Having few artificial wants, they have abundance of leisure for improvement by conversation. Our laborious manner of life, compared with theirs, they esteem

America. esteem slavish and base; and the learning on which we value ourselves, they regard as frivolous and useless.

Having frequent occasions to hold public councils, they have acquired great order and decency in conducting them. The old men sit in the foremost ranks, the warriors in the next, and the women and children in the hindmost. The business of the women is to take exact notice of what passes; imprint it in their memories, for they have no writing, and communicate it to their children. They are the records of the council, and they preserve tradition of the stipulations in treaties a hundred years back; which, when we compare with our writings, we always find exact. He that would speak rises. The rest observe a profound silence. When he has finished, and sits down, they leave him five or six minutes to recollect, that if he has omitted any thing he intended to say, or has any thing to add, he may rise again and deliver it. To interrupt another, even in common conversation, is reckoned highly indecent.

79 Politeness and civility of the American Indians.

The politeness of these savages in conversation is, indeed, carried to excess; since it does not permit them to contradict or deny the truth of what is asserted in their presence. By this means they indeed avoid disputes; but then it becomes difficult to know their minds, or what impression you make upon them. The missionaries who have attempted to convert them to Christianity, all complain of this as one of the greatest difficulties of their mission. The Indians hear with patience the truths of the gospel explained to them, and give their usual tokens of assent and approbation; but this by no means implies conviction; it is mere civility.

When any of them come into our towns, our people are apt to crowd round them, gaze upon them, and incommode them where they desire to be private; this they esteem great rudeness, and the effect of the want of instruction in the rules of civility and good manners, "We have (say they) as much curiosity as you; and when you come into our towns, we wish for opportunities of looking at you; but for this purpose we hide ourselves behind bushes where you are to pass, and never intrude ourselves into your company."

80 Their hospitality.

Their manner of entering one another's villages has likewise its rules. It is reckoned uncivil in travelling strangers to enter a village abruptly, without giving notice of their approach. Therefore, as soon as they arrive within hearing, they stop and holla, remaining there till invited to enter. Two old men usually come out to them, and lead them in. There is in every village a vacant dwelling, called the *stranger's house*. Here they are placed, while the old men go round from hut to hut, acquainting the inhabitants that strangers are arrived, who are probably hungry and weary; and every one sends him what he can spare of victuals and skins to repose on. When the strangers are refreshed, pipes and tobacco are brought; and then, but not before, conversation begins, with inquiries who they are, whither bound, what news, &c. and it usually ends with offers of service, if the strangers have occasion for guides, or any necessaries for continuing their journey; and nothing is exacted for the entertainment.

The same hospitality, esteemed among them as a principal virtue, is practised by private persons; of which Conrad Weiser, the interpreter, gave Dr Franklin the following instance: He had been naturalized among the Six Nations, and spoke well the Mohock language. In going through the Indian country to carry a message from our governor to the council at Onondaga, he called at the habitation of Canassetego, an old acquaintance, who embraced him, spread furs for him to sit on, placed before him some boiled beans and venison, and mixed some rum and water for his drink. When he was well refreshed, and had lit his pipe, Canassetego began to converse with him; asked how he had fared the many years since they had seen each other, whence he then came, what had occasioned the journey, &c. Conrad answered all his questions; and when the discourse began to flag, the Indian, to continue it, said, "Conrad, you have lived long among the white people, and know something of their customs; I have been sometimes at Albany, and have observed, that once in seven days they shut up their shops, and assemble all in the great house; tell me what it is for?—What do they do there?" "They meet there (says Conrad) to hear and learn *good things*." "I do not doubt (says the Indian) that they tell you so; they have told me the same: but I doubt the truth of what they say, and I will tell you my reasons. I went lately to Albany to sell my skins, and buy blankets, knives, powder, rum, &c. You know I generally used to deal with Hans Hanson; but I was a little inclined this time to try some other merchants. However, I called first upon Hans, and asked him what he would give for beaver. He said he could not give more than 4s. a pound; but (says he) I cannot talk on business now; this is the day when we meet together to learn *good things*, and I am going to the meeting. So I thought to myself, since I cannot do any business to-day, I may as well go to the meeting too; and I went with him. —There stood up a man in black, and began to talk to the people very angrily. I did not understand what he said; but perceiving that he looked much at me and at Hanson, I imagined he was angry at seeing me there; so I went out, sat down near the house, struck fire, and lit my pipe, waiting till the meeting should break up. I thought too, that the men had mentioned something of beaver, and I suspected that it might be the subject of their meeting. So when they came out I accosted my merchant.—Well Hans (says I), I hope you have agreed to give more than 4s. a-pound?" "No (says he), I cannot give so much, I cannot give more than 3s. 6d." "I then spoke to several other dealers, but they all sung the same song, three and sixpence, three and sixpence. This made it clear to me that my suspicion was right; and that whatever they pretended of meeting to learn *good things*, the real purpose was, to consult how to cheat Indians in the price of beaver. Consider but a little, Conrad, and you must be of my opinion. If they meet so often to learn *good things*, they certainly would have learned some before this time. But they are still ignorant. You know our practice. If a white man, in travelling through our country, enter one of our cabins, we all treat him as I treat you; we dry him if he is wet, we warm him if he is cold, and give him meat and drink, that he may allay his thirst and hunger; and we spread soft

America. furs for him to rest and sleep on: we demand nothing in return. But if I go into a white man's house at Albany, and ask for victuals and drink, they say, Where is your money? And if I have none, they say, Get out you Indian dog. You see they have not yet learned those little *good things* that we need no meeting to be instructed in; because our mothers taught them to us when we were children; and therefore it is impossible their meetings should be, as they say, for any such purpose, or have any such effect; they are only to contrive *the cheating of Indians in the price of beaver*."

THE next question that occurs is, Whether the peculiarities of the Americans, or the disparity between them and the inhabitants of Europe, afford sufficient grounds for determining them, as some have done, to be a race of men radically different from all others?

In this question, to avoid being tedious, we shall confine ourselves to what has been advanced by Lord Kames; who is of opinion, that there are many different species of men, as well as of other animals; and gives a hypothesis, whereby he pretends his opinion may be maintained in a consistency with revelation.

Sr Lord Kames's arguments for different species.

"If (says he) the only rule afforded by nature for classing animals can be depended on, there are different races of men as well as of dogs: a mastiff differs not more from a spaniel, than a white man from a negro, or a Laplander from a Dane. And if we have any faith in Providence, it ought to be so. Plants were created of different kinds, to fit them for different climates; and so were brute animals. Certain it is, that all men are not fitted equally for every climate. There is scarce a climate but what is natural to some men, where they prosper and flourish; and there is not a climate but where some men degenerate. Doth not then analogy lead us to conclude, that, as there are different climates on the face of this globe, so there are different races of men fitted for these different climates?

"M. Buffon, from the rule, That animals which can procreate together, and whose progeny can also procreate, are of one species, concludes, that all men are of one race or species; and endeavours to support that favourite opinion, by ascribing to the climate, to food, or to other accidental causes, all the varieties that are found among men. But is he seriously of opinion, that any operation of climate, or of other accidental cause, can account for the copper colour and smooth chin universal among the Americans; the prominence of the pudenda universal among the Hottentot women; or the black nipple no less universal among the female Samoiedes?—It is in vain to ascribe to the climate the low stature of the Esquimaux, the smallness of their feet, or the overgrown size of their heads. It is equally in vain to ascribe to climate the low stature of the Laplanders, or their ugly visage. The black colour of negroes, thick lips, flat nose, crisped woolly hair, and rank smell, distinguish them from every other race of men. The Abyssinians, on the contrary, are tall and well made, their complexion a brown olive, features well proportioned, eyes large and of a sparkling black, thin lips, a nose rather high than flat. There is no such difference of climate between Abyssinia and Negroland as to produce these striking differences.

"Nor shall our author's ingenious hypothesis concerning the extremities of heat and cold, purchase him impunity with respect to the sallow complexion of the Samoiedes, Laplanders, and Greenlanders. The Finlanders, and northern Norwegians, live in a climate not less cold than that of the people mentioned; and yet are fair beyond other Europeans. I say more, there are many instances of races of people preserving their original colour, in climates very different from their own; but not a single instance of the contrary, as far as I can learn. There have been four complete generations of negroes in Pennsylvania, without any visible change of colour; they continue jet black, as originally. Those who ascribe all to the sun, ought to consider how little probable it is, that the colour it impresses on the parents should be communicated to their infant children, who never saw the sun: I should be as soon induced to believe with a German naturalist, whose name has escaped me, that the negro colour is owing to an ancient custom in Africa, of dyeing the skin black. Let a European, for years, expose himself to the sun in a hot climate, till he be quite brown; his children will nevertheless have the same complexion with those in Europe. From the action of the sun, is it possible to explain, why a negro, like a European, is born with a ruddy skin, which turns jet black the eighth or ninth day?

America.

Our author next proceeds to draw some arguments for the existence of different races of men, from the various tempers and dispositions of different nations; which he reckons to be *specific* differences, as well as those of colour, stature, &c, and having summed up his evidence he concludes thus: "Upon summing up the whole particulars mentioned above, would one hesitate a moment to adopt the following opinion, were there no counterbalancing evidence, viz. 'That God created many pairs of the human race, differing from each other, both externally and internally; that he fitted those pairs for different climates, and placed each pair in its proper climate; that the peculiarities of the original pairs were preserved entire in their descendants; who having no assistance but their natural talents, were left to gather knowledge from experience, and, in particular, were left (each tribe) to form a language for itself; that signs were sufficient for the original pairs, without any language but what nature suggests; and that a language was formed gradually as a tribe increased in numbers, and in different occupations, to make speech necessary?' But this opinion, however plausible, we are not permitted to adopt; being taught a different lesson by revelation, viz. That God created but a single pair of the human species. Though we cannot doubt the authority of Moses, yet his account of the creation of man is not a little puzzling, as it seems to contradict every one of the facts mentioned above. According to that account, different races of men were not formed, nor were men formed originally for different climates. All men must have spoken the same language, viz. that of our first parents. And what of all seems the most contradictory to that account, is the savage state: Adam, as Moses informs us, was endued by his Maker with an eminent degree of knowledge; and he certainly was an excellent preceptor to his children and their progeny, among whom he lived many generations. Whence then the degeneracy of all men into the savage state? To account for that dismal catastrophe,

America.

82 His hypothesis concerning the origin of the different species,

tastrophe, mankind must have suffered some terrible convulsion. That terrible convulsion is revealed to us in the history of the tower of Babel contained in the 11th chapter of Genesis, which is, 'That, for many centuries after the deluge, the whole earth was of one 'language, and of one speech; that they united to 'build a city on a plain in the land of Shinar, with a 'tower whose top might reach unto heaven; that the 'Lord, beholding the people to be one, and to have 'all one language, and that nothing would be restrained from them which they imagined to do, confounded their language that they might not understand one another, and scattered them abroad upon 'the face of all the earth.' Here light breaks forth in the midst of darkness. By confounding the language of men, and scattering them abroad upon the face of all the earth, they were rendered savages. And to harden them for their new habitations, it was necessary that they should be divided into different kinds, fitted for different climates. Without an immediate change of constitution, the builders of Babel could not possibly have subsisted in the burning region of Guinea, nor in the frozen region of Lapland; houses not being prepared, nor any other convenience to protect them against a destructive climate."

83 incomplete.

We may first remark, on his lordship's hypothesis, that it is evidently incomplete; for, allowing the human race to have been divided into different species at the confusion of languages, and that each species was adapted to a particular climate; by what means were they to get to the climates proper for them, or how were they to know that such climates existed? How was an American, for instance, when languishing in an improper climate at Babel, to get to the land of the Amazons, or the banks of the Oroonoko, in his own country? or how was he to know that these places were more proper for him than others?—If, indeed we take the Scripture phrase, "The Lord *scattered them abroad* upon the face of all the earth," in a certain sense, we may account for it. If we suppose that the different species were immediately carried off by a whirlwind, or other supernatural means, to their proper countries, the difficulty will vanish: but if this is his lordship's interpretation, it is certainly a very singular one.

84 General principles to be kept in view in reasoning on this subject.

Before entering upon a consideration of the particular arguments used by our author for proving the diversity of species in the human race, it will be proper to lay down the following general principles, which may serve as axioms. (1.) When we assert a multiplicity of species in the human race, we bring in a supernatural cause to solve a natural phenomenon: for these species are supposed to be the immediate work of the Deity. (2.) No person has a right to call any thing the immediate effect of Omnipotence, unless by express revelation from the Deity, or from a certainty that no natural cause is sufficient to produce the effect. The reason is plain. The Deity is invisible, and so are many natural causes; when we see an effect, therefore, of which the cause does not manifest itself, we cannot know whether the immediate cause is the Deity or an invisible natural power. An example of this we have in the phenomena of thunder and earthquakes, which were often ascribed immediately to the Deity, but are now discovered to be the effects of electricity.

America.

(3.) No person can assert natural causes to be insufficient to produce such and such effects, unless he perfectly knows all these causes and the limits of their power in all possible cases; and this no man has ever known or can know.

By keeping in view those principles, which we hope are self-evident, we will easily see Lord Kames's arguments to consist entirely in a *petitio principii*.—In substance they are all reduced to this single sentence: "Natural philosophers have been hitherto unsuccessful in their endeavours to account for the differences observed among mankind; therefore these differences cannot be accounted for from natural causes."

85 Inconsistency in Lord Kames's argument.

His Lordship, however, tells us in the passages already quoted, that "a mastiff differs not more from a spaniel, than a Laplander from a Dane;" that "it is vain to ascribe to climate the low stature of the Laplanders, or their ugly visage."—Yet, in a note on the word *Laplanders*, he subjoins, that, "by late accounts it appears, that the Laplanders are only degenerated Tartars; and that they and the Hungarians originally sprung from the same breed of men, and from the same country."—The Hungarians are generally handsome and well-made, like Danes, or like other people. The Laplanders, he tells us, differ as much from them as a mastiff from a spaniel. Natural causes, therefore, according to Lord Kames himself, may cause two individuals of the same species of mankind differ from each other as much as a mastiff does from a spaniel.

86 Remarkable difference of colour from accidental causes.

While we are treating this subject of colour, it may not be amiss to observe, that a very remarkable difference of colour may accidentally happen to individuals of the same species. In the isthmus of Darien, a singular race of men has been discovered.—They are of low stature, of a feeble make, and incapable of enduring fatigue. Their colour is a dead milk-white; not resembling that of fair people among Europeans, but without any blush or sanguine complexion. Their skin is covered with a fine hairy down of a chalky white; the hair of their heads, their eyebrows, and eyelashes, are of the same hue. Their eyes are of a singular form, and so weak, that they can hardly bear the light of the sun; but they see clearly by moonlight, and are most active and gay in the night. Among the negroes of Africa, as well as the natives of the Indian islands, a small number of these people are produced. They are called *Albinos* by the Portuguese, and *Kackerlakes* by the Dutch.

87 Colour no characteristic of a different species;

This race of men is not indeed permanent; but it is sufficient to show, that mere *colour* is by no means the characteristic of a certain species of mankind. The difference of colour in these individuals is undoubtedly owing to a natural cause. To constitute, then, a race of men of this colour, it would only be necessary that this cause, which at present is merely accidental, should become permanent, and we cannot know but it may be so in some parts of the world.

88 nor stature.

If a difference in colour is no characteristic of a different species of mankind, much less can a difference in stature be thought so. In the southern parts of America, there is said to be a race of men exceeding the common size in height and strength *. This account, however, is doubted of by some; but be that as it will, it is certain that the Esquimaux are as much under the common size, as the Patagonians are said to

* See *Patagonia*.

America. be above it. Nevertheless we are not to imagine, that either of these are specific differences; seeing the Laplanders and Hungarians are both of the same species, and yet the former are generally almost a foot shorter than the latter; and if a difference of climate, or other accidental causes, can make the people of one country a foot shorter than the common size of mankind, undoubtedly accidental causes of a contrary nature may make those of another country a foot taller than other men.

89 Different causes contribute towards an alteration in colour.

Though the sun has undoubtedly a share in the production of the swarthy colour of those nations which are most exposed to his influence; yet the manner of living to which people are accustomed, their victuals, their employment, &c. must contribute very much to a difference of complexion. There are some kinds of colouring roots, which if mixed with the food of certain animals, will tinge even their bones of a yellow colour. It cannot be thought any great degree of credulity to infer from this, that if these roots were mixed with the food of a white man, they might without a miracle, tinge his skin of a yellow colour. If a man and woman were both to use food of this kind for a length of time, till they became, as it were, *radically dyed*, it is impossible, without the intervention of divine power, or of some extraordinary natural cause, but their children must be of the same colour; and was the same kind of food to be continued for several generations, it is more than probable that this colour might resist the continued use of any kind of food whatever. See further the article COMPLEXION.

90 Habit capable of altering the instinct of animals.

Of this indeed we have no examples, but we have an example of changes much more wonderful. It is allowed on all hands, that it is more easy to work a change upon the body of a man, or any other animal, than upon his mind. A man that is naturally choleric may indeed learn to prevent the bad effects of his passion by reason, but the passion itself will remain as immutable as his colour. But to reason in a manner similar to Lord Kames; though a man should be naturally choleric, or subject to any other passion, why should his children be so?—This way of reasoning, however plausible, is by no means conclusive; as will appear from the following passage in Mr Forster's Voyage.

Voyage round the World, vol. i. p. 234.

June 9th. "The officers who could not yet relish their salt provisions after the refreshments of New Zealand, had ordered their black dog, mentioned p. 135. to be killed: this day, therefore, we dined for the first time on a leg of it roasted; which tasted so exactly like mutton, that it was absolutely undistinguishable. In our cold countries, where animal food is so much used, and where to be carnivorous perhaps lies in the nature of men, or is indispensably necessary to the preservation of their health and strength, it is strange that there should exist a Jewish aversion to dogs flesh, when hogs, the most uncleanly of all animals, are eaten without scruple. Nature seems expressly to have intended them for this use, by making their offspring so very numerous, and their increase so quick and frequent. It may be objected, that the exalted degree of instinct which we observe in our dogs, inspires us with great unwillingness to kill and eat them. But it is owing to the time we spend on the education of dogs, that they acquire those eminent qualities which attach them so much to us. The natural qualities of our dogs may receive a wonderful improvement; but education must give its assistance, without which the human mind itself, though capable of an immense expansion, remains in a very contracted state. In New Zealand, and (according to former accounts of voyages) in the tropical isles of the South sea, the dogs are the most stupid dull animals imaginable, and do not seem to have the least advantage in point of sagacity over our sheep, which are commonly made the emblems of silliness. In the former country they are fed upon fish, in the latter on vegetables, and both these diets may have served to alter their disposition. Education may perhaps likewise graft new instincts; the New Zealand dogs are fed on the remains of their master's meals; they eat the bones of other dogs; and the puppies become true cannibals from their birth. We had a young New Zealand puppy on board, which had certainly had no opportunity of tasting any thing but the mother's milk before we purchased it: however, it eagerly devoured a portion of the flesh and bones of the dog on which we dined to day; while several others of the European breed, taken on board at the Cape, turned from it without touching it. America.

Ib. p. 243. "On the 4th of August, a young bitch, of the tertier breed, taken on board at the Cape of Good Hope, and covered by a spaniel, brought ten young ones, one of which was dead. The New Zealand dog mentioned above, which devoured the bones of the roasted dog, now fell upon the dead puppy, and ate of it with a ravenous appetite. This is a proof how far education may go in producing and propagating new instincts in animals. European dogs are never fed on the meat of their own species, but rather seem to abhor it. The New Zealand dogs, in all likelihood, are trained up from their earliest age to eat the remains of their master's meals: they are therefore used to feed upon fish, their own species, and perhaps human flesh; and what was only owing to a habit at first, may have become instinct by length of time. This was remarkable in our cannibal dog, for he came on board so young, that he could not have been weaned long enough to have acquired a habit of devouring his own species, and much less of eating human flesh; however, one of our seamen having cut his finger, held it out to the dog, who fell to greedily, licked it, and then began to bite it."

From this account it appears, that even the instincts of animals are not unchangeable by natural causes; and if these causes are powerful enough to change the dispositions of succeeding generations, much more may we suppose them capable of making any possible alteration in the external appearance.

91 Confirmed by an observation on the Franks.

We are not here necessitated to confine ourselves to observations made on brute animals. The Franks are an example of the production of one general character, formed by some natural cause from a mixture of many different nations.—They were a motley multitude, consisting of various German nations dwelling beyond the Rhine: who, uniting in defence of their common liberty, took thence the name of *Franks;* the word *frank* signifying in their language, as it still does in ours, *free*. Among them the following nations were mentioned, viz. the Actuarii, Chamavi, Bructeri, Salii, Frisii, Chausi, Amswarii, and Catti. We cannot suppose

America. suppose one character to belong to so many different nations; yet it is certain that the Franks were nationally characterized as treacherous; and so deeply seems this quality to have been rooted in their nature, that their descendents have not got quite free of it in 1500 years. It is in vain, then, to talk of different races of men, either from their colour, size, or prevailing dispositions, seeing we have undeniable proofs that all these may be changed in the most remarkable manner, by natural causes, without any miraculous interposition of the Deity.

THE next question, then, which presents itself is, From what part of the old world America has most probably been peopled?

92 Of the peopling of America.

Discoveries long ago made inform us, that an intercourse between the old continent and America might be carried on with facility from the north-west extremities of Europe and the north-east boundaries of Asia. In the ninth century the Norwegians discovered Greenland, and planted a colony there. The communication with that country was renewed in the last century by Moravian missionaries, in order to propagate their doctrines in that bleak and uncultivated region. By them we are informed that the north-west coast of Greenland is separated from America by a very narrow strait; that at the bottom of the bay it is highly probable that they are united; that the Esquimaux of America perfectly resemble the Greenlanders in their aspect, dress, and mode of living; and that a Moravian missionary, well acquainted with the language of Greenland, having visited the country of the Esquimaux, found, to his astonishment, that they spoke the same language with the Greenlanders, and were in every respect the same people. The same species of animals, too, are found in the contiguous regions. The bear, the wolf, the fox, the hare, the deer, the roebuck, the elk, frequent the forests of North America, as well as those in the north of Europe.

93 A communication between the old and new continents by two ways.

Other discoveries have proved, that if the two continents of Asia and America be separated at all, it is only by a narrow strait. From this part of the old continent, also, inhabitants may have passed into the new; and the resemblance between the Indians of America and the eastern inhabitants of Asia, would induce us to conjecture that they have a common origin. This is the opinion adopted by Dr Robertson in his History of America *, where we find it accompanied with the following narrative.

* *History of America*, vol. i. p. 253.

"While those immense regions which stretch eastward from the river Oby to the sea of Kamtschatka were unknown, or imperfectly explored, the north-east extremities of our hemisphere were supposed to be so far distant from any part of the new world, that it was not easy to conceive how any communication should have been carried on between them. But the Russians, having subjected the western parts of Siberia to their empire, gradually extended their knowledge of that vast country, by advancing towards the east into unknown provinces. These were discovered by hunters in their excursions after game, or by soldiers employed in levying the taxes; and the court of Moscow estimated the importance of those countries only by the small addition which they made to its revenue. At length, Peter the Great ascended the Russian throne; His enlightened comprehensive mind, intent upon every circumstance that could aggrandize his empire, or render his reign illustrious, discerned consequences of these discoveries, which had escaped the observation of his ignorant predecessors. He perceived that, in proportion as the regions of Asia extended towards the east, they must approach nearer to America; that the communication between the continents, which had long been searched for in vain, would probably be found in this quarter; and that, by opening this intercourse, some part of the wealth and commerce of the western world might be made to flow into his dominions by a new channel. Such an object suited a genius that delighted in grand schemes. Peter drew up instructions with his own hands for prosecuting this design, and gave orders for carrying it into execution. America.

"His successors adopted his ideas, and pursued his plan. The officers whom the Russian court employed in this service, had to struggle with so many difficulties, that their progress was extremely slow. Encouraged by some faint traditions among the people of Siberia, concerning a successful voyage in the year 1648 round the north-east promontory of Asia, they attempted to follow the same course. Vessels were fitted out, with this view, at different times, from the rivers Lena and Colyma; but in a frozen ocean, which nature seems not to have destined for navigation, they were exposed to many disasters, without being able to accomplish their purpose. No vessel fitted out by the Russian court ever doubled this formidable cape; we are indebted for what is known of those extreme regions of Asia, to the discoveries made in excursions by land. In all those provinces, an opinion prevails, that countries of great extent and fertility lie at no considerable distance from their own coasts. These the Russians imagined to be part of America; and several circumstances concurred not only in confirming them in this belief, but in persuading them that some portion of that continent could not be very remote. Trees of various kinds, unknown in those naked regions of Asia, are driven upon the coast by an easterly wind. By the same wind floating ice is brought thither in a few days; flights of birds arrive annually from the same quarter; and a tradition obtains among the inhabitants, of an intercourse formerly carried on with some countries situated to the east.

"After weighing all these particulars, and comparing the position of the countries in Asia which they had discovered, with such parts in the north-west of America as were already known; the Russian court formed a plan, which would have hardly occurred to any nation less accustomed to engage in arduous undertakings and to contend with great difficulties. Orders were issued to build two vessels at Oehotz, in the sea of Kamtschatka, to sail on a voyage of discovery. Though that dreary uncultivated region furnished nothing that could be of use in constructing them but some larch trees; though not only the iron, the cordage, the sails, and all the numerous articles requisite for their equipment, but the provisions for victualling them, were to be carried through the immense deserts of Siberia, along rivers of difficult navigation, and roads almost impassable, the mandate of the sovereign, and the perseverance of the people, at last surmounted every obstacle. Two vessels were finished; and under the

command

America. command of the captains Behring and Tschirikow, sailed from Kamtschatka in quest of the new world, in a quarter where it had never been approached. They shaped their course towards the east; and though a storm soon separated the vessels, which never rejoined, and many disasters befel them, the expectations from the voyage were not altogether frustrated. Each of the commanders discovered land, which to them appeared to be part of the American continent; and, according to their observations, it seems to be situated within a few degrees of the north-west coast of California. Each set some of his people ashore: but in one place the inhabitants fled as the Russians approached; in another, they carried off those who landed, and destroyed their boats. The violence of the weather, and the distress of their crews, obliged both to quit this inhospitable coast. In their return they touched at several islands, which stretch in a chain from east to west between the country which they had discovered and the coast of Asia. They had some intercourse with the natives, who seemed to them to resemble the North Americans. They presented to the Russians the calumet, or pipe of peace, which is a symbol of friendship universal among the people of North America, and a usage of arbitrary institution peculiar to them."

94 Reasons for supposing the two continents to have been once joined.

The more recent and accurate discoveries of the illustrious navigator Cook, and his successor Clerke, have brought the matter still nearer to certainty. The sea, from the south of Behring's straits to the crescent of isles between Asia and America, is very shallow. It deepens from these straits (as the British seas do from those of Dover) till soundings are lost in the Pacific ocean; but that does not take place but to the south of the isles. Between them and the straits is an increase from twelve to fifty-four fathoms, except only off St Thaddeus Noss, where there is a channel of greater depth. From the volcanic disposition, it has been judged probable, not only that there was a separation of the continents at the straits of Behring, but that the whole space from the isles to that small opening had once been occupied by land; and that the fury of the watery element, actuated by that of fire, had, in most remote times, subverted and overwhelmed the tract, and left the islands monumental fragments.

95 Probable cause of their subsequent separation.

Without adopting all the fancies of Buffon, there can be no doubt, as the abbé Clavigero observes, that our planet has been subject to great vicissitudes, since the deluge. Ancient and modern histories confirm the truth which Ovid has sung in the name of Pythagoras:

Video ego quod fuerat quondam solidissima tellus,
Esse fretum; vidi factas ex æquore terras.

At present they plough those lands over which ships formerly sailed, and now they sail over lands which were formerly cultivated; earthquakes have swallowed some lands, and subterraneous fires have thrown up others; the rivers have formed new soil with their mud: the sea retreating from the shores has lengthened the land in some places, and advancing in others has diminished it; it has separated some territories which were formerly united, and formed new straits and gulfs. We have examples of all these revolutions in the past century. Sicily was united to the continent of Naples, and the island Eubœa to Bœotia. Diodorus, Strabo, and other ancient authors, say the same thing of Spain and Africa, and affirm, that by a violent irruption of the ocean upon the land between the mountains Abyla and Calpé, that communication was broken, and the Mediterranean sea was formed. Among the people of Ceylon there is a tradition that a similar irruption of the sea separated their island from the peninsula of India. The same thing is believed by those of Malabar with respect to the isles of Maldivia, and with the Malayans with respect to Sumatra. It is certain, says the count de Buffon, that in Ceylon the earth has lost thirty or forty leagues, which the sea has taken from it; on the contrary, Tongres, a place of the Low Countries, has gained 30 leagues of land from the sea. The northern part of Egypt owes its existence to inundations of the Nile. The earth which this river has brought from the inland countries of Africa, and deposited in its inundations, has formed a soil of more than 25 cubits in depth. In like manner, adds the above author, the province of the Yellow River in China, and that of Louisiana, have only been formed of the mud of rivers. Pliny, Seneca, Diodorus, and Strabo, report innumerable examples of similar revolutions, which we omit, that our dissertation may not become too prolix; as also many modern revolutions, which are related in the theory of the earth of the count de Buffon and other authors. In South America, all those who have observed with philosophic eyes the peninsula of Yucatan, do not doubt that that country has once been the bed of the sea; and, on the contrary, in the channel of Bahama many indications show the island of Cuba to have been once united to the continent of Florida. In the strait which separates America from Asia, many islands are found, which probably were the mountains belonging to the tract of land which we suppose to have been swallowed up by earthquakes; which is made more probable by the multitude of volcanoes which we know of in the peninsula of Kamtschatka. It is imagined, however, that the sinking of that land, and the separation of the two continents, has been occasioned by those great and extraordinary earthquakes mentioned in the histories of the Americans, which formed an era almost as memorable as that of the deluge. The histories of the Toltecas fix such earthquakes in the first year of Tecpatl; but as we know not to what century that belonged, we can form no conjecture of the time that great calamity happened. If a great earthquake should overwhelm the isthmus of Suez, and there should be at the same time as great a scarcity of historians as there was in the first ages after the deluge, it would be doubted, in 300 or 400 years after, whether Asia had ever been united by that part to Africa; and many would firmly deny it.

America.

96 Separated only by a narrow strait.

Whether that great event, the separation of the continents, took place before or after the population of America, is as impossible as it is of little moment for us to know; but we are indebted to the above-mentioned navigators for settling the long dispute about the point from which it was effected. Their observations prove, that in one place the distance between continent and continent is only 39 miles, (not as the author of the *Recherches Philosophiques sur les Americains* would have it) 800 leagues. This narrow strait has also in the middle two islands, which would greatly facilitate the migration of the Asiatics into the new world, supposing

97 Easiness of the passage.

sing that it took place in canoes after the convulsion which rent the two continents asunder. Besides, it may be added, that these straits are, even in the summer, often filled with ice; in winter, often frozen. In either case mankind might find an easy passage; in the last, the way was extremely ready for quadrupeds to cross and stock the continent of America. But where, from the vast expanse of the north-eastern world, to fix on the first tribes who contributed to people the new continent, now inhabited almost from end to end, is a matter that baffles human reason. The learned may make bold and ingenious conjectures, but plain good sense cannot always accede to them.

98 Conjectures concerning the first migrations into the new continent.

As mankind increased in numbers, they naturally protruded one another forward. Wars might be another cause of migrations. There appears no reason why the Asiatic north might not be an *officina virorum*, as well as the European. The overteeming country, to the east of the Riphæan mountains, must find it necessary to discharge its inhabitants: the first great wave of people was forced forward by the next to it, more tumid and more powerful than itself; successive and new impulses continually arriving, short rest was given to that which spread over a more eastern tract; disturbed again and again, it covered fresh regions; at length, reaching the farthest limits of the old world, found a new one, with ample space to occupy unmolested for ages: till Columbus cursed them by a discovery, which brought again new sins and new deaths to both worlds.

99 Mr Pennant's opinion.

"The inhabitants of the new world (Mr Pennant observes) do not consist of the offspring of a single nation: different peoples, at several periods, arrived there; and it is impossible to say, that any one is now to be found on the original spot of its colonization. It is impossible, with the lights which we have so recently received, to admit that America could receive its inhabitants (at least the bulk of them) from any other place than eastern Asia. A few proofs may be added, taken from customs or dresses common to the inhabitants of both worlds; some have been long extinct in the old, others remain in both in full force.

100 The bulk of its inhabitants probably first received from the eastern part of Asia.

101 Proofs from a similarity of customs, &c.

"The custom of scalping was a barbarism in use with the Scythians, who carried about them at all times this savage mark of triumph: they cut a circle round the neck, and stripped off the skin, as they would that of an ox. A little image found among the Calmucks, of a Tartarian deity, mounted on a horse, and sitting on a human skin, with scalps pendent from the breast, fully illustrates the custom of their Scythian progenitors, as described by the Greek historian. This usage, as the Europeans know by horrid experience, is continued to this day in America. The ferocity of the Scythians to their prisoners extended to the remotest part of Asia. The Kamtschatkans, even at the time of their discovery by the Russians, put their prisoners to death by the most lingering and excruciating inventions; a practice in full force to this very day among the aboriginal Americans. A race of the Scythians were styled *Anthropophagi*, from their feeding on human flesh. The people of Nootka Sound still make a repast on their fellow-creatures; but what is more wonderful, the savage allies of the British army have been known to throw the mangled limbs of the French prisoners into the horrible caldron, and devour them with the same relish as those of a quadruped.

102 Customs and dresses common to the eastern Asiatics and the Americans.

"The Scythians were said, for a certain time, annually to transform themselves into wolves, and again to resume the human shape. The new-discovered Americans about Nootka Sound at this time disguise themselves in dresses made of the skins of wolves and other wild beasts, and wear even the heads fitted to their own. These habits they use in the chase, to circumvent the animals of the field. But would not ignorance or superstition ascribe to a supernatural metamorphosis these temporary expedients to deceive the brute creation?

"In their marches, the Kamtschatkans never went abreast, but followed one another in the same track. The same custom is exactly observed by the Americans.

"The Tungusi, the most numerous nation resident in Siberia, prick their faces with small punctures, with a needle, in various shapes; then rub into them charcoal, so that the marks become indelible. This custom is still observed in several parts of America. The Indians on the back of Hudson's bay, to this day, perform the operation exactly in the same manner, and puncture the skin into various figures; as the natives of New Zealand do at present, and as the ancient Britons did with the herb glastum, or woad; and the Virginians, on the first discovery of that country by the English.

"The Tungusi use canoes made of birch bark, distended over ribs of wood, and nicely sewed together. The Canadians, and many other American nations, use no other sort of boats. The paddles of the Tungusi are broad at each end; those of the people near Cook's river, and of Oonalascha, are of the same form.

"In burying of the dead, many of the American nations place the corpse at full length, after preparing it according to their customs; others place it in a sitting posture, and lay by it the most valuable clothing, wampum, and other matters. The Tartars did the same; and both people agree in covering the whole with earth, so as to form a tumulus, barrow, or carnedd.

"Some of the American nations hang their dead in trees. Certain of the Tungusi observe a similar custom.

"We can draw some analogy from dress: convenience in that article must have been consulted on both continents, and originally the materials must have been the same, the skins of birds and beasts. It is singular, that the conic bonnet of the Chinese should be found among the people of Nootka. I cannot give into the notion, that the Chinese contributed to the population of the new world; but we can readily admit, that a shipwreck might furnish those Americans with a pattern for that part of the dress.

103 Other resemblance.

"In respect to the features and form of the human body, almost every tribe found along the western coast has some similitude to the Tartar nations, and still retains the little eyes, small noses, high cheeks, and broad faces. They vary in size, from the lusty Calmucks to the little Nogaians. The internal Americans, such as the Five Indian nations, who are tall of body,

America. body, robust of make, and of oblong faces, are derived from a variety among the Tartars themselves. The fine race of Tschutski seems to be the stock from which those Americans are derived. The Tschutski, again, from that fine race of Tartars the Kabardinski, or inhabitants of Kabarda.

"But about Prince William's sound begins a race chiefly distinguished by their dress, their canoes, and their instruments of the chase, from the tribes to the south of them. Here commences the Esquimaux people, or the race known by that name in the high latitudes of the eastern side of the continent. They may be divided into two varieties. At this place they are of the largest size. As they advance northward, they decrease in height, till they dwindle into the dwarfish tribes which occupy some of the coasts of the Icy sea, and the maritime parts of Hudson's bay, of Greenland, and Terra de Labrador. The famous Japanese map places some islands seemingly within the straits of Behring, on which is bestowed the title of *Ya Sue*, or the Kingdom of the Dwarfs. Does not this in some manner authenticate the chart, and give us reason to suppose that America was not unknown to the Japanese; and that they had (as is mentioned by Kæmpfer and Charlevoix) made voyages of discovery, and, according to the last, actually wintered on the continent? That they might have met with the Esquimaux is very probable: whom, in comparison of themselves, they might justly distinguish by the name of *dwarfs*. The reason of their low stature is very obvious: these dwell in a most severe climate, amidst penury of food; the former in one much more favourable, abundant in provisions—circumstances that tend to prevent the degeneracy of the human frame. At the island of Oonalascha, a dialect of the Esquimaux is in use, which was continued along the whole coast from thence northward."

104 The brute creation migrated by the same route.

The continent which stocked America with the human race poured in the brute creation through the same passage. Very few quadrupeds continued in the peninsula of Kamtschatka; Mr Pennant enumerates only 25 which are inhabitants of land: all the rest persisted in their migration, and fixed their residence in the new world. Seventeen of the Kamtschatkan quadrupeds are found in America: others are common only to Siberia or Tartary, having, for unknown causes, entirely evacuated Kamtschatka, and divided themselves between America and the part of Asia above cited. Multitudes again have deserted the old world even to an individual, and fixed their seats at distances most remote from the spot from which they took their departure; from Mount Ararat, the resting-place of the ark, in a central part of the old world, and excellently adapted for the dispersion of the animal creation to all its parts. We need not be startled (says Mr Pennant) at the vast journeys many of the quadrupeds took to arrive at their present seats. Might not numbers of species have found a convenient abode in the vast Alps of Asia, instead of wandering to the Cordilleras of Chili? or might not others have been contented with the boundless plains of Tartary, instead of travelling thousands of miles to the extensive flats of Pampas?—To endeavour to elucidate common difficulties is certainly a trouble worthy of the philosopher and of the divine; not to attempt it would be a criminal indolence, a neglect to

America.

Vindicate the ways of God to man.

But there are multitudes of points beyond the human ability to explain, and yet are truths undeniable: the facts are indisputable, notwithstanding the causes are concealed. In such cases, faith must be called in to our relief. It would certainly be the height of folly to deny to that Being who broke open the fountains of the great deep to effect the deluge—and afterwards, to compel the dispersion of mankind to people the globe, directed the confusion of languages—powers inferior in their nature to these. After these wondrous powers of Omnipotence, it will be absurd to deny the possibility of infusing instinct into the brute creation. *Deus est anima brutorum;* "God himself is the soul of brutes:" His pleasure must have determined their will, and directed several species, and even whole genera, by impulse irresistible, to move by slow progression to their destined regions. But for that, the lama and the pacos might still have inhabited the heights of Armenia and some more neighbouring Alps, instead of labouring to gain the distant Peruvian Andes; the whole genus of armadillos, slow of foot, would never have quitted the torrid zone of the old world for that of the new; and the whole tribe of monkeys would have gamboled together in the forests of India, instead of dividing their residence between the shades of Indostan and the deep forests of the Brasils. Lions and tigers might have infested the hot parts of the new world, as the first do the deserts of Africa, and the last the provinces of Asia; or the pantherine animals of South America might have remained additional scourges with the savage beasts of those ancient continents. The old world would have been overstocked with animals; the new remained an inanimated waste! or both have contained an equal portion of every beast of the earth. Let it not be objected, that animals bred in a southern climate, after the descent of their parents from the ark, would be unable to bear the frost and snow of the rigorous north, before they reached South America, the place of their final destination. It must be considered, that the migration must have been the work of ages: that in the course of their progress each generation grew hardened to the climate it had reached; and that after their arrival in America, they would again be gradually accustomed to warmer and warmer climates, in their removal from north to south, as they had been in the reverse, or from south to north. Part of the tigers still inhabit the eternal snows of Ararat; and multitudes of the very same species live, but with exalted rage, beneath the line, in the burning soil of Borneo or Sumatra; but neither lions nor tigers ever migrated into the new world. A few of the first are found in India and Persia, but they are found in numbers only in Africa. The tiger extends as far north as Western Tartary, in lat. 40. 50. but never has reached Africa."

In fine, the conjectures of the learned respecting the vicinity of the old and new worlds, are now, by the discoveries of our great navigators, lost in conviction; and in the place of imaginary hypothesis, the real place of migration is incontrovertibly pointed out.

Some

America. Some (from a passage in Plato) have extended over the Atlantic, from the straits of Gibraltar to the coast of North and South America, an island equal in size to the continents of Asia and Africa; over which had passed, as over a bridge, from the latter, men and animals, woolly-headed negroes, and lions and tigers, none of which ever existed in the new world. A mighty sea arose, and in one day and night engulfed this stupendous tract, and with it every being which had not completed its migration into America: The whole negro race, and almost every quadruped, now inhabitants of Africa, perished in this critical day. Five only are to be found at present in America; and of these only one, the bear, in South America: Not a single custom, common to the natives of Africa and America, evinces a common origin. Of the quadrupeds, the bear, stag, wolf, fox, and weasel, are the only animals which we can pronounce with certainty to be found on each continent. The stag, fox, and weasel, have made also no farther progress in Africa than the north; but on the same continent the wolf is spread over every part, yet is unknown in South America, as are the fox and weasel. In Africa and South America the bear is very local, being met with only in the north of the first, and on the Andes in the last. Some cause unknown arrested its progress in Africa, and impelled the migration of a few into the Chilian Alps, and induced them to leave unoccupied the vast tract from North America to the lofty Cordilleras.

105 Remains of antiquity in America. Allusions have often been made to some remains, on the continent of America, of a more polished and cultivated people, when compared with the tribes which possessed it on its first discovery by Europeans, Mr Barton, in his *Observations on some parts of Natural History*, Part I. has collected the scattered hints of Kalm, Carver, and some others, and has added a plan of a regular work which has been discovered on the banks of the Muskingum, near its junction with the Ohio. These remains are principally stone walls, large mounds of earth, and a combination of these mounds with the walls, suspected to have been fortifications. In some places the ditches and the fortress are said to have been plainly seen: in others, furrows, as if the land had been ploughed.

The mounds of earth are of two kinds: they are artificial tumuli, designed as repositories for the dead; or they are of a greater size, for the purpose of defending the adjacent country; and with this view they are artificially constructed, or advantage is taken of the natural eminences, to raise them into a fortification.

The remains near the banks of the Muskingum, are situated about one mile above the junction of that river with the Ohio, and 160 miles below Fort Pitt. They consist of a number of walls and other elevations, of ditches, &c. altogether occupying a space of ground about 300 perches in length, and from about 150 to 25 or 20 in breadth. The town, as it has been called, is a large level, encompassed by walls, nearly in the form of a square, the sides of which are from 96 to 86 perches in length. These walls are, in general, about 10 feet in height above the level on which they stand, and about 20 feet in diameter at the base, but at the top they are much narrower; they are at present overgrown with vegetables of different kinds, and, among others, with trees of several feet diameter. The chasms, or openings in the walls, were probably intended for gateways; they are three in number at each side, besides the smaller openings in the angles. Within the walls there are three elevations, each about six feet in height, with regular ascents to them: these elevations considerably resemble some of the eminences already mentioned, which have been discovered near the river Mississippi. This author's opinion is, That the Toltecas, or some other Mexican nation, were the people to whom the mounts and fortifications, which he has described, owe their existence; and that those people were probably the descendants of the Danes. The former part of this conjecture is thought probable, from the similarity of the Mexican mounts and fortifications described by the abbé Clavigero, and other authors, to those described by our author; and from the tradition of the Mexicans, that they came from the north-west; for, if we can rely on the testimony of late travellers, fortifications similar to those mentioned by Mr Barton, have been discovered as far to the north as Lake Pepin; and we find them, as we approach to the south, even as low as the coasts of Florida. The second part of our author's conjecture appears not so well supported.

America.

106 The ancients supposed to have had some imperfect notion of a new world. It is believed by many, that the ancients had some imperfect notions of a new world; and several ancient authors are quoted in confirmation of this. In a book ascribed to the philosopher Aristotle, we are told that the Carthaginians discovered an island far beyond the pillars of Hercules, large, fertile, and finely watered with navigable rivers, but uninhabited. This island was distant a few days sailing from the continent; its beauty induced the discoverers to settle there; but the policy of Carthage dislodged the colony, and laid strict prohibition on all the subjects of the state not to attempt any future establishment. This account is also confirmed by a historian of no mean credit, who relates, that the Tyrians would have settled a colony on the new discovered island, but were opposed by the Carthaginians for state reasons. The following passage has also been quoted from Seneca's *Medea*, in confirmation of this notion.

——Venient annis
Sæcula seris, quibus oceanus
Vincula rerum laxet, et ingens
Pateat tellus, Typhisque novos
Delegat orbes; nec sit terris
Ultima Thule——

Act iii. ver. 375.

Other authors are also quoted in support of this belief. But however this may be, nobody ever believed the existence of this continent so firmly as to go in quest of it; at least, there are no accounts well supported that America received any part of its first inhabitants from Europe prior to the 15th century. The Welsh fondly imagine that our country contributed, in 1170, to people the new world, by the adventure of Madoc, son of Owen Gwynedd, who, on the death of his father, sailed there, and colonized part of the country. All that is advanced in proof is, a quotation from one of our poets, which proves no more than that he had distinguished himself by sea and land. It is pretended that he made two voyages: that sailing west, he left

107 Pretensions of the Welsh to the discovery of America in the 12th century.

America. Ireland so far to the north, that he came to a land unknown, where he saw many strange things; that he returned home, and making a report of the fruitfulness of the new-discovered country, prevailed on numbers of the Welsh of each sex to accompany him on a second voyage, from which he never returned. The favourers of this opinion assert, that several Welsh words, such as *gwrando*, "to hearken or listen;" the isle of *Crœso*, or "welcome;" *Cape Breton*, from the name of our own island; *gwynndwr*, or "the white water;" and *pengwyn*, or "the bird with a white head;" are to be found in the American language. But likeness of sound in a few words will not be deemed sufficient to establish the fact; especially if the meaning has been evidently perverted: for example, the whole penguin tribe have unfortunately not only black heads, but are not inhabitants of the northern hemisphere; the name was also bestowed on them by the Dutch, *à pinguedine*, from their excessive fatness; but the inventor of this, thinking to do honour to our country, inconsiderately caught at a word of European origin, and unheard of in the new world. It may be added, that the Welsh were never a naval people; that the age in which Madoc lived was peculiarly ignorant in navigation; and the most which they could have attempted must have been a mere coasting voyage.

108 Those of the Norwegians better founded.

The Norwegians put in for a share of the glory, on grounds rather better than the Welsh. By their settlements in Iceland and in Greenland, they had arrived within so small a distance of the new world, that there is at least a possibility of its having been touched at by a people so versed in maritime affairs, and so adventurous, as the ancient Nortmans were. The proofs are much more numerous than those produced by the British historians; for the discovery is mentioned in several of the Icelandic manuscripts. The period was about the year 1002, when it was visited by one Biorn: and the discovery pursued to greater effect by Lief, the son of Eric, the discoverer of Greenland. It does not appear that they reached farther than Labrador; on which coast they met with Esquimaux, on whom they bestowed the name of *Skrælingues*, or dwarfish people, from their small stature. They were armed with bows and arrows, and had leathern canoes, such as they have at present. All this is probable; nor should the tale of the German, called *Turkil*, one of the crew, invalidate the account. He was one day missing; but soon returned, leaping and singing with all the extravagant marks of joy a *bon vivant* could show, on discovering the inebriating fruit of his country, the grape: Torfæns even says, that he returned in a state of intoxication. To convince his commander, he brought several bunches, who from that circumstance named the country *Vinland*. It is not to be denied that North America produces the true vine; but it is found in far lower latitudes than our adventurers could reach in the time employed in their voyage, which was comprehended in a very small space. There appears no reason to doubt of the discovery; but as the land was never colonized, nor any advantage made of it, it may be fairly conjectured, that they reached no farther than the barren country of Labrador. In short, it is from a much later period that we must date the real discovery of America.

Towards the close of the 15th century, Venice and Genoa being rivals in commerce, in which the former had greatly the superiority, Christopher Columbus, a native of Genoa, whose knowledge of the true figure of the earth, however attained, was much superior to the general notions of the age in which he lived, conceived a project of sailing to the East Indies by directing his course westward. The design was founded upon a mistake of the geographers of those days, who place the eastern parts of Asia immensely too far to the eastward; so that, had they been in the right, the shortest way would have been to sail directly westward. He applied first to his own countrymen; but being rejected by them, he applied to France, where he was laughed at and ridiculed. He next applied to Henry VII. of England; but meeting with a disappointment there, he made an application to Portugal, where he met with the same mortifying reception. Spain was his next resource; where, after eight years attendance, he obtained, in 1492, a fleet of three ships. The largest, a ship of no considerable burden, was commanded by Columbus as admiral, who gave it the name of *Santa Maria*, out of respect for the blessed Virgin, whom he honoured with singular devotion. Of the second, called the *Pinta*, Martin Pinzon was captain, and his brother Francis pilot. The third, named the *Nigna*, was under the command of Vincent Yanez Pinzon. These two were light vessels, hardly superior in burden or force to large boats. This squadron, if it merits that name, was victualled for 12 months, and had on board 90 men, mostly sailors, together with a few adventurers who followed the fortune of Columbus, and some gentlemen of Isabella's court, whom she appointed to accompany him. Though the expence of the undertaking was one of the circumstances which chiefly alarmed the court of Spain, and retarded so long the negotiation with Columbus, the sum employed in fitting out this squadron did not exceed 4000l. As Columbus was deeply impressed with sentiments of religion, he would not set out upon an expedition so arduous, and of which one great object was to extend the knowledge of the Christian faith, without imploring publicly the guidance and protection of Heaven. With this view, he, together with all the persons under his command, marched in solemn procession to the monastery of Rabida. After confessing their sins, and obtaining absolution, they received the holy sacrament from the hands of the guardian, who joined his prayers to theirs for the success of an enterprise which he had so zealously patronised.

109 The projects of Christopher Columbus.

110 His voyage.

Next morning being Friday the third day of August, in the year 1492, Columbus set sail a little before sunrise, in presence of a vast crowd of spectators, who sent up their supplications to Heaven for the prosperous issue of the voyage, which they wished rather than expected. Columbus steered directly for the Canary islands, and arrived there without any occurrence that would have deserved notice on any other occasion: but in a voyage of such expectation and importance, every circumstance was the object of attention. The rudder of the Pinta broke loose the day after she left the harbour, and that accident alarmed the crew, no less superstitious than unskilful, as a certain omen of the unfortunate destiny of the expedition. Even in the short run to the Canaries, the ships were found to be so crazy and ill appointed, as to be very improper for

America. for a navigation which was expected to be both long and dangerous. Columbus refitted them, however, to the best of his power; and having supplied himself with fresh provisions, he took his departure from Gomera, one of the most westerly of the Canary islands, on the sixth day of September.

Here the voyage of discovery may properly be said to begin; for Columbus, holding his course due west, left immediately the usual track of navigation, and stretched into unfrequented and unknown seas. The first day, as it was very calm, he made but little way; but on the second, he lost sight of the Canaries; and many of the sailors, dejected already and dismayed, when they contemplated the boldness of the undertaking, began to beat their breasts, and to shed tears, as if they were never more to behold land. Columbus comforted them with assurances of success, and the prospect of vast wealth, in those opulent regions whither he was conducting them. He regulated every thing by his sole authority; he superintended the execution of every order; and allowing himself only a few hours for sleep, he was at all other times upon deck. As his course lay through seas which had not formerly been visited, the sounding line or instruments for observation were continually in his hands. After the example of the Portuguese discoverers, he attended to the motion of tides and currents: watched the flight of birds, the appearance of fishes, of sea-weeds, and of every thing that floated on the waves; and entered every occurrence, with a minute exactness, in the journal which he kept. As the length of the voyage could not fail of alarming sailors habituated only to short excursions, Columbus endeavoured to conceal from them the real progress which they made. With this view, though they ran 18 leagues on the second day after they left Gomera, he gave out that they had advanced only 15: and he uniformly employed the same artifice of reckoning short during the whole voyage. By the 14th of September, the fleet was above 200 leagues to the west of the Canary isles, at a greater distance from land than any Spaniard had been before that time.

III Astonishment occasioned by observing the variation of the compass.

There they were struck with an appearance no less astonishing than new. They observed that the magnetic needle, in their compasses, did not point exactly to the polar star, but varied towards the west; and as they proceeded this variation increased. This appearance, which is now familiar, though it still remains one of the mysteries of nature, into the cause of which the sagacity of man hath not been able to penetrate, filled the companions of Columbus with terror. They were now in a boundless unknown ocean, far from the usual course of navigation; nature itself seemed to be altered, and the only guide which they had left was about to fail them. Columbus, with no less quickness than ingenuity, invented a reason for this appearance, which, though it did not satisfy himself, seemed so plausible to them, that it dispelled their fears, or silenced their murmurs.

He still continued to steer due west, nearly in the same latitude with the Canary islands. In this course he came within the sphere of the trade wind, which blows invariably from east to west between the tropics, and a few degrees beyond them. He advanced before this steady gale with such uniform rapidity, that it was seldom necessary to shift a sail. When about 400 leagues to the west of the Canaries, he found the sea so covered with weeds, that it resembled a meadow of vast extent; and in some places they were so thick as to retard the motion of the vessels. This strange appearance occasioned new alarm and disquiet. The sailors imagined that they were now arrived at the utmost boundary of the navigable ocean; that these floating weeds would obstruct their further progress, and concealed dangerous rocks, or some large tract of land, which had sunk, they knew not how, in that place. Columbus endeavoured to persuade them, that what had alarmed, ought rather to have encouraged them, and was to be considered as a sign of approaching land. At the same time, a brisk gale arose, and carried them forward. Several birds were seen hovering about the ship, and directing their flight towards the west. The desponding crew resumed some degree of spirit, and began to entertain fresh hopes. America.

Upon the first of October, they were, according to the admiral's reckoning, 770 leagues to the west of the Canaries; but lest his men should be intimidated by the prodigious length of the navigation, he gave out that they had proceeded only 584 leagues; and, fortunately for Columbus, neither his own pilot, nor those of the other ships, had skill sufficient to correct this error, and discover the deceit. They had now been about three weeks at sea; they had proceeded far beyond what former navigators had attempted or deemed possible: all their prognostics of discovery, drawn from the flight of birds and other circumstances, had proved fallacious; the appearances of land, with which their own credulity or the artifice of their commander had from time to time flattered and amused them, had been altogether illusive, and their prospect of success seemed now to be as distant as ever. These reflections occurred often to men, who had no other object or occupation, than to reason and discourse concerning the intention and circumstances of their expedition. They made impression at first upon the ignorant and timid, and by extending by degrees to such as were better informed or more resolute, the contagion spread at length from ship to ship. From secret whispers or murmurings they proceeded to open cabals and public complaints. They taxed their sovereign with inconsiderate credulity, in paying such regard to the vain promises and rash conjectures of an indigent foreigner, as to hazard the lives of so many of her own subjects, in prosecuting a chimerical scheme. They affirmed that they had fully performed their duty, by venturing so far in an unknown and hopeless course, and could incur no blame, for refusing to follow, any longer, a desperate adventurer to certain destruction. They contended, that it was necessary to think of returning to Spain, while their crazy vessels were still in a condition to keep the sea, but expressed their fears that the attempt would prove vain, as the wind which had hitherto been so favourable to their course, must render it impossible to sail in the opposite direction. All agreed that Columbus should be compelled by force to adopt a measure on which their common safety depended. Some of the more audacious proposed, as the most expeditious and certain method for getting rid at once of his remonstrances, to throw him into the sea; being persuaded

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that, upon their return to Spain, the death of an unsuccessful projector would excite little concern, and be inquired into with no curiosity.

112 Perilous situation of Columbus.

Columbus was fully sensible of his perilous situation. He had observed, with great uneasiness, the fatal operation of ignorance and of fear in producing disaffection among his crew; and saw that it was now ready to burst out into open mutiny. He retained, however, perfect presence of mind. He affected to seem ignorant of the machinations. Notwithstanding the agitation and solicitude of his own mind, he appeared with a cheerful countenance; like a man satisfied with the progress which he had made, and confident of success. Sometimes he employed all the arts of insinuation to soothe his men. Sometimes he endeavoured to work upon their ambition or avarice, by magnificent descriptions of the fame and wealth which they were about to acquire. On other occasions, he assumed a tone of authority, and threatened them with vengeance from their sovereign, if, by their dastardly behaviour, they should defeat this noble effort to promote the glory of God, and to exalt the Spanish name above that of every other nation. Even with seditious sailors, the words of a man whom they had been accustomed to reverence were weighty and persuasive; and not only restrained them from those violent excesses which they meditated, but prevailed with them to accompany their admiral for some time longer.

As they proceeded, the indications of approaching land seemed to be more certain, and excited hope in proportion. The birds began to appear in flocks, making towards the south-west. Columbus, in imitation of the Portuguese navigators, who had been guided in several of their discoveries by the motion of birds, altered his course from due west towards that quarter whither they pointed their flight. But after holding on for several days in this new direction without any better success than formerly, having seen no object during 30 days but the sea and sky, the hopes of his companions subsided faster than they had risen: their fears revived with additional force; impatience, rage, and despair, appeared in every countenance. All sense of subordination was lost. The officers, who had hitherto concurred with Columbus in opinion, and supported his authority, now took part with the private men: they assembled tumultuously on the deck, expostulated with their commander, mingled threats with their expostulations, and required him instantly to tack about and to return to Europe. Columbus perceived that it would be of no avail to have recourse to any of his former arts, which having been tried so often had lost their effect; and that it was impossible to rekindle any zeal for the success of the expedition among men in whose breasts fear had extinguished every generous sentiment. He saw that it was no less vain to think of employing either gentle or severe measures, to quell a mutiny so general and so violent. It was necessary, on all these accounts, to soothe passions which he could no longer command, and give way to a torrent too impetuous to be checked. He promised solemnly to his men that he would comply with their request, provided they would accompany him, and obey his commands for three days longer; and if, during that time, land were not discovered, he would then abandon the enterprise, and direct his course towards Spain.

113 The crews ready to mutiny.

Enraged as the sailors were, and impatient to turn their faces again towards their native country, this proposition did not appear to them unreasonable. Nor did Columbus hazard much in confining himself to a term so short. The presages of discovering land were now so numerous and promising, that he deemed them infallible. For some days the sounding line reached the bottom, and the soil which it brought up indicated land to be at no great distance. The flocks of birds increased; and were composed not only of sea fowl, but of such land birds as could not be supposed to fly far from the shore. The crew of the Pinta observed a cane floating which seemed to be newly cut, and likewise a piece of timber artificially carved. The sailors aboard the Nigna took up the branch of a tree with red berries perfectly fresh. The clouds around the setting sun assumed a new appearance; the air was more mild and warm; and, during night, the wind became unequal and variable. From all these symptoms, Columbus was so confident of being near land, that on the evening of the 11th of October, after public prayers for success, he ordered the sails to be furled, and the ships to lie by, keeping strict watch, lest they should be driven ashore in the night. During this interval of suspense and expectation, no man shut his eyes, all kept upon deck, gazing intently towards that quarter, where they expected to discover the land which had been so long the object of their wishes.

114 Their joy on descrying the coast.

About two hours before midnight, Columbus standing on the forecastle, observed a light at a distance, and privately pointed it out to Pedro Guttierez, a page of the queen's wardrobe. Guttierez perceived it; and calling to Salcedo, comptroller of the fleet, all three saw it in motion, as if it were carried from place to place. A little after midnight the joyful sound of *Land! Land!* was heard from the Pinta, which kept always ahead of the other ships. But having been so often deceived by fallacious appearances, every man was now become slow of belief; and waited, in all the anguish of uncertainty and impatience, for the return of day. As soon as morning dawned, all doubts and fears were dispelled. From every ship an island was seen about two leagues to the north, whose flat and verdant fields, well stored with wood, and watered with many rivulets, presented the aspect of a delightful country. The crew of the Pinta instantly began the *Te Deum*, as a hymn of thanksgiving to God; and were joined by those of the other ships, with tears of joy and transports of congratulation. This office of gratitude to heaven was followed by an act of justice to their commander. They threw themselves at the feet of Columbus, with feelings of self-condemnation mingled with reverence. They implored him to pardon their ignorance, incredulity, and insolence, which had created him so much unnecessary disquiet, and had so often obstructed the prosecution of his well-concerted plan; and passing, in the warmth of their admiration, from one extreme to another, they now pronounced the man whom they had so lately reviled and threatened, to be a person inspired by Heaven with sagacity and fortitude more than human, in order to accomplish a design so far beyond the ideas and conceptions of all former ages.

As soon as the sun arose, all the boats were manned and armed. They rowed towards the island with their

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their colours displayed, with warlike music, and other martial pomp. As they approached the coast, they saw it covered with a multitude of people, whom the novelty of the spectacle had drawn together, whose attitudes and gestures expressed wonder and astonishment at the strange objects which presented themselves to their view. Columbus was the first European who set foot in the new world which he had discovered. He landed in a rich dress, and with a naked sword in his hand. His men followed; and, kneeling down, they all kissed the ground which they had so long desired to see. They next erected a crucifix; and, prostrating themselves before it, returned thanks to God for conducting their voyage to such a happy issue.

115 They land in one of the islands of the new world.

The above was one of the Bahama islands; to which he gave the name of *San Salvador*, and took possession of it in the name of their Catholic majesties. In this first voyage he discovered several other of the Lucayo or Bahama islands, with those of Cuba and Hispaniola. The natives considered the Spaniards as divinities, and the discharge of the artillery as their thunder: they fell prostrate at the sound. The women, however, offered their favours, and courted the embraces of their new guests as men. Their husbands were not jealous of them; and in the arms of these wantons the companions of Columbus are said to have caught that malady which directs its poison to the springs of life. In a second voyage many new islands were discovered. In a third, he attained the great object of his ambition, by discovering the continent of America, near the mouth of the river Oroonoko, on the first day of August 1498. His success produced a crowd of adventurers from all nations; but the year before this, the northern continent had been discovered by Sebastian Cabot in the service of Henry VII. of England.

116 The continent afterwards discovered.

Notwithstanding the many settlements of the Europeans in this continent, some part of America remains still unknown. The northern continent contains the British colonies of Hudson's Bay, Canada, and Nova Scotia, and the twenty-one united states of the American republic, extending from the river St Lawrence to the gulf of Mexico. It contains also the Spanish territories of New Mexico, California, and Mexico. Besides these, there are immense regions to the west and to the north, where the boundaries have never yet been ascertained. In such as are in any degree known, dwell the Esquimaux, the Algonquins, the Hurons, the Iroquois, the Cherokees, the Chickasaws, and many other tribes of Indians. In the southern continent lie the Spanish provinces of Terra Firma, Guiana, Peru, Paraguay, and Chili; together with that of Brasil, belonging to the Portuguese; and the country of Surinam, belonging to the Dutch. Vast tracts, however, in the inland parts, are unknown, being comprehended under the general name of *Amazonia*. A large district also, said to be the residence of a gigantic race of men, lies on the east side of the continent, between the straits of Magellan and the province of Paraguay. See PATAGONIA.

117 Division of America.

118 Its productions.

This vast country produces most of the metals, minerals, plants, fruits, trees, and woods, to be met with in the other parts of the world, and many of them in greater quantities and high perfection. The gold and silver of America have supplied Europe with such immense quantities of those valuable metals, that they are become vastly more common; so that the gold and silver of Europe now bear little proportion to the high price set upon them before the discovery of America.

America.

It also produces diamonds, pearls, emeralds, amethysts, and other valuable stones, which, by being brought into Europe, have contributed likewise to lower their value. To these, which are chiefly the production of Spanish America, may be added a great number of other commodities, which, though of less price, are of much greater use; and many of them make the ornament and wealth of the British empire in this part of the world. Of these are the plentiful supplies of cochineal, indigo, anatto, logwood, brazil, fustic, pimento, lignum vitæ, rice, ginger, cacao or the chocolate nut, sugar, cotton, tabacco, banillas, red-wood, the balsams of Tolu, Peru, and Chili, that valuable article in medicine the Jesuits bark, mechoacan, sassafras, sarsaparilla, cassia, tamarinds, hides, furs, ambergris, and a great variety of woods, roots, and plants; to which before the discovery of America, we were either entire strangers, or forced to buy at an extravagant rate from Asia and Africa, through the hands of the Venetians and Genoese, who then engrossed the trade of the eastern world.

On this continent there grows also a variety of excellent fruits; as pine-apples, pomegranates, citrons, lemons, oranges, malicatons, cherries, pears, apples, figs, grapes; great numbers of culinary, medicinal, and other herbs, roots, and plants; with many exotic productions, which are nourished in as great perfection as in their native soil.

119 The different possessors of America.

Although the Indians still live in the quiet possession of many large tracts, America, so far as known, was till lately divided into colonies, by three European nations, the Spaniards, English, and Portuguese. The Spaniards, as they first discovered it, had the the largest and richest portion, extending from New Mexico and Louisiana in North America, to the straits of Magellan in the South sea, excepting the large province of Brasil, which belongs to Portugal; for though the French and Dutch have some forts in Surinam and Guiana, they scarcely deserve to be considered as proprietors of any part of the southern continent.

Next to Spain, the most considerable proprietor of America was Great Britain, who derived her claim to North America from the first discovery of that continent by Sebastian Cabot in the name of Henry VII. anno 1497, about six years after the discovery of South America by Columbus in the name of the king of Spain. This country was in general called *Newfoundland*; a name which is now appropriated solely to an island upon its coast. It was a long time before we made an attempt to settle in this country. Sir Walter Raleigh, an uncommon genius and a brave commander, first showed the way, by planting a colony in the southern part, which he called *Virginia*, in honour of his mistress Queen Elizabeth.

The French indeed, from this period until the conclusion of the war before last, laid claim to, and actually possessed, Canada and Louisiana; comprehending all that extensive inland country reaching from Hudson's Bay on the north, to Mexico and the gulf of the same name on the south. But in that war, to which

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which their perfidy and ambition gave rise, they were not only driven from Canada and its dependencies, but obliged to relinquish all that part of Louisiana lying on the east side of the Mississippi, as related under the *History of* BRITAIN. And thus our colonies were preserved, secured, and extended so far, as to render it difficult to ascertain the precise bounds of our empire in North America. To the northward we might have extended our claims quite to the pole itself, nor did any nation seem inclined to dispute the property of this northernmost country with us. From that extremity we had a territory extending southward to Cape Florida in the gulf of Mexico, N. Lat. 25°, and consequently near 4000 miles long in a direct line. And to the westward our boundaries reached to nations unknown even to the Indians of Canada.

120 Vast extent of the British possessions before the late revolution.

Of the revolution that has since taken place, by which a great part of those territories has been separated from the British empire, the history follows in the next article.

121 Rise of the American republic.

AMERICA, United States of. Of the rise and establishment of this republic, which has given a new face to the western world, a succinct and impartial narrative shall in this article be attempted; in which, however, we cannot hope entirely to avoid errors, as they are perhaps unavoidable. The accounts from which the historian must derive his information are not yet cleared from the mistakes of prejudice and the fabrications of party; when they differ, their comparative authenticity is with difficulty ascertained: and they want above all that softening which they can receive from time alone.

The beginning of every political establishment is contemptible. Some few banditti taking refuge among the marshes on the banks of the Tiber, laid the foundation of the Roman empire. The turbulence of some North Americans, and the blunders of some British statesmen, gave birth to this new republic, which at a future period, it has been fancied, may perhaps surpass even the splendour of Rome.

122 State and character of the British colonies at the end of the war 1763.

The state of the British colonies at the conclusion of the war in 1763, was such as attracted the attention of all the politicians in Europe. Their flourishing condition at that period was remarkable and striking: their trade had prospered in the midst of all the difficulties and distresses of a war in which they were so nearly and so immediately concerned. Their population continued on the increase, notwithstanding the ravages and depredations that had been so fiercely carried on by the French, and the native Indians in their alliance. They abounded with spirited and active individuals of all denominations. They were flushed with the uncommon prosperity that had attended them in their commercial affairs and military transactions. Hence they were ready for all kinds of undertakings, and saw no limits to their hopes and expectations.

As they entertained the highest opinion of their value and importance, and the immense benefit that Britain derived from its connexion with them, their notions were adequately high in their own favour. They deemed themselves, not without reason, entitled to every kindness and indulgence which the mother-country could bestow.

Although their pretensions did not amount to a perfect equality of advantages and privileges in matters of commerce, yet in those of government they thought themselves fully competent to the task of conducting their domestic concerns with little or no interference from abroad. Though willing to admit the supremacy of Great Britain, they viewed it with a suspicious eye, and with a marked desire and intent speedily to give it limitations.

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Their improvements in all the necessary and useful arts did honour to their industry and ingenuity. Though they did not live in the luxury of Europe, they had all the solid and substantial enjoyments of life, and were not unacquainted with many of its elegancies and refinements.

A circumstance much to their praise is, that notwithstanding their peculiar addiction to those occupations of which lucre is the sole object, they were duly attentive to cultivate the field of learning; and they have ever since their first foundation been particularly careful to provide for the education of their rising progeny.

Their vast augmentation of internal trade and external commerce, was not merely owing to their position and facility of communication with other parts; it arose also from their natural turn and temper, full of schemes and projects, ever aiming at new discoveries, and continually employed in the search of means of improving their condition.

Their ambition carried them into every quarter from whence profit could be derived. There was scarcely any port of the American hemisphere to which they had not extended their navigation. They were continually exploring new sources of trade, and were found in every spot where business could be transacted.

To this extensive and incessant application to commerce, they added an equal vigilance in the administration of their affairs at home. Whatever could conduce to the amelioration of the soil they possessed, to the progress of agriculture, or to the improvement of their domestic circumstances, was attended to with so much labour and care, that it may be strictly said, that Nature had given them nothing of which they did not make the most.

In the midst of this solicitude and toil in matters of business, the affairs of government were conducted with a steadiness, prudence, and lenity, seldom experienced, and never exceeded, in the best regulated countries of Europe.

Such was the situation of the British colonies in general throughout North America, and of the New England provinces in particular, when the pacification above mentioned opened one of the most remarkable scenes that ever commanded the attention of the world.

123 Intrigues of the French

The French, who have for many ages been the professed and natural enemies of Britain, had long viewed, with equal envy and apprehension, the flourishing state of those colonies she had founded in North America. No doubt at present subsists, that they began immediately after the peace of Paris to carry into execution the scheme they had formed for the separation of the British colonies from the mother country.

Conscious that, whilst a good understanding lasted between them, the superiority must henceforth remain for

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for ever on the side of Britain, it was only by their disunion that France could hope to regain the station and consequence she had formerly possessed in Europe.

The first steps she took were to employ her secret emissaries in spreading dissatisfaction among the British colonists; and the effects produced by her machinations were precisely such as they had intended and expected. The disposition of the inhabitants of North America began gradually to alter from that warmth of attachment to the mother-country which had so peculiarly characterized them. They began to view her rather in the light of a sovereign than that of a parent; and to examine, with a scrupulous nicety, the nature of those ties that rendered them parts of her empire.

124 Taxes laid on goods imported into the colonies, and other obnoxious acts framed;

In March 1764, a bill was passed, by which heavy duties were laid on goods imported by the colonists from such West India islands as did not belong to Great Britain; at the same time that these duties were to be paid into the exchequer in specie: and in the same session, another bill was framed to restrain the currency of paper money in the colonies themselves. These acts coming so close upon each other, threw the whole continent into the utmost ferment. Vehement remonstrances were made to the ministry, and every argument made use of that reason or ingenuity could suggest; but to no purpose. Their reasoning, however, convinced a great number of people at home; and thus the American cause came to be considered as the cause of liberty.

125 which exasperate the Americans.

The Americans, finding all argumentation vain, at last united in an agreement to import no more of the manufactures of Great Britain, but to encourage to the utmost of their power every thing of that kind among themselves. Thus the British manufacturers also became a party against ministry, and did not fail to express their resentment in the strongest terms; but the ministry were not to be so easily daunted, and therefore proceeded to the last step of their intended plan, which was to lay on stamp duties throughout the continent. Previous to this, indeed, several regulations were passed in favour of the commerce of the colonies; but they had now imbibed such unfavourable sentiments of the British ministry, that they paid very little regard to any thing pretended to be done in their favour; or if these acts made any favourable impression, it was quickly obliterated by the news of the stamp act. The reason given for this act so exceedingly obnoxious was, that a sum might be raised sufficient for the defence of the colonies against a foreign enemy; but this pretence was so far from giving any satisfaction to the Americans, that it excited their indignation to the utmost degree. They not only asserted that they were abundantly able to defend themselves against any foreign enemy, but denied that the British parliament had any right to tax them at all.

126 The stamp act framed

It would be superfluous to enter into any arguments used by the contending parties on this important occasion. It was evident that the matter was not to be decided by argument but by force of arms; and the British ministry, too confident of the authority and power of this country, determined to carry on matters with a high hand, to terrify the colonists into an implicit subjection, or, if that would not do, to compel them to it by force. The stamp act, after a violent opposition in parliament, was passed, and its reception in America was such as might have been expected. The news, and the act itself, first arrived at Boston, where the bells were muffled and rung a funeral peal. The act was first hawked about the streets, with a Death's head affixed to it, and styled the "Folly of England, and the Ruin of America;" and afterwards publicly burnt by the enraged populace: The stamps themselves were seized and destroyed, unless brought by men of war, or kept in fortified places; those who were to receive the stamp duties were compelled to resign their offices; and such of the Americans as sided with government on this occasion had their houses plundered and burnt.

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127 Received with universal indignation in America.

Though these outrages were committed by the lowest of the multitude, they were first connived at by those of superior rank, and the principles on which they were founded afterwards openly patronised by them; and the doctrine became general, and openly avowed, that Britain had no right whatever to tax the colonies without their own consent.

It was now found absolutely necessary either to yield to the Americans, by repealing the obnoxious statutes, or to enforce them by arms. The ferment had diffused itself universally throughout the colonies. Virginia first, and after that all the rest of the provinces, declared against the right of Britain to lay on taxes in America; and that every attempt to vest others with this power besides the king, or the governor of the province and his general assembly, was illegal, unconstitutional, and unjust. Non-importation agreements were everywhere entered into; and it was even resolved to prevent the sale of any more British goods after the present year. American manufactures, though dearer, as well as inferior in quality to the British, were universally preferred. An association was entered into against eating of lamb, in order to promote the growth of wool: and the ladies with cheerfulness agreed to renounce the use of every species of ornament manufactured in Britain. Such a general and alarming confederacy determined the ministry to repeal some of the most obnoxious statutes; and to this they were the more inclined by a petition from the first American congress, held at New York in the beginning of October 1765.

128 Repealed.

The stamp act was therefore repealed, to the universal joy of the Americans, and indeed to the general satisfaction of the English, whose manufactures had begun to suffer very severely in consequence of the American association against them. The disputes on the subject without doors, however, were by no means silenced, but each party continued to argue the case as violently as ever. The celebrated Dr Benjamin Franklin was on this occasion examined before the house of commons; and his opinion was in substance as follows:

129 Opinion of Dr Franklin on this subject.

"That the tax in question was impracticable and ruinous. The very attempt had so far alienated the affection of the colonies, that they behaved in a less friendly manner towards the natives of England than before; considering the whole nation as conspiring against their liberty, and the parliament as willing rather to oppress than to support and assist them. America, in fact, did not stand in any need of British manufactures, having already begun to construct such as might be deemed absolutely necessary, and that with such

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such success, as left no doubt of their arriving in a short time at perfection. The elegancies of dress had already been renounced for manufactures of the American kind, though much inferior; and the bulk of the people, consisting of farmers, were such as could in no way be affected by the want of British commodities, as having every necessary within themselves. Materials of all kinds were to be had in plenty: the wood was fine; flax grew in great abundance, and iron was everywhere to be met with."

The Doctor also insisted, "That the Americans had been greatly misrepresented; that they had been traduced as void of gratitude and affection to the parent state; than which nothing could be more contrary to truth. In the war of 1755 they had at their own expence, raised at army of 25,000 men; and in that of 1739 they assisted the British expeditions against South America with several thousand men, and had made many brave exertions against the French in North America. It was said, that the war of 1755 had been undertaken in defence of the colonies; but the truth was, that it originated from a contest about the limits between Canada and Nova Scotia, and in defence of the English rights to trade on the Ohio. The Americans, however, would still continue to act with their usual fidelity; and, were any war to break out in which they had no concern, would show themselves as ready as ever to assist the parent state to the utmost of their power, and would never fail to manifest their readiness in contributing to the emergencies of government, when called to do so in a regular and constitutional manner."

The ministry were conscious, that in repealing this obnoxious act, they yielded to the Americans; and therefore, to support, as they thought, the dignity of Great Britain, it was judged proper to publish a declaratory bill, setting forth the authority of the mother-country over her colonies, and her power to bind them by laws and statutes *in all cases whatever*. This much diminished the joy with which the repeal of the stamp act was received in America. It was considered as a proper reason to enforce any claims equally prejudicial with the stamp act, which might hereafter be set up; a spirit of jealousy pervaded the whole continent, and a strong party was formed, watchful on every occasion to guard against the supposed encroachments of the British power.

130 Declaratory bill gives offence in America.

It was not long before an occasion offered, in which the Americans manifested a spirit of absolute independency; and that, instead of being bound by the British legislature in all cases, they would not be controlled by it in the most trivial affairs. The Rockingham ministry had passed an act, providing the troops stationed in different parts of the colonies with such accommodations as were necessary for them. The assembly of New York, however, took upon them to alter the mode of execution prescribed by the act of parliament, and to substitute one of their own. This gave very great offence to the new ministry, and rendered them, though composed of those who had been active against the stamp bill, less favourable to the colonies than in all probability they would have otherwise been. An unlucky circumstance at the same time occurred, which threw every thing once more into confusion. One of the new ministry, Mr Charles Townshend, having declared that he could find a way of taxing the Americans without giving them offence, was called upon to propose his plan. This was by imposing a duty upon tea, paper, painters colours, and glass imported into America. The undutiful behaviour of the New York assembly, and that of Boston, which had proceeded in a similar manner, caused this bill to meet with less opposition than otherwise it might have done. As a punishment to the refractory assemblies, the legislative power was taken from that of New York, until it should fully comply with the terms of the act. That of Boston at last submitted with reluctance. The bill for the new taxes was quickly passed, and sent to America in 1768.

131 Assembly of New York disobeys an act of parliament.

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132 Mr Townshend's plan to tax America.

A ferment much greater than that occasioned by the stamp act now took place throughout the continent. The populace renewed their outrages, and those of superior station entered into regular combinations against it. Circular letters were sent from Massachusets colony to all the rest, setting forth the injustice and impropriety of the behaviour of the British legislature. Meetings were held in all the principal towns, in which it was proposed to lessen the consumption of foreign manufactures, by giving proper encouragement to their own. Continual disputes ensued betwixt the governors and general assemblies of their provinces, which were much heightened by a letter to Lord Shelburne from Governor Bamand of Massachusets Bay, containing complaints of the people he governed. The assembly, exasperated to the highest degree, charged their governor with having misrepresented them to the court of Britain, required him to produce copies of the letters he had sent; and, on his refusal, wrote letters to the English ministry, accusing him of misrepresentation and partiality, complaining at the same time most grievously of the proceedings of parliament, as utterly subversive of the liberties of America, and the rights of British subjects.

133 is received there with still greater indignation than even the stamp act.

134 Quarrel between the people of Massachusets Bay, and their governor.

The governor, at a loss how to defend himself, prorogued the assembly; and, in his speech on the occasion, gave a loose to his resentment, accusing the members of ambitious designs, incompatible with those of dutiful and loyal subjects. To counteract the circular letter of the province of Massachusets Bay, Lord Hillsborough, secretary for the American department, sent another to the governors of the different colonies, reprobating the other as full of misrepresentation, and tending to excite a rebellion against the authority of the parent state.

Matters now hastened to a crisis. The governor had been ordered to proceed with vigour, and by no means to show any disposition to yield to the people as formerly. In particular, they were required to rescind that resolution by which they had written the circular letter above mentioned; and, in case of a refusal, it was told them that they would be dissolved. As this letter had been framed by the resolutions of a former house, they desired, after a week's consultation, that a recess might be granted to consult with their constituents; but this being refused, they came to a determination, 92 against 17, to adhere to the resolution which produced the circular letter. At the same time a letter was sent to Lord Hillsborough, and a message to the governor, in justification of their proceedings. In both they expressed themselves with such freedom

135 He requires the assembly to rescind their circular letter;

136 which they refuse.

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as was by no means calculated to accord with the sentiments of those in power. They insisted that they had a right to communicate their sentiments to their fellow-subjects upon matters of such importance; complained of the requisition to rescind the circular letter as unconstitutional and unjust; and particularly insisted, that they were represented as harbouring seditious designs, when they were doing nothing but what was lawful and right. At the same time, they condemned the late acts of parliament as highly oppressive, and subversive of liberty. The whole was concluded by a list of accusations against their governor, representing him as unfit to continue in his station, and petitioning the king for his removal from it.

137 Accuse their governor, and petition for his removal.

These proceedings were followed by a violent tumult at Boston. A vessel belonging to a capital trader had been seized in consequence of his having neglected some of the new regulations; and being taken under the protection of a man of war at that time lying in the harbour, the populace attacked the houses of the commissioners of excise, broke their windows, destroyed the collector's boats, and obliged the customhouse officers to take refuge in Castle William, situated at the entrance of the harbour.

138 A tumult at Boston.

The governor now took the last step in his power to put a stop to the violent proceedings of this assembly, by dissolving it entirely; but this was of little moment. Their behaviour had been highly approved by the other colonies, who had written letters to them expressive of their approbation. After the dissolution of the assembly, frequent meetings of the people were held in Boston, which ended in a remonstrance to the governor, to the same purpose as some of the former; but concluding with an extraordinary request, that he would take upon him to order the king's ships out of the harbour.

139 The assembly dissolved.

While the disposition of the Bostonians was thus going on from bad to worse, news arrived that the agent for the colony had not been allowed to deliver their petition to the king; it having been objected, that the assembly without the governor was not sufficient authority. This did not contribute to allay the ferment; and it was further augmented by the news that a number of troops had been ordered to repair to Boston, to keep the inhabitants in awe.

140 The disturbances still increase.

141 Some troops ordered to Boston.

A dreadful alarm now took place. The people called on the governor to convene a general assembly, in order to remove the fears of the military; who they said were to be assembled to overthrow their liberties, and force obedience to laws to which they were entirely averse. The governor replied that it was no longer in his power to call an assembly; having, in his last instructions from England, been required to wait the king's orders, the matter being then under consideration at home. Being thus refused, the people took upon themselves the formation of an assembly, which they called a *Convention*. The proceedings and resolutions of this were conformable to their former behaviour; but now they went a step farther, and, under pretence of an approaching rupture with France, ordered the inhabitants to put themselves in a posture of defence against any sudden attack of an enemy; and circular letters were directed to all the towns in the province, acquainting them with the resolution that had been taken in the capital, and exhorting them to proceed in the same manner. The town of Hatfield alone refused its concurrence; but this served only to expose them to the censure and contempt of the rest. The convention, however, thought proper to assure the governor of their pacific intentions, and renewed their request that an assembly might be called; but being refused any audience, and threatened with being treated as rebels, they at last thought proper to dissolve of themselves, and sent over to Britain a circumstantial account of their proceedings, with the reason of their having assembled in the manner already mentioned.

142 The people form an assembly called a *Convention*;

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143 which dissolves, and endeavours to vindicate its own conduct.

The expected troops arrived on the very day on which the convention broke up, and had some houses in the town fitted up for their reception. Their arrival had a considerable influence on the people, and for some time seemed to put a stop to the disturbances; but the seeds of discord had now taken such deep root, that it was impossible to quench the flame. The late outrageous behaviour in Boston had given the greatest offence in England; and, notwithstanding all the efforts of opposition, an address from both houses of parliament was presented to the king; in which the audacious behaviour of the colony of Massachusets Bay was set forth in the most ample manner, and the most vigorous measures recommended for reducing them to obedience. The Americans, however, continued stedfast in the ideas they had adopted. Though the troops had for some time quieted the disturbances, yet the calm continued no longer than they appeared respectable on account of their number; but as soon as this was diminished by the departure of a large detachment, the remainder were treated with contempt, and it was even resolved to expel them altogether. The country people took up arms for this purpose, and were to have assisted their friends in Boston; but before the plot could be put in execution, an event happened which put an end to every idea of reconciliation betwixt the contending parties.

144 Both houses of parliament address the king against America.

On the 5th of March 1770, a scuffle happened between some soldiers and a party of the town's people. The inhabitants poured in from all quarters to the assistance of their fellow-citizens; a violent tumult ensued, during which the military fired among the mob, killing and wounding several of them. The whole province now rose in arms, and the soldiers were obliged to retire to Castle William to prevent their being cut in pieces. In other respects, the determinations of the Americans continued, if possible, more firm than ever, until at last government, determined to act with vigour, and at the same time to behave with as much condescension as possible, repealed all the duties lately laid on, that of tea alone excepted. This was left on purpose to maintain the dignity of the crown of Britain; and it was thought that it could not be productive of any discontent in America, as being an affair of very little moment, the produce of which was not expected to exceed 16,000l. The opposition, however, were strenuous in their endeavours to get this tax likewise abrogated; insisting, that the Americans would consider it only as an inlet to others; and that the repeal of all the rest, without this, would answer no great purpose. The event showed that their opinion was well founded. The Americans, opposed the tea tax with the same violence as they had done all the rest;

145 Some people killed by the soldiers in a mob at Boston.

146 All the duties except that on tea taken off;

147 which is as violently opposed as all the rest.

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rest: and at last, on the news that salaries had been settled on the justices of the superior court of Boston, the governor was addressed on the subject; the measure was condemned in the strongest terms; and a committee, selected out of the several districts of the colony, appointed to inquire into it.

148 Assembly of Massachusets Bay formally denies the British right of taxation.

The new assembly proceeded in the most formal manner to disavow the supremacy of the British legislature; accused the parliament of Britain of having violated the natural rights of the Americans in a number of instances. Copies of the transactions of this assembly were transmitted to every town in Massachusets, exhorting the inhabitants to rouse themselves, and exert every nerve in opposition to the iron hand of oppression, which was daily tearing the choicest fruits from the fair tree of liberty. The disturbances were also greatly heightened by an accidental discovery that Mr Hutchison, governor of Massachusets Bay, had written several confidential letters to people in power in England, complaining of the behaviour of the province, recommending vigorous measures against them, and, among other things, asserting, that "there must be an abridgement of what is called British liberty." Letters of this kind had somehow or other fallen into the hands of the agent for the colony at London. They were immediately transmitted to Boston, where the assembly was sitting, by whom they were laid before the governor, who was thus reduced to a very mortifying situation. Losing every idea of respect or friendship for him as their governor, they instantly despatched a petition to the king, requesting him to remove the governor and deputy governor from their places; but to this they not only received no favourable answer, but the petition itself was declared groundless and scandalous.

149 Gov. Hutchison's letters to British ministry discovered.

150 The petition against him refused.

151 Tea destroyed at Boston,

Matters were now ripe for the utmost extremities on the part of the Americans; and they were brought on in the following manner: Though the colonists had entered into a non-importation agreement against tea as well as all other commodities from Britain, it had nevertheless found its way into America, though in smaller quantities than before. This was sensibly felt by the East India Company, who had now agreed to pay a large sum annually to government; in recompense for which compliance, and to make up their losses in other respects, they were empowered to export their tea free from any duty payable in Britain; and in consequence of this permission, several ships freighted with the commodity were sent to North America, and proper agents appointed for disposing of it. The Americans now perceiving that the tax was thus likely to be enforced whether they would or not, determined to take every possible method to prevent the tea from being landed, as well knowing that it would be impossible to hinder the sale, should the commodity once be brought on shore. For this purpose the people assembled in great numbers, forcing those to whom the tea was consigned to resign their offices, and to promise solemnly never to resume them; and committees were appointed to examine the accounts of merchants, and make public tests, declaring such as would not take them enemies to their country. Nor was this behaviour confined to the colony of Massachusets Bay; the rest of the provinces entered into the contest with the same warmth, and manifested the same resolution to oppose the mother-country. United States.

In the midst of this confusion three ships laden with tea arrived at Boston; but so much were the captains alarmed at the disposition which seemed to prevail among the people, that they offered, providing they could obtain the proper discharges from the tea consignees, customhouse, and governor, to return to Britain without landing their cargoes. The parties concerned, however, though they durst not order the tea to be landed, refused to grant the discharges required. The ships, therefore, would have been obliged to remain in the harbour; but the people, apprehensive that if they remained there the tea would be landed in small quantities, and disposed of in spite of every endeavour to prevent it, resolved to destroy it at once. This resolution was executed with equal speed and secrecy. The very evening after the above-mentioned discharges had been refused, a number of people, dressed like Mohawk Indians, boarded the ships, and threw into the sea their whole cargoes, consisting of 342 chests of tea; after which they retired without making any further disturbance, or doing any more damage. No tea was destroyed in other places, though the same spirit was everywhere manifested. At Philadelphia the pilots were enjoined not to conduct the vessels up the river; and at New York, though the governor caused some tea to be landed under the protection of a man of war, he was obliged to deliver it up to the custody of the people, to prevent its being sold.

152 and refused admittance in other places.

The destruction of the tea at Boston, which happened in November 1773, was the immediate prelude to the disasters attending civil discord. Government finding themselves everywhere insulted and despised, resolved to enforce their authority by all possible means; and as Boston had been the principal scene of the riots and outrages, it was determined to punish that city in an exemplary manner. Parliament was acquainted by a message from his majesty with the undutiful behaviour of the city of Boston, as well as of all the colonies, recommending at the same time the most vigorous and spirited exertions to reduce them to obedience. The parliament in its address promised a ready compliance; and indeed the Americans, by their outrageous behaviour, had now lost many of their partisans. It was proposed to lay a fine on the town of Boston equal to the price of the tea which had been destroyed, and to shut up its port by armed vessels until the refractory spirit of the inhabitants should be subdued; which it was thought must quickly yield, as a total stop would thus be put to their trade. The bill was strongly opposed on the same grounds that the other had been; and it was predicted, that instead of having any tendency to reconcile or subdue the Americans, it would infallibly exasperate them beyond any possibility of reconciliation. The petitions against it, presented by the colony's agent, pointed out the same consequence in the strongest terms, and in the most positive manner declared that the Americans never would submit to it; but such was the infatuation attending every rank and degree of men, that it never was imagined the Americans would dare to resist the parent state openly, but would in the end submit implicitly to her commands. In this confidence a third bill was proposed

153 Punishment of Boston resolved on

154 Arguments and petitions against it,

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proposed for the impartial administration of justice on such persons as might be employed in the suppression of riots and tumults in the province of Massachusets Bay. By this act it was provided, that should any persons acting in that capacity be indicted for murder, and not able to obtain a fair trial in the province, they might be sent by the governor to England, or to some other colony, if necessary, to be tried for the supposed crime.

155 and for the partial administration of justice.

156 Quebec Bill.

These three bills having passed so easily, the ministry proposed a fourth, relative to the government of Canada; which, it was said, had not yet been settled on any proper plan. By this bill the extent of that province was greatly enlarged; its affairs were put under the direction of a council into which Roman Catholics were to be admitted; the Roman Catholic clergy were secured in their possessions and the usual perquisites from those of their own profession. The council above mentioned were to be appointed by the crown, to be removable at its pleasure; and to be invested with every legislative power excepting that of taxation.

157 These acts exasperate the Americans.

No sooner were these laws made known in America, than they cemented the union of the colonies almost beyond any possibility of dissolving it. The assembly of Massachusets Bay had passed a vote against the judges accepting salaries from the crown, and put the question, Whether they would accept them as usual from the general assembly? Four answered in the affirmative; but Peter Oliver the chief justice refused. A petition against him, and an accusation, were brought before the governor; but the latter refused the accusation, and declined to interfere in the matter: but as they still insisted for what they called justice against Mr Oliver, the governor thought proper to put an end to the matter by dissolving the assembly.

158 Resentment occasioned by the port bill.

In this situation of affairs a new alarm was occasioned by the news of the port bill. This had been totally unexpected, and was received with the most extravagant expressions of displeasure among the populace; and while these continued, the new governor, General Gage, arrived from England. He had been chosen to this office on account of his being well acquainted in America, and generally agreeable to the people; but human wisdom could not now point out a method by which the flame could be allayed. The first act of his office as governor was to remove the assembly to Salem, a town 17 miles distant, in consequence of the late act. When this was intimated to the assembly, they replied, by requesting him to appoint a day of public humiliation for deprecating the wrath of heaven, but met with a refusal. When met at Salem, they passed a resolution, declaring the necessity of a general congress composed of delegates from all the provinces, in order to take the affairs of the colonies at large into consideration; and five gentlemen, remarkable for their opposition to the British measures, were chosen to represent that of Massachusets Bay. They then proceeded with all expedition to draw up a declaration, containing a detail of the grievances they laboured under, and the necessity of exerting themselves against lawless power: they set forth the disregard shown to their petitions, and the attempts of Great Britain to destroy their ancient constitution; and concluded with exhorting the inhabitants of the colony to obstruct, by every method in their power, such evil designs, recommending at the same time a total renunciation of every thing imported from Great Britain till a redress of grievances could be procured.

159 Proceedings of the general assembly met at Salem.

Intelligence of this declaration was carried to the governor on the very day that it was completed; on which he dissolved the assembly. This was followed by an address from the inhabitants of Salem in favour of those of Boston, and concluding with these remarkable words: "By shutting up the port of Boston, some imagine that the course of trade might be turned hither, and to our benefit; but nature, in the formation of our harbour, forbids our becoming rivals in commerce with that convenient mart; and were it otherwise, we must be dead to every idea of justice, lost to all feelings of humanity, could we indulge one thought to seize on wealth, and raise our fortunes on the ruin of our suffering neighbours."

160 Generosity of the people of Salem to those of Boston.

It had been fondly hoped by the ministerial party at home, that the advantages which other towns of the colony might derive from the annihilation of the trade of Boston would make them readily acquiesce in the measure of shutting up that port, and rather rejoice in it than otherwise; but the words of the address above mentioned seemed to preclude all hope of this kind; and subsequent transactions soon manifested it to be totally vain. No sooner did intelligence arrive of the remaining bills passed in the session of 1774, than the cause of Boston became the cause of all the colonies. The port bill had already occasioned violent commotions throughout them all. It had been reprobated in provincial meetings, and resistance even to the last had been recommended against such oppression. In Virginia, the first of June, the day on which the port of Boston was to be shut up, was held as a day of humiliation, and a public intercession in favour of America was enjoined. The style of the prayer enjoined at this time was, that "God would give the people one heart and one mind, firmly to oppose every invasion of the American rights." The Virginians, however, did not content themselves with acts of religion. They recommended in the strongest manner a general congress of all the colonies, as fully persuaded that an attempt to tax any colony in an arbitrary manner was in reality an attack upon them all, and must ultimately end in the ruin of them all.

161 The cause of Boston espoused by all the rest of the colonies.

The provinces of New York and Pennsylvania, however, were less sanguine than the rest, being so closely connected in the way of trade with Great Britain, that the giving it up entirely appeared a matter of the most serious magnitude, and not to be thought of but after every other method had failed. The intelligence of the remaining bills respecting Boston, however, spread a fresh alarm throughout the continent, and fixed those who had seemed to be the most wavering. The proposal of giving up all commercial intercourse with Britain was again proposed; contributions for the inhabitants of Boston were raised in every quarter: and they every day received addresses commending them for the heroic courage with which they sustained their calamity.

162 The Americans firmly united in their opposition to Britain.

The Bostonians on their part were not wanting in their endeavours to promote the general cause. An agreement was framed, which, in imitation of former

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times, they called a Solemn League and Covenant. By this the subscribers most religiously bound themselves to break off all communication with Britain after the expiration of the month of August ensuing, until the obnoxious acts were repealed; at the same time they engaged neither to purchase nor use any goods imported after that time, and to renounce all connection with those who did, or who refused to subscribe to this covenant; threatening to publish the names of the refractory, which at this time was a punishment by no means to be despised. Agreements of a similar kind were almost instantaneously entered into throughout all America. General Gage indeed attempted to counteract the covenant by a proclamation, wherein it was declared an illegal and traitorous combination, threatening with the pains of law such as subscribed or countenanced it. But matters were too far gone for his proclamations to have any effect. The Americans retorted the charge of illegality on his own proclamation, and insisted that the law allowed subjects to meet in order to consider of their grievances, and associate for relief from oppression.

163 Solemn league and covenant at Boston.

164 The governor attempts in vain to counteract it by proclamation.

Preparations were now made for holding the general congress so often proposed. Philadelphia, as being the most central and considerable town, was pitched upon for the place of its meeting. The delegates of whom it was to be composed were chosen by the representatives of each province, and were in number from two to seven for each colony, though no province had more than one vote. The first congress which met at Philadelphia, in the beginning of September 1774, consisted of 51 delegates. The novelty and importance of the meeting excited universal attention; and their transactions were such as could not but tend to render them respectable.

165 Congress meets at Philadelphia.

166 Account of its transactions.

The first act of congress was an approbation of the conduct of Massachusets Bay, and an exhortation to continue in the same spirit with which they had begun. Supplies for the suffering inhabitants (whom indeed the operation of the port bill had reduced to great distress) were strongly recommended; and it was declared, that in case of attempts to enforce the obnoxious acts by arms, all America should join to assist the town of Boston; and should the inhabitants be obliged, during the course of hostilities, to remove farther up the country, the losses they might sustain should be repaired at the public expence.

They next addressed General Gage by letter; in which having stated the grievances of the people of Massachusets colony, they informed him of the fixed and unalterable determination of all the other provinces to support their brethren, and to oppose the British acts of parliament; that they themselves were appointed to watch over the liberties of America; and entreated him to desist from military operations, lest such hostilities might be brought on as would frustrate all hope of a reconciliation with the parent state.

The next step was to publish a declaration of their rights. These they summed up in the rights belonging to Englishmen; and particularly insisted, that as their distance rendered it impossible for them to be represented in the British parliament, their provincial assemblies, with the governor appointed by the king, constituted the only legislative power within each province. They would, however, consent to such acts of parliament as were evidently calculated merely for the regulation of commerce, and securing to the parent state the benefits of the American trade; but would never allow that they could impose any tax on the colonies, for the purpose of raising a revenue, without their consent. They proceeded to reprobate the intention of each of the new acts of parliament; and insisted on all the rights they had enumerated as being unalienable, and what none could deprive them of. The Canada act they particularly pointed out as being extremely inimical to the colonies by whose assistance it had been conquered; and they termed it, "An act for establishing the Roman Catholic religion in Canada, abolishing the equitable system of English laws, and establishing a tyranny there." They further declared in favour of a non-importation and non-consumption of British goods until the act was repealed by which duties were imposed upon tea, coffee, wine, sugar, and molasses, imported into America, as well as the Boston port-act, and the three others passed in the preceding session of parliament. The new regulations against the importation and consumption of British commodities were then drawn up with great solemnity; and they concluded with returning the warmest thanks to those members of parliament who had with so much zeal, though without any success, opposed the obnoxious acts of parliament.

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Their next proceedings were to frame a petition to the king, an address to the British nation, and another to the colonies; all of which were so much in the usual strain of American language for some time past, that it is needless to enter into any particular account of them. It is sufficient to say, that they were all drawn up in a masterly manner, and ought to have impressed the people of this country with a more favourable idea of the Americans than they could at that time be induced to entertain.

All this time the disposition of the people had corresponded with the warmest wishes of congress. The first of June had been kept as a fast, not only throughout Virginia where it was first proposed, but through the whole continent. Contributions for the distresses of Boston had been raised throughout America, and people of all ranks seemed to be particularly touched with them. Even those who seemed to be most likely to derive advantages from them took no opportunity, as has been already instanced in the case of Salem. The inhabitants of Marblehead also showed a noble example of magnanimity in the present case. Though situated in the neighbourhood of Boston, and most likely to derive benefit from their distresses, they did not attempt to take any advantage, but generously offered the use of their harbour to the Bostonians, as well as their wharfs and warehouses, free of all expence. In the mean time, the British forces at Boston were continually increasing in number, which greatly augmented the general jealousy and disaffection; the country was ready to rise at a moment's warning: and the experiment was made by giving a false alarm that the communication between the town and country was to be cut off, in order to reduce the former by famine to a compliance with the acts of parliament. On this intelligence the country people assembled in great numbers, and could not be satisfied till they had sent messengers into the city to inquire into the truth

167 Generosity of the inhabitants of Marblehead to Boston.

168 Extreme attachment of the country people to the Bostonians.

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truth of the report. These messengers were enjoined to inform the town's people, that if they should be so pusillanimous as to make a surrender of their liberties, the province would not think itself bound by such examples; and that Britain, by breaking their original charter, had annulled the contract subsisting between them, and left them to act as they thought proper.

The people in every other respect manifested their inflexible determination to adhere to the plan they had so long followed. The new counsellors and judges were obliged to resign their offices, in order to preserve their lives and properties from the fury of the multitude. In some places they shut up the avenues to the court houses; and when required to make way for the judges, replied, that they knew of none but such as were appointed by the ancient usage and custom of the province. Everywhere they manifested the most ardent desire of learning the art of war; and every individual who could bear arms, was most assiduous in procuring them, and learning their exercise.

169 Gen. Gage fortifies Boston Neck;

Matters at last proceeded to such a height, that General Gage thought proper to fortify the neck of land which joins the town of Boston to the continent. This, though undoubtedly a prudent measure in his situation, was exclaimed against by the Americans in the most vehement manner; but the general, instead of giving ear to their remonstrances, deprived them of

170 and seizes the military stores belonging to the province.

all power of acting against himself, by seizing the provincial powder, ammunition, and military stores, at Cambridge and Charlestown. This excited such indignation, that it was with the utmost difficulty the people could be restrained from marching to Boston and attacking the troops. Even in the town itself, the company of cadets that used to attend him disbanded themselves, and returned the standard he had as usual presented them with on his accession to the government. This was occasioned by his having deprived the celebrated John Hancock, afterwards president of the congress, of his commission as colonel of the cadets. A similar instance happened of a provincial colonel having accepted a seat in the new council; upon which 24 officers of his regiment resigned their commissions in one day.

171 Opposition to the British parliament still increases.

In the mean time a meeting was held of the principal inhabitants of the towns adjacent to Boston. The purport of this was publicly to renounce all obedience to the late act of parliament, and to form an engagement to indemnify such as should be prosecuted on that account; the members of the new council were declared violators of the rights of their country; all ranks and degrees were exhorted to learn the use of arms; and the receivers of the public revenue were ordered not to deliver it into the treasury, but retain it in their own hands till the constitution should be restored, or a provincial congress dispose of it otherwise.

A remonstrance against the fortifications on Boston Neck was next prepared; in which, however, they still pretended their unwillingness to proceed to any hostile

172 A general assembly called, and dissolved by proclamation.

measures; asserting only as usual their firm determination not to submit to the acts of parliament they had already so much complained of. The governor, to restore tranquillity, if possible, called a general assembly; but so many of the council had resigned their seats, that he was induced to countermand its sitting by proclamation. This measure, however, was deemed illegal; the assembly met at Salem; and after waiting a day for the governor, voted themselves into a provincial congress, of which Mr Hancock was chosen president. A committee was instantly appointed, who waited on the governor with a remonstrance concerning the fortifications on Boston Neck; but nothing of consequence took place, both parties mutually criminating each other. The winter was now coming on, and the governor, to avoid quartering the soldiers upon the inhabitants, proposed to erect barracks for them; but the select men of Boston compelled the workmen to desist. Carpenters were sent for to New York, but they were refused; and it was with the utmost difficulty that he could procure winter lodgings for his troops. Nor was the difficulty less in procuring clothes; as the merchants of New York told him, that "they would never supply any article for the benefit of men sent as enemies to their country."

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173 Gen. Gage meets with great difficulties in accommodating his troops.

174 The Americans make preparations for war.

This disposition, known to be almost universal throughout the continent, was in the highest degree satisfactory to congress. Every one saw that the ensuing spring was to be the season of commencing hostilities, and the most indefatigable diligence was used by the colonies to be well provided against such a formidable enemy. A list of all the fencible men in each colony was made out, and especially of those who had served in the former war; of whom they had the satisfaction to find that two-thirds were still alive and fit to bear arms. Magazines of arms were collected, and money was provided for the payment of troops. The governors in vain attempted to put a stop to these proceedings by proclamations; the fatal period was now arrived; and the more the servants of government attempted to repress the spirit of the Americans, the more violent it appeared.

175 Distress of the inhabitants of Boston.

In the mean time the inhabitants of Boston were reduced to great distress. The British troops, now distinguished by the name of the *enemy*, were absolutely in possesion of it; the inhabitants were kept as prisoners, and might be made accountable for the conduct of the whole colonies; and various measures were contrived to relieve the latter from such a disagreeable situation. Sometimes it was thought expedient to remove the inhabitants altogether; but this was impracticable without the governor's consent. It was then proposed to set fire to the town at once, after valuing the houses and indemnifying the proprietors; but this being found equally impracticable, it was resolved to wait some other opportunity, as the garrison was not very numerous, and, not being supplied with necessaries by the inhabitants, might soon be obliged to leave the place. The friends of British government indeed attempted to do something in opposition to the general voice of the people; but after a few ineffectual meetings and resolutions they were utterly silenced, and obliged to yield to the superior number of their adversaries.

176 Military stores seized by the Americans.

Matters had now proceeded so far that every idea of reconciliation or friendship with Britain was lost. The Americans, therefore, without ceremony, began to seize on the military stores and ammunition belonging to government. This first commenced at Newport in Rhode Island, where the inhabitants carried off 40 pieces of cannon appointed for the protection of the

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place; and on being asked the reason of this proceeding, they replied, that the people had seized them lest they should be made use of against themselves. After this the assembly met, and resolved that ammunition and warlike stores should be purchased with the public money.

New Hampshire followed the example of Rhode Island, and seized a small fort for the sake of the powder and military stores it contained. In Pennsylvania, however, a convention was held, which expressed an earnest desire of reconciliation with the mother country; though at the same time, in the strongest manner declaring, that they were resolved to take up arms in defence of their just rights, and defend to the last their opposition to the late acts of parliament; and the people were exhorted to apply themselves with the greatest assiduity to the prosecution of such manufactures as were necessary for their defence and subsistence, such as salt, saltpetre, gunpowder, steel, &c. This was the universal voice of the colonies, New York only excepted. The assembly of that province, as yet ignorant of the fate of their last remonstrance, refused to concur with the other colonies in their determination to throw off the British yoke: their attachment, however, was very faint, and by the event it appeared that a perseverance in the measures which the ministry had adopted was sufficient to unite them to the rest.

As the disturbances had originated in the province of Massachusets Bay, and there continued all along with the greatest violence, so this was the province where the first hostilities were formally commenced. In the beginning of February the provincial congress met at Cambridge; and as no friends to Britain could now find admittance to that assembly, the only consideration was how to make proper preparations for war. Expertness in military discipline was recommended in the strongest manner, and several military institutions enacted; among which that of the *minute-men* was one of the most remarkable. These were chosen from the most active and expert among the militia; and their business was to keep themselves in constant readiness at the call of their officers; from which perpetual vigilance they derived their title.—It was now easily seen that a slight occasion would bring on hostilities, which could not but be attended with the most violent and certain destruction to the vanquished party: for both were so much exasperated by a long course of reproaches and literary warfare, that they seemed to be filled with the utmost inveteracy against each other.

177 Massachusets assembly recommend preparations for war.

On the 26th of February, General Gage having been informed that a number of field-pieces had been brought to Salem, despatched a party to seize them. Their road was obstructed by a river, over which was a drawbridge. This the people had pulled up, and refused to let down: upon which the soldiers seized a boat to ferry them over; but the people cut out her bottom. Hostilities would immediately have commenced, had it not been for the interposition of a clergyman, who represented to the military, on the one hand, the folly of opposing such numbers; and to the people, on the other, that as the day was far spent the military could not execute their design, so that they might without any fear leave them the quiet possession of the drawbridge. This was complied with; and the soldiers, after having remained for some time at the bridge, returned without executing their orders.

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The next attempt, however, was attended with more serious consequences. General Gage, having been informed that a large quantity of ammunition and military stores had been collected at Concord, about 20 miles from Boston, and where the provincial congress was sitting, sent a detachment, under the command of Colonel Smith and Major Pitcairn, to destroy the stores, and, as was reported, to seize Messrs Hancock and Adams, the leading men of the congress. They set out before daybreak, on the 19th of April, marching with the utmost silence, and securing every one they met on the road, that they might not be discovered. But notwithstanding all their care, the continual ringing of bells and firing of guns as they went along, soon gave them notice that the country was alarmed. About five in the morning they had reached Lexington, 15 miles from Boston, where the militia of the place were exercising. An officer called out to them to disperse; but some shots, it is said, being at that moment fired from a house in the neighbourhood, the military made a discharge, which killed and wounded several of the militia. The detachment then proceeded to Concord, where, having destroyed the stores, they were encountered by the Americans; and a scuffle ensued, in which several fell on both sides. The purpose of their expedition being thus accomplished, it was necessary for the king's troops to retreat, which they did through a continual fire kept upon them from Concord to Lexington. Here their ammunition was totally expended; and they would have been unavoidably cut off, had not a considerable reinforcement commanded by Lord Percy luckily met them. The Americans, however, continued their attack with great fury; and the British would still have been in the utmost danger, had it not been for two field-pieces which Lord Percy had brought with him. By these the impetuosity of the Americans was checked, and the British made good their retreat to Boston with the loss of 250 killed and wounded: that of the Americans was about 60.

178 Skirmish at Lexington.

By this engagement the spirits of the Americans were so raised, that they meditated nothing less than the total expulsion of the British troops from Boston. An army of 20,000 men was assembled, who formed a line of encampment from Roxbury to Mystic, through a space of about 30 miles; and here they were soon after joined by a large body of Connecticut troops, under General Putnam, an old officer of great bravery and experience. By this formidable force was the town of Boston now kept blocked up. General Gage, however, had so strongly fortified it, that the enemy, powerful as they were, durst not make an attack; while, on the other hand, his force was by far too insignificant to meet such an enemy in the field. But towards the end of May, a considerable reinforcement having arrived, with Generals Howe, Burgoyne, and Clinton, he was soon enabled to attempt something of consequence; and this the boasts of the provincials, that they were besieging those who had been sent to subdue them, seemed to render necessary. Some skirmishes in the mean time happened in the islands lying off Boston harbour, in which the Americans had the advantage, and burnt an armed schooner, which her people

179 A great army assembles before Boston.

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180 Battle at Bunker's Hill.

people had been obliged to abandon after she was left aground by the tide. Nothing decisive, however, took place till the 17th of June. In the neighbourhood of Charlestown, a place on the northern shore of the peninsula on which Boston stands, is a high ground called *Bunker's Hill*, which overlooks and commands the whole town of Boston. In the night of the 16th the provincials took possession of this place: and worked with such indefatigable diligence, that, to the astonishment of their enemies, they had before daylight almost completed a redoubt, with a strong intrenchment reaching half a mile eastward, as far as the river Mystic. After this they were obliged to sustain a heavy and incessant fire from the ships and floating batteries with which Charlestown Neck was surrounded, as well as the cannon that could reach the place from Boston; in spite of which, however, they continued their work, and finished it before mid-day. A considerable body of foot was then landed at the foot of Bunker's Hill, under the command of Generals Howe and Pigot; the former being appointed to attack the lines, and the latter the redoubt. The Americans, however, having the advantage of the ground, as well as of their intrenchments, poured down such incessant volleys as threatened the whole body with destruction; and General Howe was for a little time left almost alone, all his officers being killed or wounded. The provincials in the mean time had taken possession of Charlestown, so that General Pigot was obliged to contend with them in that place as well as in the redoubt. The consequence was, that he was overmatched; his troops were thrown into disorder; and he would in all probability have been defeated, had not General Clinton advanced to his relief: upon which the attack was renewed with such fury, that the provincials were driven beyond the neck that leads to Charlestown. In the heat of the engagement the British troops were obliged to set fire to the town of Charlestown, which quickly obliged the provincials to yield after they were deprived of that shelter. The loss of the British side amounted to about 1000, among whom were 19 officers killed and 70 wounded; that of the Americans did not exceed 500.

The British troops claimed the victory in this engagement with justice, though it must be allowed that it was dearly bought; and the Americans boasted that the real advantages were on their side, as they had so much weakened the enemy, that they durst not afterwards venture out of their intrenchments. From the many advantages, however, which the Americans possessed, it is evident that the greatest display of valour was on the side of their enemies. The former were strongly intrenched, and most of their fortifications cannon proof; their soldiers were all chosen, and excellent marksmen, to whom muskets ready loaded were handed as fast as they were discharged; and when one party was wearied, another came to their assistance, as was perceived by the spectators on the tops of the houses at Boston. Considering, however, that this was the first time the provincials had been in actual service, it must be owned that they behaved with great spirit, and by no means merited the appellation of *cowards*, with which they were so often branded in Britain.

In other places the same determined spirit of resistance appeared on the part of the Americans. Lord North's conciliatory scheme was utterly rejected by the assemblies of Pennsylvania and New Jersey, and afterwards in every other colony. The commencement of hostilities at Lexington determined the colony of New York, which had hitherto continued to waver, to unite with the rest; and as the situation of New York renders it unable to resist an attack from the sea, it was resolved, before the arrival of a British fleet, to secure the military stores, send off the women and children, and to set fire to the city if it was still found incapable of defence. The exportation of provisions was everywhere prohibited, particularly to the British fishery on the banks of Newfoundland, or to such colonies of America as should adhere to the British interest. Congress resolved on the establishment of an army, and of a large paper currency in order to support it. In the inland northern colonies, Colonels Easton and Ethan Allen, without receiving any orders from congress, or communicating their design to anybody, with a party of only 250 men, surprised the forts of Crown Point, Ticonderago, and the rest that form a communication betwixt the colonies and Canada. On this occasion 200 pieces of cannon fell into their hands, besides mortars and a large quantity of military stores, together with two armed vessels, and materials for the construction of others.

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181 The Americans become more and more determined in their opposition.

182 Crown Point and Ticonderago taken by the Americans.

After the battle of Bunker's Hill, the provincials erected fortifications on the heights which commanded Charlestown, and strengthened the rest in such a manner that there was no hope of driving them from thence; at the same time that their activity and boldness astonished the British officers, who had been accustomed to entertain too mean an opinion of their courage.

183 Troops in Boston distressed.

The troops, thus shut up in Boston, were soon reduced to distress. Their necessities obliged them to attempt the carrying off the American cattle on the islands before Boston, which produced frequent skirmishes; but the provincials, better acquainted with the navigation of these shores, landed on the islands, destroyed or carried off whatever was of any use, burned the lighthouse at the entrance of the harbour, and took prisoners the workmen sent to repair it, as well as a party of marines who guarded them. Thus the garrison were reduced to the necessity of sending out armed vessels to make prizes indiscriminately of all that came in their way, and of landing in different places to plunder for subsistence as well as they could.

184 Articles of union betwixt the colonies.

The congress in the mean time continued to act with all the vigour which its constituents had expected. Articles of confederation and perpetual union were drawn up and solemnly agreed upon; by which they bound themselves and their posterity for ever. These were in substance as follow:

1. Each colony was to be independent within itself, and to retain an absolute sovereignty in all domestic affairs.

2. Delegates to be annually elected to meet in congress, at such time and place as should be enacted in the preceding congress.

3. This assembly should have the power of determining war or peace, making alliances; and in short all that power which sovereigns of states usually claim as their own.

4. The

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4. The expences of war to be paid out of the common treasury, and raised by a poll tax on males between 16 and 60; the proportions to be determined by the laws of the colony.

5. An executive council to be appointed to act in place of the congress during its recess.

6. No colony to make war with the Indians without consent of congress.

7. The boundaries of all the Indian lands to be secured and ascertained to them; and no purchases of lands were to be made by individuals, or even by a colony, without consent of congress.

8. Agents, appointed by congress should reside among the Indians, to prevent frauds in trading with them, and to relieve, at the public expence, their wants and distresses.

9. This confederation to last until there should be a reconciliation with Britain; or, if that event should not take place, it was to be perpetual.

After the action of Bunker's Hill, however, when the power of Great Britain appeared less formidable in the eyes of America than before, congress proceeded formally to justify their proceedings in a declaration drawn up in terms more expressive, and well calculated to excite attention.

"Were it possible (said they) for men who exercise their reason, to believe that the divine Author of our existence intended a part of the human race to hold an absolute property in and unbounded power over others, marked out by His infinite goodness and wisdom as the objects of a regal domination, never rightfully resistible, however severe and oppressive; the inhabitants of these colonies might at least require from the parliament of Great Britain some evidence that this dreadful authority over them had been granted to that body; but a reverence for our great Creator, principles of humanity, and the dictates of common sense, must convince all those who reflect upon the subject, that government was instituted to promote the welfare of mankind, and ought to be administered for the attainment of that end.

"The legislature of Great Britain, however stimulated by an inordinate passion for power, not only unjustifiable, but which they know to be peculiarly reprobated by the very constitution of that kingdom; and despairing of success in any mode of contest where regard should be had to law, truth, or right; have at length, deserting those, attempted to effect their cruel and impolitic purpose, of enslaving these colonies by violence, and have thereby rendered it necessary for us to close with their last appeal from reason to arms. Yet, however blinded that assembly may be, by their intemperate rage for unlimited domination, so to slight justice in the opinion of mankind, we esteem ourselves bound by obligations to the rest of the world to make known the justice of our cause."

185 Declaration on taking up arms.

After taking notice of the manner in which their ancestors left Britain, the happiness attending the mutual friendly commerce betwixt that country and her colonies, and the remarkable success of the late war, they proceed as follows: "The new ministry finding the brave foes of Britain, though frequently defeated, yet still contending, took up the unfortunate idea of granting them a hasty peace, and then of subduing her faithful subjects.

"These devoted colonies were judged to be in such a state as to present victories without bloodshed, and all the easy emoluments of statutable plunder. The uninterrupted tenour of their peaceable and respectful behaviour from the beginning of their colonization; their dutiful, zealous, and useful services during the war, though so recently and amply acknowledged in the most honourable manner by his majesty, by the late king, and by parliament, could not save them from the intended innovations. Parliament was influenced to adopt the pernicious project; and assuming a new power over them, has in the course of eleven years given such decisive specimens of the spirit and consequences attending this power, as to leave no doubt of the effects of acquiescence under it. United States.

"They have undertaken to give and grant our money without our consent, though we have ever exercised an exclusive right to dispose of our own property. Statutes have been passed for extending the jurisdiction of the courts of admiralty, and vice-admiralty, beyond their ancient limits; for depriving us of the accustomed and inestimable rights of trial by jury, in cases affecting both life and property; for suspending the legislature of one of our colonies; for interdicting all commerce to the capital of another; and for altering fundamentally the form of government established by charter, and secured by acts of its own legislature; and solemnly confirmed by the crown; for exempting the murderers of colonists from legal trial, and in effect from punishment; for erecting in a neighbouring province, acquired by the joint arms of Great Britain and America, a despotism dangerous to our very existence; and for quartering soldiers upon the colonists in time of a profound peace. It has also been resolved in parliament, that colonists charged with committing certain offences, shall be transported to England to be tried.

"But why should we enumerate our injuries in detail? By one statute it was declared, that parliament can of right make laws to bind us in all cases whatever. What is to defend us against so enormous, so unlimited a power? Not a single person who assumes it is chosen by us, or is subject to our controul or influence; but, on the contrary, they are all of them exempt from the operation of such laws; and an American revenue, if not diverted from the ostensible purposes from which it is raised, would actually lighten their own burdens in proportion as it increases ours.

"We saw the misery to which such despotism would reduce us. We for ten years incessantly and ineffectually besieged the throne as supplicants; we reasoned, we remonstrated with parliament in the most mild and decent language: but administration, sensible that we should regard these principles as free men ought to do, sent over fleets and armies to enforce them.

"We have pursued every temperate, every respectful measure; we have even proceeded to break off all commercial intercourse with our fellow-subjects as our last peaceable admonition, that our attachment to no nation on earth would supplant our attachment to liberty: this we flattered ourselves was the ultimate step of the controversy; but subsequent events have shown how vain was this hope of finding moderation in our enemies!

"The Lords and Commons, in their address in the month

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month of February said, that a rebellion at that time actually existed in the province of Massachusets Bay, and that those concerned in it had been countenanced and encouraged by unlawful combinations and engagements entered into by his majesty's subjects in several of the colonies; and therefore they besought his majesty that he would take the most effectual measures to enforce due obedience to the laws and authority of the supreme legislature. Soon after, the commercial intercourse of whole colonies with foreign countries was cut off by an act of parliament; by another, several of them were entirely prohibited from the fisheries in the seas near their coasts, on which they always depended for their subsistence; and large reinforcements of ships and troops were immediately sent over to General Gage.

"Fruitless were all the entreaties, arguments, and eloquence of an illustrious band of the most distinguished peers and commoners, who nobly and strenuously asserted the justice of our cause, to stay, or even to mitigate, the heedless fury with which these accumulated outrages were hurried on. Equally fruitless was the interference of the city of London, of Bristol, and many other respectable towns, in our favour."

After having reproached parliament, General Gage, and the British government in general, they proceed thus: "We are reduced to the alternative of choosing an unconditional submission to tyranny, or resistance by force. The latter is our choice. We have counted the cost of this contest, and find nothing so dreadful as voluntary slavery. Honour, justice, and humanity, forbid us tamely to surrender that freedom which we received from our gallant ancestors, and which our innocent posterity have a right to receive from us. Our cause is just; our union is perfect; our internal resources are great; and, if necessary, foreign assistance is undoubtedly attainable. We fight not for glory or conquest; we exhibit to mankind the remarkable spectacle of a people attacked by unprovoked enemies. They boast of their privileges and civilization, and yet proffer no milder conditions than servitude or death. In our own native land, in defence of the freedom that is our birthright, for the protection of our property acquired by the honest industry of our forefathers and our own, against violence actually offered, we have taken up arms; we shall lay them down when hostilities shall cease on the part of our aggressors, and all danger of their being renewed shall be removed,—and not before."

These are some of the most striking passages in the declaration of congress on taking up arms against Great Britain, and dated July 6th 1775. Without inquiring whether the principles on which it is founded are right or wrong, the determined spirit which it shows ought to have convinced us, that the conquest of America was an event scarcely ever to be expected. In every other respect an equal spirit was shown; and the rulers of the British nation had the mortification to see those whom they styled *rebels* and *traitors*, succeed in negotiations in which they themselves were utterly foiled. In the passing of the Quebec bill, ministry had flattered themselves that the Canadians would be so much attached to them on account of restoring the French laws, that they would very readily join in any attempt against the colonists, who had reprobated that bill in such strong terms; but in this, as in every thing

186 Quebec bill disagreeable to those whom it was intended to please.

else indeed they found themselves mistaken. The Canadians having been subject to Britain for a period of 15 years, and being thus rendered sensible of the superior advantages of British government, received the bill itself with evident marks of disapprobation; nay, reprobated it as tyrannical and oppressive. A scheme had been formed for General Carleton, governor of the province, to raise an army of Canadians wherewith to act against the Americans; and so sanguine were the hopes of administration in this respect, that they had sent 20,000 stand of arms, and a great quantity of military stores, to Quebec for the purpose. But the people, though they did not join the Americans, yet were found immoveable in their purpose to stand neuter. Application was made to the bishop; but he declined to interpose his influence, as contrary to the rules of the Popish clergy: so that the utmost efforts of government in this province were found to answer little or no purpose.

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187 Ministry attempt in vain to arm the Indians.

The British administration next tried to engage the Indians in their cause. But though agents were dispersed among them with large presents to the chiefs, they universally replied, that they did not understand the nature of the quarrel, nor could they distinguish whether those who dwelt in America or on the other side of the ocean were in fault: but they were surprised to see Englishmen ask their assistance against one another; and advised them to be reconciled, and not think of shedding the blood of their brethren. To the representations of congress they paid more respect. These set forth, that the English on the other side of the ocean had taken up arms to enslave not only their countrymen in America, but the Indians also; and if the latter should enable them to overcome the colonists, they themselves would soon be reduced to a state of slavery also. By arguments of this kind these savages were engaged to remain neuter; and thus the colonists were freed from a most dangerous enemy. On this occasion the congress thought proper to hold a solemn conference with the different tribes of Indians. The speech made by them on the occasion is curious, but too long to be fully inserted. The following is a specimen of the European mode of addressing these people.

188 Speech of the commissioners from congress to the Indians.

"Brothers, Sachems, and Warriors!

"We, the delegates from the Twelve United Provinces, now sitting in general congress at Philadelphia, send their talk to you our brothers.

"Brothers and Friends now attend!

"When our fathers crossed the great water, and came over to this land, the king of England gave them a talk, assuring them that they and their children should be his children; and that if they would leave their native country, and make settlements, and live here, and buy and sell, and trade with their brethren beyond the water, they should still keep hold of the same covenant chain, and enjoy peace; and it was covenanted, that the fields, houses, goods, and possessions which our fathers should acquire, should remain to them as their own, and be their children's for ever, and at their sole disposal.

"Brothers and Friends, open a kind ear!

"We will now tell you of the quarrel betwixt the

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counsellors of King George and the inhabitants and colonies of America.

"Many of his counsellors have persuaded him to break the covenant chain, and not to send us any more good talks. They have prevailed upon him to enter into a covenant against us; and have torn asunder, and cast behind their backs, the good old covenant which their ancestors and ours entered into, and took strong hold of. They now tell us, they will put their hands into our pocket without asking, as though it were their own; and at their pleasure they will take from us our charters or written civil constitution, which we love as our lives; also our plantations, our houses, and goods, whenever they please, without asking our leave. They tell us, that our vessels may go to that or this island in the sea, but to this or that particular island we shall not trade any more; and, in case of our non-compliance with these new orders, they shut up our harbours.

"Brothers, we live on the same ground with you; the same island is our common birthplace. We desire to sit down under the same tree of peace with you; let us water its roots, and cherish the growth, till the large leaves and flourishing branches shall extend to the setting sun, and reach the skies. If any thing disagreeable should ever fall out between us, the Twelve United Colonies, and you, the Six Nations, to wound our peace, let us immediately seek measures for healing the breach. From the present situation of our affairs, we judge it expedient to kindle up a small fire at Albany, where we may hear each other's voice, and disclose our minds fully to one another."

The other remarkable transactions of this congress were the ultimate refusal of the conciliatory proposal made by Lord North, of which such sanguine expectations had been formed by the English ministry; and appointing a generalissimo to command their armies, which were now very numerous. The person chosen for this purpose was George Washington: a man so universally beloved, that he was raised to such a high station by the unanimous voice of congress; and his subsequent conduct showed him every way worthy of it. Horace Gates and Charles Lee, two English officers of considerable reputation, were also chosen; the former an adjutant-general, the second a major-general. Artemus Ward, Philip Schuyler, and Israel Putnam, were likewise nominated major-generals. Seth Pomeroy, Richard Montgomery, David Wooster, William Heath, Joseph Spencer, John Thomas, John Sullivan, and Nathaniel Green, were chosen brigadier-generals at the same time.

189 General Washington appointed commander in chief.

Congress had now also the satisfaction to receive deputies from the colony of Georgia, expressing a desire to join the confederacy. The reasons they gave for renouncing their allegiance to Britain were, that the conduct of parliament towards the other colonies had been oppressive; that though the obnoxious acts had not been extended to them, they could view this only as an omission, because of the seeming little consequence of their colony; and therefore looked upon it rather to be a slight than a favour. At the same time they framed a petition to the king, similar to that sent by the other colonies, and which met with a similar reception.

190 Georgia accedes to the confederacy.

The success which had hitherto attended the Americans in all their measures, now emboldened them to think not only of defending themselves, but likewise of acting offensively against Great Britain. The conquest of Canada appeared an object within their reach, and one that would be attended with many advantages; and as an invasion of that province was already facilitated by the taking of Crown Point and Ticonderago, it was resolved if possible to penetrate that way into Canada, and reduce Quebec during the winter, before the fleets and armies, which they were well assured would sail thither from Britain, should arrive. By order of congress, therefore, 3000 men were put under the command of Generals Montgomery and Schuyler, with orders to proceed to Lake Champlain, from whence they were to be conveyed in flat-bottomed boats to the mouth of the river Sorel, a branch of the great river St Lawrence, and on which is situated a fort of the same name with the river. On the other hand, they were opposed by General Carleton governor of Canada, a man of great activity and experience in war; who, with a very few troops, had hitherto been able to keep in awe the disaffected people of Canada, notwithstanding all the representations of the colonists. He had now augmented his army by a considerable number of Indians, and promised even in his present situation to make a very formidable resistance.

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191 The Americans attempt the conquest of Canada.

As soon as General Montgomery arrived at Crown Point, he received information that several armed vessels were stationed at St John's, a strong fort on the Sorel, with a view to prevent his crossing the lake; on which he took possession of an island which commands the mouth of the Sorel, and by which he could prevent them from entering the lake. In conjunction with General Schuyler, he next proceeded to St John's: but finding that place too strong, he landed on a part of the country considerably distant, and full of woods and swamps. From thence, however, they were driven by a party of Indians whom General Carleton had employed.

The provincial army was now obliged to retreat to the island of which they had at first taken possession; where General Schuyler being taken ill, Montgomery was left to command alone. His first step was to gain over the Indians whom General Carleton had employed, and this he in a great measure accomplished; after which, on receiving the full number of troops appointed for his expedition, he determined to lay siege to St John's. In this he was facilitated by the reduction of Chamblee, a small fort in the neighbourhood, where he found a large supply of powder. An attempt was made by General Carleton to relieve the place; for which purpose he with great pains collected about 1000 Canadians, while Colonel Maclean proposed to raise a regiment of the Highlanders who had emigrated from their own country to America.

192 Chamblee taken.

But while General Carleton was on his march with these new levies, he was attacked by a superior force of provincials, and utterly defeated; which being made known to another body of Canadians who had joined Colonel Maclean, they abandoned him without striking a blow, and he was obliged to retreat to Quebec.

193 General Carleton defeated.

The defeat of General Carleton was a sufficient recompense to the Americans for that of Colonel Ethan Allen, which had happened some time before. The success

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success which had attended this gentleman against Crown Point and Ticonderago had emboldened him to make a similar attempt on Montreal; but being attacked by the militia of the place, supported by a detachment of regulars, he was entirely defeated and taken prisoner.

194 St John's fort taken.

As the defeat of General Carleton and the desertion of Maclean's forces left no room for the garrison of St John's to hope for any relief, they now consented to surrender themselves prisoners of war; but were in other respects treated with great humanity. They were in number 500 regulars and 200 Canadians, among whom were many of the French nobility; who had been very active in promoting the cause of Britain among their countrymen.

General Montgomery next took measures to prevent the British shipping from passing down the river from Montreal to Quebec. This he accomplished so effectually, that the whole were taken. The town itself was obliged to surrender at discretion; and it was with the utmost difficulty that General Carleton escaped in an open boat by the favour of a dark night.

195 and likewise Montreal.

No further obstacles now remained in the way of the Americans to the capital, except what arose from the nature of the country; and these indeed were very considerable. Nothing, however, could damp the ardour of the provincials. Notwithstanding it was now the middle of November, and the depth of winter was at hand, Colonel Arnold formed a design of penetrating through woods, morasses, and the most frightful solitudes from New England to Canada, by a nearer way than that which Montgomery had chosen; and this he accomplished in spite of every difficulty, to the astonishment of all who saw or heard of the attempt. This desperate march, however, cannot be looked upon as conducive to any good purpose. A third part of his men under another colonel had abandoned him by the way, under pretence of want of provisions; the total want of artillery rendered his presence insignificant before a place strongly fortified; and the smallness of his army rendered it even doubtful whether he could have taken the town by surprise. The Canadians indeed were amazed at the exploit, and their inclination to revolt from Britain was somewhat augmented; but none of them as yet took up arms in behalf of America. The consternation into which the town of Quebec was thrown proved detrimental rather than otherwise to the expedition; as it doubled the vigilance and activity of the inhabitants to prevent any surprise; and the appearance of common danger united all parties, who, before the arrival of Arnold, were contending most violently with one another. He was therefore obliged to content himself with blocking up the avenues to the town, in order to distress the garrison for want of provisions; and even this he was unable to do effectually, by reason of the small number of his men.

196 Col. Arnold penetrates into Canada.

The matter was not much mended by the arrival of General Montgomery. The force he had with him, even when united to that of Arnold, was too insignificant to attempt the reduction of a place so strongly fortified, especially with the assistance only of a few mortars and field-pieces. After the siege had continued through the month of December, General Montgomery, conscious that he could accomplish his end no other way than by surprise, resolved to make an attempt on the last day of the year 1775. The method he took at this time was perhaps the best that human wisdom could devise. He advanced by break of day, in the midst of a heavy fall of snow, which covered his men from the sight of the enemy. Two real attacks were made by himself and Colonel Arnold, at the same time that two feigned attacks were made on two other places, thus to distract the garrison, and make them divide their forces. One of the real attacks was made by the people of New York, and the other by those of New England under Arnold. Their hopes of surprising the place, however, were defeated by the signal for the attack being through some mistake given too soon. General Montgomery himself had the most dangerous place, being obliged to pass between the river and some high rocks on which the Upper Town stands; so that he was forced to make what haste he could to close with the enemy. His fate, however, was now decided. Having forced the first barrier, a violent discharge of musketry and grape shot from the second killed him, his principal officers, and the most of the party he commanded; on which those who remained immediately retreated. Colonel Arnold in the mean time made a desperate attack on the Lower Town, and carried one of the barriers after an obstinate resistance for an hour; but in the action he himself received a wound, which obliged him to withdraw. The attack, however, was continued by the officers whom he had left, and another barrier forced: but the garrison, now perceiving that nothing was to be feared except from that quarter, collected their whole force against it; and, after a desperate engagement of three hours, overpowered the provincials, and obliged them to surrender.

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197 Attempt to surprise Quebec.

198 General Montgomery killed, and the Americans defeated.

In this action, it must be confessed that the valour of the provincial troops could not be exceeded. They had fought under as great disadvantages as those which attended the British at Bunker's Hill, and had behaved equally well. Such a terrible disaster left no hope remaining of the accomplishment of their purpose, as General Arnold could now scarce number 800 effective men under his command. He did not, however, abandon the province, or even remove to a greater distance than three miles from Quebec; and here he still found means to annoy the garrison very considerably by intercepting their provisions. The Canadians, notwithstanding the bad success of the American arms, still continued friendly; and thus he was enabled to sustain the hardships of a winter encampment in that most severe climate. The congress, far from passing any censure on him for his misfortune, created him a brigadier-general.

199 Arnold created a brigadier-general.

While hostilities were thus carried on with vigour in the north, the flame of contention was gradually extending itself in the south. Lord Dunmore, the governor of Virginia, was involved in disputes similar to those which had taken place in other colonies. These had proceeded so far that the assembly was dissolved; which in this province was attended with a consequence unknown to the rest. As Virginia contained a great number of slaves, it was necessary that a militia should be kept constantly on foot to keep them in awe. During the dissolution of the assembly the militia laws expired; and the people, after complaining of the danger they were in from the negroes, formed a convention,

200 Disputes of Lord Dunmore with his province of Virginia.

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which enacted that each county should raise a quota for the defence of the province. Dunmore, on this, removed the powder from Williamsburg; which created such discontents, that an immediate quarrel would probably have ensued, had not the merchants of the town undertaken to obtain satisfaction for the injury supposed to be done to the community. This tranquillity, however, was soon interrupted; the people, alarmed by a report that an armed party were on their way from the man of war where the powder had been deposited, assembled in arms, and determined to oppose by force any farther removals. In some of the conferences which passed at this time, the governor let fall some unguarded expressions, such as threatening them with setting up the royal standard, proclaiming liberty to the negroes, destroying the town of Williamsburg, &c. which were afterwards made public, and exaggerated in such a manner as greatly to increase the public ferment.

The people now held frequent assemblies. Some of them took up arms with a design to force the governor to restore the powder, and to take the public money into their own possession; but on their way to Williamsburg for this purpose they were met by the receiver-general, who became security for the payment of the gunpowder, and the inhabitants promised to take care of the magazine and public revenue.

201 He sends his family aboard a man of war.

By this insurrection the governor was so much intimidated, that he sent his family on board a man of war. He himself, however, issued a proclamation, in which he declared the behaviour of the persons who promoted the tumult treasonable, accused the people of disaffection, &c. On their part they were by no means deficient in recriminating; and some letters of his to Britain being about the same time discovered, consequences ensued extremely similar to those which had been occasioned by those of Mr Hutchison at Boston.

202 Fortifies his palace.

In this state of confusion the governor thought it necessary to fortify his palace with artillery, and procure a party of marines to guard it. Lord North's conciliatory proposal arriving also about the same time, he used his utmost endeavours to cause the people comply with it. The arguments he used were such as must do him honour; and had not matters already gone to such a pitch of distraction, it is highly probable that some attention would have been paid to them. "The view (he said) in which the colonies ought to behold this conciliatory proposal, was no more than an earnest admonition from Great Britain to relieve her wants: that the utmost condescendence had been used in the mode of application; no determinate sum having been fixed, as it was thought most worthy of British generosity to take what they thought could be conveniently spared, and likewise to leave the mode of raising it to themselves," &c. But the clamour and dissatisfaction were now so universal, that nothing else could be attended to. The governor had called an assembly for the purpose of laying this conciliatory proposal before them; but it had been little attended to. The assembly began their session by inquiries into the state of the magazine. It had been broken into by some of the townsmen; for which reason spring-guns had been placed there by the governor, which discharged themselves upon the offenders at their entrance: these circumstances, with others of a similar kind, raised such a

203 His arguments for L. North's conciliatory plan.

violent uproar, that as soon as the preliminary business of the session was over, the governor retired on board a man of war, informing the assembly that he durst no longer trust himself on shore. This produced a long course of disputation, which ended in a positive refusal of the governor to trust himself again in Williamsburg, even to give his assent to the bills, which could not be passed without it, and though the assembly offered to bind themselves for his personal safety. In his turn he requested them to meet him on board the man of war, where he then was; but this proposal was rejected, and all further correspondence containing the least appearance of friendship was discontinued.

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204 The governor retires on board a man of war.

205 Attempts to reduce the colony by force,

Lord Dunmore, thus deprived of his government, attempted to reduce by force those whom he could no longer govern. Some of the most strenuous adherents to the British cause, whom their zeal had rendered obnoxious at home, now repaired to him. He was, also joined by numbers of black slaves. With these and the assistance of the British shipping, he was for some time enabled to carry on a kind of predatory war, sufficient to hurt and exasperate, but not to subdue. After some inconsiderable attempts on land, proclaiming liberty to the slaves, and setting up the royal standard, he took up his residence at Norfolk, a maritime town of some consequence, where the people were better affected to Britain than in most other places. A considerable force, however, was collected against him; and the natural impetuosity of his temper prompting him to act against them with more courage than caution, he was entirely defeated, and obliged to retire to his shipping, which was now crowded by the number of those who had incurred the resentment of the provincials.

206 but is entirely defeated.

207 Mr Conolly's plan for reducing Virginia.

In the meantime a scheme of the utmost magnitude and importance was formed by one Mr Conolly, a Pennsylvanian of an intrepid and aspiring disposition, and attached to the cause of Britain. The first step of this plan was to enter into a league with the Ohio Indians. This he communicated to Lord Dunmore, and it received his approbation: Upon which Conolly set out, and actually succeeded in his design. On his return he was dispatched to General Gage, from whom he received a colonel's commission, and set out in order to accomplish the remainder of his scheme. The plan in general was, that he should return to the Ohio, where, by the assistance of the British and Indians in these parts, he was to penetrate through the back settlements into Virginia, and join Lord Dunmore at Alexandria. But by an accident very naturally to be expected, he was discovered, taken prisoner, and thrown into a dungeon.

208 He is discovered and taken prisoner.

After the retreat of Lord Dunmore from Norfolk, that place was taken possession of by the provincials, who treated the loyalists that had remained there with great cruelty; at the same time that they greatly distressed those on board Lord Dunmore's fleet, by refusing to supply them with any necessaries. Nor was this all; the vicinity of the shipping was so great as to afford the riflemen an opportunity of aiming at the people on board, and exercising the cruel occupation of killing them, in which they did not fail every day to employ themselves. These proceedings at last drew a remonstrance from his lordship; in which he insisted that the fleet should be furnished with necessaries, and that

209 Cruelty of the Americans.

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that the soldiers should desist from the cruel diversion above mentioned; but both these requests being denied, a resolution was taken to set fire to the town. After giving the inhabitants proper warning, a party landed, under cover of a man of war, and set fire to that part which lay nearest the shore; but the flames were observed at the same time to break forth in every other quarter, and the whole town was reduced to ashes. This universal destruction, by which a loss of more than 300,000l. was incurred, is said to have been occasioned by order of the congress itself, that the loyalists might find no refuge there for the future.

210 The town of Norfolk destroyed.

211 The governors of South and North Carolina expelled.

In the southern colonies of Carolina the governors were expelled, and obliged to take refuge on board of men of war, as Lord Dunmore had been; Mr Martin, governor of North Carolina, on a charge of attempting to raise the back settlers, consisting chiefly of Scots Highlanders, against the colony. Having secured themselves against any attempts from these enemies, however, they proceeded to regulate their internal concerns in the same manner as the rest of the colonies; and by the end of the year 1775, Britain beheld the whole of America united against her in the most determined opposition. Her vast possessions of that tract of land (since known by the name of the *Thirteen United States*) were now reduced to the single town of Boston; in which her forces were besieged by an enemy with whom they were apparently not able to cope, and by whom they must of course expect in a very short time to be expelled. The situation of the inhabitants of Boston, indeed, was peculiarly unhappy. After having failed in their attempts to leave the town, General Gage had consented to allow them to retire with their effects; but afterwards, for what reason does not well appear, he refused to fulfil his promise. When he resigned his place to General Howe in October 1775, the latter, apprehensive that they might give intelligence of the situation of the British troops, strictly prohibited any person from leaving the place under pain of military execution. Thus matters continued till the month of March 1776, when the town was evacuated.

212 Miserable situation of the inhabitants of Boston.

213 Boston severely cannonaded by the provincials.

On the 2d of that month, General Washington opened a battery on the west side of the town, from whence it was bombarded, with a heavy fire of cannon at the same time; and three days after, it was attacked by another battery from the eastern shore. This terrible attack continued for 14 days without intermission; when General Howe, finding the place no longer tenible, determined if possible to derive the enemy from their works. Preparations were therefore made for a most vigorous attack on a hill called Dorchester Neck, which the Americans had fortified in such a manner as would in all probability have rendered the enterprise next to desperate. No difficulties, however, were sufficient to daunt the spirit of the general; and every thing was in readiness, when a sudden storm prevented this intended exertion of British valour. Next day, upon a more close inspection of the works they were to attack, it was thought advisable to desist from the enterprise altogether. The fortifications were very strong, and extremely well provided with artillery; and besides other implements of destruction, upwards of 100 hogsheads of stones were provided to roll down upon the enemy as they came up; which, as the ascent was extremely steep, must have done prodigious execution.

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Nothing therefore now remained but to think of a retreat; and even this was attended with the utmost difficulty and danger. The Americans, however, knowing that it was in the power of the British general to reduce the town to ashes, which could not have been repaired in many years, did not think proper to give the least molestation; and for the space of a fortnight the troops were employed in the evacuation of the place, from whence they carried along with them 2000 of the inhabitants, who durst not stay on account of their attachment to the British cause. From Boston they sailed to Halifax; but all their vigilance could not prevent a number of valuable ships from falling into the hands of the enemy. A considerable quantity of cannon and ammunition had also been left at Bunker's Hill and Boston Neck; and in the town an immense variety of goods, principally woollen and linen, of which the provincials stood very much in need. The estates of those who fled to Halifax were confiscated; as also those who were attached to government, and had remained in the town. As an attack was expected as soon as the British forces should arrive, every method was employed to render the fortifications, already very strong, impregnable. For this purpose some foreign engineers were employed, who had before arrived at Boston; and so eager were people of all ranks to accomplish this business, that every able-bodied man in the place, without distinction of rank, set apart two days in the week, to complete it the sooner.

214 The place evacuated.

215 Its fortifications strengthened.

The Americans, exasperated to the utmost by the proceedings of parliament, now formally renounced all connexion with Britain, and declared themselves independent. This celebrated declaration was published on the 4th of July 1776. Previous to this a circular letter had been sent through each colony, stating the reasons for it; and such was the animosity now everywhere prevailing against Great Britain, that it met with universal approbation, except in the province of Maryland alone. It was not long, however, before the people of that colony, finding themselves left in a very dangerous minority, thought proper to accede to the measures of the rest. The manifesto itself was much in the usual style, stating a long list of grievances, for which redress had been often applied for in vain; and for these reeasons they determined on a final separation; to hold the people of Britain as the rest of mankind, "enemies in war, in peace friends."

216 Congress declares the States of America independent.

After thus publicly throwing off all allegiance and hope of reconciliation, the colonists soon found that an exertion of all their strength was required in order to support their pretensions. Their arms, indeed, had not, during this season, been attended with success, in Canada. Reinforcements had been promised to Colonel Arnold, who still continued the blockade of Quebec; but they did not arrive in time to second his operations. Being sensible, however that he must either desist from the enterprise, or finish it successfully, he recommenced in form; attempting to burn the shipping, and even to storm the town itself. They were unsuccessful, however, by reason of the smallness of their number, though they succeeded so far as to burn a number of houses in the suburbs; and the garrison

217 The siege of Quebec still continued.

were

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were obliged to pull down the remainder, in order to prevent the fire from spreading.

As the provincials, though unable to reduce the town, kept the garrison in continual alarms, and in a very disagreeable situation, some of the nobility collected themselves into a body under the command of one Mr Beaujeu, in order to relieve their capital; but they were met on their march by the provincials, and so entirely defeated, that they were never afterwards able to attempt any thing. The Americans, however, had but little reason to plume themselves on this success. Their want of artillery at last convinced them, that it was impracticable in their situation to reduce a place so strongly fortified: the smallpox at the same time made its appearance in their camp, and carried off great numbers; intimidating the rest to such a degree, that they deserted in crowds. To add to their misfortunes, the British reinforcements unexpectedly appeared, and the ships made their way through the ice with such celerity, that the one part of their army was separated from the other; and General Carleton sallying out as soon as the reinforcement was landed, obliged them to fly with the utmost precipitation, leaving behind them all their cannon and military stores; at the same time their shipping was entirely captured by vessels sent up the river for that purpose. On this occasion the provincials fled with such precipitation that they could not be overtaken; so that none fell into the hands of the British excepting the sick and wounded. General Carleton now gave a signal instance of his humanity: Being well apprised that many of the provincials had not been able to accompany the rest in their retreat, and that they were concealed in woods, &c. in a very deplorable situation, he generously issued a proclamation, ordering proper persons to seek them out, and give them relief at the public expence; at the same time, lest, through fear of being made prisoners, they should refuse these offers of humanity, he promised, that as soon as their situation enabled them, they should be at liberty to depart to their respective homes.

218 Canadians defeated by the provincials;

219 who are in their turn defeated by General Carleton.

220 Humanity of the British general.

221 He pursues the provincials.

The British general, now freed from any danger of an attack, was soon enabled to act offensively against the provincials, by the arrival of the forces destined for that purpose from Britain. By these he was put at the head of 12,000 regular troops, among whom were those of Brunswick. With this force he instantly set out to the Three Rivers, where he expected that Arnold would have made a stand; but he had fled to Sorel, a place 150 miles distant from Quebec, where he was at last met by the reinforcements ordered by congress. Here, though the preceding events were by no means calculated to inspire much military ardour, a very daring enterprise was undertaken; and this was to surprise the British troops posted here under Generals Fraser and Nesbit; of whom the former commanded those on land, the latter such as were on board of transports and were but a little way distant. The enterprise was undoubtedly very hazardous, both on account of the strength of the parties, against whom they were to act, and as the main body of the British forces was advanced within 50 miles of the place; besides that a number of armed vessels and transports with troops lay between them and the Three Rivers. Two thousand chosen men, however, under General Thomson, engaged in this enterprise. Their success was by no means answerable to their spirit and valour. Though they passed the shipping without being observed, General Fraser had notice of their landing; and thus being prepared to receive them, they were soon thrown into disorder, at the same time that General Nesbit, having landed his forces, prepared to attack them in the rear. On this occasion some field pieces did prodigious execution, and a retreat was found to be unavoidable. General Nesbit, however, had got between them and their boats; so that they were obliged to take a circuit through a deep swamp, while they were hotly pursued by both parties at the same time, who marched for some miles on each side of the swamp, till at last the miserable provincials were sheltered from further danger by a wood at the end of the swamp. Their general, however, was taken, with 200 of his men.

United States.

222 General Thomson defeated and taken prisoner by General Fraser.

223 The provincials pursued by General Burgoyne,

By this disaster the provincials lost all hopes of accomplishing any thing in Canada. They demolished their works, and carried off their artillery with the utmost expedition. They were pursued, however, by General Burgoyne; against whom it was expected that they would have collected all their force, and made a resolute stand. But they were now too much dispirited by misfortune, to make any further exertions of valour. On the 18th of June the British general arrived at Fort St John's, which he found abandoned and burnt. Chamblee had shared the same fate, as well as all the vessels that were not capable of being dragged up against the current of the river. It was thought that they would have made some resistance at Nut Island, the entrance to Lake Champlain; but this also they had abandoned, and retreated across the lake to Crown Point, whither they could not be immediately followed. Thus was the province of Canada entirely evacuated by the Americans; whose loss in their retreat from Quebec was calculated at not less than 1000 men, of whom 400 fell at once into the hands of the enemy at a place called the Cedars, about 50 miles above Montreal. General Sullivan, however, who conducted this retreat after the affair of General Thomson, was acknowledged to have had great merit in what he did, and received the thanks of congress accordingly.

224 but escape to Crown Point.

This bad success in the north, however, was somewhat compensated by what happened in the southern colonies.—We have formerly taken notice that Mr Martin, governor of North Carolina, had been obliged to leave his province, and take refuge on board a man of war. Notwithstanding this, he did not despair of reducing it again to obedience. For this purpose he applied to the Regulators, a daring set of banditti, who lived in a kind of independent state; and though considered by government as rebels, yet had never been molested, on account of their numbers and known skill in the use of fire-arms. To the chiefs of these people commissioners were sent, in order to raise some regiments; and Colonel Macdonald, a brave and enterprising officer, was appointed to command them. In the month of February he erected the king's standard, issued proclamations, &c. and collected some forces, expecting to be soon joined by a body of regular troops, who were known to be shipped from Britain to act against the southern colonies. The Americans, sensible of their danger, despatched immediately what forces they

225 An insurrection in North Carolina in favour of Britain.

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they had to act against the royalists, at the same time that they diligently exerted themselves to support these with suitable reinforcements. Their present force was commanded by a General Moore, whose numbers were inferior to Macdonald's; for which reason the latter summoned him to join the king's standard under pain of being treated as a rebel. But Moore, being well provided with cannon, and conscious that nothing could be attempted against him, returned the compliment, by acquainting Colonel Macdonald, that if he and his party would lay down their arms and subscribe an oath of fidelity to congress, they should be treated as friends; but if they persisted in an undertaking for which it was evident they had not sufficient strength, they could not but expect the severest treatment. In a few days General Moore found himself at the head of 8000 men, by reason of the continual supplies which daily arrived from all parts. The royal party amounted only to 2000, and they were destitute of artillery, which prevented them from attacking the enemy while they had the advantage of numbers. They were now therefore obliged to have recourse to a desperate exertion of personal valour; by dint of which they effected a retreat for 80 miles to Moor's Creek, within 16 miles of Wilmington. Could they have gained this place, they expected to have been joined by Governor Martin and General Clinton, who had lately arrived with a considerable detachment. But Moore with his army pursued them so close, that they were obliged to attempt the passage of the creek itself, though a considerable body of the enemy, under the command of Colonel Coswell, with fortifications well planted with cannon, was posted on the other side. On attempting the creek, however, it was found not to be fordable. They were obliged therefore to cross over a wooden bridge which the provincials had not time to destroy entirely. They had, however, by pulling up part of the planks, and greasing the remainder in order to render them slippery, made the passage so difficult, that the royalists could not attempt it. In this situation they were, on the 27th of February, attacked by Moore, with his superior army, and totally defeated, with the loss of their general and most of their leaders, as well as the best and bravest of their men.

226 The royalists entirely defeated.

227 Lord Dunmore finally driven out of Virginia.

Thus was the power of the provincials established in North Carolina. Nor were they less successful in the province of Virginia; where Lord Dunmore, having long continued an useless predatory war, was at last driven from every creek and road in the province. The people he had on board were distressed to the highest degree by confinement in small vessels. The heat of the season, and the numbers crowded together, produced a pestilential fever, which made great havock, especially among the blacks. At last, finding themselves in the utmost hazard of perishing by famine as well as by disease, they set fire to the least valuable of their vessels, reserving only about 50 for themselves, in which they bade a final adieu to Virginia, some sailing to Florida, some to Bermuda, and the rest to the West Indies.

228 British armament sent against Charlestown.

In South Carolina the provincials had a more formidable enemy to deal with. A squadron, whose object was the reduction of Charlestown, had been fitted out in December 1775; but by reason of unfavourable weather did not reach Cape Fear in North Carolina till the month of May 1776: and here it met with further obstacles till the end of the month. Thus the Americans, always noted for their alertness in raising fortifications, had time to strengthen those of Charlestown in such a manner as rendered it extremely difficult to be attacked. The British squadron consisted of two 50 gun ships, four of 30 guns, two of 20, an armed schooner and bomb-ketch; all under the command of Sir Peter Parker. The land forces were commanded by Lord Cornwallis, with General Clinton and Vaughan. As they had yet no intelligence of the evacuation of Boston, General Howe despatched a vessel to Cape Fear with some instructions; but it was too late; and in the beginning of June the squadron anchored off Charlestown bar. Here they met with some difficulty in crossing, being obliged to take out the guns from the two large ships, which were, notwithstanding, several times in danger of sticking fast. The next obstacle was a strong fort on Sullivan's island, six miles east from Charlestown; which, though not completely finished, was very strong. However, the British generals resolved without hesitation to attack it; but though an attack was easy from the sea, it was very difficult to obtain a co-operation of the land forces. This was attempted by landing them on Long Island, adjacent to Sullivan's Island on the east, from which it is separated by a very narrow creek, said not to be above two feet deep at low water. Opposite to this ford the provincials had posted a strong body of troops, with cannon and intrenchments; while General Lee was posted on the main land, with a bridge of boats betwixt that and Sullivan's Island, so that he could at pleasure send reinforcements to the troops in the fort on Sullivan's Island.

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On the part of the British, so many delays occurred, that it was the 28th of June before matters were in readiness for an attack; and by this time the provincials had abundantly provided for their reception. On the morning of that day the bomb-ketch began to throw shells into Fort Sullivan, and about mid-day the two 50 gun ships and 30 gun frigates came up and began a severe fire. Three other frigates were ordered to take their station between Charlestown and the fort, in order to enfilade the batteries, and cut off the communication with the main land; but through the ignorance of the pilots they all stuck fast; and though two of them were disentangled, they were found to be totally unfit for service: the third was burnt, that she might not fall into the hands of the enemy.

229 The fleet make a furious attack.

The attack was therefore confined to the five armed ships and bomb-ketch, between whom and the fort a dreadful fire ensued. The Bristol suffered excessively. The springs on her cable being shot away, she was for some time entirely exposed to the enemy's fire. As the enemy poured in great quantities of red-hot balls, she was twice in flames. The captain (Mr Morriss), after receiving five wounds, was obliged to go below deck in order to have his arm amputated. After undergoing this operation he returned to his place, where he received another wound, but still refused to quit his station: at last he received a red-hot ball in his belly, which instantly put an end to his life. Of all the officers and seamen who stood on the quarter-deck of this vessel, not one escaped without a wound, excepting Sir Peter Parker alone; whose intrepidity and presence

230 Bravery of Captain Morris.

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presence of mind on this occasion were very remarkable. The engagement lasted till darkness put an end to it. Little damage was done by the British, as the works of the enemy lay so low that many of the shot flew over; and the fortifications, being composed of palm-trees mixed with earth, were extremely well calculated to resist the impression of cannon. During the height of the attack, the provincial batteries remained for some time silent, so that it was concluded that they had been abandoned: but this was found to proceed only from want of powder; for as soon as a supply of this necessary article was obtained, the firing was resumed as brisk as before. During the whole of this desperate engagement it was found impossible for the land forces to give the least assistance to the fleet. The enemy's works were found to be much stronger than they had been imagined, and the depth of water effectually prevented them from making any attempt. In this unsuccessful attack the killed and wounded on the part of the British amounted to about 200. The Bristol and Experiment were so much damaged, that it was thought they could not have been got over the bar; however, this was at last accomplished by a very great exertion of naval skill, to the surprise of the provincials, who had expected to make them both prizes. On the American side the loss was judged to have been very considerable, as most of their guns were dismounted, and reinforcements had poured into the fort during the whole time of the action.

231 The British repulsed.

232 Americans form a navy.

This year also, the Americans, having so frequently made trial of their valour by land, became desirous of trying it by sea also, and of forming a navy that might in some measure be able to protect their trade, and do essential hurt to the enemy. In the beginning of March, Commodore Hopkins was dispatched with five frigates to the Bahama islands, where he made himself master of the ordnance and military stores; but the gunpowder, which had been the principal object, was removed. On his return he captured several vessels; but was foiled in his attempt on the Glasgow frigate, which found means to escape notwithstanding the efforts of his whole squadron.

The time, however, was now come when the fortitude and patience of the Americans were to undergo a severe trial. Hitherto they had been on the whole successful in their operations: but now they were doomed to experience misfortune, misery, and disgrace; the enemy overrunning their country, and their own armies not able to face them in the field. The province

233 Armament sent against New York.

of New York, as being the most central colony, and most accessible by sea, was pitched upon for the object of the main attack. The force sent against it consisted of 6 ships of the line, 30 frigates, besides other armed vessels, and a vast number of transports. The fleet was commanded by Lord Howe, and the land forces by his brother General Howe, who was now at Halifax. The latter, however, a considerable time before his brother arrived, had set sail from Halifax, and lay before New York, but without attempting to commence hostilities until he should be joined by his brother. The Americans had, according to custom, fortified New York, and the adjacent islands, in an

234 General Howe lands on Staten Island.

extraordinary manner. However, General Howe was suffered to land his troops on Staten Island, where he was soon joined by a number of the inhabitants. About the middle of July, Lord Howe arrived with the grand armament; and being one of the commissioners appointed to receive the submission of the colonists, he published a circular letter to this purpose to the several governors who had lately been expelled from their provinces, desiring them to make the extent of his commission, and the powers he was invested with by parliament, as public as possible. Here, however, congress saved him trouble, by ordering his letter and declaration to be published in all the newspapers, that every one, as they said, might see the insidiousness of the British ministry, and that they had nothing to trust to besides the exertion of their own valour.

United States.

235 General Washington refuses a letter from Lord Howe.

Lord Howe next sent a letter to General Washington; but as it was directed "To George Washington, Esq." the general refused to accept of it, as not being directed in the style suitable to his station. To obviate this objection, Adjutant-general Paterson was sent with another letter, directed "To George Washington, &c. &c. &c." But though a very polite reception was given the bearer, General Washington utterly refused the letter; nor could any explanation of the adjutant induce him to accept of it. The only interesting part of the conversation was that relating to the powers of the commissioners, of which Lord Howe was one. The adjutant told him, that these powers were very extensive; that the commissioners were determined to exert themselves to the utmost, in order to bring about a reconciliation; and that he hoped the general would consider this visit as a step towards it. General Washington replied, That it did not appear that these powers consisted in any thing else than granting pardons; and as America had committed no offence, she asked no forgiveness, and was only defending her unquestionable rights.

236 Hostilities commence.

The decision of every thing being now, by consent of both parties, left to the sword, no time was lost, but hostilities commenced as soon as the British troops could be collected. This, however, was not done before the month of August; when they landed without any opposition on Long Island, opposite to the shore of Staten Island. General Putnam, with a large body

237 Situation of the British and American armies.

of troops, lay encamped and strongly fortified on a peninsula on the opposite shore, with a range of hills between the armies, the principal pass of which was near a place called *Flat-bush*. Here the centre of the British army, consisting of Hessians, took post; the left wing, under General Grant, lying near the shore; and the right, consisting of the greater part of the British forces, lay under Lords Percy, Cornwallis, and General Clinton. Putman had ordered the passes to be secured by large detachments, which was executed as to those at hand; but one of the utmost importance, that lay at a distance, was entirely neglected. This gave an opportunity to a large body of troops under Lord Percy and Clinton to pass the mountains and attack the Americans in the rear, while they were engaged with the Hessians in front. Through this piece of negligence their defeat became inevitable. Those who were engaged with the Hessians first perceived their mistake, and began a retreat towards their camp; but the passage was intercepted by the British troops, who drove them back into the woods. Here they were met by the Hessians; and thus were they for many hours slaughtered between the two parties, no

way

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way of escape remaining but by breaking through the British troops, and thus regaining their camp. In this attempt many perished; and the right wing, engaged with General Grant, shared the same fate. The victory was complete; and the Americans lost on this fatal day (August 27th,) between 3000 and 4000 men, of whom 2000 were killed in the battle or pursuit. Among these a regiment, consisting of young gentlemen of fortune and family in Maryland, was almost entirely cut in pieces, and of the survivors not one escaped without a wound.

238 The Americans defeated with great slaughter.

The ardour of the British troops was now so great, that they could scarcely be restrained from attacking the lines of the provincials; but for this there was now no occasion, as it was certain they could not be defended. Of the British only 61 were killed in this engagement, and 257 wounded. Eleven hundred of the enemy, among whom were three generals, were taken prisoners.

239 They abandon their camp in the night.

As none of the American commanders thought it proper to risk another attack, it was resolved to abandon their camp as soon as possible. Accordingly, on the night of the 29th of August, the whole of the continental troops were ferried over with the utmost secrecy and silence; so that in the morning the British had nothing to do but take possession of the camp and artillery which had been abandoned.

240 Lord Howe sends a message to congress,

This victory, though complete, was very far from being so decisive as the conquerors imagined. Lord Howe, supposing that it would be sufficient to intimidate the congress into some terms, sent General Sullivan, who had been taken prisoner in the late action, to congress, with a message, importing, that though he could not consistently treat with them as a legal assembly, yet he would be very glad to confer with any of the members in their private capacity; setting forth at the same time the nature and extent of his powers as commissioner. But the congress were not as yet sufficiently humbled to derogate in the least from the dignity of character they had assumed. They replied, That the congress of the free and independent states of America could not consistently send any of its members in another capacity than that which they had publicly assumed; but as they were extremely desirous of restoring peace to their country upon equitable conditions, they would appoint a committee of their body to wait upon him, and learn what proposals he had to make.

241 and is waited on by a committee.

This produced a new conference. The committee appointed by congress was composed of Dr Franklin, Mr Adams, and Mr Rutledge. They were very politely received by his lordship; but the conference proved as fruitless as before independency had been declared, and the final answer of the deputies was, That they were extremely willing to enter into any treaty with Great Britain that might conduce to the good of both nations, but that they would not treat in any other character than that of independent states. This positive declaration instantly put an end to all hopes of reconciliation; and it was resolved to prosecute the war with the utmost vigour. Lord Howe, after publishing a manifesto, in which he declared the refusal of congress, and that he himself was willing to confer with all well-disposed persons about the means of restoring public tranquillity, set about the most proper methods for

242 The conference terminates ineffectually.

reducing the city of New York. Here the provincial troops were posted, and from a great number of batteries kept continually annoying the British shipping. The East River lay between them, of about 1200 yards in breadth, which the British troops were extremely desirous of passing. At last the ships having, after an incessant cannonade of several days, silenced the most troublesome batteries, a body of troops was sent up the river to a bay, about three miles distant, where the fortifications were less strong than in other places. Here having driven off the provincials by the cannon of the fleet, they marched directly towards the city; but the enemy, finding that they should now be attacked on all sides, abandoned the city, and retired to the north of the island, where their principal force was collected. In their passage thither they skirmished with the British, but carefully avoided a general engagement; and it was observed that they did not behave with that ardour and impetuous valour which had hitherto marked their character.

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243 New York abandoned by the provincials.

The British and provincial armies were not now above two miles distant from each other. The former lay encamped from shore to shore for an extent of two miles, being the breadth of the island, which, though 15 miles long, exceeds not two in any part in breadth. The provincials, who lay directly opposite, had strengthened their camp with many fortifications; at the same time, being masters of all the passes and defiles betwixt the two camps, they were enabled to defend themselves against an army much more numerous than their own: and they had also strongly fortified a pass called *King's Bridge*, whence they could secure a passage to the continent in case of any misfortune. Here General Washington, in order to inure the provincials to actual service, and at the same time to annoy the enemy as much as possible, employed his troops in continual skirmishes; by which it was observed that they soon recovered their spirits, and behaved with their usual boldness.

244 Situation of the British and American armies.

As the situation of the two armies was now highly inconvenient for the British generals, it was resolved to make such movements as might oblige General Washington to relinquish his strong situation. The possession of New York had been less beneficial than was expected. It had been concerted among the provincials, that the city should be burnt at the time of evacuation; but as they were forced to depart with precipitation, they were prevented from putting the scheme in execution. In a few days, however, it was attempted by some who had been left behind for that purpose. Taking advantage of a high wind and dry weather, the town was set on fire in several places at once, by means of combustibles properly placed for that purpose; and notwithstanding the most active exertions of the soldiery and sailors, a fourth part of the city was consumed.

245 New York set on fire by the provincials.

On this occasion the British were irritated to the highest degree; and many persons, said to be incendiaries, were without mercy thrown into the flames. It was determined to force the provincial army to a greater distance, that they might have it less in their power, by any emissaries, to engage others in a similar attempt. For this purpose, General Howe having left Lord Percy with sufficient force to garrison New York, he embarked his army in flat-bottomed boats, by which

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they were conveyed through the dangerous passage called *Hell Gate*, and landed near the town of West Chester, lying on the continent towards Connecticut. Here, having received a supply of men and provisions, they moved to New Rochelle, situated on the sound which separates Long Island from the continent. After this, receiving still fresh reinforcements, they made such movements as threatened to distress the provincials very much, by cutting off their convoys of provisions from Connecticut, and thus force them to an engagement. This, however, General Washington determined at all events to avoid. He therefore extended his forces into a long line opposite to the way in which the enemy marched, keeping the Bruna, a river of considerable magnitude, between the two armies, with the North River on his rear. Here again the provincials continued for some time to annoy and skirmish with the royal army, until at last, by some other manœuvres, the British general found means to attack them advantageously at a place called the *White Plains*, and drove them from some of their posts. The victory on this occasion was much less complete than the former; however, it obliged the provincials once more to shift their ground, and to retreat farther up the country. General Howe pursued for some time; but at last finding all his endeavours vain to bring the Americans to a pitched battle, he determined to give over such an useless chase, and employ himself in reducing the forts which the provincials still retained in the neighbourhood of New York. In this he met with the most complete success. The Americans, on the approach of the king's force, retreated from King's Bridge into Fort Washington; and this, as well as Fort Lee, which lay in the neighbourhood, was quickly reduced, though the garrison made their escape. Thus the Jerseys were laid entirely open to the incursions of the British troops; and so fully were these provinces taken possession of by the royal army, that its winter quarters extended from New Brunswick to the river Delaware. Had any number of boats been at hand, it is probable that Philadelphia would now have fallen into their hands. All these, however, had been carefully removed by the Americans. In lieu of this enterprise, Sir Henry Clinton undertook an expedition to Rhode Island, and became master of it without losing a man. His expedition was also attended with this further advantage, that the American fleet under Commodore Hopkins was obliged to sail as far as possible up the river Providence, and thus remained entirely useless.

246 General Washington obliged to remove farther from New York.

247 Is defeated at White Plains.

248 The Jerseys entirely overrun by the British troops.

249 Rhode Island taken.

The same ill success continued to attend the Americans in other parts. After their expulsion from Canada, they had crossed the lake Champlain, and taken up their quarters at Crown Point, as we have already mentioned. Here they remained for some time in safety, as the British had no vessels on the lake, and consequently General Burgoyne could not pursue them. To remedy this deficiency, there was no possible method, but either to construct vessels on the spot, or take to pieces some vessels already constructed, and drag them up the river into the lake. This, however, was effected in no longer a space than three months; and the British general, after incredible toil and difficulty, saw himself in possession of a great number of vessels, by which means he was enabled to pursue his enemies, and invade them in his turn. The labour

250 The British convey vessels up to Lake Champlain.

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undergone at this time by the sea and land forces must indeed have been prodigious; since there were conveyed over land, and dragged up the rapids of St Lawrence, no fewer than 30 large long boats, 400 batteaux, besides a vast number of flat-bottomed boats, and a gondola of 30 tons. The intent of the expedition was to push forward before winter to Albany, where the army would take up its winter quarters, and next spring effect a junction with that under General Howe, when it was not doubted that the united forces and skill of these two commanders would speedily put a termination to the war.

By reason of the difficulties with which the equipment of this fleet had been attended, it was the beginning of October before the expedition could be undertaken. It was now, however, by every judge allowed to be completely able to answer the purpose for which it was intended. It consisted of one large vessel with three masts, carrying 18 twelve pounders; two schooners, the one carrying 14, the other 12 six pounders; a large flat-bottomed radeau with 6 twenty-four and 6 twelve pounders; and a gondola with 8 nine ponnders. Besides these were 20 vesssels of a smaller size, called *gun-boats*, carrying each a piece of brass ordnance from 9 to 24 pounders, or howitzers. Several long-boats were fitted out in the same manner; and besides all these, there was a vast number of boats and tenders, of various sizes, to be used as transports for the troops and baggage. It was manned by a number of select seamen, and the guns were to be served by a detachment from the corps of artillery; the officers and soldiers appointed for this expedition were also chosen out of the whole army.

To oppose this formidable armament the Americans had only a very inconsiderable force, commanded by General Arnold; who, after engaging part of the British fleet for a whole day, took advantage of the darkness of the night to set sail without being perceived, and next morning was out of sight: but he was so hotly pursued by the British, that on the second day after he was overtaken, and forced to a second engagement. In this he behaved with great gallantry; but his force being very inferior to that of the enemy, he was obliged to run his ships ashore and set them on fire. A few only escaped to Lake George; and the garrison of Crown Point having destroyed or carried off every thing of value, retired to Ticonderago. Thither General Carleton intended to have pursued them; but the difficulties he had to encounter appeared so many and so great, that it was thought proper to march back into Canada, and desist from any further operations till next spring.

251 Destroy the naval force of the provincials.

Thus the affairs of the Americans seemed everywhere going to wreck: even those who had been most sanguine in their cause began to waver. The time, also, for which the soldiers had enlisted themselves was now expired; and the bad success of the preceding campaign had been so very discouraging, that no person was willing to engage himself during the continuance of a war, of which the event seemed to be so doubtful. In consequence of this, therefore, General Washington found his army daily decreasing in strength; so that from 30,000, of which it consisted when General Howe landed on Staten Island, scarce a tenth part could now be mustered. To assist the chief commander as much

252 The Americans almost entirely dispersed.

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as possible, General Lee had collected a body of forces in the north; but on his way southward, having imprudently taken up his lodging at some distance from his troops, information was given to Colonel Harcourt, who happened at that time to be in the neighbourhood, and Lee was made prisoner. The loss of this general was much regretted, the more especially as he was of superior quality to any prisoner in the possession of the colonists, and could not therefore be exchanged. Six field officers were offered in exchange for him, and refused; and the congress was highly irritated, at its being reported that he was to be treated as a deserter, having been a half-pay officer in the British service at the commencement of the war. In consequence of this they issued a proclamation, threatening to retaliate on the prisoners in their possession whatever punishment should be inflicted on any of those taken by the British, and especially that their conduct should be regulated by the treatment of General Lee.

253 General Lee taken prisoner.

254 Continental army for 1777.

In the mean time they proceeded with the most indefatigable diligence to recruit their army, and bound their soldiers to serve for a term of three years, or during the continuance of the war. The army designed for the ensuing campaign was to consist of 88 battalions; of which each province was to contribute its quota; and 20 dollars were offered as a bounty to each soldier, besides an allotment of lands at the end of the war. In this allotment it was stipulated, that each soldier should have 100 acres; an ensign 150; a lieutenant 200; a captain 300; a major 400; a lieutenant-colonel 450; and a colonel 500. No lands were promised to those who inlisted only for three years. All officers or soldiers disabled through wounds received in the service were to enjoy half-pay during life. To defray the expence, congress borrowed five millions of dollars at five per cent.; for payment of which the United States became surety. At the same time, in order to animate the people to vigorous exertions, a declaration was published, in which they set forth the necessity there was for taking proper methods to ensure success in their cause: they endeavoured to palliate as much as possible the misfortunes which had already happened; and represented the true cause of the present distress to be the short term of inlistment.

This declaration, together with the imminent danger of Philadelphia, determined the Americans to exert themselves to the utmost in order to reinforce General Washington's army. They soon received farther encouragement however, by an exploit of that general against the Hessians. As the royal army extended in different cantonments for a great way, General Washington, perceiving the imminent danger to which Philadelphia was exposed, resolved to make some attempt on those divisions of the enemy which lay nearest that city. These happened to be the Hessians, who lay in three divisions, the last only 20 miles distant from Philadelphia. On the 25th of December, having collected as considerable a force as he could, he set out with an intent to surprise that body of the enemy who lay at Trenton. His army was divided into three bodies; one of which he ordered to cross the Delaware at Trenton Ferry, a little below the town; the second at a good distance below, at a place called *Bordentown*, where the second division of Hessians was placed; while he himself with the third, directing his course to a ferry some miles above Trenton, intended to have passed it at midnight, and attacked the Hessians at break of day. But by reason of various impediments, it was eight in the morning before he could reach the place of his destination. The enemy, however, did not perceive his approach till they were suddenly attacked. Colonel Ralle, who commanded them, did all that could be expected from a brave and experienced officer; but every thing was in such confusion, that no efforts of valour or skill could now retrieve matters. The colonel himself was mortally wounded, his troops were entirely broken, their artillery seized, and about 1000 taken prisoners.

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This action, though seemingly of no very decisive nature, was sufficient at that time to turn the fortune of war in favour of America. It tended greatly to lessen the fear which the provincials had of the Hessians, at the same time that it equally abated the confidence which the British had till now put in them. Reinforcements came in to General Washington's army from all quarters; so that he was soon in a condition to leave Philadelphia, and take up his quarters at Trenton. Emboldened by his success, he determined to make an attempt on a division of the British forces stationed at Maidenhead, a town situated half way between Trenton and Princetown. This consisted of three regiments under the command of Colonel Mawhood, an officer of great merit. The troops were surprised on their march: but though they were separately surrounded and attacked by a force so vastly superior, they charged the enemy so resolutely with their bayonets, that they effected a retreat. These attempts of the Americans, however, with the hostile disposition of the people, showed the impossibility of maintaining posts so far advanced in the enemy's country; so that it was resolved to retreat towards Brunswick, in order to prevent it, with the troops and magazines it contained, from falling into the hands of the provincials. General Washington lost no opportunity of recovering what had been lost; and, by dividing his army into small parties, which could be reunited on a few hours warning, he in a manner entirely covered the country with it, and repossessed himself of all the important places.

255 Another attempt on three British regiments;

256 but they make good their retreat.

Thus ended the campaign of 1776, with scarce any real advantage, other than the acquisition of the city of New York, and of a few fortresses in its neighbourhood; where the troops were constrained to act with as much circumspection as if they had been besieged by a victorious army, instead of being themselves the conquerors.

The army at New York began in 1777 to exercise a kind of predatory war, by sending out parties to destroy magazines, make incursions, and take or destroy such forts as lay on the banks of rivers, to which their great command of shipping gave them access. In this they were generally successful: the provincial magazines at Peek's Hill, a place about 50 miles distant from New York, were destroyed, the town of Dunbury in Connecticut burnt, and that of Ridgefield in the same province was taken possession of. In returning from the last expedition, however, the British were greatly harassed by the enemy under Generals Arnold, Wooster, and Sullivan; but they made good their retreat in spite of all opposition, with the loss of only 170

257 Excursions of the British from New York.

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killed and wounded. On the American side the loss was much greater; General Wooster was killed, and Arnold in the most imminent danger. On the other hand, the Americans destroyed the stores at Sagg harbour, in Long Island, and made prisoners of all who defended the place.

As this method of making war, however, could answer but little purpose, and savoured more of the barbarous incursions of savages than of a war carried on by a civilized people, it was resolved to make an attempt on Philadelphia. At first it was thought that this could be done through the Jerseys; but General Washington had received such large reinforcements, and posted himself so strongly, that it was found to be impracticable. Many stratagems were used to draw him from this strong situation, but without success; so that it was found necessary to make the attempt on Philadelphia by sea. While the preparations necessary for this expedition were going forward, the Americans found means to make amends for the capture of General Lee by that of General Prescot, who was seized in his quarters with his aid de-camp, in much the same manner as General Lee had been. This was exceedingly mortifying to the general himself, as he had not long ago set a price upon General Arnold himself, by offering a sum of money to any one that apprehended him; which the latter answered by setting a lower price upon General Prescot.

258 General Prescot taken prisoner.

The month of July was far advanced before the preparations for the expedition against Philadelphia were completed; and it was the 23d before the fleet was able to sail from Sandy Hook. The force employed in this expedition consisted of 36 battalions of British and Hessians, a regiment of light horse, and a body of loyalists raised at New York. The remainder of these, with 17 battalions, and another body of light horse, was stationed at New York under Sir Henry Clinton. Seven battalions were stationed at Rhode Island. After a week's sailing they arrived at the mouth of the Delaware; but there received certain intelligence, that the navigation of the river was so effectually obstructed, that no possibility of forcing a passage remained. Upon this it was resolved to proceed farther southward to Chesapeak bay in Maryland, from whence the distance to Philadelphia was not very great, and where the provincial army would find less advantage from the nature of the country than in the Jerseys.

259 The fleet sails for Philadelphia.

The navigation from Delaware to Chesapeak took up the best part of the month of August, and that up the bay itself was extremely difficult and tedious. At last, having sailed up the river Elk as far as was practicable, the troops were landed without opposition, and set forward on their intended expedition. On the news of their arrival in Chesapeak, General Washington left the Jerseys, and hastened to the relief of Philadelphia; and in the beginning of September met the royal army at Brandy-wine Creek, about mid-way between the head of the Elk and Philadelphia. Here he adhered to his former method of skirmishing and harassing the royal army on its march; but as this proved insufficient to stop its progress, he retired to that side of the creek next to Philadelphia, with an intent to dispute the passage. This brought on a general engagement on the 11th of September, in which the Americans were worsted through the superior discipline of the British troops; and it was only through the approach of night that they were saved from being entirely destroyed. On this occasion the provincials lost about 1000 in killed and wounded, besides 400 taken prisoners.

260 The army lands at the head of the Elk.

261 The Americans defeated.

United States.

The loss of this battle proved also the loss of Philadelphia. General Washington retired toward Lancaster, an inland town at a considerable distance from Philadelphia. Here, however, the British general took such measures as must have forced the provincials to a second engagement; but a violent rain, which lasted a day and a night, prevented his design. General Washington, though he could not prevent the loss of Philadelphia, still adhered to his original plan of distressing the royal party, by laying ambushes and cutting off detached parties: but in this he was less successful than formerly; and one of his own detachments, which lay in ambush in a wood, were themselves surprised and entirely defeated, with the loss of 300 killed and wounded, besides a great number taken, and all their arms and baggage.

262 An American detachment surprised and defeated with great slaughter.

General Howe now perceiving that the Americans would not venture another battle even for the sake of their capital, took peaceable possession of it on the 26th of September. His first care was then to cut off, by means of strong batteries, the communication between the upper and lower parts of the river: which was executed notwithstanding the opposition of some American armed vessels; one of which, carrying 36 guns, was taken. His next task was to open a communication with it by sea; and this was a work of no small difficulty. A vast number of batteries and forts had been erected, and immense machines formed like *chevaux de frize*, from whence they took their name, sunk in the river to prevent its navigation. As the fleet was sent round to the mouth of the river in order to co-operate with the army, this work, however difficult, was accomplished; nor did the provincials give much opposition, as well knowing that all places of this kind were now untenable. General Washington, however, took the advantage of the royal army being divided, to attack the camp of the principal division of it that lay at German-town in the neighbourhood of Philadelphia. In this he met with very little success; for though he reached the place of destination by three o'clock in the morning, the patrols had time to call the troops to arms. The Americans, notwithstanding, made a very resolute attack; but they were received with such bravery, that they were compelled to abandon the attempt, and retreat in great disorder; with the advantage, however, of carrying off their cannon, though pursued for a considerable way, after having 300 killed, 600 wounded, and upwards of 400 taken prisoners, among whom were 54 officers. On the British side, the loss amounted to 430 wounded and prisoners, and 70 killed; but among the last were General Agnew and Colonel Bird, with some other excellent officers.

263 General Howe takes possession of Philadelphia.

264 Royal army attacked at German-town.

265 The Americans defeated.

There still remained two strong forts on the Delaware to be reduced. These were Mud Island and Red Bank. The various obstructions which the Americans had thrown in the way rendered it necessary to bring up the Augusta, a ship of the line, and the Merlin frigate, to the attack of Mud Island; but during the heat of action both were grounded. Upon this

United States.

266 Two British ships of war burnt.

this the Americans sent down four fire-ships, and directed the whole fire from their galleys against them. The former were rendered ineffectual by the courage and skill of the British seamen; but during the engagement both the Augusta and Merlin took fire and were burnt to ashes, and the other ships obliged to withdraw. The enemy, encouraged by this unsuccessful attempt, proceeded to throw new obstructions in the way; but the British general having found means to convey a number of cannon, and to erect batteries within gunshot of the fort by land, and bringing up three ships of the line which mounted heavy cannon, the garrison, after making a vigorous defence for one day, perceiving that preparations were making for a general assault on the next, abandoned the place in the night. Those who defended Red Bank followed their example, and abandoned it on the approach of Lord Cornwallis. A great number of the American shipping now finding themselves entirely destitute of any protection, sailed up the river in the night time. Seventeen however remained, whose retreat was intercepted by a frigate and some armed vessels; on which the Americans ran them ashore and burnt them, to prevent their falling into the enemy's hands.

267 All the forts near Philadelphia reduced.

268 Expedition projected against New England.

Thus the campaign of 1777 in Pennsylvania concluded successfully on the part of the British. In the north, however, matters wore a different aspect. The expedition in that quarter had been projected by the British ministry as the most effectual method that could be taken to crush the colonies at once. The four provinces of New England had originally begun the confederacy against Britain, and were still considered as the most active in the continuation of it; and it was thought that any impression made upon them would contribute in an effectual manner to the reduction of all the rest. For this purpose, an army of 4000 chosen British troops and 3000 Germans was put under the command of General Burgoyne; General Carleton was directed to use his interest with the Indians to persuade them to join in this expedition; and the province of Quebec was to furnish large parties to join in the same. The officers who commanded under General Burgoyne were General Philips of the artillery, Generals Fraser, Powel, and Hamilton, with the German officers, Generals Reidesel and Sprecht. The soldiers, as has already been observed, were all exceellently disciplined, and had been kept in their winter-quarters with all imaginable care, in order to prepare them for the expedition on which they were going. To aid the principal expedition, another was projected on the Mohawk river under Colonel St Leger, who was to be assisted by Sir John Johnson, son to the famous Sir William Johnson, who had so greatly distinguished himself in the war of 1755.

269 General Burgoyne joined by the Indians.

On the 21st of June 1777, the army encamped on the western side of the lake Champlain; where being joined by a considerable body of Indians, General Burgoyne made a speech, in which he exhorted those new allies to lay aside their ferocious and barbarous manner of making war; to kill only such as opposed them in arms; and to spare prisoners, with such women and children as should fall into their hands. After issuing a proclamation, in which the force of Britain and that which he commanded was set forth in very ostentatious terms, the campaign opened with the siege of Ticonderago. The place was very strong, and garrisoned by 6000 men under General Sinclair; nevertheless the works were so extensive, that even this number was scarce sufficient to defend them properly. They had therefore omitted to fortify a rugged eminence called *Sugar Hill*, the top of which overlooked and effectually commanded the whole works; vainly imagining that the difficulty of the ascent would be sufficient to prevent the enemy from taking possession of it. On the approach of the first division of the army, the provincials abandoned and set fire to their outworks; and so expeditious were the British troops, that by the 5th of July every post was secured which was judged necessary for investing it completely. A road was soon after made to the very summit of that eminence which the Americans had with such confidence supposed could not be ascended; and so much were they now disheartened, that they instantly abandoned the fort entirely, taking the road to Skenesborough, a place to the south of Lake George; while their baggage, with what artillery and military stores they could carry off, were sent to the same place by water. But the British generals were determined not to let them pass so easily. Both were pursued, and both overtaken. Their armed vessels consisted only of five galleys; two of which were taken, and three blown up; on which they set fire to their boats and fortifications at Skenesborough. On this occasion the provincials lost 200 boats, 130 pieces of cannon, with all their provisions and baggage. Their land forces under Colonel Francis made a brave defence against General Fraser; and being greatly superior in number, had almost overpowered him, when General Reidesel with a large body of Germans came to his assistance. The enemy were now overpowered in their turn; and their commander being killed, they fled on all sides with great precipitation. In this action 260 Americans were killed, as many taken prisoners, and above 600 wounded, many of whom perished in the woods for want of assistance.

United States.

270 Ticonderago besieged and taken.

271 Americans defeated by land and water.

During the engagement General Sinclair was at Castleton, about six miles from the place; but instead of going forward to Fort Anne, the next place of strength, he repaired to the woods which lie between that fortress and New England. General Burgoyne, however, detached Colonel Hill with the ninth regiment, in order to intercept such as should attempt to retreat towards Fort Anne. On his way he met with a body of the enemy, said to be six times as numerous as his own; but after an engagement of three hours, they were obliged to retire with great loss. After so many disasters, despairing of being able to make any stand at Fort Anne, they set fire to it, and retired to Fort Edward. In all these engagements the loss in killed and wounded in the royal army did not exceed 200 men.

272 They are again defeated, and abandon Fort Anne.

General Burgoyne was now obliged to suspend his operations for some time, and wait at Skenesborough for the arrival of his tents, provisions, &c. but employed this interval in making roads through the country about St Anne, and in clearing a passage for his troops to proceed against the enemy. This was attended with incredible toil; but all obstacles were surmounted with equal patience and resolution by the army. In short, after undergoing the utmost difficulty that could be undergone, and making every exertion that man could

273 General Burgoyne makes his way to Fort Edward with great difficulty.

United States.

could make, he arrived with his army before Fort Edward about the end of July. Here General Schuyler had been for some time endeavouring to recruit the shattered American forces, and had been joined by General Sinclair with the remains of his army; the garrison of Fort George also, situated on the lake of that name, had evacuated the place and retired to Fort Edward.

274 Americans retire to Saratoga.

But on the approach of the royal army, they retired from thence also, and formed their head-quarters at Saratoga. Notwithstanding the great successes of the British general, they showed not the least disposition to submit, but seemed only to consider how they might make the most effectual resistance. For this purpose, the militia was everywhere raised and draughted to join the army at Saratoga; and such numbers of volunteers were daily added, that they soon began to recover from the terror into which they had been thrown. That they might have a commander whose abilities could be relied on, General Arnold was appointed, who repaired to Saratoga with a considerable train of artillery; but receiving intelligence that Colonel St Leger was proceeding with great rapidity in his expedition on the Mohawk river, he removed to Still-water, a place about half way between Saratoga and the junction of the Mohawk and Hudson's river. The colonel, in the mean time, had advanced as far as Fort Stanwix; the siege of which he pressed with great vigour. On the 6th of August, understanding that a supply of provisions, escorted by 800 or 900 men, was on the way to the fort, he dispatched Sir John Johnson with a strong detachment to intercept it. This he did so effectually, that, besides intercepting the provisions, 400 of its guard were slain, 200 taken, and the rest escaped with great difficulty. The garrison, however, were not to be intimidated by this disaster, nor by the threats or representations of the colonel; on the contrary, they made several successful sallies under Colonel Willet, the second in command; and this gentleman, in company with another, even ventured out of the fort, and, eluding the vigilance of the enemy, passed through them in order to hasten the march of General Arnold to their assistance.

275 Fort Stanwix besieged.

276 A detachment of Americans cut in pieces.

277 The Indians desert, and force the colonel to raise the siege.

Thus the affairs of Colonel St Leger seemed to be in no very favourable situation, notwithstanding his late success, and they were soon totally ruined by the desertion of the Indians. They had been alarmed by the report of General Arnold's advancing with 2000 men to the relief of the fort; and while the colonel was attempting to give them encouragement, another report was spread, that General Burgoyne had been defeated with great slaughter, and was now flying before the provincials. On this he was obliged to do as they thought proper; and the retreat could not be effected without the loss of the tents and some of the artillery and military stores.

278 General Burgoyne distressed for want of provisions.

General Burgoyne, in the mean time, notwithstanding all the difficulties he had already sustained, found that he must still encounter more. The roads he had made with so much labour and pains were destroyed either by the wetness of the season or by the enemy; so that the provisions he brought from Fort George could not arrive at his camp without the most prodigious toil. On hearing of the siege of Fort Stanwix by Colonel St Leger, he determined to move forward in hopes of enclosing the enemy betwixt his own army and that of St Leger, or of obtaining the command of all the country between Fort Stanwix and Albany; or at any rate, a junction with Colonel St Leger would be effected, which could not but be attended with the most happy consequences. The only difficulty was the want of provisions; and this it was proposed to remedy by reducing the provincial magazines at Bennington. For this purpose, Colonel Baum, a German officer of great bravery, was chosen, with a body of 500 men. The place was about twenty miles from Hudson's river; and to support Colonel Baum's party, the whole army marched up the river's bank, and encamped almost opposite to Saratoga, with the river betwixt it and that place. An advanced party was posted at Batten Kill, between the camp and Bennington, in order to support Colonel Baum. In their way the British seized a large supply of cattle and provisions, which were immediately sent to the camp; but the badness of the roads retarded their march so much, that intelligence of their design was sent to Bennington. Understanding now that the American force was greatly superior to his own, the colonel acquainted the general, who immediately despatched Colonel Breyman with a party to his assistance; but through the same causes that had retarded the march of Colonel Baum, this assistance could not arrive in time. General Starke, in the mean time, who commanded at Bennington, determined to attack the two parties separately; and for this purpose advanced against Colonel Baum, whom he surrounded on all sides, and attacked with the utmost violence. The troops defended themselves with great valour, but were to a man either killed or taken. Colonel Breyman after a desperate engagement, had the good luck to effect a retreat through the darkness of the night, which otherwise he could not have done, as his men had expended all their ammunition, being 40 rounds to each.

United States.

279 Makes an attempt on the Provincial magazines at Bennington.

280 Colonel Baum utterly defeated and taken prisoner.

281 Colonel Breymen defeated.

General Burgoyne, thus disappointed in his attempt on Bennington, applied himself with indefatigable diligence to procure provisions from Fort George; and having at length amassed a sufficient quantity to last for a month, he threw a bridge of boats over the river Hudson, which he crossed about the middle of September, encamping on the hills and plains near Saratoga. As soon as he approached the provincial army, at this time encamped at Still-water under General Gates, he determined to make an attack; for which purpose he put himself at the head of the central division of his army, having General Fraser and Colonel Breyman on the right, with Generals Reidesel and Philips on the left. In this position he advanced towards the enemy on the 19th September. But the Americans did not now wait to be attacked: on the contrary, they attacked the central division with the utmost violence; and it was not until General Phillips with the artillery came up that they could be repulsed. On this occasion, though the British troops lost only 330 in killed and wounded, and the enemy no fewer than 1500, the former were very much alarmed at the obstinate resolution shown by the Americans. This did not, however, prevent them from advancing towards the enemy, and posting themselves the next day within cannon-shot of their lines. But their allies the Indians began to desert in great numbers; and at the same time the general

282 The Americans attack the royal army;

283 and are with great difficulty repulsed.

284 The Indians desert

United States.

general was in the highest degree mortified by having no intelligence of any assistance from Sir Henry Clinton, as had been stipulated. He now received a letter from him, by which he was informed, that Sir Henry intended to make a diversion on the North River in his favour. This afforded but little comfort: however, he returned an answer by several trusty persons whom he despatched different ways, stating his present distressed situation, and mentioning that the provisions and other necessaries he had would only enable him to hold out till the 12th of October.

285 A letter from Sir Henry Clinton, with General Burgoyne's answer.

In the mean time the Americans, in order to cut off the retreat of the British army in the most effectual manner, undertook an expedition against Ticonderago; but were obliged to abandon the enterprise after having surprised all the outposts, and taken a great number of boats with some armed vessels, and a number of prisoners. The army under General Burgoyne, however, continued to labour under the greatest distresses; so that in the beginning of October he had been obliged to diminish the soldiers allowance. On the 7th of that month he determined to move towards the enemy. For this purpose he sent a body of 1500 men to reconnoitre their left wing; intending, if possible, to break through it in order to effect a retreat. The detachment, however, had not proceeded far when a dreadful attack was made upon the left wing of the British army, which was with great difficulty preserved from being entirely broken by a reinforcement brought up by General Fraser, who was killed in the attack. After the troops had with the most desperate efforts regained their camp, it was most furiously assaulted by General Arnold; who, notwithstanding all opposition, would have forced the intrenchments, had he not received a dangerous wound, which obliged him to retire. Thus the attack failed on the left, but on the right the camp of the German reserve was forced, Colonel Breyman killed, and his countrymen defeated with great slaughter, and the loss of all their artillery and baggage.

286 Expedition of the provincials against Ticonderago.

287 They make a desperate attack upon the royal army;

288 kill General Fraser,

289 and defeat the Germans with great slaughter.

290 The royal army in danger of being surrounded.

This was by far the heaviest loss the British army had sustained since the action at Bunker's Hill. The list of killed and wounded amounted to near 1200, exclusive of the Germans; but the greatest misfortune was, that the enemy had now an opening on the right and rear of the British forces, so that the army was threatened with entire destruction. This obliged General Burgoyne once more to shift his position, that the enemy might also be obliged to alter theirs. This was accomplished on the night of the 7th, without any loss, and all the next day he continued to offer the enemy battle; but they were now too well assured of obtaining a complete victory, by cutting off all supplies from the British, to risk a pitched battle. Wherefore they advanced on the right side, in order to enclose him entirely; which obliged the general to direct a retreat towards Saratoga. But the enemy had now stationed a great force on the ford at Hudson's river, so that the only possibility of retreat was by securing a passage to Lake George; and to effect this, a body of workmen was detached, with a strong guard, to repair the roads and bridges that led to Fort Edward. As soon as they were gone, however, the enemy seemed to prepare for an attack; which rendered it necessary to recal the guard, and the workmen being of course left exposed could not proceed.

291 Attempt a retreat without success.

United States.

In the mean time, the boats which conveyed provisions down Hudson's river were exposed to the continual fire of the American marksmen, who took many of them; so that it became necessary to convey the provisions over land. In this extreme danger it was resolved to march by night to Fort Edward, forcing the passages at the fords either above or below the place; and in order to effect this the more easily, it was resolved that the soldiers should carry their provisions on their backs, leaving behind their baggage and every other incumbrance. But before this could be executed, intelligence was received that the enemy had raised strong intrenchments opposite to these fords, well provided with cannon, and they had likewise taken possession of the rising ground between Fort George and Fort Edward, which in like manner was provided with cannon.

292 Distressed situation of the royal army.

All this time the American army was increasing by the continual arrival of militia and volunteers from all parts. Their parties extended all along the opposite bank of Hudson's river, and some had even passed it in order to observe the least movement of the British army. The whole force under General Gates was computed at 16,000 men, while the army under General Burgoyne scarcely amounted to 6000; and every part of the camp was reached by the grape and rifle shot of the enemy, besides a discharge from their artillery, which was almost incessant. In this state of extreme distress and danger, the army continued with the greatest constancy and perseverance till the evening of the 13th of October, when an inventory of provisions being taken, it was found that no more remained than what was sufficient to serve for three days; and a council of war being called, it was unanimously determined that there was no method now remaining but to treat with the enemy. In consequence of this, a negotiation was opened next day, which speedily terminated in the capitulation of the whole British army; the principal article of which was, that the troops were to have a free passage to Britain, on condition of not serving against America during the war. On this occasion, General Gates ordered his army to keep within their camp, while the British soldiers went to a place appointed for them to lay down their arms, that the latter might not have the additional mortification of being made spectacles in so melancholy an event. The number of those who surrendered at Saratoga amounted to 5750, according to the American accounts; the list of the sick and wounded left in the camp when the army retreated to Saratoga, to 528; and the number of those lost by other accidents since the taking of Ticonderago, to near 3000. Thirty-five brass field-pieces, 7000 stand of arms, clothing for an equal number of soldiers, with the tents, military chest, &c. constituted the booty on this occasion.

293 It is obliged to capitulate.

294 Successful expedition of Sir Henry Clinton.

Sir Henry Clinton, in the mean time, had sailed up the North river, and destroyed the two forts called Montgomery and Clinton, with Fort Constitution, and another place called Continental Village, where were barracks for 2000 men. Several large cannon were carried away, besides a number of smaller artillery, and a great quantity of stores and ammunition; a large

boom

United States.

boom and chain reaching across the river from Fort Montgomery to a point of land called St Anthony's Nose, and which cost not less than 70,000l. sterling, were partly destroyed and partly carried away, as was also another boom of little less value at Fort Constitution. The loss of the British army was but small in number, though some officers of great merit were killed in the different attacks.

Another attack was made by Sir James Wallace with some frigates, and a body of land forces under General Vaughan. The place which now suffered was named Esopus: the fortifications were destroyed, and the town itself was reduced to ashes, as that called Continental Village had been before.

295 Great dejection on account of Burgoyne's capture.

But these successes, of whatever importance they might be, were now disregarded by both parties. They served only to irritate the Americans, flushed with their success; and they were utterly insufficient to raise the spirits of the British, who were now thrown into the utmost dismay.

On the 16th March 1778, Lord North intimated to the house of commons, that a paper had been laid before the king by the French ambassador, intimating the conclusion of an alliance between the court of France and the United States of America. The preliminaries of this treaty had been concluded in the end of the year 1777, and a copy of them sent to congress, in order to counteract any proposals that might be made in the mean time by the British ministry. On the 6th of February 1778, the articles were formally signed, to the great satisfaction of the French nation.

296 Treaty between France and America.

They were in substance as follows:

1. If Great Britain should, in consequence of this treaty, proceed to hostilities against France, the two nations should mutually assist one another.

2. The main end of the treaty was in an effectual manner to maintain the independency of America.

3. Should those places of North America still subject to Britain be reduced by the colonies, they should be confederated with them, or subjected to their jurisdiction.

4. Should any of the West India islands be reduced by France, they should be deemed its property.

5. No formal treaty with Great Britain should be concluded either by France or America without the consent of each other; and it was mutually engaged that they should not lay down their arms till the independence of the States had been formally acknowledged.

6. The contracting parties mutually agreed to invite those powers that had received injuries from Great Britain to join the common cause.

7. The United States guaranteed to France all the possessions in the West Indies which she should conquer; and France in her turn guaranteed the absolute independency of the States, and their supreme authority over every country they possessed, or might acquire during the war.

297 Debates occasioned by the treaty.

The notification of such a treaty as this could not but be looked upon as a declaration of war. On its being announced to the house, every one agreed in an address to his Majesty, promising to stand by him to the utmost in the present emergency; but it was warmly contended by the members in opposition, that the present ministry ought to be removed on account of their numberless blunders and miscarriages in every instance. Many were of opinion, that the only way to extricate the nation from its trouble was to acknowledge the independency of America at once; and thus we might still do with a good grace what must inevitably be done at last, after expending much more blood and treasure than had yet been lavished in this unhappy contest. The ministerial party, however, entertained different ideas. Instigated by zeal for the national honour, it was determined at once to resent the arrogance of France, and prosecute hostilities against America with more vigour than ever, should the terms now offered them be rejected.

United States.

298 Americans send agents to different courts.

The Americans, in the mean time, assiduously employed their agents at the courts of Spain, Vienna, Prussia, and Tuscany, in order, if possible, to conclude alliances with them, or at least to procure an acknowledgment of their independency. As it had been reported that Britain intended to apply for assistance to Russia, the American commissioners were enjoined to use their utmost influence with the German princes to prevent such auxiliaries from marching through their territories, and to endeavour to procure the recall of the German troops already sent to America. To France they offered a cession of such West India islands as should be taken by the united strength of France and America; and should Britain by their joint endeavours be dispossessed of Newfoundland, Cape Breton, and Nova Scotia, these territories should be divided betwixt the two nations, and Great Britain be totally excluded from the fishery. The proposals to the Spanish court were, that in case they should think proper to espouse their quarrel, the American states should assist in reducing Pensacola under the dominion of Spain, provided their subjects were allowed the free navigation of the river Mississippi, and the use of the harbour of Pensacola; and they further offered, that if agreeable to Spain, they would declare war against Portugal, should that power expel the American ships from its ports.

299 General Burgoyne's troops detained in America.

In the mean time, the troops under General Burgoyne were preparing to embark for Britain according to the convention at Saratoga; but to their utter surprise, congress positively refused to allow them to embark, under pretence that some sinister designs were harboured on the part of Britain, and that they only wanted an opportunity to join the other troops at Philadelphia or New York.

300 Predatory war carried on by the British troops.

The season for action was now approaching; and congress was indefatigable in its preparations for a new campaign, which it was confidently said would be the last. Among other methods taken for this purpose, it was recommended to all the young gentlemen of the colonies to form themselves into bodies of cavalry to serve at their own expence during the war. General Washington at the same time, in order to remove all encumbrances from his army, lightened the baggage as much as possible, by substituting sacks and portmanteaus in place of chests and boxes, and using packhorses instead of waggons. On the other hand, the British army, expecting to be speedily reinforced by 20,000 men, thought of nothing but concluding the war according to their wishes before the end of the campaign. It was with the utmost concern as well as indignation, therefore, that they received the news of Lord North's conciliatory bill. It was universally looked upon as a national disgrace;

301 Conciliatory bill received with indignation by the army.

United States.

disgrace: and some even tore the cockades from their hats, and trampled them under their feet as a token of their indignation. By the colonists it was received with indifference. The British commissioners endeavoured to make it as public as possible; and the congress, as formerly, ordered it to be printed in all the newspapers. On this occasion Governor Tryon enclosed several copies of the bill to General Washington in a letter, entreating that he would allow them to be circulated; to which that general returned for answer a copy of a newspaper in which the bill was printed, with the resolutions of congress upon it. These were, That whoever presumed to make a separate agreement with Britain should be deemed a public enemy; that the United States could not with any propriety keep correspondence with the commissioners until their independence was acknowledged, and the British fleets and armies removed from America. At the same time, the colonies were warned not to suffer themselves to be deceived into security by any offers that might be made; but to use their utmost endeavours to send their quotas with all diligence into the field. The individuals with whom the commissioners conversed on the subject of the conciliatory bill, generally returned for answer, that the day of reconciliation was past; and that the haughtiness of Britain had extinguished all filial regard in the breasts of the Americans.

302 Despised by the colonists.

About this time also Mr Silas Deane arrived from France with two copies of the treaty of commerce and alliance to be signed by congress. Advices of the most agreeable nature were also received from various parts, representing in the most favourable light the dispositions of the European powers; all of whom, it was said, wished to see the independence of America settled upon the most firm and permanent basis. Considering the situation of matters with the colonists at this time, therefore, it is no wonder that the commissioners found themselves unable to accomplish the business on which they came. Their proposals were utterly rejected, themselves treated as spies, and all intercourse with them interdicted.

303 Bad success of the commissioners.

But before any final answer could be obtained from congress, Sir Henry Clinton had taken the resolution of evacuating Philadelphia. Accordingly, on the 10th of June, after having made all necessary preparations, the army marched out of the city, and crossed the Delaware before noon with all its baggage and other encumbrances. General Washington, apprised of this design, had despatched expresses into the Jerseys with orders to collect all the force that could be assembled in order to obstruct the march of the enemy. After various movements on both sides, Sir Henry Clinton, with the royal army, arrived on the 27th of June at a place called Freehold; where, judging that the enemy would attack him, he encamped in a very strong situation. Here General Washington determined to make an attack as soon as the army had again begun its march. The night was spent in making the necessary preparations, and General Lee with his division was ordered to be ready by daybreak. But Sir Henry Clinton, justly apprehending that the chief object of the enemy was the baggage, committed it to the care of General Knyphausen, whom he ordered to set out early in the morning, while he followed with the rest of the army. The attack was accordingly made: but the British general had taken such care to arrange his troops properly, and so effectually supported his forces when engaged with the Americans, that the latter not only made no impression, but were with difficulty preserved from a total defeat by the advance of General Washington with the whole army. The British troops effected their retreat with the loss of 300 men, of whom many died through mere fatigue, without any wound. In this action General Lee was charged by General Washington with disobedience and misconduct in retreating before the British army. He was tried by a court martial, and sentenced to a temporary suspension from his command. After they had arrived at Sandy Hook, a bridge of boats was by Lord Howe's directions thrown from thence over the channel which separated the island from the main land, and the troops were conveyed aboard the fleet; after which they sailed to New York. After sending some light detachments to watch the enemy's motions, General Washington marched towards the North River, where a great force had been collected to join him; and where it was now expected that some very capital operations would take place.

304 Philadelphia evacuated.

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In the mean time, France had set about her preparations for the assistance of the Americans. On the 14th of April Count d'Estaing had sailed from Toulon with a strong squadron of ships of the line and frigates, and arrived on the coast of Virginia in the beginning of July, while the British fleet was employed in conveying the forces from Sandy Hook to New York. It consisted of one ship of 90 guns, one of 80, six of 74, and four of 64, besides several large frigates; and, exclusive of its complement of sailors, had 6000 marines and soldiers on board. To oppose this the British had only six ships of 64 guns, three of 50, and two of 40, with some frigates and ships. Notwithstanding this inferiority, however, the British admiral posted himself so advantageously, and showed such superior skill, that D'Estaing did not think proper to attack him. He therefore remained at anchor four miles off Sandy Hook till the 22d of July, without effecting any thing more than the capture of some vessels, which, through ignorance of his arrival, fell into his hands.

305 French fleet arrives in America.

The next attempt of the French admiral was, in conjunction with the Americans, on Rhode island. It was proposed that D'Estaing, with the 6000 troops he had with him, should make a descent on the southern part of the island, while a body of the Americans should take possession of the north; at the same time the French squadron was to enter the harbour of Newport, and take and destroy all the British shipping. On the 8th of August the French admiral entered the harbour as was proposed, but found himself unable to do any material damage. Lord Howe, however, instantly set sail for Rhode Island; and D'Estaing, confiding in his superiority, immediately came out of the harbour to attack him. A violent storm parted the two fleets, and did so much damage that they were rendered totally unfit for action. The French, however, suffered most; and several of the ships being afterwards attacked singly by the British, very narrowly escaped being taken. On the 20th of August he

306 Attempts Rhode Island without success.

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he returned to Newport in a very shattered condition; and, not thinking himself safe there, sailed two days after for Boston. General Sullivan had landed in the mean time on the northern part of Rhode Island with 10,000 men. On the 17th of August they began their operations by erecting batteries, and making their approaches to the British lines. But General Pigot, who commanded in Newport, had taken such effectual care to secure himself on the land side, that without the assistance of a marine force it was altogether impossible to attack him with any probability of success. The conduct of D'Estaing, therefore, who had abandoned them when master of the harbour, gave the greatest disgust to the people of New England, and Sullivan began to think of a retreat. On perceiving his intentions, the garrison sallied out upon him with so much vigour, that it was not without difficulty that he effected his retreat. He had not been long gone when Sir Henry Clinton arrived with a body of 4000 men; which, had it arrived sooner, would have enabled the British commander to have gained a decisive advantage over him, as well as to have destroyed the town of Providence, which, by its vicinity to Rhode Island, and the enterprises which were continually projected and carried on in that place, kept the inhabitants of Rhode Island in continual alarms.

307 The coasts of America invaded by the British fleet.

The first British expedition was to Buzzard's Bay, on the coast of New England and neighbourhood of Rhode Island. Here they destroyed a great number of privateers and merchantmen, magazines, with storehouses, &c.; whence proceeding to a fertile and populous island called Martha's Vineyard, they carried off 10,000 sheep and 300 black cattle. Another expedition took place up the North River, under Lord Cornwallis and General Knyphausen; the principal event of which was the destruction of a regiment of American cavalry, known by the name of Washington's Light Horse. A third expedition was directed to Little Egg Harbour in New Jersey, a place noted for privateers, the destruction of which was its principal intention. It was conducted by Captains Ferguson and Collins, and ended in the destruction of the enemy's vessels, as well as of the place itself. At the same time part of another body of American troops, called Pulaski's Legion, was surprised, and a great number of them put to the sword.

308 Expedition against Georgia.

The Americans had in the beginning of the year projected the conquest of West Florida; and one Captain Willing, with a party of resolute men, had made a successful incursion into the country. This awakened the attention of the British to the southern colonies, and an expedition against them was resolved on. Georgia was the place of destination; and the more effectually to ensure success, Colonel Campbell, with a sufficient force, under convoy of some ships of war, commanded by Commodore Hyde Parker, embarked at New York, while General Prevost, who commanded in East Florida, was directed to set out with all the force he could spare. The armament from New York arrived off the coast of Georgia in the month of December; and though the enemy were very strongly posted in an advantageous situation on the shore, the British troops made good their landing, and advanced towards Savannah, the capital of the province. That very day they defeated the forces of the provincials which opposed them; and took possession of the town with such celerity, that the Americans had not time to execute a resolution they had taken of setting it on fire. In ten days the whole province of Georgia was reduced, Sunbury alone excepted; and this was also brought under subjection by General Prevost in his march northward. Every proper method was taken to secure the tranquillity of the country; and rewards were offered for apprehending committee and assembly men, or such as they judged most inimical to the British interests. On the arrival of General Prevost, the command of the troops naturally devolved on him as the senior officer; and the conquest of Carolina was next projected.

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309 Take possession of Georgia.

310 Carolina invaded.

In this attempt there was no small probability of success. The country contained a great number of friends to government, who now eagerly embraced the opportunity of declaring themselves; many of the inhabitants of Georgia had joined the royal standard; and there was not in the province any considerable body of provincial forces capable of opposing the efforts of regular and well disciplined troops. On the first news of General Prevost's approach, the loyalists assembled in a body, imagining themselves able to stand their ground until their allies should arrive; but in this they were disappointed. The Americans attacked and defeated them with the loss of half their number. The remainder retreated into Georgia; and after undergoing many difficulties, at last effected a junction with the British forces.

In the mean time, General Lincoln, with a considerable body of American troops, had encamped within 20 miles of the town of Savannah; and another strong party had posted themselves at a place called *Briar's Creek*, farther up the river of the same name. Thus the extent of the British government was likely to be circumscribed within very narrow bounds. General Prevost therefore determined to dislodge the party at Briar's Creek: and the latter, trusting to their strong situation, and being remiss in their guard, suffered themselves to be surprised on the 30th of March 1779; when they were utterly routed with the loss of 400 killed and taken, besides a great number drowned in the river or the swamps. The whole artillery, stores, baggage, and almost all the arms, of this unfortunate party were taken, so that they could no more make any stand; and thus the province of Georgia was once more freed from the enemy, and a communication opened with those places in Carolina where the royalists chiefly resided.

311 Americans defeated.

The victory at Briar's Creek proved of considerable service to the British cause. Great numbers of the loyalists joined his army, and considerably increased its force. Hence he was enabled to stretch his posts further up the river, and to guard all the principal passes: so that General Lincoln was reduced to a state of inaction; and at last moved off towards Augusta, in order to protect the provincial assembly, which was obliged to sit in that place, the capital being now in the hands of the British.

Lincoln had no sooner quitted his post, than it was judged a proper time by the British general to put in execution the grand scheme which had been meditated against Carolina. Many difficulties indeed lay in his way. The river Savannah was so swelled by the excessive

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sive rains of the season, that it seemed impassable; the opposite shore, for a great way, was so full of swamps and marshes, that no army could march over it without the greatest difficulty; and, to render the passage still more difficult, General Moultrie was left with a considerable body of troops in order to oppose the enemy's attempts. But in spite of every opposition, the constancy and perseverance of the British forces at last prevailed. General Moultrie was defeated, and obliged to retire towards Charlestown; and the victorious army, after having waded through the marshes for some time, at last arrived in an open country, through which they pursued their march with great rapidity towards the capital; while General Lincoln remained in a state of security at Augusta, vainly imagining that the obstacles he had left in the way could not be surmounted.

312 The British troops advance to Charlestown.

313 General Lincoln advances to its relief.

Certain intelligence of the danger to which Charlestown was exposed at last aroused the American general from his lethargy. A chosen body of infantry, mounted on horseback for the greater expedition, was despatched before him; while Lincoln himself followed with all the forces he could collect. General Moultrie too, with the troops he had brought from Savannah, and some others he had collected since his retreat from thence, had taken possession of all the avenues leading to Charlestown, and prepared for a vigorous defence. But all opposition proved ineffectual. The Americans were defeated in every encounter; and, retreating continually, allowed the British army to come within cannon-shot of Charlestown on the 12th of May.

The town was now summoned to surrender, and the inhabitants would gladly have agreed to observe a neutrality during the rest of the war, and would have engaged also for the rest of the terms. But these terms not being accepted, they made preparations for a vigorous defence. It was not, however, in the power of the British commander at this time to make an attack with any prospect of success. His artillery was not of sufficient weight; there were no ships to support his attack by land; and General Lincoln advancing rapidly with a superior army, threatened to enclose him between his own force and the town; so that should he fail in his first attempt, certain destruction would be the consequence. For these reasons he withdrew his forces from before the town, and took possession of two islands called *St James's* and *St John's* lying to the southward; where having waited some time, his force was augmented by the arrival of two frigates. With these he determined to make himself master of Port Royal, another island possessed of an excellent harbour, and many other natural advantages, from its situation also commanding all the sea coast from Charlestown to Savannah river. The American general, however, did not allow this to be accomplished without opposition. Perceiving that his opponent had occupied an advantageous post on St John's island, preparatory to his enterprise against Port Royal, he attempted on the 20th of June, to dislodge him from it; but after an obstinate attack, the provincials were, as usual, obliged to retire with considerable loss. On this occasion the success of the British arms was in a great measure owing to an armed float; which galled the right flank of the enemy so effectually, that they could direct their efforts only against the strongest part of the lines, which

314 The attempt on it abandoned.

315 The Americans defeated.

proved impregnable to their attacks. This disappointment was instantly followed by the loss of Port Royal, which General Prevost took possession of, and put his troops into proper stations, waiting for the arrival of such reinforcements as were necessary for the intended attack on Charlestown.

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316 D'Estaing's proclamation.

In the mean time Count d'Estaing, who, as we have already observed, had put into Boston harbour to refit, had used his utmost efforts to ingratiate himself with the inhabitants of that city. Zealous also in the cause of his master, he had published a proclamation to be dispersed through Canada, inviting the people to return to their original friendship with France, and declaring that all who renounced their allegiance to Great Britain should certainly find a protector in the king of France. All his endeavours, however, proved insufficient at this time to produce any revolution, or even to form a party of any consequence among the Canadians.

317 D'Estaing sails to the West Indies.

As soon as the French admiral had refitted his fleet, he took the opportunity, while that of Admiral Byron had been shattered by a storm, of sailing to the West Indies. During his operations there, the Americans having represented his conduct as totally unserviceable to them, he received orders from Europe to assist the colonies with all possible speed.

318 D'Estaing's expedition against Georgia.

In compliance with these orders, he directed his course towards Georgia, with a design to recover that province out of the hands of the enemy, and to put it, as well as South Carolina, in such a posture of defence as would effectually secure them from any future attack. This seemed to be an easy matter, from the little force by which he knew he should be opposed; and the next object in contemplation was no less than the destruction of the British fleet and army at New York, and their total expulsion from the continent of America. Full of these hopes, the French commander arrived off the coast of Georgia with a fleet of 22 sail of the line and 10 large frigates. His arrival was so little expected, that several vessels laden with provisions and military stores fell into his hands; the Experiment also, a vessel of 50 guns, commanded by Sir James Wallace, was taken after a stout resistance. On the continent, the British troops were divided. General Prevost, with an inconsiderable part, remained at Savannah; but the main force was under Colonel Maitland at Port Royal. On the first appearance of the French fleet, an express was despatched to Colonel Maitland: but it was intercepted by the enemy; so that before he could set out in order to join the commander in chief, the Americans had secured most of the passes by land, while the French fleet effectually blocked up the passage by sea. But, by taking advantage of creeks and rivulets, and marching over land, he arrived just in time to relieve Savannah.

319 Absurd conduct of the French commander.

D'Estaing, after making a gasconade of what had happened at St Vincents and Grenada, had allowed General Prevost 24 hours to deliberate whether he should capitulate or not. This time the general employed in making the best preparations he could for a defence; and during this time it was that Colonel Maitland arrived. D'Estaing's summons was now rejected; and as on this occasion the superiority of the enemy was by no means so much out of proportion as it had been at Grenada, there was every probability of

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success on the part of the British. The garrison now consisted of 3000 men, all of approved valour and experience, while the united force of the French and Americans did not amount to 10,000. The event was answerable to the expectations of the British general. Having the advantage of a strong fortification and excellent engineers, the fire of the allies made so little impression, that D'Estaing resolved to bombard the town, and a battery of nine mortars was erected for the purpose. This produced a request from General Prevost, that the women and children might be allowed to retire to a place of safety. But the allied commanders had the inhumanity to refuse compliance; and they resolved to give a general assault. This was accordingly attempted on the 9th of October: but the assailants were everywhere repulsed with such slaughter, that 1200 were killed and wounded; among the former was Count Pulaski, and among the latter was D'Estaing himself.

320 Cruelty of the French and American generals.

321 They are utterly defeated.

This disaster entirely overthrew the sanguine hopes of the Americans and French; mutual reproaches and animosities took place in the most violent degree; and after waiting eight days longer, both parties prepared for a retreat; the French to their shipping, and the Americans into Carolina.

322 Successful expeditions against the northern American provinces.

While the allies were thus unsuccessfully employed in the southern colonies, their antagonists were no less assiduous in distressing them in the northern parts. Sir George Collier was sent with a fleet, carrying on board General Matthews, with a body of land forces, into the province of Virginia. Their first attempt was on the town of Portsmouth; where, though the enemy had destroyed some ships of great value, the British troops arrived in time to save a great number of others. On this occasion about 120 vessels of different sizes were burnt, and 20 carried off; and an immense quantity of provisions designed for the use of General Washington's army was either destroyed or carried off, together with a great variety of naval and military stores. The fleet and army returned with little or no loss to New York.

The success with which this expedition was attended, soon gave encouragement to attempt another. The Americans had for some time been employed in the erection of two strong forts on the river; the one at Verplanks Neck on the east, and the other at Stoney Point on the west side. These when completed would have been of the utmost service to the Americans, as commanding the principal pass, called the *King's Ferry*, between the northern and southern colonies. At present, however, they were not in a condition to make any effectual defence; and it was therefore determined to attack them before the works should be completed. The force employed on this occasion was divided into two bodies; one of which directed its course against Verplanks, and the other against Stoney Point. The former was commanded by General Vaughan, the latter by General Pattison, while the shipping was under the direction of Sir George Collier. General Vaughan met with no resistance, the enemy abandoning their works, and setting fire to every thing combustible that they could not carry off. At Stoney Point, however, a vigorous defence was made, though the garrison was at last obliged to capitulate upon honourable conditions. To secure the possession of this last, which was the more important of the two, General Clinton removed from his former situation, and encamped in such a manner that Washington could not give any assistance. The Americans, however, revenged themselves by distressing, with their numerous privateers, the trade to New York.

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This occasioned a third expedition to Connecticut, where these privateers were chiefly built and harboured. The command was given to Governor Tryon, and to General Garth, an officer of known valour and experience. Under convoy of a considerable number of armed vessels they landed at Newhaven, where they demolished the batteries that had been erected to oppose them, and destroyed the shipping and naval stores; but they spared the town itself, as the inhabitants had abstained from firing out of their houses upon the troops. From Newhaven they marched to Fairfield, where they proceeded as before, reducing the town also to ashes. Norwalk was next attacked, which in like manner was reduced to ashes; as was also Greenfield, a small seaport in the neighbourhood.

Their successes proved very alarming as well as detrimental to the Americans; so that General Washington determined at all events to drive the enemy from Stoney Point. For this purpose he sent General Wayne with a detachment of chosen men, directing them to attempt the recovery of it by surprise. On this occasion the Americans showed a spirit and resolution exceeding any thing they had performed during the course of the war. Though after the capture of it by the British the fortifications of this place had been completed, and were very strong, they attacked the enemy with bayonets, after passing through a heavy fire of musketry and grape shot; and in spite of all opposition, obliged the surviving part of the garrison, amounting to 500 men, to surrender themselves prisoners of war.

Though the Americans did not at present attempt to retain possession of Stoney Point, the success they had met with in the enterprise emboldened them to make a similar attempt on Paulus Hook, a fortified post on the Jersey side opposite to New York; but in this they were not attended with equal success, being obliged to retire with precipitation after they had made themselves masters of one or two posts.

323 Unsuccessful expedition of the Americans against Penobscot.

Another expedition of greater importance was now projected on the part of the Americans. This was against a post on the river Penobscot, on the borders of Nova Scotia, of which the British had lately taken possession, and where they had begun to erect a fort which threatened to be a very great inconvenience to the colonists. The armament destined against it was so soon got in readiness, that Colonel Maclean, the commanding officer at Penobscot, found himself obliged to drop the execution of part of his scheme; and instead of a regular fort, to content himself with putting the works already constructed in as good a posture of defence as possible. The Americans could not effect a landing without a great deal of difficulty, and bringing the guns of their largest vessels to bear upon the shore. As soon as this was done, however, they erected several batteries, and kept up a brisk fire for the space of a fortnight; after which they proposed to give a general assault: but before this could be effected, they perceived Sir George Collier with a British fleet sailing up the river to attack

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tack them. On this they instantly embarked their artillery and military stores, sailing up the river as far as possible in order to avoid him. They were so closely pursued, however, that not a single vessel could escape; so that the whole fleet, consisting of 19 armed vessels and 24 transports, was destroyed; most of them indeed being blown up by themselves. The soldiers and sailors were obliged to wander through immense deserts, where they suffered much for want of provisions; and to add to their calamities, a quarrel broke out between the soldiers and seamen concerning the cause of their disaster, which ended in a violent fray, wherein a great number were killed.

Thus the arms of America and France being almost everywhere unsuccessful, the independency of the former seemed yet to be in danger notwithstanding the assistance of so powerful an ally, when further encouragement was given by the accession of Spain to the

324 Spain joins the confederacy against Britain.

confederacy against Britain in the month of June 1779. The first effect of this appeared in an invasion of West Florida by the Spaniards in September 1779. As the country was in no state of defence, the enemy easily made themselves masters of the whole almost without opposition. Their next enterprise was against the Bay of Honduras, where the British logwood-cutters were settled. These finding themselves too weak to resist, applied to the governor of Jamaica for relief; who sent them a supply of men, ammunition, and military stores, under Captain Dalrymple. Before the arrival of this detachment, the principal settlement in those parts, called *St George's Key*, had been taken by the Spaniards and retaken by the British. In his way Captain Dalrymple fell in with a squadron from Admiral Parker in search of some register ships richly laden; but which retreating into the harbour of Omoa,

325 Fort Omoa taken by the British;

were too strongly protected by the fort to be attacked with safety. A project was then formed in conjunction with the people of Honduras, to reduce this fort. The design was to surprise it; but the Spaniards having discovered them, they were obliged to fight. Victory quickly declared for the British; but the fortifications were so strong, that the artillery they had brought along with them were found too light to make any impression. It was then determined to try the success of an escalade; and this was executed with so much spirit, that the Spaniards stood astonished without making any resistance, and, in spite of all the efforts of their officers, threw down their arms and surrendered. The spoil was immense, being valued at three millions of dollars. The Spaniards chiefly lamented the loss of 250 quintals of quicksilver; a commodity indispensably necessary in the working of their gold and silver mines, so that they offered to ransom it at any price; but this was refused, as well as the ransom of the fort, though the governor offered 300,000 dollars for it. A

326 but they are obliged to evacuate it.

small garrison was left for the defence of the place: but it was quickly attacked by a superior force, and obliged to evacuate it, though not without destroying every thing that could be of use to the enemy; spiking the guns, and even locking the gates of the fort and carrying off the keys. All this was done in the sight of the besiegers; after which the garrison embarked without the loss of a man.

As no operation of any consequence took place this year in the province of New York, the congress made use of the opportunity to dispatch General Sullivan with a considerable force, in order to take vengeance on the Indians for their ravages and depredations: and the object of the expedition was, not merely the reduction of them, but if possible their utter extirpation. Of this the Indians were apprised; and collecting all their strength, resolved to come to a decisive engagement. Accordingly they took a strong post in the most woody and mountainous part of the country; erecting a breastwork in the front, of large logs of wood, extending half a mile in length, while their right flank was covered by a river, and the left by a hill of difficult access. This advantageous position they had taken by the advice of the refugees who were among them, and of whom 200 or 300 were present in the battle.

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327 Americans take vengeance on the Indians.

Thus posted, the Indians waited the approach of the American army; but the latter having brought some artillery along with them, played it against the breastwork of the enemy with such success, that in two hours it was almost destroyed; and at the same time a party having reached the top of the hill, they became apprehensive of being surrounded, on which they instantly fled with precipitation, leaving a great number of killed and wounded behind them. The Americans after this battle met with no further resistance of any consequence. They were suffered to proceed without interruption, and to execute in the most ample manner the vengeance they had projected. On entering the country of the Indians, it appeared that they had been acquainted with agriculture and the arts of peace far beyond what had been supposed. From General Sullivan's account it was learned, that the Indian houses were large, convenient, and even elegant; their grounds were excellently cultivated, and their gardens abounded in fruit trees and vegetables of all kinds fit for food. The whole of this fine country was now by the American general converted into a desert. Forty towns and settlements, besides scattered habitations, were demolished; the fields of corn, the orchards, the plantations, were utterly laid waste; all the fruit trees were cut down; and so great had been the industry of the Indians, that in one orchard 1500 of these were destroyed. The quantity of corn wasted on this occasion was supposed to amount to 160,000 bushels. In short such was the desolation, that on the American army's leaving the country, not a house, not a field of corn, not a fruit tree, was left upon the ground, nor was an Indian to be seen throughout the whole tract.

We must now take a view of the transactions in the southern colonies; to which the war was, in the year 1780, so effectually transferred, that the operations there became at last decisive. The success of General Prevost in advaneing to the very capital of South Carolina has been already related, together with the obstacles which prevented him from becoming master of it at that time. Towards the end of the year 1779, however, Sir Henry Clinton set sail from New York with a considerable body of troops, intended for the attack of Charlestown, South Carolina, in a fleet of ships of war and transports under the command of Vice Admiral Arbuthnot. They had a very tedious voyage; the weather was uncommonly bad; several of the transports were lost, as was also the greater part of the

328 Expedition of Sir Henry Clinton against Charlestown.

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horses which they carried with them, intended for cavalry or other public uses; and an ordnance ship likewise foundered at sea. Having arrived at Savannah, where they endeavoured to repair the damages sustained on their voyage, they proceeded from thence on the 10th of February 1780 to North Edisto, the place of debarkation which had been previously appointed. They had a favourable and speedy passage thither: and though it required time to have the bar explored and the channel marked, the transports all entered the harbour the next day; and the army took possession of John's Island without opposition. Preparations were then made for passing the squadron over Charlestown bar, where the high water spring tides were only 19 feet deep: but no opportunity offered of going into the harbour till the 20th of March, when it was effected without any accident, though the American galleys continually attempted to prevent the English boats from sounding the channel. The British troops had previously removed from John's to James's island; and on the 29th of the same month they effected their landing at Charlestown Neck. On the 1st of April they broke ground within 800 yards of the American works; and by the 8th the besiegers guns were mounted in battery.

As soon as the army began to erect their batteries against the town, Admiral Arbuthnot embraced the first favourable opportunity of passing Sullivan's island, upon which there was a strong fort of batteries, the chief defence of the harbour. He weighed on the 9th, with the Roebuck, Richmond, and Romulus, Blonde, Virginia, Raleigh, and Sandwich armed ship, the Renown bringing up the rear; and, passing through a severe fire, anchored in about two hours under James's island, with the loss of 27 seamen killed and wounded. The Richmond's fore-top-mast was shot away, and the ships in general sustained damage in their masts and rigging, though not materially in their hulls. But the Acetus transport, having on board some naval stores, grounded within gunshot of Sullivan's island, and received so much damage that she was obliged to be abandoned and burnt.

329 The town defended by Lincoln.

On the 10th, Sir Henry Clinton and Admiral Arbuthnot summoned the town to surrender to his majesty's arms: but Major-general Lincoln, who commanded in Charlestown, returned them an answer, declaring it to be his intention to defend the place. The batteries were now opened against the town; and from their effect the fire of the American advanced works considerably abated. It appears that the number of troops under the command of Lincoln was by far too few for defending works of such extent as those of Charlestown; and that many of these were men little accustomed to military service, and very ill provided with clothes and other necessaries. Lincoln had been for some time expecting reinforcements and supplies from Virginia and other places; but they came in very slowly. Earl Cornwallis, and Lieutenant-colonel Tarleton under him, were also extremely active in intercepting such reinforcements and supplies as were sent to the American general. They totally defeated a considerable body of cavalry and militia which was proceeding to the relief of the town; and also made themselves masters of some posts which gave them in a great degree the command of the country, by which means great supplies of provisions fell into their hands.

330 Several reinforcements intended for his relief intercepted

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Such was the state of things, and Fort Sullivan had also been taken by the king's troops, when on the 18th General Clinton again summoned the town to surrender; an offer being made, as had been done before, that if they surrendered, the lives and property of the inhabitants should be preserved to them. Articles of capitulation were then proposed by General Lincoln; but the terms were not agreed to by General Clinton. At length, however, the town being closely invested on all sides, and the preparations to storm it in every part being in great forwardness, and the ships ready to move to the assault, General Lincoln, who had been applied to for that purpose by the inhabitants, surrendered it on such articles of capitulation as General Clinton had before agreed to. This was on the 12th of May, which was one month and two days after the town had been first summoned to surrender.

331 The place surrenders.

A large quantity of ordnance, arms, and ammunition, was found in Charlestown; and, according to Sir Henry Clinton's account, the number of prisoners taken in Charlestown amounted to 5618 men, exclusive of near a thousand sailors in arms; but according to General Lincoln's account, transmitted to the congress, the whole number of continental troops taken prisoners amounted to no more than 2487. The remainder, therefore, included in General Clinton's account, must have consisted of militia and inhabitants of the town. Several American frigates were also taken or destroyed in the harbour of Charlestown.

The loss of Charlestown evidently excited a considerable alarm in America: and their popular writers, particularly the author of the celebrated performance entitled Common Sense, in some other pieces made use of it as a powerful argument to lead them to more vigorous exertions against Great Britain, that they might the more effectually and certainly secure their independence.

332 Apprehensions at New York.

While Sir Henry Clinton was employed in his voyage to Charlestown, and in the siege of that place, the garrison at New York seem not to have been wholly free from apprehensions for their own safety. An intense frost, accompanied with great falls of snow, began about the middle of December 1779, and shut up the navigation of the port of New York from the sea, within a few days after the departure of Admiral Arbuthnot and General Clinton. The severity of the weather increased to so great a degree, that towards the middle of January all communications with New York by water were entirely cut off, and as many new ones opened by the ice. The inhabitants could scarcely be said to be in an insular state. Horses with heavy carriages could go over the ice into the Jerseys from one island to another. The passage in the North River, even in the widest part from New York to Paulus Hook, which was 2000 yards, was about the 19th of January practicable for the heaviest cannon: an event which had been unknown in the memory of man. Provisions were soon after transported upon sledges, and a detachment of cavalry marched upon the ice from New York to Staten island, which was a distance of 11 miles.

The city of New York being thus circumstanced, was

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was considered as much exposed to the attacks from the continental troops: and it was strongly reported that General Washington was meditating a great stroke upon New York with his whole force, by different attacks. Some time before this, Major-general Pattison, commandant at New York, having received an address from many of the inhabitants, offering to put themselves in military array, he thought the present a favourable opportunity of proving the sincerity of their professions. Accordingly he issued a proclamation, calling upon all the male inhabitants from 16 to 60 to take up arms. The requisition was so readily complied with, that in a few days 40 companies from the six wards of the city were enrolled, officered, and under arms, to the number of 2600, many substantial citizens serving in the ranks of each company. Other volunteer companies were formed; and the city was put into a very strong posture of defence.

333 Forwardness of the inhabitants to be enrolled for its defence.

No attack, however, was made upon New York, whatever design might originally have been meditated; but an attempt was made upon Staten Island, where there were about 1800 men, under the command of Brigadier-general Sterling, who were well intrenched. General Washington, whose army was hutted at Morristown, sent a detachment of 2700 men, with six pieces of cannon, two mortars, and some horses, commanded by Lord Sterling, who arrived at Staten Island early in the morning of the 15th January. The advanced posts of the British troops retired upon the approach of the Americans, who formed the line, and made some movements in the course of the day; but they withdrew in the night, after having burnt one house, pillaged some others, and carried off with them about 200 head of cattle. Immediately on the arrival of the Americans on Staten island, Lieutenant-general Knyphausen had embarked 600 men to attempt a passage, and to support General Sterling: but the floating ice compelled them to return. It is, however, imagined, that the appearance of these transports, with the British troops on board, which the Americans could see towards the close of the day, induced the latter to make so precipitate a retreat.

334 The provincials attack Staten Island;

335 but are induced to make a precipitate retreat.

After Charlestown had surrendered to the king's troops, General Clinton issued two proclamations, and also circulated a hand bill amongst the inhabitants of South Carolina, in order to induce them to return to their allegiance, and to be ready to join the king's troops. It was said, that the helping hand of every man was wanted to re-establish peace and good government: and that as the commander in chief wished not to draw the king's friends into danger, while any doubt could remain of their success; so now that this was certain, he trusted that one and all would heartily join, and by a general concurrence give effect to such necessary measures for that purpose as from time to time might be pointed out. Those who had families were to form a militia to remain at home, and occasionally to assemble in their own districts, when required, under officers of their own choosing, for the maintenance of peace and good order. Those who had no families, and who could conveniently be spared for a time, it was presumed, would cheerfully assist his majesty's troops in driving their oppressors, acting under the authority of congress, and all the miseries of war, far from that colony. For this purpose it was said to be necessary that the young men should be ready to assemble when required, and to serve with the king's troops for any six months of the ensuing twelve that might be found requisite, under proper regulations. They might choose officers to each company to command them; and were to be allowed, when on service, pay, ammunition, and provisions, in the same manner as the king's troops. When they joined the army, each man was to be furnished with a certificate, declaring that he was only engaged to serve as a militiaman for the time specified; that he was not to be marched beyond North Carolina and Georgia; and that, when the time was out, he was freed from all claims whatever of military service, excepting the common and usual militia duty where he lived. He would then, it was said, have paid his debt to his country, and be entitled to enjoy undisturbed that peace, liberty, and property, at home, which he had contributed to secure. The proclamations and publications of General Clinton appeared to have produced some effect in South Carolina; though they probably operated chiefly upon those who were before not much inclined to the cause of American independence. Two hundred and ten of the inhabitants of Charlestown signed an address to General Clinton and Admiral Arbuthnot, soliciting to be readmitted to the character and condition of British subjects, the inhabitants of that city having been hitherto considered as prisoners on parole; declaring their disapprobation of the doctrine of American independence; and expressing their regret, that after the repeal of those statutes which gave rise to the troubles in America, the overtures made by his majesty's commissioners had not been regarded by the congress. Sir Henry Clinton, in one of the proclamations issued at this time, declared, that if any persons should thenceforward appear in arms in order to prevent the establishment of his majesty's government in that country, or should, under any pretence or authority whatsoever, attempt to compel any other person or persons to do so, or should hinder or intimidate the king's faithful and loyal subjects from joining his forces or otherwise performing those duties their allegiance required, such persons should be treated with the utmost severity, and their estates be immediately seized in order to be confiscated.

336 Proclamations by General Clinton.

Mean time the ravages of war did not prevent the Americans from paying some attention to the arts of peace. On the 4th of May an act passed by the council and house of representatives of Massachusets Bay for incorporating and establishing a society for the cultivation and promotion of the arts and sciences.

Some doubts having arisen in the congress, towards the close of the preceding year, about the propriety of their assembling in the city of Philadelphia, it was now resolved that they should continue to meet there: and a committee of three members was appointed, to report a proper place where buildings might be provided for the reception of the congress, together with an estimate of the expence of providing such buildings and the necessary offices for the several boards. It was also resolved by the congress, that a monument should be erected to the memory of their late general Richard Montgomery, who fell at Quebec, in testimony of his signal and important services to the United States.

337 Proceedings of congress.

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United States. States of America, with an inscription expressive of his amiable character and heroic achievements; and that the continental treasurers should be directed to advance a sum not exceeding 300l. to Dr Franklin to defray the expence; that gentleman being desired to cause the monument to be executed at Paris, or in some other part of France. It was likewise resolved by the congress, that a court should be established for the trial of all appeals from the court of admiralty of the United States of America, in cases of capture; to consist of three judges, appointed and commissioned by congress, and who were to take an oath of office: and that the trials in this court should be determined by the usage of nations.

338 Difficulties arising from the depreciation of their paper currency.

The difficulties of the congress and of the people of America had been greatly increased by the depreciation of their paper currency. At the time when the colonies engaged in a war with Great Britain, they had no regular civil governments established among them of sufficient energy to enforce the collection of taxes, or to provide funds for the redemption of such bills of credit as their necessities obliged them to issue. In consequence of this state of things, their bills increased in quantity far beyond the sum necessary for the purpose of a circulating medium; and as they wanted at the same time specific funds to rest on for their redemption, they saw their paper currency daily sink in value. The depreciation continued, by a kind of gradual progression, from the year 1777 to 1780; so that, at the latter period, the continental dollars were passed, by common consent, in most parts of America, at the rate of at least $\frac{1}{40}$ths below their nominal value. The impossibility of keeping up the credit of the currency to any fixed standard, occasioned great and almost insurmountable embarrassments in ascertaining the value of property, or carrying on trade with any sufficient certainty. Those who sold, and those who bought, were left without a rule whereon to form a judgment of their profit or their loss; and every species of commerce or exchange, whether foreign or domestic, was exposed to numberless and increasing difficulties. The consequences of the depreciation of the paper currency were also felt with peculiar severity by such of the Americans as were engaged in their military services, and greatly augmented their other hardships. The requisitions made by the congress to the several colonies for supplies, were also far from being always regularly complied with: and their troops were not unfrequently in want of the most common necessaries; which naturally occasioned complaints and discontent among them. Some of these difficulties, resulting from their circumstances and situation, perhaps no wisdom could have prevented: but they seem to have arisen in part from the congress not being sufficiently acquainted with the principles of finance, and from a defect of system in the departments of their government. The cause of the Americans appears also to have suffered somewhat by their depending too much on temporary inlistments. But the congress endeavoured, towards the close of the year 1780, to put their army on a more permanent footing, and to give all the satisfaction to their officers and soldiers which their circumstances would permit. They appointed a committee for arranging their finances, and made some new regulations respecting their war-office and treasury-board, and other public departments. United States.

Notwithstanding the disadvantages under which they laboured, the Americans seemed to entertain no doubts but that they should be able to maintain their independency. The 4th of July was celebrated this year at Philadelphia with some pomp, as the anniversary of American independence. A commencement for conferring degrees in the arts was held the same day, in the hall of the university there; at which the president and members of the congress attended, and other persons in public offices. The chevalier de la Lucerne, minister plenipotentiary from the French king to the United States, was also present on the occasion. A charge was publicly addressed by the provost of the university to the students; in which he said, that he could not but congratulate them "on that auspicious day, which, amidst the confusions and desolations of war, beheld learning beginning to revive; and animated them with the pleasing prospect of seeing the sacred lamp of science burning with a still brighter flame, and scattering its invigorating rays over the unexplored deserts of that extensive continent; until the whole world should be involved in the united blaze of knowledge, liberty, and religion. When he stretched his views forward (he said), and surveyed the rising glories of America, the enriching consequences of their determined struggle for liberty, the extensive fields of intellectual improvement and useful invention, in science and arts, in agriculture and commerce, in religion and government, through which the unfettered mind would range, with increasing delight, in quest of the undiscovered treasure which yet lay concealed in the animal, vegetable, and mineral kingdoms of that new world, or in the other fertile sources of knowledge with which it abounded; his heart swelled with the pleasing prospect, that the sons of that institution would distinguish themselves, in the different walks of life, by their literary contributions to the embellishment and increase of human happiness."

339 Anniversary of American independence celebrated at Philadelphia.

340 A large body of French troops land at Rhode Island.

On the 10th of July, M. Ternay, with a fleet consisting of seven ships of the line, besides frigates, and a large body of French troops, commanded by the count de Rochambeau, arrived at Rhode Island; and the following day 6000 men were landed there. A committee from the general assembly of Rhode Island was appointed to congratulate the French general upon his arrival: whereupon he returned an answer, in which he informed them, that the king his master had sent him to the assistance of his good and faithful allies the United States of America. At present, he said, he only brought over the vangnard of a much greater force destined for their aid; and the king had ordered him to assure them, that his whole power should be exerted for their support. He added, that the French troops were under the strictest discipline; and, acting under the orders of General Washington, would live with the Americans as their brethren.

A scheme was soon after formed, of making a combined attack with English ships and troops, under the command of Sir Henry Clinton and Admiral Arbuthnot, against the French fleet and troops at Rhode Island. Accordingly a considerable part of the troops at New York was embarked for that purpose. General

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neral Washington having received information of this, passed the North River, by a very rapid movement, and with an army increased to 12,000 men, proceeded with celerity towards King's Bridge, in order to attack New York; but learning that the British general had changed his intentions, and disembarked his troops on the 31st of the month, General Washington recrossed the river, and returned to his former station. Sir Henry Clinton and the admiral had agreed to relinquish their design of attacking the French and Americans at Rhode Island as impracticable for the present.

341 Unsuccessful expedition in the Jerseys.

An unsuccessful attempt was also made about this time in the Jerseys by General Knyphausen, with 7000 British troops under his command, to surprise the advanced posts of General Washington's army. They proceeded very rapidly towards Springfield, meeting little opposition till they came to the bridge there, which was very gallantly defended by 170 of the continental troops for 15 minutes, against the British army: but they were at length obliged to give up so unequal a contest, with the loss of 37 men. After securing this pass, the British troops marched into the place, and set fire to most of the houses. They also committed some other depredations in the Jerseys, but gained no laurels there, being obliged to return about the beginning of July without effecting any thing material.

But in South Carolina the royal arms were attended with more success. Earl Cornwallis, who commanded the British troops there, obtained a very signal victory over General Gates, on the 16th of August. The action began at break of day, in a situation very advantageous for the British troops, but very unfavourable to the Americans. The latter were much more numerous; but the ground on which both armies stood was narrowed by swamps on the right and left, so that the Americans could not properly avail themselves of their superior numbers. There seems to have been some want of generalship in Gates, in suffering himself to be surprised in so disadvantageous a position: but this circumstance was partly the effect of accident; for both armies set out with a design of attacking each other precisely at the same time, at ten the preceding evening, and met together before daylight at the place where the action happened. The attack was made by the British troops with great vigour, and in a few minutes the action was general along the whole line. It was at this time a dead calm, with a little haziness in the air, which preventing the smoke from rising, occasioned so thick a darkness, that it was difficult to see the effect of a very heavy and well-supported fire on both sides. The British troops either kept up a constant fire, or made use of bayonets, as opportunities offered; and, after an obstinate resistance during three quarters of an hour, threw the Americans into total confusion, and forced them to give way in all quarters. The continental troops appear to have behaved well; but the militia were soon broken, and left the former to oppose the whole force of the British troops. General Gates did all in his power to rally the militia, but without effect: the continentals retreated in some order; but the rout of the militia was so great, that the British cavalry are said to have continued the pursuit of them to the distance of 22 miles from the place where the action happened. The loss of the Americans was very considerable: about 1000 prisoners were taken, and more are said to have been killed and wounded, but the number is not very accurately ascertained. Seven pieces of brass cannon, a number of colours, and all the ammunition waggons of the Americans, were also taken. Of the British troops, the killed and wounded amounted to 213. Among the prisoners taken was Major-general Baron de Kalb, a Prussian officer in the American service, who was mortally wounded, having exhibited great gallantry in the course of the action, and received 11 wounds. The British troops by whom this great victory was achieved did not much exceed 2000, while the American army is said to have amounted to 6000, of which, however, the greatest part was militia.

342 Victory obtained by Lord Cornwallis over General Gates.

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343 Activity of Lieut. Col. Tarleton.

Lieutenant-colonel Tarleton, who had greatly distinguished himself in this action, was detached the following day, with some cavalry and light infantry, amounting to about 350 men, to attack a corps of Americans under General Sumpter. He executed this service with great activity and military address. He procured good information of Sumpter's movements; and by forced and concealed marches came up with and surprised him on the middle of the day on the 18th, near the Catawba fords. He totally destroyed or dispersed his detachment, which consisted of 700 men, killing 150 on the spot, and taking two pieces of brass cannon, 300 prisoners, and 44 waggons.

344 General Arnold deserts the service of congress.

Not long after these events, means were found to detach Major-general Arnold, who had engaged so ardently in the cause of America, and who had exhibited so much bravery in the support of it, from the interests of the congress. Major Andrè, adjutant-general to the British army, was a principal agent in this transaction; or, if the overture of joining the king's troops came first from Arnold, this gentleman was the person employed to concert the affair with him. More must have been originally comprehended in the scheme than the mere desertion of the American cause by Arnold: but whatever designs had been formed for promoting the views of the British government, they were frustrated by the apprehending of Major Andrè. He was taken in disguise, after having assumed a false name, on the 23d of September, by three American soldiers; to whom he offered considerable rewards, if they would have suffered him to escape, but without effect. Several papers written by Arnold were found upon him; and when Arnold had learned that Major Andrè was seized, he found means to get on board a barge, and to escape to one of the king's ships.

345 Unhappy fate of Major Andrè.

General Washington referred the case of Major Andrè to the examination and decision of a board of general officers, consisting of Major-general Greene, Major-general Lord Sterling, Major-general the Marquis de la Fayette, Major-general the Baron de Stenben, two other major-generals, and eight brigadier-generals. Major Andrè was examined before them, and the particulars of his case, inquired to; and they reported to the American commander in chief, that Mr Andrè came on shore from the Vulture sloop of war in the night, on an interview with General Arnold, in a private and secret manner; that he changed his dress within the American lines; and, under a feigned name and in a disguised habit, passed the American works at

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Stoney and Verplank's Points, on the evening of the 22d of September; that he was taken on the morning of the 23d at Tarry town, he being then on the way for New York; and that, when taken, he had in his possession several papers which contained intelligence for the enemy. They therefore determined, that he ought to be considered as a spy from the enemy; and that, agreeable to the law and usage of nations, he ought to suffer death. Sir Henry Clinton, Lieutenant-general Robertson, and the late American general Arnold, all wrote pressing letters to General Washington on the occasion, in order to prevent the decision of the board of general officers from being put in force: But their applications were ineffectual. Major André was hanged at Tappan, in the province of New York, on

346 His amiable character.

the 2d of October. He met his fate with great firmness; but appeared somewhat hurt that he was not allowed a more military death, for which he had solicited. He was a gentleman of very amiable qualities, had a taste for literature and the fine arts, and possessed many accomplishments. His death, therefore, was regretted even by his enemies: and the severity of the determination concerning him was much exclaimed against in Great Britain. It was, however, generally acknowledged by impartial persons, that there was nothing in the execution of this unfortunate gentleman but what was perfectly consonant to the rules of war.

Arnold was made a brigadier-general in the king's service, and published an address to the inhabitants of America, dated from New York, October 7. in which he endeavoured to justify his desertion of their cause.

347 Motives assigned by Arnold for his conduct.

He said, that when he first engaged in it, he conceived the rights of his country to be in danger, and that duty and honour called him to her defence. A redress of grievances was his only aim and object; and therefore he acquiesced unwillingly in the declaration of independence, because he thought it precipitate. But what now induced him to desert their cause was the disgust he had conceived at the French alliance, and at the refusal of congress to comply with the last terms offered by Great Britain, which he thought equal to all their expectations and to all their wishes.

348 Different reasons alleged by the Americans.

The Americans, however, accounted for the conduct of Arnold in a different manner. They alleged, that he had so involved himself in debts and difficulties by his extravagant manner of living in America, that he had rendered it very inconvenient for him to continue there: that after the evacuation of Philadelphia by the British troops, Arnold, being invested with the command in that city, had made the house of Mr Penn, which was the best in the city, his head quarters. This he had furnished in an elegant and expensive manner, and lived in a style far beyond his income. It was manifest, they said, that he could at first have no great aversion to the French alliance, because that when M. Gerard, minister plenipotentiary from the court of France, arrived at Philadelphia in July 1778, General Arnold early and earnestly solicited that minister, with his whole suite, to take apartments and bed and board at his house, until a proper house could be provided by the order of the congress. This offer M. Gerard accepted, and he continued with him some weeks. The French minister resided upwards of 14 months in Philadelphia; during which time General Arnold kept up the most friendly and intimate acquaintance with him, and there was a continued interchange of dinners, balls, routes, and concerts: so that M. Gerard must have believed, that in General Arnold he had found and left one of the warmest friends the court of France had in America. He was also one of the first in congratulating the Chevalier la Luzerne, the second French minister. About this time complaints and accusations were exhibited against him by the government of Philadelphia for divers mal-practices; among which charges were, the appropriation of goods and merchandise to his own use, which he had seized as British property in Philadephia in July 1778. It was determined by a court-martial, that his conduct was highly reprehensible; but he was indulgently treated, and was therefore only reprimanded by the commander in chief General Washington. It was in these circumstances, the Americans said, bankrupted in reputation and fortune, loaded with debts, and having a growing and expensive family, that General Arnold first turned his thoughts towards joining the royal arms.

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349 Actions in South Carolina.

After the defeat of General Gates by Earl Cornwallis, that nobleman exerted himself to the utmost in extending the progress of the British arms, and with considerable effect. But one enterprise, which was conducted by Major Ferguson, proved unsuccessful. That officer had taken abundant pains to discipline some of the Tory militia, as they were termed; and with a party of these and some British troops, amounting in the whole to about 1400 men, made incursions into the country. But on the 7th of October he was attacked by a superior body of Americans at a place called King's Mountain, and totally defeated. One hundred and fifty were killed in the action, and 810 made prisoners, of whom 150 were wounded. Fifteen hundred stand of arms also fell into the hands of the Americans, whose loss was inconsiderable. But the following month Lieutenant-colonel Tarleton, who continued to exert his usual activity and bravery, with a party of 170, chiefly cavalry, attacked and defeated General Sumpter, who is said to have had 1000 men, at a place called *Black Stocks*. Sumpter was wounded, and about 120 of the Americans killed, wounded, or taken. Of the British troops about 50 were killed and wounded.

350 Capture of Mr Laurens.

On the 3d of September, the Mercury, a congress packet, was taken by the Vestal, Captain Keppel, near Newfoundland. On board this packet was Mr Laurens, late president of the congress, who was bound on an embassy to Holland. He had thrown his papers overboard, but great part of them were recovered without having received much damage. He was brought to London, and examined before the privy council; in consequence of which he was committed close prisoner to the Tower on the 6th of October, on a charge of high treason. His papers were delivered to the ministry, and contributed to facilitate a rupture with Holland, as among them was found the sketch of a treaty of amity and commerce between the republic of Holland and the United States of America.

At the beginning of the year 1781, an affair happened in America, from which expectations were formed by Sir Henry Clinton, that some considerable advantage might be derived to the royal cause. The

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long continuance of the war, and the difficulties under which the congress laboured, had prevented their troops from being properly supplied with necessaries and conveniences. In consequence of this, on the 1st of January, the American troops that were hutted at Morris Town, and who formed what was called the *Pennsylvania line*, turned out, being in number about 1300, and declared, that they would serve no longer, unless their grievances were redressed, as they had not received their pay, or been furnished with the necessary clothing or provisions. It is said that they were somewhat inflamed with liquor in consequence of rum having been distributed to them more liberally than usual, New-year's-day being considered as a kind of festival. A riot ensued, in which an officer was killed, and four wounded; five or six of the insurgents were also wounded. They then collected the artillery, stores, provisions, and waggons, and marched out of the camp. They passed by the quarters of General Wayne, who sent a message to them, requesting them to desist, or the consequences would prove fatal. They refused, and proceeded on their march till the evening, when they took post on an advantageous piece of ground, and elected officers from among themselves. On the second, they marched to Middlebrook, and on the third to Princetown, where they fixed their quarters. On that day a flag of truce was sent to them from the officers of the American camp, with a message, desiring to know what were their intentions. Some of them answered, that they had already served longer than the time for which they were inlisted, and would serve no longer; and others, that they would not return, unless their grievances were redressed. But at the same time they repeatedly, and in the strongest terms, denied being influenced by the least disaffection to the American cause, or having any intentions of deserting to the enemy.

351 Discontents among the mong the American troops.

352 Revolt of the Pennsylvania line.

Intelligence of this transaction was soon conveyed to New York. A large body of British troops were immediately ordered to hold themselves in readiness to move on the shortest notice, it being hoped that the American revolters might be induced to join the royal army. Messengers were also sent to them from General Clinton, acquainting them that they should directly be taken under the protection of the British government; that they should have a free pardon for all former offences; and that the pay due to them from the congress should be faithfully paid them, without any expectation of military service, unless it should be voluntary, upon condition of their laying down their arms and returning to their allegiance. It was also recommended to them to move beyond the South river; and they were assured, that a body of British troops should be ready to protect them whenever they desired it. These propositions were rejected with disdain; and they even delivered up two of Sir Henry Clinton's messengers to the congress. Joseph Reed, Esq. president of the state of Pennsylvania, afterwards repaired to them at Princetown, and an accommodation took place: such of them as had served out their full terms were permitted to return to their own homes, and others again joined the American army, upon receiving satisfactory assurances that their grievances should be redressed.

353 Ineffectual attempts to induce them to join the royal army.

354 Exertions of Lord Cornwallis in North Carolina.

Lord Cornwallis now began to make very vigorous exertions, in order to penetrate into North Carolina. On the 11th of January his lordship's army was in motion, and advancing towards that province; but was somewhat delayed by an attempt made by the Americans, under General Morgan, to make themselves masters of the valuable district of Ninety-six. In order to prevent this, Lord Cornwallis detached Lieutenant-colonel Tarleton, with 300 cavalry, 300 light infantry, the 7th regiment, the 1st battalion of the 71st regiment, and two three-pounders, to oppose the progress of Morgan, not doubting but that he would be able to perform this service effectually. The British troops came up with the Americans under General Morgan, on the 17th of January. The Americans were drawn up in an open wood, and, having been lately joined by some militia, were more numerous than the British troops under Lieutenant-colonel Tarleton; but the latter were so much better disciplined, that they had the utmost confidence of obtaining a speedy victory. The attack was begun by the first line of infantry, consisting of the 7th regiment and a corps of light infantry, with a troop of cavalry placed on each flank. The first battalion of the 71st and the remainder of the cavalry formed the reserve. The American line soon gave way, and their militia quitted the field; upon which the royal troops, supposing the victory already gained, engaged with ardour in the pursuit, and were thereby thrown into some disorder. General Morgan's corps, who were supposed to have been routed, then immediately faced about, and threw in a heavy fire on the king's troops, which occasioned the utmost confusion amongst them; and they were at length totally defeated by the Americans. Four hundred of the British infantry were either killed, wounded, or taken prisoners: the loss of the cavalry was much less considerable; but the two three-pounders fell into the hands of the Americans, together with the colours of the 7th regiment; and all the detachment of royal artillery were either killed or wounded in defence of their colours. Lieutenant-colonel Tarleton, however, made another effort: having assembled about 50 of his cavalry, with which he charged and repulsed Colonel Washington's horse, retook his baggage, and killed the Americans who were appointed to guard it. He then retreated to Hamilton's ford, near the mouth of Bullock's creek, carrying with him part of his baggage, and destroying the remainder.

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355 Defeat of Colonel Tarleton.

356 Operations in consequence of that event.

This defeat of the troops under Tarleton was a severe stroke to Lord Cornwallis, as the loss of his light infantry was a great disadvantage to him. The day after that event, he employed in collecting the remains of Tarleton's corps, and in endeavouring to form a junction with General Leslie, who had been ordered to march towards him with a body of British troops from Wynesborough. Considerable exertions were then made by part of the army, without baggage, to retake the prisoners in the hands of the Americans, and to intercept General Morgan's corps, on its retreat to the Catawba. But that American officer, after his defeat of Tarleton, had made forced marches up into the country, and crossed the Catawba the evening before a great rain, which swelled the river to such a degree, as to prevent the royal army from crossing for several days; during which time the British prisoners were got over the Yadkin; whence they proceeded to Dan

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River, which they also passed, and on the 14th of February had reached Court-house in the province of Virginia.

357 Lord Cornwallis marches through North Carolina.

Lord Cornwallis employed a halt of two days in collecting some flour, and in destroying superfluous baggage and all his waggons, excepting those laden with hospital stores, salt, and ammunition, and four reserved empty in readiness for sick or wounded. Being thus freed from all unnecessary encumbrances, he marched through North Carolina with great rapidity, and penetrated to the remotest extremities of that province on the banks of the Dan. His progress was sometimes impeded by parties of the militia, and some skirmishes ensued, but he met with no very considerable opposition. On the first of February, the king's troops crossed the Catawba at M'Cowan's Ford, where General Davidson, with a party of American militia, was posted in order to oppose their passage; but he falling by the first discharge, the royal troops made good their landing, and the militia retreated. When Lord Cornwallis arrived at Hillsborough, he erected the king's standard, and invited, by proclamation, all loyal subjects to repair to it, and to stand forth and take an active part in assisting his lordship to restore order and government. He had been taught to believe that the king's friends were numerous in that part of the country: but the event did not confirm the truth of the representations that had been given. The royalists were but few in number, and some of them too timid to join the king's standard. There were, indeed, about 200 who were proceeding to Hillsborough, under Colonel Pyle, in order to avow their attachment to the royal cause; but they were met accidentally, and surrounded by a detachment from the American army, by whom a number of them are said to have been killed when they were begging for quarter, without making the least resistance. Meanwhile General Greene was marching with great expedition with the troops under his command, in order to form a junction with other corps of American troops, that he might thereby be enabled to put some effectual stop to the progress of Lord Cornwallis.

358 Large quantities of American stores destroyed by Arnold.

In other places some considerable advantages were obtained by the royal arms. On the 4th of January, some ships of war, with a number of transports, on board which was a large body of troops under the command of Brigadier-general Arnold, arrived at Westover, about 140 miles from the capes of Virginia, where the troops immediately landed and marched to Richmond; which they reached without opposition, the militia that was collected having retreated on their approach. Lieutenant-colonel Simcoe marched from hence with a detachment of the British troops to Westham, where they destroyed one of the finest founderies for cannon in America, and a large quantity of stores and cannon. General Arnold, on his arrival at Richmond, found there large quantities of salt, rum, sail-cloth, tobacco, and other merchandise; and that part of these commodities which was public property he destroyed. The British troops afterwards attacked and dispersed some small parties of the Americans, took some stores and a few pieces of cannon, and on the 20th of the same month marched into Portsmouth. On the 25th Captain Barclay, with several ships of war, and a body of troops under the command of Major Craig, arrived in Cape Fear river. The troops landed about nine miles from Wilmington, and on the 28th entered that town. It was understood that their having possession of that town, and being masters of Cape Fear river, would be productive of very beneficial effects to Lord Cornwallis's army.

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General Greene having effected a junction about the 10th of March with a continental regiment of what were called *eighteen months men*, and two large bodies of militia belonging to Virginia and North Carolina, formed a resolution to attack the British troops under the command of Lord Cornwallis. The American army marched from the High Roek Ford on the 12th of the month, and on the 14th arrived at Guildford. Lord Cornwallis, from the information he had received of the motions of the American general, concluded what were his designs. As they approaehed more nearly to each other, a few skirmishes ensued between some advanced parties, in which the king's troops had the advantage. On the morning of the 15th, Lord Cornwallis marched with his troops at daybreak in order to meet the Americans, or to attack them in their encampment. About four miles from Guildford, the advanced guard of the British army, commanded by Lieutenant-colonel Tarleton, fell in with a corps of the Americans, consisting of Lieutenant-colonel Lee's legion, some Black Mountain men and Virginian militia, with whom he had a severe skirmish, but whom he at length obliged to retreat.

359 Different skirmishes.

The greater part of the country in which the action happened is a wilderness, with a few cleared fields interspersed. The American army, which was superior to the royal in point of numbers, was posted on a rising ground about a mile and a half from Guildford court-house. It was drawn up in three lines: the front line was composed of the North Carolinian militia, under the command of the generals Butler and Eaton; the second line, of Virginian militia, commanded by the generals Stephens and Lawson, forming two brigades; the third line, consisting of two brigades, one of Virginia and one of Maryland continental troops, commanded by General Huger and Colonel Williams. Lieutenant-colonel Washington, with the dragoons of the first and third regiments, a detachment of light infantry composed of continental troops, and a regiment of riflemen under Colonel Lynch, formed a corps of observation for the security of their right flank. Lieutenant-colonel Lee, with his legion, a detachment of light infantry, and a corps of riflemen under Colonel Campbell, formed a corps of observation for the security of their left flank. The attack of the American army was directed to be made by Lord Cornwallis in the following order: On the right, the regiment of Bose and the 71st regiment, led by Major-general Leslie, and supported by the first battalion of guards; on the left the 23d and 33d regiments, led by Lieutenant-colonel Webster, and supported by the grenadiers and second battalion of guards commanded by Brigadier-general O'Hara; the yagers and light infantry of the guards remained in a wood on the left of the guns, and the cavalry in the road, ready to act as circumstances might require.

360 Battle at Guildford.

About half an hour after one in the afternoon, the action commenced by a cannonade, which lasted about twenty minutes; when the British troops advanced in three

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three columns and attacked the North Carolinian brigades with great vigour, and soon obliged part of these troops, who behaved very ill, to quit the field; but the Virginian militia gave them a warm reception, and kept up a heavy fire for a long time, till being beaten back, the action became general almost everywhere. The American corps under the lieutenant-colonels Washington and Lee were also warmly engaged, and did considerable execution. Lieutenant-colonel Tarleton had directions to keep his cavalry compact, and not to charge without positive orders, excepting to protect any of the corps from the most evident danger of being defeated. The excessive thickness of the woods rendered the British bayonets of little use, and enabled the broken corps of Americans to make frequent stands with an irregular fire. The second battalion of the guards first gained the clear ground near Guildford court-house, and found a corps of continental infantry, superior in number, formed in an open field on the left of the road. Desirous of signalizing themselves, they immediately attacked and soon defeated them, taking two six-pounders: but as they pursued the Americans into the wood with too much ardour, they were thrown into confusion by a heavy fire, and instantly charged and driven back into the field by Lieutenant colonel Washington's dragoons, with the loss of the six-pounders they had taken. But the American cavalry were afterwards repulsed, and the two six-pounders again fell into the hands of the British troops. The spirited exertions of Brigadier-general O'Hara and of Lieutenant-colonel Tarleton, greatly contributed to bring the action to a termination. The British troops having at length broken the second Maryland regiment, and turned the left flank of the Americans, got into the rear of the Virginian brigade, and appeared to be gaining their right, which would have encircled the whole of the continental troops, when General Greene thought it prudent to order a retreat. Many of the American militia dispersed in the woods; but the continental troops retreated in good order to the Reedy Fork river, and crossed at the ford about three miles from the field of action, and there halted. When they had collected their stragglers, they retreated to the iron works, 10 miles distant from Guildford, where they encamped. They lost their artillery and two waggons laden with ammunition. It was a hard fought action, and lasted an hour and a half. Of the British troops, the loss, as stated by Lord Cornwallis, was 532 killed, wounded, and missing. General Greene, in his account of the action transmitted to the congress, stated the loss of the continental troops to amonnt to 329 killed, wounded, and missing; but he made no estimate of the loss of the militia. Lieutenant-colonel Stuart was killed in the action; and Lieutenant-colonel Webster, and the captains Schutz, Maynard and Goodriche, died of the wounds that they received in it. Brigadier-general O'Hara, Brigadier-general Howard, and Lieutenant-colonel Tarleton, were also wounded. Of the Americans, the principal officer killed was Major Anderson of the Maryland line; and the generals Stephens and Huger were wounded.

361 The Americans defeated.

362 Hardships endured by the British troops.

The British troops underwent great hardships in the course of this campaign; and in a letter of Lord Cornwallis's to Lord George Germain, dated March 17th, he observed, that "the soldiers had been two days without bread." His lordship quitted Guildford three days after the battle which was fought in that place; and on the 7th of April arrived in the neighbourhood of Wilmington. Soon after, General Greene, notwithstanding his late defeat, endeavoured to make some vigorous attempts against the king's forces in South Carolina. Lord Rawdon had been appointed to defend the post of Camden, with about 800 British and provincials; and on the 19th of April General Greene appeared before that place with a large body of continentals and militia. He found it, however, impossible to attempt to storm the town with any prospect of success; and therefore endeavoured to take such a position as should induce the British troops to sally from their works. He posted the Americans about a mile from the town, on an eminence which was covered with woods, and flanked on the left by an impassable swamp. But on the morning of the 25th, Lord Rawdon marched out of Camden, and with great gallantry attacked General Greene in his camp. The Americans made a vigorous resistance, but were at last compelled to give way; and the pursuit is said to have been continued three miles. For some time after the action commenced, General Greene entertained great hopes of defeating the British troops: in which, as the Americans were superior in point of numbers, he would probably have succeeded, had not some capital military errors been committed by one or two of the officers who served under him. On the American side Colonel Washington had behaved extremely well in this action, having made upwards of 200 of the English prisoners, with ten or twelve officers, before he perceived that the Americans were abandoning the field of battle. The loss of the English was about 100 killed and wounded. Upwards of 100 of the Americans were taken prisoners; and, according to the account published by General Greene, they had 126 killed and wounded. After this action, Greene retreated to Rugeley's mills, 12 miles from Camden, in order to collect his troops and wait for reinforcements.

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363 General Greene attacked in his camp Lord Rawdon, and defeated.

Notwithstanding the advantage which Lord Rawdon had obtained over General Greene at Camden, that nobleman soon after found it necessary to quit that post; and the Americans made themselves masters of several other posts that were occupied by the king's troops, and the garrisons of which were obliged to surrender themselves prisoners of war. These troops were afterwards exchanged under a cartel which took place between Lord Cornwallis and General Greene for the release of all prisoners of war, in the southern district. After these events, General Greene laid close siege to Ninety-six, which was considered as the most commanding and important of all the posts in the back-country; and on the 19th of June he attempted to storm the garrison, but was repulsed by the gallantry of the British troops, with the loss, as it is said, of 75 killed and 120 wounded. General Greene then raised the siege, and retired with his army behind the Saluda, to a strong situation within 16 miles of Ninety-six.

364 Afterwards lays siege to Ninety-six; but is repulsed.

On the 18th of April a large body of British troops, under the command of Major-general Phillips and Brigadier-general Arnold, embarked at Portsmouth in Virginia, in order to proceed on an expedition for the purpose of destroying some of the American stores. A

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party of light infantry were sent ten or twelve miles up the Chickahomany; where they destroyed several armed ships, sundry warehouses, and the American state ship-yards. At Petersburgh, the English destroyed 4000 hogsheads of tobacco, one ship, and a number of small vessels on the stocks and in the river. At Chesterfield court-house, they burnt a range of barracks for 2000 men and 300 barrels of flour. At a place called *Osborn's*, they made themselves masters of several vessels loaded with cordage and flour, and destroyed about 2000 hogsheads of tobacco, and sundry vessels were sunk and burnt. At Warwick, they burnt a magazine of 500 barrels of flour, some fine mills belonging to Colonel Carey, a large range of public rope-walks and storehouses, tan and bark houses full of hides and bark, and great quantities of tobacco. A like destruction of stores and goods was made in other parts of Virginia.

365 Destruction of American stores.

From the account already given of some of the principal military operations of the present year in America, it appears, that though considerable advantages had been gained by the royal troops, yet no event had taken place from which it could rationally be expected that the final termination of the war would be favourable to Great Britain. It was also a disadvantageous circumstance, that there was a misunderstanding between Admiral Arbuthnot and Sir Henry Clinton, and a mutual disapprobation of each other's conduct. This was manifest from their dispatches to government, and especially from those of General Clinton, whose expressions respecting the conduct of the admiral were by no means equivocal.

366 Unlucky misunderstanding between the British admiral and general.

On the 16th of March 1781, a partial action happened off the capes of Virginia, between the fleet under Admiral Arbuthnot, consisting of seven ships of the line and one fifty-gun ship, and a French squadron, consisting of the same number of ships of the line and one forty-gun ship. Some of the ships in both fleets received considerable damage in the action, and the loss of the English was 30 killed and 73 wounded; but no ship was taken on either side. The British fleet had, however, considerably the advantage; as the French were obliged to retire, and were supposed to be prevented by this action from carrying troops up the Chesapeak, in order to attack General Arnold and impede the progress of Lord Cornwallis. But it was an unfortunate circumstance, that some time before this engagement, the Romulus, a ship of 44 guns, was captured by the French off the capes of Virginia.

367 Action between the British and French fleets off the capes of Virginia.

Lord Cornwallis, after his victory over General Greene at Guildford, proceeded, as we have seen, to Wilmington, where he arrived on the 7th of April. But before he reached that place, he published a proclamation, calling upon all loyal subjects to stand forth and take an active part in restoring good order and government; and declaring to all persons who had engaged in the present rebellion against his Majesty's authority, but who were now convinced of their error, and desirous of returning to their duty and allegiance, that if they would surrender themselves with their arms and ammunition at head-quarters, or to the officer commanding in the district contiguous to their respective places of residence, on or before the 20th of that month, they would be permitted to return to their homes upon giving a military parole; they would be

368 Proclamation by Lord Cornwallis.

protected in their persons and properties from all sorts of violence from the British troops; and would be restored as soon as possible to all the privileges of legal and constitutional government. But it does not appear that any considerable number of the Americans were allured by these promises to give any evidences of their attachment to the royal cause.

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On the 20th of May, his lordship arrived at Petersburgh in Virginia, where he joined a body of British troops that had been under the command of Major-general Phillips; but the command of which, in consequence of the death of that officer, had devolved upon Brigadier-general Arnold. Before this junction he had encountered considerable inconveniences from the difficulty of procuring provisions and forage; so that in a letter to Sir Henry Clinton, he informed him, that his cavalry wanted every thing, and his infantry every thing but shoes. He added, that he had experienced the distresses of marching hundreds of miles in a country chiefly hostile, without one active or useful friend, without intelligence, and without communication with any part of the country.

369 Different actions.

On the 26th of June, about six miles from Williamsburgh, Lieutenant-colonel Simcoe, and 350 of the queen's rangers, with 80 mounted yagers, were attacked by a much superior body of the Americans; but whom they repulsed with great gallantry and with equal success, making four officers and twenty private men prisoners. The loss of the Americans in this action is said to have been upwards of 120, and that of the British troops not more than 40.

On the 6th of July an action happened near the Green Springs in Virginia, between a reconnoitring party of the Americans under General Wayne, amounting to about 800, and a large party of the British army under Lord Cornwallis: in which the Americans had 127 killed and wounded, and the loss of the royal troops is supposed to have been considerably greater. It was an action in which no small degree of military skill and courage was exhibited by the Americans. In a variety of skirmishes, the marquis La Fayette very much distinguished himself, and displayed the utmost ardour in the American cause.

370 General Greene defeated by Col. Stuart.

In South Carolina, an action happened on the 9th of September near the Eata Springs, between a large body of British troops under the command of Lieutenant-colonel Stuart and a much superior body of Americans, said to amount to more than 4000, under the command of General Greene. It was an obstinate engagement, and lasted near two hours; but the Americans were defeated, and two of their six-pounders fell into the hands of the English. The loss, however, of the royal troops was very considerable; amounting to more than 400 killed and wounded, and upwards of 200 missing.

371 Expedition against New London.

In the course of the same month, General Arnold was sent on an expedition against New London, in Connecticut, where he destroyed a great part of the shipping, and an immense quantity of naval stores, European manufactures, and East and West India commodities. The town itself was also burnt, which is said to have been unavoidable, on account of the explosions of great quantities of gunpowder which happened to be in the storehouses that were set on fire. A fort, of which it was thought necessary to gain possession in this

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this expedition, was not taken without considerable loss. This was Fort Griswold; which was defended by the Americans with great gallantry, and the assault was made by the English with equal bravery. The British troops entered the works with fixed bayonets, and were opposed with great vigour by the garrison with long spears. After a most obstinate defence of near forty minutes, the assailants gained possession of the fort, in which 85 Americans were found dead, and 60 wounded, most of them mortally. Of the British troops Major Montgomery was killed by a spear in entering the American works; and 192 men were also killed and wounded in this expedition.

372 Critical situation of Lord Cornwallis.

Notwithstanding the signal advantages that Lord Cornwallis had obtained over the Americans, his situation in Virginia began by degrees to be very critical; and the rather because he did not receive those reinforcements and supplies from Sir Henry Clinton, of which he had formed expectations, and which he conceived to be necessary to the success of his operations. Indeed, the commander in chief was prevented from sending those reinforcements to Lord Cornwallis which he otherwise might have done, by his fears respecting New York, against which he entertained great apprehensions that General Washington intended to make a very formidable attack. In fact, that able American general appears to have taken much pains, and to have employed great finesse, in order to lead Sir Henry Clinton to entertain this imagination. Letters, expressive of this intention, fell into the hands of Sir Henry, which were manifestly written with a design that they should be intercepted, and only with a view to amuse and deceive the British general. The project was successful; and by a variety of judicious military manœuvres, in which he completely out-generalled the British commander, he increased his apprehensions about New York, and prevented him from sending proper assistance to Lord Cornwallis. Having for a considerable time kept Sir Henry Clinton in perpetual alarm in New York, though with an army much inferior to the garrison of that city, General Washington suddenly quitted his camp at White Plains, crossed the Delaware, and marched towards Virginia, apparently with a design to attack Lord Cornwallis. Sir Henry Clinton then received information, that the count de Grasse, with a large French fleet, was expected every moment in the Chesapeak, in order to co-operate with General Washington. He immediately endeavoured, both by land and water, to communicate this information to Lord Cornwallis; and also sent him assurances that he would either reinforce him by every possible means in his power, or make the best diversion he could in his favour. In the mean time, Lord Cornwallis had taken possession of the posts of York town and Gloucester in Virginia, where he fortified himself in the best manner he was able.

373 Ineffectual attempts to afford him assistance.

On the 28th of August, Sir Samuel Hood, with a squadron from the West Indies, joined the squadron under the command of Admiral Graves before New York. It was then necessary, on account of the situation of Lord Cornwallis, that they should immediately proceed to the Chesapeak; but some time appears to have been needlessly lost, though Admiral Hood was extremely anxious that no delay might be made. They arrived, however, in the Chesapeak, on the 5th of September, with 19 ships of the line; where they found the count de Grasse, who had anchored in that bay on the 30th of August, with 24 ships of the line. The French admiral had previously landed a large body of troops, which had been brought from Rhode island, and who immediately marched to join the American army under General Washington. The British and French fleets came to an action on the same day in which the former arrived in the Chesapeak. On board the British fleet 90 were killed and 246 wounded; some of the ships were greatly damaged in the engagement, and the Terrible, a 74 gun ship, was so much shattered, that it was afterwards found necessary to set fire to it. That this action had not been favourable to the English, was manifest from the event: the fleets continued in sight of each other for five days successively, and sometimes were very near; but at length the French fleet all anchored within the Cape, so as to block up the passage. Admiral Graves, who was the commander in chief, then called a council of war, in which it was resolved that the fleet should proceed to New York, that the ships might be there put into the best state for the service: and thus were the French left masters of the navigation of the Chesapeak.

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374 Action between the British and French fleets in the Chesapeak.

Before the news of this action had reached New York, a council of war was held there, in which it was resolved, that 5000 men should be embarked on board the king's ships, in order to proceed to the assistance of Lord Cornwallis. But when it was known that the French were absolute masters of the navigation of the Chesapeak, it was thought inexpedient to send off that reinforcement immediately. In another council of war, it was resolved, that as Lord Cornwallis had provisions to last him till the end of October, it was advisable to wait for more favourable accounts from Admiral Graves, or for the arrival of Admiral Digby, who was expected with three ships of the line. It was not then known at New York, that Admiral Graves had determined to return with the whole fleet to that port.

375 Danger of Lord Cornwallis increased.

In the mean time, the most effectual measures were adopted by General Washington for surrounding the British army under Lord Cornwallis. A large body of French troops, under the command of Lieutenant-general the count de Rochambeau, with a very considerable train of artillery, assisted in the enterprise. The Americans amounted to near 8000 continentals and 5000 militia. General Washington was invested with the authority of commander in chief of these combined forces of America and France. On the 29th of September, the investment of York Town was complete, and the British army quite blocked up. The day following, Sir Henry Clinton wrote a letter to Lord Cornwallis, containing assurances that he would do every thing in his power to relieve him, and some information concerning the steps that would be taken for that purpose. A duplicate of this letter was sent to his lordship by Major Cochran on the 3d of October. That gentleman, who was a very gallant officer, went in a vessel to the capes, and made his way to Lord Cornwallis, through the whole French fleet, in a open boat. He got to York Town on the 10th of the month; and soon after his arrival had his head carried off by a cannon ball.

After the return of Admiral Graves to New York, a council of war was held, consisting of flag and general

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ral officers; in which it was resolved, that a large body of troops should be embarked on board the king's ships as soon as they were refitted, and that the exertions of both fleet and army should be made in order to form a junction with Lord Cornwallis. Sir Henry Clinton himself embarked on board the fleet, with upwards of 7000 troops, on the 18th; they arrived off Cape Charles, at the entrance of the Chesapeak, on the 24th, where they received intelligence that Lord Cornwallis had been obliged to capitulate five days before.

376 Late arrival of General Clinton.

377 Lord Cornwallis's army obliged to surrender.

It was on the 19th of October that Lord Cornwallis surrendered himself and his whole army, by capitulation, prisoners to the combined armies of America and France, under the command of General Washington. He made a defence suitable to the character he had before acquired for courage and military skill; but was compelled to submit to untoward circumstances and superior numbers. It was agreed by the articles of capitulation, that the British troops were to be prisoners to the United States of America, and the seamen to the French king, to whose officers also the British vessels found at York Town and Gloucester were to be delivered up. The British prisoners amounted to more than 6000; but many of them, at the time of surrender, were incapable of duty. A considerable number of cannon, and a large quantity of military stores, fell into the hands of the Americans on this occasion.

As no rational expectation now remained of a subjugation of the colonies, the military operations that succeeded in America were of little consequence. Some inconsiderable actions and skirmishes did indeed take place after that event; in which the refugees chiefly distinguished themselves, and discovered an inveterate animosity against the Americans. On the 5th of May 1782, Sir Guy Carleton arrived at New York, being appointed to the command of the British troops in America in the room of Sir Henry Clinton. Two days after his arrival, he wrote a letter to General Washington, acquainting him, that Admiral Digby was joined with himself in a commission to treat of peace with the people of America; transmitting to him, at the same time, some papers tending to manifest the pacific disposition of the government and people of Britain towards those of America. He also desired a passport for Mr Morgan, who was appointed to transmit a similar letter of compliment to the congress. General Washington declined signing any passport till he had taken the opinion of congress upon that measure; and by them he was directed to refuse any passport for such a purpose. However, another letter was sent to General Washington, dated the 2d of August, and signed by Sir Guy Carleton and Rear-Admiral Digby, in which they informed him, that they were acquainted by authority that negotiations for a general peace had already commenced at Paris; that Mr Grenville was invested with full powers to treat with all the parties at war; and was then at Paris in the execution of his commission. They farther informed him, that his majesty, in order to remove all obstacles to that peace which he so ardently wished to restore, had commanded his ministers to direct Mr Grenville, that the independency of the thirteen provinces should be proposed by him, in the first instance, instead of making it the condition of a general treaty. But some jealousies were entertained by the Americans, that it was the design of the British court either to disunite them, or to bring them to treat of a peace separately from their ally the king of France: They therefore resolved, that any man, or body of men, who should presume to make any separate or partial convention or agreement with the king of Great Britain, or with any commissioner or commissioners under the crown of Great Britain, ought to be considered and treated as open and avowed enemies of the United States of America; and also that those states could not with propriety hold any conference or treaty with any commissioners on the part of Great Britain, unless they should, as a preliminary thereto, either withdraw their fleets and armies, or else, in positive or express terms, acknowledge the independence of the said states. They likewise resolved, that any propositions which might be made by the court of Great Britain, in any manner tending to violate the treaty subsisting between them and the king of France, ought to be treated with every mark of indignity and contempt.

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379 Resolution of congress in consequence thereof.

380 Different places evacuated by the king's troops.

In the month of June, the town of Savannah, and the whole province of Georgia, were evacuated by the king's troops; as was also Charlestown, South Carolina, about the close of the year. In the mean time, the negotiations for peace being continued, provisional articles of peace were signed at Paris on the 30th of November by the commissioner of his Britannic Majesty and the American commissioners, in which his majesty acknowledged the united colonies of New Hampshire, Massachusets Bay, Rhode Island and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia, to be "free, sovereign, and independent states." They had constituted themselves such on the 4th of July 1776; they had been acknowledged such by the French king on the 30th of January 1778, when he concluded with them a treaty of amity and commerce; Holland had acknowledged them as such April 19th 1782; Sweden acknowledged them as such February 5th 1783; Denmark the 25th February, Spain in March, and Russia in July, the same year.

381 Independency of America acknowledged.

According to the report of the committee appointed for that purpose, the *Foreign Debt* of the United States incurred by the war, amounted to 7,885,085 dollars, and the *Domestic Debt* to 34,115,290; total at 4s. 6d. each, equal to 9,450,084l. sterling, the interest of which at 6 per cent. is 567,005l. But the cost to Great Britain is moderately computed at 115,654,914l. and the additional annual burden by it 4,557,575l. since January 1775. As to the loss of men during this unhappy war, the States of America, according to authentic estimates, lost by the sword and in prison near 80,000 men; and by the British returns at New York, the number of soldiers killed in the service amounted to 43,633.

382 Loss of men and treasure by the war.

Such was the end of the contest between Great Britain and America: A contest in which the latter attained to an independent rank among the nations, that may be productive of more important consequences than can yet be foreseen; and in which the former, happily for herself, was forced to relinquish a sovereignty that served only to repress her own internal industry,

383 General consequences.

378 Sir Guy Carleton arrives at New York, with powers to treat of peace.

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industry, and retard her prosperity. She has, in the event, only suffered a diminution of unwieldy empire, which has been more than compensated by an increase of population, commerce, revenues, and wealth.

384 Constitution of the American states.

As to the general constitution of the American States: By the acts of confederation and perpetual union, each of the colonies contracted a reciprocal treaty of alliance and friendship for their common defence, for the maintenance of their liberties, and for their general and mutual advantage; obliging themselves to assist each other against all violence that might threaten all, or any one of them, and to repel in common all the attacks that might be levelled against all, or any one of them, on account of religion, sovereignty, commerce, or under any other pretext whatsoever. Each of the colonies reserved to itself alone the exclusive right of regulating its internal government, and of framing laws in all matters not included in the articles of confederation.—But for the more convenient management of the general interest of the United States, it was determined that delegates should be annually appointed in such a manner as the legislature of each state should direct, to meet in congress on the first Monday of November of every year, with a power reserved to each state to recall its delegates, or any of them, at any time within the year, and to send others in their stead for the remainder of the year. No state is to be represented in congress by less than two, nor more than seven members; and no person is capable of being a delegate for more than three years, in any term of six years; nor is any person, being a delegate, capable of holding any office under the United States, for which he, or any other for his benefit, shall receive any salary, fees, or emoluments of any kind. In determining questions in the United States, in congress assembled, each state is to have one vote. Every state is to abide by the determinations of the United States in congress assembled, on all questions which are submitted to them by the confederation. The articles of confederation are to be inviolably observed by every state, and the union is to be perpetual; nor is any alteration, at any time hereafter, to be made in any of them, unless such alteration be agreed to in a congress of the United States, and be afterwards confirmed by the legislature of every state.

385 Immediate consequences of the revolution to America.

In the mean time, the return of peace was very far from immediately producing in the United States, all that tranquillity and prosperity, which the eager supporters of the revolution had promised to themselves and their country. The public finances were in such a state of entire derangement, as rendered it utterly impossible to make payment of the arrears due to the army. Accordingly the whole officers and soldiers that composed this body, which, at the end of a long war, is always so formidable and dangerous to a free state, were extremely discontented. Attempts were made, by anonymous publications, to inflame their minds, which were already sufficiently agitated, and to induce them to unite in redressing their own grievances, while they had still arms in their hands. During the time that matters were in this state, had the commander in chief of the army been a less virtuous man, it is not impossible, that the freedom of America might have been overturned, and these colonies might have exchanged the mild government of Britain, for a military usurpation. It immediately appeared, however, that General Washington was greatly superior to the temptations of vulgar ambition. He summoned a meeting of the general and field officers, with a deputation of an officer from each company, and a proper representation from the staff of the army. Previous to the meeting, he sent for each officer, and enlarged in private on the fatal consequences to their country, and on the loss of reputation to the whole army, which would result from intemperate resolutions. When the day arrived on which they had been summoned to assemble, the 15th of March 1783, he addressed them in a speech, well calculated to produce calmness and moderation. He promised to exert in their favour his whole influence, requesting them to rely on the public faith which had been pledged to them; and he conjured them "as they valued their honour, as they respected the rights of humanity, and as they regarded the military and national character of America, to express their utmost detestation of the men, who were attempting to open the flood-gates of civil discord, and to deluge their rising empire with blood." Having spoken thus, he retired. No reply was made to his speech; and while the assembly hesitated, the friends of tranquillity seized the happy moment, and proposed a resolution, which was carried without opposition, that no circumstances of distress or danger should induce the American army to sully their reputation by sedition, or to distrust the justice of their country.

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386 Dismission of the army.

After all, however, the government was only able to give to the army four months pay, in place of the arrears of several years. Notwithstanding this great deficiency, the soldiers suffered themselves, with tolerable quietness, to be disbanded towards the fall of the year, care having been previously taken to get quit of great numbers of the men individually, by granting leave of absence to all that applied for it; in consequence of which, this dangerous body of veteran troops was soon scattered and lost in the immense extent of the American territory. The commander in chief proceeded to Annapolis, then the seat of congress, and on the 23d of December, resigned his commission to the president at a public audience. He immediately retired as a private person, to his farm of Mount Vernon, on the banks of the Potowmack in Virginia.

387 Embarrassments of the Americans.

But here the troubles of the country seemed only to commence. During the early periods of the revolution, amidst the dangers of the war, and while the public zeal for independence remained ardent, the defects of the form of government were not felt. From the mere strength which the public opinion conferred, the congress was able to levy armies, to raise extensive loans, and to conduct the war with vigour; but when immediate danger was removed, and the selfish passions had leisure to operate, its powers were soon found altogether inadequate to provide for the public welfare. Articles of confederation had indeed been entered into with a view to confer more extensive powers upon congress, but still its authority was extremely defective. By these articles, it was entitled to require from the different states, the sums necessary for the war, and the public expences of the union: But as it had no power to legislate over individuals, but only over the states as political bodies, and possessed no means of coercion over such states as should neglect to make good the

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payments with which they were assessed, the revenue of the union was ill paid, and all its exertions were enfeebled. The congress had no power of making general commercial regulations to bind the whole states, nor could it even interfere to prevent their waging war against each other if they thought fit. Hence, from the mutual jealousies of thirteen separate legislatures, the most discordant regulations arose.

As soon as the war was at an end, Great Britain naturally treated the American states as a foreign nation, and prohibited, under pain of confiscation, any of their commodities to be conveyed to the British West India islands, unless in British built vessels, navigated by British mariners. Thus the Americans were excluded from that branch of commerce in which they had formerly obtained most of the ready money or specie that came into their country. With a view to induce Great Britain to relax the severity of this and other regulations injurious to their commerce, some of the American states imposed heavy taxes upon goods of British manufacture. Other states took advantage of this circumstance to invite the British merchants to frequent their ports exclusively, and not only received all British commodities free from any duty, but they suffered their people to engage in a smuggling traffic, for the transportation of these commodities into the states in which they had been heavily taxed. Thus the same commodities which were severely taxed in Philadelphia, were imported without difficulty or expence into the Jerseys, on the opposite side of the Delaware, and were daily conveyed by illicit traders across the river. Hence arose a spirit of commercial jealousy, and a warfare between the different legislatures, which filled the whole country with a degree of dissension, little short of hostility.

The Americans were at the same time in a great measure excluded from the trade to the Mediterranean. They could no longer navigate that sea with safety, a privilege which as British subjects they had always enjoyed. As the congress possessed no funds, wherewith to enter into a compromise with the piratical states of Barbary, to whom all Europe pays tribute, the American vessels were constantly exposed to danger. Being unable to defend themselves from the corsairs, they were obliged either to relinquish the beneficial trade which they had formerly possessed in that quarter, or to ensure it at a ruinous premium.

Independent of these partial evils, the general balance of trade speedily became extremely unfavourable to the United States. The debts due from the merchants to Great Britain, the payment of which had been prohibited by congress during the war, were now impatiently demanded. The American merchants were almost universally sued, and the remnant of their effects seized by the agents of British houses. To relieve their own distress, they proceeded against the retailers, who had been unable to pay them during the war, and to whom peace had not yet restored prosperity. In this way the old traders were almost universally ruined, and compelled to abandon all commercial concerns. At the same time, however, as the ravages of armies and the want of a free communication between Europe and America during the war, had multiplied the wants of the latter, an inundation of European manufactures was one of the first effects that followed the establishment of peace. These were purchased by the Americans far beyond their means of payment, and thus almost every person connected with commerce was brought to ruin, and a great part of the people were involved in their distress. United States.

All there evils were aggravated by the want of an efficient government. Congress had incurred debts, and issued paper money for payment of the interest of these debts, or of the current public expences; but as it possessed no efficient revenue, its paper was soon depreciated, and became an object of speculation. Dishonest men paid their debts with it, and thus defrauded their creditors, and the morality of the people was severely wounded. The several states had themselves also contracted debts for the war. Some states willing to fund their debts, imposed taxes for the purpose, which were so far beyond the means of the inhabitants, that they could not be levied without extreme rigour. The extremities to which government proceeded in these cases, occasioned general discontents, and even produced an insurrection in the state of Massachusets.—From all these causes, an embarrassed commerce, a depreciated paper money which inundated all America, the inability of the laws to enforce payment of the taxes, a spirit of jealousy between the different states, and the inadequacy of congress to apply a remedy to these complicated evils, something little short of anarchy was produced in the United States.

388 Proposal of a new constitution.

In the midst of these calamities, a proposition was made in 1785, in the house of delegates in Virginia, to appoint commissioners to meet such commissioners as other states might appoint, to form a system of commercial regulations for the United States. Accordingly, several states appointed commissioners, who, in 1786, assembled at Annapolis. But, as the states were not all represented, and the commissioners thought their own powers too limited to authorize them to propose a proper remedy for the evils that pressed upon their country, they agreed to recommend a general convention, to be held at Philadelphia the following year, with power to frame a general plan of government for the United States. In consequence of this recommendation, in May 1787 delegates from all the states, except Rhode Island, assembled at Philadelphia, and chose General Washington for their president. They sat four months, and deliberated in private. Their debates have never been published; but they are known to have been extremely animated. The public opinion was, at that period, by no means fixed with regard to the kind of government that ought to be adopted. At the commencement of the war, a considerable party disliked the violent measures of their countrymen. At different periods about 30,000 men had been in the service of Great Britain. This implied that a large body of royalists existed in America. Even of those who disliked the supremacy of Britain, and wished to establish American independence, many were by no means prepared to relish the whole principles of a republican government. When the question, therefore, came to be agitated concerning the best political constitution for the United States, a variety of opinions were broached. These, however, in a great measure resolved themselves into two systems: one party, at that time called *federalists*, wished to establish a constitution as purely republican as possible; and the other

389 Convention of Philadelphia.

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party, then called *antifederalists*, wished to give the new government a monarchical character and tendency. It is even said that some were not wanting who eagerly desired to copy closely the model of the British constitution. This was not wonderful. Under the principles of that constitution Britain had become a great nation, and America had prospered. It was the most free form of government at that time known. The vices which had crept into it were evidently independent of its radical structure, and might easily be avoided in a new country. By adopting this tried and well known form of government, it was said that the hazard of new experiments would be avoided, and the states might at once place themselves in a secure train of prosperity. But the feelings of the people at the time were, upon the whole, hostile to these reasonings. Their sufferings, in consequence of British hostility, were too recent to permit them to regard with complacency, in speculation, a system which in practice they had taught themselves to dislike. Their pride would not suffer them to become the servile imitators of another nation; and the public sentiments were so generally republican, as to lead them to dislike all kinds of permanent or hereditary ranks and privileges. Hence, when in the early sittings of the convention of Philadelphia a plan was presented, which proposed the establishment of a president for life, and senators for life, and expressed a desire to render these offices hereditary, and to subject the laws of the respective states to the review of the general government, it met with no adequate support; and a committee was appointed to prepare a plan of a new constitution for the United States.

In addition to the divisions that existed among the members of this convention, from their tendency to republican or to monarchical principles, they were also divided in consequence of the different interests of their constituents. The votes were given by states, and when the delegates of a state differed in opinion, the majority was reckoned the vote of the state. The greater states, after a considerable contest, carried the point, that in the new house of representatives, the representation should stand upon the basis of the population of each state, though they were under the necessity of conceding to the lesser states, that each state should be equally represented in the new senate. Virginia and the southern states, with the aid of the antifederalists, in opposition to the federalist or republican party, obtained the strange privilege, in a nation of freemen, of numbering three-fifths of their slaves as a part of their population in all questions about the number of their representatives. In other questions, however, the delegates of the great states frequently voted with the federalist party, though, upon the whole, the more zealous republicans were greatly disgusted by many articles of the new constitution. Of these the celebrated Dr Franklin was one. He had the integrity, and the moderation, however, on this occasion, to prefer the peace of his country to his private political opinions; and when the plan was completed, he proposed that it should be signed by all the members of the convention, that from their apparent unanimity, it might have the better chance of being accepted by the different states. "In the long career I have already run" (said that eminent statesman and philosopher), "I have more than once been compelled to abandon opinions I had openly maintained, and which I thought well founded from the deep consideration I had given them. As I grow older I am more and more disposed to question my own judgment, and to pay respect to that of others. There are some men, as well as some religious sects, who imagine that reason is entirely on their side; and that their opponents plunge deeper into error in proportion as they depart from their opinions. Struck with these examples, which are but too common, I accept of this constitution with all its faults, even supposing I am not mistaken in my opinion of its faults; for I am persuaded that a general government is necessary to our safety, and that no form of government that is well administered is incapable of producing the happiness of the people; and I think there is reason to believe that this constitution will be well administered for a number of years, and that it will not end, as too many other governments have done, in despotism, unless the American people shall reach that degree of corruption, in which, at once incapable of being directed by a free constitution, and unworthy of its blessings, despotism becomes necessary to their existence. I therefore give my vote for this constitution, both because, in the present circumstances of this nation, I cannot hope to see one more perfect, and because I am not sure this is not as perfect as any it can have. I make a sacrifice of the opinion I have expressed of its defects to the public happiness. I have never uttered my objections out of this house; here they had their birth, and here I wish them to be for ever buried. If every one of us who have opposed the constitution, when we return to our constituents, were to unfold the motives of our opposition, and endeavour to gain partisans to our side, perhaps we might prevent the unanimous adoption of the constitution; but, by this, we should only lose the advantage which the appearance of unanimity will give us with foreign nations, and indeed with our own people. The general good opinion of a nation respecting its government is as necessary as the wisdom and integrity of its administration, to the happiness of its people. I trust, therefore, both for our own safety as members of the community, and for the sake of our posterity, that we shall be of one mind, in recommending this constitution wherever our influence reaches; and that afterwards our whole thoughts will be bent to its happy administration. I cannot forbear to form the wish that such of us as still entertain objections to this constitution will follow my example, and doubt a little of their infallibility, and sign this constitutional act, that no question may be left of our unanimity." The authority and example of Franklin prevailed, and the following constitution was unanimously transmitted by the convention to the different states for their acceptance.

390 Speech of Franklin.

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"We, the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquillity, provide for the common defence, promote the general welfare, and secure the blessing of liberty to ourselves and our posterity, do ordain and establish this constitution for the United States of America.

ARTICLE I.

"*Section* 1. All legislative powers herein granted shall be vested in a congress of the United States, which shall consist of a senate and house of representatives.

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"*Sect.* 2. The house of representatives shall be composed of members chosen every second year by the people of the several states; and the electors in each state shall have the qualifications requisite for electors of the most humerous branch of the state legislature.

"No person shall be a representative who shall not have attained to the age of 25 years, and been seven years a citizen of the United States; and who shall not, when elected, be an inhabitant of the state in which he shall be chosen.

"Representatives, and direct taxes, shall be apportioned among the several states which may be included within the union, according to their respective numbers, which shall be determined by adding to the whole number of free persons, including those bound to service for a term of years, and excluding Indians not taxed, three-fifths of all other persons. The actual enumeration shall be made within three years after the first meeting of the congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law direct. The number of representatives shall not exceed one for every 30,000: but each state shall have at least one representative; and until such enumeration shall be made, the state of New Hampshire shall be entitled to choose three, Massachusets eight, Rhode Island and Providence Plantations one, Connecticut five, New York six, New Jersey, four, Pennsylvania eight, Delaware one, Maryland six, Virginia ten, North Carolina five, South Carolina five, and Georgia three.

"When vacancies happen in the representation from any state, the executive authority thereof shall issue writs of election to fill such vacancies.

"The house of representatives shall choose their speaker and other officers; and shall have the sole power of impeachment.

"*Sect.* 3. The senate of the United States shall be composed of two senators from each state, chosen by the legislature thereof, for six years: and each senator shall have one vote.

"Immediately after they shall be assembled, in consequence of the first election, they shall be divided, as equally as may be, into three classes. The seats of the senators of the first class shall be vacated at the expiration of the second year; of the second class, at the expiration of the fourth year; and the third class, at the expiration of the sixth year; so that one-third may be chosen every second year: and if vacancies happen by resignation or otherwise, during the recess of the legislature of any state, the executive thereof may make temporary appointments until the next meeting of the legislature, which shall then fill such vacancies.

"No person shall be a senator who shall not have attained to the age of 30 years, and been nine years a citizen of the United States, and who shall not, when elected, be an inhabitant of that state for which he shall be chosen.

"The vice-president of the United States shall be president of the senate, but shall have no vote, unless they be equally divided.

"The senate shall choose their other officers, and also a president *pro tempore* in the absence of the vice-president, or when he shall exercise the office of president of the United States.

"The senate shall have the sole power to try all impeachments: When sitting for that purpose they shall be on oath or affirmation. When the president of the United States is tried, the chief justice shall preside: and no persons shall be convicted without the concurrence of two-thirds of the members present. United States

"Judgment in cases of impeachment shall not extend farther than to removal from office, and disqualification to hold and enjoy any office of honour, trust, or profit under the United States; but the party convicted shall nevertheless be liable and subject to indictment, trial, judgment, and punishment, according to law.

"*Sect.* 5. The times, places, and manners of holding elections for senators and representatives shall be prescribed in each state by the legislature thereof; but the congress may at any time, by law, make or alter such regulations, except as to the placing or choosing senators.

"The congress shall assemble at least once in every year; and such meeting shall be on the first Monday in December, unless they shall by law appoint a different day.

"*Sect.* 5. Each house shall be the judge of the elections, returns, and qualifications of its own members; and a majority of each shall constitute a quorum to do business; but a small number may adjourn from day to day, and may be authorized to compel the attendance of absent members, in such manner, and under such penalties, as each house may provide.

"Each house may determine the rules of its proceedings, punish its members for disorderly behaviour, and, with the concurrence of two thirds, expel a member.

"Each house shall keep a journal of its proceedings, and from time to time publish the same, excepting such parts as may in their judgments require secrecy; and the yeas and nays of the members of either house on any question shall, at the desire of one-fifth of those present, be entered on the journal.

"Neither house during the session of congress shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two houses shall be sitting.

"*Sect.* 6. The senators and representatives shall receive a compensation for their services, to be ascertained by law, and paid out of the treasury of the United States. They shall in all cases, except treason, felony, and breach of peace, be privileged from arrest during their attendance at the session of their respective houses, and in going to and returning from the same; for any speech or debate in either house, they shall not be questioned in any other place,

"No senator or representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United States, which shall have been created, or the emoluments whereof shall have been increased during such time: and no person holding any office under the United States shall be a member of either house during his continuance in office.

"*Sect.* 7. All bills for raising revenue shall originate in the house of representatives; but the senate may propose or concur with amendments as on other bills.

"Every bill which shall have passed the house of representatives and the senate, shall, before it becomes

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a law, be presented to the president of the United States: if he approve, he shall sign it; but if not, he shall return it with his objections to that house in which it shall have originated, who shall enter the objections at large on their journal, and procced to re-consider it. If after such re-consideration two-thirds of that house shall agree to pass the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be re-considered; and if approved by two-thirds of that house, it shall become a law. But in all such cases the votes of both houses shall be determined by yeas and nays; and the names of the persons voting for and against the bill shall be entered on the journal of each house respectively. If any bill shall not be returned by the president within ten days (Sundays excepted) after it shall have been presented to him, the same shall be a law, in like manner as if he had signed it, unless the congress, by their adjournment, prevent its return; in which case it shall not be a law.

"Every order, resolution, or vote, to which the concurrence of the senate and house of representatives may be necessary, (except on a question of adjournment), shall be presented to the president of the United States; and before the same shall take effect, shall be approved by him, or, being disapproved by him, shall be re-passed by two-thirds of the senate and house of representatives; according to the rules and limitations prescribed in the case of a bill.

"*Sect.* 8. The congress shall have power

"To lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defence and general welfare of the United States; but all duties, imposts, and excises shall be uniform throughout the United States:

"To borrow money on the credit of the United States:

"To regulate commerce with foreign nations, and among the several states, and with the Indian tribes:

"To establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies throughout the United States:

"To coin money, regulate the value thereof and of foreign coin, and fix the standard of weights and measures:

"To provide for the punishment of counterfeiting the securities and current coin of the United States:

"To establish post-offices and post-roads:

"To promote the progress of science and useful arts, by securing, for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries:

"To constitute tribunals inferior to the supreme courts:

"To define and punish piracies and felonies committed on the high seas, and offences against the law of nations:

"To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water:

"To raise and support armies; but no appropriation of money to that use shall be for a longer term than two years:

"To provide and maintain a navy:

"To make rules for the government and regulation of the land and naval forces:

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"To provide for the calling forth the militia to execute the laws of the union, suppress insurrections, and repel invasions:

"To provide for organizing, arming, and disciplining the militia; and for governing such part of them as may be employed in the service of the United States; reserving to the states, respectively, the appointment of the officers, and the authority of training the militia according to the discipline prescribed by congress:

"To exercise exclusive legislation in all cases whatsoever over such district (not exceeding ten miles square) as may, by cession of particular states and the acceptance of congress, become the seat of government of the United States, and to exercise like authority over all places purchased by the consent of the legislature of the state in which the same shall be, for the erection of forts, magazines, arsenals, dockyards, and other needful buildings:—and

"To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this constitution in the government of the United States, or in any department or office thereof.

"*Sect.* 9. The migration or importation of such persons as any of the states now existing shall think proper to admit, shall not be prohibited by the congress prior to the year 1808; but a tax or duty may be imposed on such importation not exceeding ten dollars for each person.

"The privilege of the writ of *habeas corpus* shall not be suspended, unless when in cases of rebellion or invasion the public safety may require it.

"No bill of attainder, or *ex post facto* law, shall be passed.

"No capitation, or other direct tax, shall be laid, unless in proportion to the census or enumeration herein before directed to be taken.

"No tax or duty shall be laid on articles exported from any state:—No preference shall be given by any regulation of commerce or revenue to the ports of one state over those of another; nor shall vessels bound to or from one state be obliged to enter, clear, or pay duties in another.

"No money shall be drawn from the treasury but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

"No title of nobility shall be granted by the United States; and no person holding any office of profit or trust under them, shall, without the consent of the congress, accept of any present, emolument, office or title of any kind whatever, from any king, prince, or foreign state.

"*Sect.* 10. No state shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make any thing but gold and silver coin a tender in payment of debts; pass any bill of attainder, *ex post facto* law, or law impairing the obligation of contracts, or grant any title of nobility.

"No

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No state shall, without the consent of the congress, lay any imposts or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts laid by any state on imports or exports shall be for the use of the treasury of the United States; and all such laws shall be subject to the revision and controul of the congress. No state shall, without the consent of congress, lay any duty of tonnage, keep troops or ships of war in time of peace, enter into any agreement or compact with another state or with a foreign power, or engage in war unless actually invaded, or in such imminent danger as will not admit of delay.

Article II.

"*Sect.* 1. The executive power shall be vested in a president of the United States of America. He shall hold his office during the term of four years, and together with the vice-president, chosen for the same term, be elected as follows:

"Each state shall appoint, in such manner as the legislature thereof may direct, a number of electors equal to the whole number of senators and representatives to which the states may be entitled in the congress; but no senator, or representative, or person holding an office of trust or profit under the United States shall be appointed an elector.

"The electors shall meet in their respective states, and vote by ballot, for two persons, of whom one at least shall not be an inhabitant of the same state with themselves. And they shall make a list of all the persons voted for, and of the number of votes for each; which list they shall sign, and certify, and transmit, sealed, to the seat of the government of the United States, directed to the president of the senate. The president of the senate shall, in the presence of the senate and house of representatives, open all the certificates; and all the votes shall then be counted. The person having the greatest number of votes, shall be the president, if such number be a majority of the whole number of electors appointed; and if there be more than one who have such majority, and have an equal number of votes, then the house of representatives shall immediately choose by ballot one of them for president; and if no person have a majority, then, from the five highest on the list, the said house shall, in like manner, choose the president. But in choosing the president, the votes shall be taken by states, the representatives from each state having one vote; a quorum for this purpose shall consist of a member or members from two-thirds of the states, and a majority of all the states shall be necessary to a choice. In every case after the choice of the president, the person having the greatest number of votes of the electors shall be the vice-president. But if there should remain two or more who have equal votes, the senate shall choose from them by ballot the vice-president.

"The congress may determine the time of choosing the electors, and the day on which they shall give their votes; which day shall be the same throughout the United States.

"No person except a natural-born citizen, or a citizen of the United States at the time of the adoption of this constitution, shall be eligible to the office of president; neither shall any person be eligible to that office who shall not have attained to the age of 35 years, and been 14 years a resident within the United States. United States.

"In case of the removal of the president from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the vice-president, and the congress may by law provide for the case of removal, death, resignation, or inability both of the president and vice-president, declaring what officer shall then act as president; and such officer shall act accordingly until the disability be removed or a president shall be elected.

"The president shall, at stated times, receive for his services a compensation which shall neither be increased nor diminished during the period for which he shall have been elected, and he shall not receive within that period any other emolument from the United States, or any of them.

"Before he enter on the execution of his office he shall take the following oath or affirmation.

"I do solemnly swear (or affirm) that I will faithfully execute the office of president of the United States, and will, to the best of my ability, preserve, protect, and defend the constitution of the United States.

"*Sect.* 2. The president shall be commander in chief of the army and navy of the United States, and of the militia of the several states when called into the actual service of the United States: he may require the opinion in writing of the principal officer in each of the executive departments, upon any subject relating to the duties of their respective offices; and he shall have power to grant reprieves and pardons for offences against the United States, except in cases of impeachment.

"He shall have power, by and with the advice and consent of the senate, to make treaties, provided two-thirds of the senators present concur; and he shall nominate, and by and with the advice and consent of the senate, shall appoint ambassadors, other public ministers, and consuls, judges of the supreme court, and all other officers of the United States, whose appointments are not herein otherwise provided for, and which shall be established by law. But the congress may by law vest the appointment of such inferior officers as they think proper, in the president alone, in the courts of law, or in the heads of departments.

"The president shall have power to fill up all vacancies that may happen during the recess of the senate, by granting commissions, which shall expire at the end of their next session.

"*Sect.* 3. He shall from time to time give to the congress information of the state of the union, and recommend to their consideration such measures as he shall judge necessary and expedient; he may, on extraordinary occasions, convene both houses, or either of them; and in case of disagreement between them with respect to the time of adjournment, he may adjourn them to such time as he shall think proper: he shall receive ambassadors, and other public ministers; he shall take care that the laws be faithfully executed, and shall commission all the officers of the United States.

"*Sect.* 4. The president, vice-president, and all civil

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vil officers of the United States shall be removed from office on impeachment for a conviction of treason, bribery, or other high crimes and misdemeanours.

ARTICLE III.

"*Sect.* 1. The judicial power of the United States shall be vested in one supreme court, and in such inferior courts as the congress may from time to time ordain and establish. The judges both of the supreme and inferior courts shall hold their offices during good behaviour, and shall at stated times receive for their services, a compensation which shall not be diminished during their continuance in office.

"*Sect.* 2. The judicial power shall extend to all cases in law and equity arising under this constitution, the laws of the United States, and treaties made or which shall be made under their authority; to all cases affecting ambassadors, other public ministers and consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be party; to controversies between two or more states, between a state and citizens of another state, between citizens of different states, between citizens of the same state claiming lands under grants of different states, and between a state, or the citizens thereof, and foreign states, citizens, or subjects.

"In all cases affecting ambassadors, other public ministers and consuls, and those in which a state shall be party, the supreme court shall have original jurisdiction. In all the other cases before mentioned the supreme court shall have appellate jurisdiction both as to law and fact, with such exceptions and under such regulations as the congress shall make.

"The trial of all crimes, except in cases of impeachment, shall be by jury; and such trial shall be held in the state where the said crime shall have been committed; but when not committed within any state, the trial shall be at such place or places as the congress may by law have directed.

"*Sect.* 3. Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort. No person shall be convicted of treason, unless on the testimony of two witnesses to the same overt act, or on confession in open court.

"The congress shall have power to declare the punishment of treason, but no attainder of treason shall work corruption of blood or forfeiture, except during the life of the person attainted.

ARTICLE IV.

"*Sect.* 1. Full faith and credit shall be given in each state to the public acts, records, and judicial proceedings of every other state, and the congress may by general laws prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof.

"*Sect.* 2. The citizens of each state shall be entitled to all the privileges and immunities of citizens in the several states.

"A person charged in any state with treason, felony, or other crime, who shall flee from justice, and be found in another state, shall, on demand of the executive authority of the state from which he fled, be delivered up, to be removed to the state having jurisdiction of the crime.

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"No person held to service or labour in one state, under the laws thereof, escaping into another, shall, in consequence of any law or regulation therein, be discharged from such service or labour, but shall be delivered up on claim of the party to whom such service or labour may be due.

"*Sect.* 3. New states may be admitted by the congress into this union: but no new state shall be formed or erected within the jurisdiction of any other state; nor any state be formed by the junction of two or more states or parts of states, without the consent of the legislatures of the states concerned as well as of the congress.

"The congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this constitution shall be construed as to prejudice any claims of the United States, or of any particular state.

"*Sect.* 4. The United States shall guarantee to every state in this union a republican form of government, and shall protect each of them against invasion, and on application of the legislature or of the executive, (when the legislature cannot be convened) against domestic violence.

ARTICLE V.

"The congress, whenever two-thirds of both houses shall deem it necessary, shall propose amendments to this constitution, or, on the application of the legislatures of two-thirds of the several states, shall call a convention for proposing amendments, which, in either case, shall be valid to all intents and purposes as part of this constitution, when ratified by the legislatures of three-fourths of the several states, or by conventions in three-fourths thereof, as the one or the other mode of ratification may be proposed by the congress; provided that no amendment which may be made prior to the year 1808, shall in any manner affect the first and fourth clauses in the ninth section of the first article; and that no state, without its consent, shall be deprived of its equal suffrage in the senate.

ARTICLE VI.

"All debts contracted and engagements entered into, before the adoption of this constitution, shall be as valid against the United States under this constitution as under the confederation.

"This constitution and the laws of the United States shall be made in pursuance thereof; and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, any thing in the constitution or laws of any state to the contrary notwithstanding.

"The senators and representatives before mentioned, and the members of the several state legislatures, and all executive and judicial officers, both of the United States and of the several states, shall be bound by oath or affirmation to support this constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States.

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ARTICLE VII.

"The ratification of the convention of nine states shall be sufficient for the establishment of this constitution between the states so ratifying the same.

"Done in convention, by the unanimous consent of the states present, the 17th day of September, in the year of our Lord 1787, and of the independence of the United States of America the 12th. In witness whereof, we have hereunto subscribed our names:

George Washington, *president and deputy of Virginia.*

Dep. of New Hampshire,	John Langdon
	Nicolas Gilman
Massachusets,	Nathaniel Gorham
	Rufus King
Connecticut,	William Samuel Johnson
	Roger Sherman
New York,	Alexander Hamilton
New Jersey,	William Livingston
	David Brearly
	William Paterson
	Jonathan Dayton
Pennsylvania,	Benjamin Franklin
	Thomas Miflin
	Robert Morris
	George Clymer
	Thomas Fitz-simons
	Jared Ingersoll
	James Wilson
	Gouverneur Morris
Delaware,	George Read
	Gunning Bedford, junior
	Richard Bassett
	Jacob Broom
Maryland,	James Mac Henry
	Daniel St Thomas Jenifer
	Daniel Carroll
Virginia,	John Blair
	James Maddison, junior
North Carolina,	William Blount
	Richard Dobbspaight
	Hugh Williamson
South Carolina,	John Rutledge
	Charles Cotesworth Pinckney
	Charles Pinckney
	Pierce Butler
Georgia,	William Few
	Abraham Baldwin.

Attested, WILLIAM JACKSON, *secretary.*

To the constitution the following resolutions were added:

"That the preceding constitution be laid before the United States in congress assembled, and that it is the opinion of this convention, that it should afterwards be submitted to a convention of delegates, chosen in each state by the people thereof, under the recommendation of its legislature for their assent and ratification; and that each convention assenting to, and ratifying the same, should give notice thereof to the United States in congress assembled.

"Resolved, that it is the opinion of this convention, that as soon as the conventions of nine states shall have ratified this constitution, the United States in congress assembled, should fix a day on which the electors should be appointed by the states which shall have ratified the same, and a day on which the electors should assemble to vote for the president, and the time and place for commencing proceedings under this constitution. That after such publication the electors should be appointed and the senators and representatives elected. That the electors should meet on the day fixed for the election of the president, and should transmit their votes certified, signed, sealed, and directed, as the constitution requires, to the secretary of the United States in congress assembled; that the senators and representatives should convene at the time and place assigned; that the senators should appoint a president of the senate for the sole purpose of receiving, opening, and counting the votes for president; and that after he shall be chosen, the congress, together with the president, shall proceed without delay to execute this constitution.

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392 Additions to the constitution.

The ten following articles were afterwards, in 1789, proposed by congress to be added to the constitution; and having received the ratification required by article fifth of the above constitution, they are to be regarded as forming a part of it.

ARTICLE I.

"Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press, or the right of people peaceably to assemble, and to petition the government for a redress of grievances.

ARTICLE II.

"A well-regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed.

ARTICLE III.

"No soldier shall in time of peace be quartered in any house, without the consent of the owner, nor in time of war, but in a manner to be prescribed by law.

ARTICLE IV.

"The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated: and no warrants shall issue but upon probable cause, supported by oath or affirmations; and particularly describing the place to be searched, and the person or things to be seized.

ARTICLE V.

"No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, excepting in cases arising in the land or naval forces, or in the militia when in actual service in time of war or public danger; nor shall be tried twice for the same offence; nor shall be compelled in any criminal case to be a witness against himself; nor be derived of life, liberty, or property, without due process of law: nor shall private property be taken for public use, without just compensation.

ARTICLE VI.

"In all criminal prosecutions, the accused party shall

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shall enjoy the right to speedy and public trial by an impartial jury of the state and district wherein the crime shall have been committed, which district shall have been previously ascertained by law; and to be informed of the nature and cause of the accusation, to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favour; and to have the assistance of counsel for his defence.

ARTICLE VII.

"In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved; and no fact tried by a jury shall be otherwise re-examined in any court of the United States, than according to the rules of the common law.

ARTICLE VIII.

"Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

ARTICLE IX.

"The enumeration in the constitution of certain rights, shall not be construed to deny or disparage others retained by the people.

ARTICLE X.

"The powers not delegated to the United States by the constitution, nor prohibited by it to the states, are reserved to the states respectively or to the people."

393 Opposition to the constitution.

The reference of the constitution to the several states to be adopted or rejected by them, in conventions assembled for that special purpose, occasioned the most violent debates. Pamphlets poured from the press, and the newspapers were daily filled with discussions of the merits and defects of the proposed plan of government. Three states, Delaware, New Jersey, and Georgia, accepted the constitution unanimously; but in the other states the parties were more nearly balanced. The conventions convoked by the state legislatures, went into an analysis of the constitution in detail. This took place more especially in Pennsylvania, New York, Massachusets, and Virginia; and every part of it was made the subject of separate votes. The objections stated against the constitution were chiefly the following: That the convention was only entitled to revise the articles of the original confederation, and had exceeded its powers in framing a new constitution, more especially, as it had declared the acceptance of this constitution by nine states sufficient to make it law: That the constitution ought to have been preceded by a declaration of rights to secure to the several states their particular constitution. It was alleged, that the proposed senate would possess excessive powers and privileges, by being authorized to make amendments in money bills, by its concurring with the president in the nomination to places, while its members were eligible to every appointment, and by its having the sole trial of impeachments entrusted to it. The prerogative given to the president to pardon criminals convicted of high treason, was represented as dangerous to public liberty, and his power of conferring appointments upon the members of both houses of legislature was accounted a source of corruption. It was said, that the jurisdiction given to the federal courts would prove vexatious, by drawing individuals from distant states to attend to suits instituted before them. The powers given to congress to impose all kinds of taxes, to regulate the election of its members, to maintain a standing army in time of peace, were alleged to be exorbitant. It was said, that the most important of all privileges, the trial by jury, and the liberty of the press, were not secured: And lastly, It was asserted that the function of president being made capable of indefinite continuance in the same hands, might give an ambitious and artful man an influence dangerous to the congress, to individuals, and to the constitution itself.

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Some of these objections do not appear very forcible, and others of them have been obviated by the articles afterwards added to the constitution, which have been already noticed; but it is said, that at the period in question they possessed considerable influence, and that a very great majority of the people of the United States was averse to the constitution. So sensible, however, were all parties, of the extreme defectiveness of the existing government, and of the absolute necessity of putting an end to the anarchy in which the country was plunged, that a majority in the different states was prevailed upon to give their votes for its acceptance. In Connecticut, Maryland, and Pennsylvania, a minority voted against it, but it passed without any amendment. In Pennsylvania, where the opposition was strong, the minority withdrew and protested against the constitution. South Carolina, Virginia, New York, and Massachusets, accepted the constitution by a very small majority, but proposed several amendments. New York was on the eve of rejecting the constitution, when intelligence arrived, that it was already accepted by nine of the states; and this circumstance produced an acceptance there also. The convention of New Hampshire separated without coming to a resolution; and, having afterwards assembled, gave its assent, with some proposals for amendment. North Carolina not only proposed amendments, but made them the condition of its acceptance. Some time afterwards, however, it accepted the constitution without reserve. Rhode Island, instead of calling a convention, referred the constitution to the assemblies of the towns, by a majority of which it was rejected; but a convention for the purpose being afterwards called, it accepted the constitution. The following table indicates the periods and the manner in which the constitution was accepted.

States.	Period of accepting the Constitution.	Manner of passing it.
Delaware	Dec. 31. 1787.	Unanimously
Pennsylvania	—— 13. ——	For 47 Against 23 Maj. 24.
New Jersey	—— 19. ——	Unanimously
Georgia	Jan. 2. 1788.	Ditto
Connecticut	—— 9. ——	For 128 Against 40 Maj. 88
Massachusets	Feb. 6. ——	—— 187 —— 168 —— 19
Maryland	April 28. ——	—— 63 —— 12 —— 51
South Carolina	May 23. ——	—— 149 —— 73 —— 76
New Hampshire	June 21. ——	—— 57 —— 46 —— 11
Virginia	—— 15. ——	—— 89 —— 79 —— 10
New York	July 26. ——	—— 30 —— 25 —— 5
North Carolina	Nov. 27. 1789.	—— 193 —— 75 —— 118
Rhode Island.	May 29. 1790.	—— —— —— —— —— 2

394 Executive officers in the American government.

Of the public officers appointed under the constitution of the United States, those of president and vice-president are the most conspicuous and important. In March 1791, the following law was enacted by congress for regulating the mode of their election.

395 President and vice-president how elected.

"*Section* 1. The case of the election of president or vice-president of the United States before the usual period of election, which case is herein after provided for, being accepted, the electors for choosing the president and vice-president shall be named within 34 days immediately preceding the first Wednesday of December 1792, and thenceforth within 34 days immediately preceding the first Wednesday of December, in the fourth year after the last election. The said electors shall be equal in number to that of the senators and representatives in congress, of which the several states shall have a right to compose their deputation at the time when the president and vice-president to be chosen shall enter into office: provided that, if the new apportioning of representatives in virtue of the new enumeration of the inhabitants, shall not take place before the period for choosing the electors, then the number of electors shall be proportioned to the number of senators and representatives of the present congress.

"*Sect.* 2. The electors shall assemble and vote on the first Wednesday of December in each state, at such place as shall be named by the legislature of the state; and shall draw up and sign three certificates of their respective votes, and shall fold up and seal the same separately, and shall indorse upon the cover of each packet a declaration, that it contains a list of the votes of the state for the president and vice-president; and every elector, or majority of electors, shall appoint by ballot the person to whom they will entrust one of the said certificates, to be by him conveyed to the president of the senate, at the place of residence of the government, before the first Wednesday of the January following; and shall address another of the said certificates, by the post, to the president of the senate at the place of residence of the government; and shall transmit the third of the said certificates to the judge of the district in which their assembly shall be held.

"*Sect.* 3. The executive power, in each state, shall cause to be drawn up, and properly certified, three lists of the names of the electors of the state, and shall transmit the same to the electors before the first Wednesday of December; and the electors shall add one of the said lists to each of the before-mentioned lists of their votes.

"*Sect.* 4. In the case of a list of the votes of a state not arriving at the place of residence of the government in January, the secretary of state shall despatch an express to the judge of the district of such state in whose hands the third certificate shall have been deposited, who shall transmit it by the same messenger to the place of residence of the government.

"*Sect.* 5. The congress shall commence its sittings on the second Wednesday of February 1793; and thenceforth on the second Wednesday of the February following each assembly of electors; and the certificates, or as many of them as shall have arrived, shall be opened, the votes counted, and names of the persons elected to fill the offices of president and vice president declared and proclaimed, according to the forms of the constitution.

"*Sect.* 6. In the case of the president of the senate not being present at the place of residence of the government on the arrival of persons charged with the lists of the votes of the electors, such person shall deliver the lists to the secretary of state, who shall carefully preserve them, and remit them as soon as possible to the president of the senate.

"*Sect.* 7. The persons appointed by the electors to convey the lists to the president of the senate, shall receive, at the time of delivering the said lists, 15d. per mile, for the distance, by the high road, from the place of election to the residence of the government.

"*Sect.* 8. If any person being appointed to convey the votes of the electors to the president of the senate, and having accepted that trust, shall neglect to discharge the same, he shall incur a penalty of 1000 dollars.

"*Sect.* 9. In the case of the removal, death, resignation, or incapacity to fill his office of the president or vice-president, the provisional president of the senate, or, where no such officer has been appointed, the speaker of the house of representatives, shall fulfil the

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duties of president of the United States, or vice-president, until the president or vice-president shall resume his functions, or a new election shall take place.

"*Sect.* 10. When the offices of president and vice-president shall become vacant at the same time, the secretary of state shall give notice of the same to the executive power of each state; and shall publish the said notice, in one gazette at least of each state, in which it shall be declared, that the electors for the president of the United States shall be appointed or chosen in the several states within the 34 days immediately preceding the first Wednesday of the month of December following, provided a space of two months shall intervene between the date of such notice, and the first Wednesday of the December following; but when the said space of time shall not so intervene, or if the term for which the late president and vice-president were elected does not expire on the third day of March following, then the secretary of state shall declare in such notice that the electors are to be appointed, or chosen, within the 34 days immediately preceding the first Wednesday of December in the following year; and the electors shall be appointed accordingly, and shall proceed as is provided in this act.

"*Sect.* 11. The only evidence that shall be required of the refusal to accept the office of president or vice-president, or resignation of either of said offices, shall be a declaration in writing to that effect, signed by the person refusing to accept or resigning such office, which shall be transmitted to, and deposited in the office of the secretary of state.

"*Sect.* 12. The term for which the president and vice-president shall be chosen shall be four years; commencing, in all cases, on the 4th of March following the day of the election.

By this law, as well as by the constitution, the power of declaring the manner of nominating the electors who are to chuse the president and vice-president, was left to the legislatures of the several states; the result of which was that a uniform mode was not adopted. In some of the states the people were left to nominate the electors in the same manner as they voted for other representatives. In other states, that power was confined to the legislatures themselves.

During the session of congress, the president and vice-president necessarily remain at Washington; but during the recess they retire to their usual places of residence. The president, when at the seat of government, lives in the house destined for him, which is furnished at the public expence. The vice-president, who is president of the senate, has no similar mark of distinction, but lodges at an inn, or private house, like other members of congress. The yearly salary of the president is 25,000 dollars; that of the vice-president only 5000; but the latter is not subject to any extraordinary expence, while the president, according to established custom, spends more than his salary in the expences of his table.

In case of the death, resignation, or removal of the president, his powers devolve upon the vice-president. He is commander in chief of the army and navy of the United States, and of the militia when called into actual service. He is authorised to grant reprieves and pardons for offences against the United States, except in cases of impeachment. By and with the advice of the senate, he appoints ambassadors, and judges of the supreme court, and all military and other officers, not otherwise provided for by law. United States.

In the executive government of the United States there are three departments, the department of state, the department of finances, and that of war: a secretary is at the head of each of these, who acts under the authority of the president. The secretary of state is keeper of the seals of the union. It belongs to his office to countersign the laws, and to promulgate them. He has the custody of all public papers, but his principal employment is to transact affairs with foreign powers. 396 Secretary of state.

At the head of the finances is a secretary of the treasury. This part of the public business was attended with many difficulties at the period when the constitution was formed, and for some years thereafter. The new congress, at the close of its first session, in September 1789, ordered the secretary of the treasury of the union, Mr Hamilton, to prepare a plan for the restoration of public credit. This duty was performed in January 1790, and, after long debates, the congress, on the 4th of August of that year, passed the plan into a law. By this law, the debt due to foreign nations, as well as to the creditors at home, was funded, together with a long arrear of interest, and even interest upon interest. The debt due to foreign nations amounted to 11,908,188 dollars, and the domestic debt to 40,905,485 dollars, making together 52,813,673 dollars. The president of the United States was authorized to borrow 12,000,000 of dollars to pay the foreign debt. Another loan was made to extinguish the domestic debt, and in payment of this loan certificates of interest due (one of the kinds of public paper then current) were received and funded at three per cent. The capital of the debt, including the rest of the paper money then in circulation, was funded at 6 per cent. interest, with a provision that for a third of the debt thus funded no interest should be paid till the year 1800. This part of the debt therefore received the name of *deferred stock*. The deferred stock was appointed to be redeemed in the proportion of eight per cent. per annum. For the rest of the debt two other funds were created, one of three per cent. and one of six per cent.—By this law the whole debts due by the several states to the union, and for which the credit of congress stood pledged to the public creditors, were adopted as the debt of the union, But as the debts due by the several states were very unequal, this part of the plan met with much opposition. It is understood, however, to have been at last carried, in consequence of a kind of compromise between the northern and southern states. The northern states, including New York, were the principal debtors, Massachusets alone owed 6,000,000 of dollars. The northern states therefore were deeply interested, that the public debt should be adopted by the whole union. The southern states, on the contrary, were all, with the exception of South Carolina, creditors of the union. But it was their favourite project to draw the seat of the federal government nearer to them. Virginia was more eager in the prosecution of this object than the rest, and Virginia was the principal public creditor. Accordingly, the deputies of the northern states made a compromise with the southern states, agreeing to vote that the seat of the federal govern- 397 Treasury.

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ment should be placed on the river Potowmack, on condition of the others voting for the consolidation of the debts. Orders were given to prepare buildings for the public offices, previous to December 1800. In honour of the president of the union, who had so long been the commander in chief of the armies of the states, the new city was ordained to be called Washington.

The congress afterwards erected an office for the reduction of national debt; but the government, from an infirmity natural to governments in general, rather exceeded its revenue, and the debt, instead of diminishing, increased till the period of Mr Jefferson's administration. In 1790 the debt of the United States was 72,613,254 dollars; in 1804 it was 86,427,120; but from this time it was gradually reduced till it reached 45,211,981 dollars in 1812. The war which began then made great additions to it, and in 1816 it amounted to 123,630,691 dollars. About 35,000,000, however, have been paid off since the peace; and on the 1st January 1820, the amount was 88,885,203 dollars.

398 National bank.

A bank of the United States was incorporated in 1791, with a capital of 10,000,000 of dollars, of which 2,000,000 were subscribed by the United States. It had branches in Boston, New York, Baltimore, Washington, Northfolk, Charlestown, and Savannah. It expired in 1811, and congress refused to renew it. A new bank of the United States was established in 1816, with a capital of 35,000,000, with branches at eighteen of the most considerable towns in the union. It seems likely to succeed no better than its predecessor; having fallen into embarrassments in 1819, when such extraordinary failures took place among the banks in the United States as to cover the country with general distress. Banks have increased with extraordinary rapidity in the United States. The whole number of these establishments in 1790 was 95, and in 1818 there were above 400. They are most numerous in Pennsylvania and Kentucky. They issue notes for sums as low as a dollar, which are cut into halves and quarters; and generally pass at a discount, which increases in proportion to the distance of the place whence they are issued.

399 Army.

On the conclusion of the war with Great Britain in 1815, the army of the United States was reduced to 10,000 men; consisting of 32 companies of artillery, 3200 men; 10 companies of light artilerry, 660 men; 80 companies, or eight regiments, of infantry, 5440 men; 10 companies of riflemen, 680; in all 9980 men. The chief officers are two major-generals (Jackson and Brown) for the southern and northern divisions, four brigade inspectors, and four brigade quarter-masters. From the accounts presented to congress in December 1819, this force appears to be reduced to little more than 8000 men. Forts have been established also, or are erecting at the mouths of the principal bays. The whole expence of the military department in 1819 was 9,195,961 dollars. The pay of a major-general is 200 dollars per month, with 15 rations a-day; a colonel of infantry 75 dollars, with 6 rations; a major 50 dollars, with 4 rations; a captain 40 dollars, with 3 rations; a first lieutenant 30 dollars and 3 rations; a regimental surgeon 45 dollars and 3 rations; a serjeant 8 dollars and 1 ration; a private 5 dollars and 1 ration. During the war which ended in 1815, the United States had 62,588 men in their service. The militia of the United States, on the 13th September 1816, amounted to 748,566 men, including officers. (*Warden's America*, chap. 44.). United States.

The navy of the United States was very small before the late war. They had no vessel above the size of a frigate, and but a few of these. But their unexpected success in battles with British vessels of the same class, has brought the naval service into high esteem; and since the peace they have been diligently employed in building ships of the line. In the beginning of 1819 the navy consisted of 5 ships of the line of 74 guns, 5 frigates of 44 guns, and 32 vessels of inferior size, carrying altogether 1142 guns. There were besides some barges and gunboats, and five large ships building. By an act of congress, dated April 1816, the president was authorized to build 9 ships of 74 guns, and 12 frigates of 44 guns. The steam frigate constructed by Mr Fulton, a new and singular species of naval force, measures 145 feet by 55, on the deck; and draws only 8 feet water. The machinery by which it moves is placed in the centre, and is defended by a side of six feet in thickness. The navy is managed by a board of three commissioners, each with a salary of 3500 dollars.

400 Law officers.

For the administration of justice, an attorney general of the United States, is by law attached to the executive government. In the United States, justice is administered by district courts, circuit courts, and a supreme court. These possess exclusive jurisdiction, in all suits that affect the interests of the union. The courts of district are held four times a year in each state, by a judge appointed by the federal government, and residing in the state. They have jurisdictions in crimes within the district and the adjoining sea, where the penalty does not exceed 100 dollars, or a slight corporal punishment. They judge also in civil questions, in which the union or foreigners are interested to the amount of 100 dollars, and unless in admiralty cases, the question is tried by a jury.

The circuit courts are held by a judge of the supreme court, twice a-year in each state, along with the judges of the district. They have an exclusive cognizance of all crimes against the union, and they are courts of appeal from the district courts. They have cognizance, along with the courts of the different states, of all civil causes, not exceeding 300 dollars in value, or where a foreigner is party, or the dispute is between citizens of different states.

The supreme court of the union consists of a chief justice, and five judges. It sits twice a year at the seat of government. It is a court of appeal from the circuit courts, and the tribunals of the several states. It has exclusive jurisdiction in all civil causes, where one of the states is a party, unless the adverse party be a citizen of the same state, and over all suits against foreign ambassadors or envoys, and their domestics, according to the law of nations. It may also try, but not exclusively, causes in which an ambassador, consul, or other foreign minister, is interested as prosecutor.

On account of the distance of the states of Kentucky and Tenessee, and the province of Maine, their courts of district exercise the jurisdiction of courts of circuit, except in cases of appeal, which are carried before the supreme federal court. Juries serving in the

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federal courts, are chosen according to the forms observed in the states where these courts happen to be held.

Crimes or offences of which the federal tribunals take cognizance, are treasons, rebellions, refusals to pay imposts enjoined by the union, smuggling, frauds by officers of the revenue in matters of revenue, and in short, every offence committed against laws passed by the congress. In addition to these, the federal courts take cognizance of all offences committed within what is accounted not the territory of any particular state, but of the union at large, such as, the open seas, or forts or arsenals belonging to the union, and also the precincts of the federal city of Washington, which is considered as the common property of the American nation.

In civil matters, both in the courts of the union, and of the particular states, the common law of England is considered as the law of America, where no special enactments exist to the contrary. The administration of justice, however, is understood to be no less embarrassed by intricacies and delays in North America, than it is under some of the oldest governments of Europe. A reform in this respect will not readily be expected, when it is considered, that more than one half of the legislature of the union, as well as of the legislatures of the different states, is always composed of lawyers.

401 The mint.

In April 1792, the congress ordered the establishment for the United States, of a public mint, by a law which regulates the division, the value, and the standard of their money. The division and value of these moneys, are as follows.

Gold Coin.

The *Eagle*, value ten dollars.
The *Half-Eagle*, value five dollars.
The *Quarter-Eagle*, value two dollars and a half.

Silver Coin.

The *Dollar*, value a hundred cents.
The *Half-Dollar*, value fifty cents.
The *Quarter-Dollar*, value twenty-five cents.
The *Tenth of a Dollar*, value twelve cents and a half.
The *Half-Tenth*, value six cents and a quarter.

Copper Coin.

The *Cent*, value the hundredth part of a dollar.
The *Half-Cent*, value the two hundreth part of a dollar.

The weight of these is as follows: The eagle ought to contain $247\frac{1}{2}$ grains of pure gold, or 270 grains of standard gold, which is thus regulated; 11 parts of pure gold in $12\frac{1}{2}$ of alloy, of which one half ought to be of silver.

The half-eagle ought to contain $123\frac{3}{4}$ grains of pure gold, or 135 grains of alloy gold.

The quarter-eagle ought to contain 61 grains of pure gold, or $67\frac{1}{2}$ grains of alloy gold.

The dollar ought to contain $371\frac{1}{4}$ grains of pure silver, or 416 grains of alloy silver.

The standard of silver is 1485 parts of pure silver, and 179 parts of alloy which is of pure copper.

The half-dollar ought to contain $182\frac{5}{8}$ grains of pure silver, or 280 grains of standard silver.

A quarter-dollar ought to contain $92\frac{1}{16}$ grains of pure silver, or 104 grains of standard silver. United States.

The tenth of a dollar ought to contain $37\frac{1}{8}$ grains of pure silver, or 52 grains of standard silver.

The half-tenth ought to contain $18\frac{1}{16}$ grains of pure silver, or 26 grains of standard silver.

The cent ought to contain 11 pennyweights of copper.

The half cent ought to contain five and a half.

The gold and silver coins ought, according to law, to bear on one side an emblematical figure of liberty, and upon the other, the eagle of the United States, with the words "United States."

The copper coins, instead of the American eagle, bear an inscription denominating their value.

The proportional value between gold and silver, when coined, to the coin of the United States, is determined by comparing one pound of the one to fifteen of the other; that is to say, one pound of coined gold is equal to fifteen pounds of coined silver.

All the countries of the United States are required to make use of these coins.

The Spanish dollar is the only piece of foreign coin which is current in the United States as money: all others, which had received a valuation by the law, are only received by weight since 1765. It does not appear, however, that the United States have hitherto made much use of their mint, at least for the coinage of the more valuable metals.

402 History continued.

The convulsions of nations and the calamities and the crimes of mankind, always form the most interesting subject of history; and happy is that people concerning whom the historian finds little to relate. From the period of the acceptance of their constitution, the American states have, in a great degree, enjoyed that fortunate situation. On the 13th of September 1788, the old congress having received the ratification of the constitution from eleven states, declared it to be in force, and appointed the first Wednesday of the following January for choosing the electors, who were to assemble on the first Wednesday in February following to elect the president and vice-president. The new congress was also appointed to meet on the first Wednesday of March following at New York. Accordingly, on the first Wednesday of February 1789, George Washington, who had been the commander in chief of the armies of the United States, and president of the convention of Philadelphia that framed the constitution, was elected president, and John Adams, who had seconded Mr Jefferson in proposing the original declaration of American independence, was at the same time elected vice-president. The popularity of the president was deservedly very great; and, as all parties concurred in supporting the new constitution, much unanimity prevailed in the public councils. By degrees, however, it appeared, that two parties continued to exist, possessing the same radical principles as formerly. The party most attached to the principles that leaned towards monarchy, or rather towards aristocracy, concurred steadily in giving support to the new authorities in all their exertions as soon as they were constituted, adopting for themselves the appellation of *federalists*, which had by that time become popular. On the other hand, the more strict and zealous

403 Washington president.

404 Political factions.

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ous republicans, who had originally been called *federalists*, and who had only opposed the constitution, because, in their opinion, it did not sufficiently incorporate the whole states into one nation, now began to receive the appellation of *antifederalists:* because, from their temper and character they frequently opposed the measures of the new federal government. In this way the names of the parties were changed, while their principles remained the same. It is not believed, however, that in the United States there exists any party that wishes to dissolve the confederation; the word antifederalist being only used to express the democratic or most zealous republican party, whereas the appellation of federalist is applied to those of a more aristocratical character and tendency, who array themselves most steadily on the side of established authority, in opposition to every kind of innovation. In the earliest period of the constitution, the only extraordinary effort that we find to have been made by either of these parties, consisted of a proposal made in the senate of congress, in which the aristocratical party, now called *federalists*, were very numerous, to give the titles of *illustrious highness* to the president of the United States, of *right honourable* to the members of the senate, and *honourable* to the members of the house of representatives; but this project was abandoned by the senate itself, as the public opinion was found to be averse to it, and as the house of representatives was disposed to impose a negative upon it. When the system of finance, of which we have already taken notice, and which still exists, was proposed, it was vehemently combated by the opposition or the antifederalist party, on account of the tendency, which, in their opinion, it must have to introduce a funding system, and by means of it an extravagant and expensive government, in consequence of the facility with which that system enables ministers to negociate loans, and thereby rather to increase than diminish their own power by the dependence upon government which these loans produce. The same reasons which induced the antifederalist party to oppose the new system of finance, or the introduction of a funding system, recommended it to the support of the federalists, who, by means of it, expected to increase the strength and influence of government. This last motive probably derived greater weight from the personal interests and prejudices of the individuals who usually joined the federalist or aristocratical party.

405 Titles proposed.

406 Character of the parties.

It is to be observed, that, in North America as in Europe, the political opinions of men are, in a great measure, formed by their situations. At the same time, local situation produces in America an effect precisely the reverse of what it does among the Europeans. In Europe the proprietors of land constitute the aristocracy of the country in which they live, and are the pillars of the government; whereas the inhabitants of towns, from being crowded into a narrow space, and from their want of personal distinction, have a tendency to assume a more levelling and turbulent character. But, in America, unless when land is bought in large quantities to be speedily disposed of as an object of commercial speculation, it is usually held in property by the cultivators of it, who labour upon their own farms, and constitute a body of yeomanry in easy circumstances, but not possessed of great wealth. Hence in all political questions they are led to adopt equalizing notions, and a jealousy of the conduct of those entrusted with power. In the towns, on the contrary, a great diversity of rank exists. By means of an extensive commerce large fortunes are made, the owners of which live in a stile of great splendour, and along with the members of the learned professions constitute the aristocracy of America. The commercial men being also intimately connected with Great Britain, are naturally led to approve of the institutions that exist in it, and to favour her cause in every quarrel with European nations.

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It was not till the second period of the French revolution, or the fall of monarchy in that country, that the American parties became in any great degree exasperated against each other. That extraordinary event, by which Europe was convulsed from its centre to its extremities, and by which all its nations were roused to arms, carried agitation and discord even beyond the shores of the Atlantic. The people of the American states belonging to the race of Europe, and having so recently been an object of lively interest and of hostility between different states, could not fail to have their minds occupied by the new events and speculations which at that time engaged the attention of all ranks of men. The French had been the allies of America. Their troops had fought for the independence of that country, and Fayette and other names that were distinguished in the early periods of the French revolution, were well known, and enjoyed much personal popularity among the Americans. It is not wonderful, therefore, that the antifederalist party in America regarded with favour the early progress of the French revolution, especially as they considered the French soldiers as now engaged on the side of principles which they had learned in the school of America. They contemplated with exultation the progress of republicanism in France, and fancied they beheld in it a confirmation of their own sentiments, and the means of preventing their own government from acquiring an aristocratical or a monarchical tendency. When the governing party in France dishonoured themselves and human nature by the excess of their barbarity and of their crimes under Robespierre, the antifederalists in America being men of a better character, could not fail to regard the conduct of the European revolutionists with much horror. Still, however, they flattered themselves that the disorders of France were only temporary: and they vainly hoped that the spirit of freedom would in that country soon be rendered consistent with the existence of public order.

407 Antifederalists fond of the French political opinions.

408 The federalists attached to Britain.

On the other hand, the federalist party in America, whose objects were to strengthen the government of the union, to increase the influence of the executive power, and to carry the constitution as far as possible towards aristocracy and monarchy, naturally considered the example and influence of the English government as a barrier against the system of French republicanism. As many of the members of this party were strongly bound to Great Britain by the ties of commercial interest, they soon became extremely eager to detach the United States from France, and to connect them with Britain. This party derived a great accession of strength from the crimes, which nobody pretended to justify, of the rulers of the French republic. They

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They derived still greater strength from the disorganizing system with regard to foreign nations which the French adopted, and which they extended even to the republican states of America. Their ambassador, M. Genet, and their consuls at different ports, instituted political clubs in the towns and villages, and attempted to introduce everywhere the Jacobin practice of affiliation or fraternization. The ambassador also attempting to force the United States into a war with Great Britain, quarrelled openly with the president, and attempted, by the publication of official notes addressed to him, to excite discontents, and to introduce a distinction between the government and the people of the country. He was recalled by the French government, but not till his conduct had excited the disapprobation of all parties in America. It would appear, however, that for a time the American government was disposed to regard the French republic with favour. Payment was readily made to the republic of the debt incurred by the United States to the late French monarch; and as France suffered great distress from a scarcity of provisions, the money was laid out in the purchase of grain and flour, which was conveyed from America to France in a fleet of 160 ships. It was in defence of this fleet that the French fought the naval engagement with Lord Howe on the 1st of June 1794, in which their ships of war were defeated; but they were successful in conveying the transports loaded with grain into Brest harbour. But the American government soon found itself much embarrassed with regard to the part which it ought to act towards the contending powers of Europe. George Washington was still at the head of affairs, having been re-elected president in December 1792, though not altogether unanimously, as in the former instance. This prudent statesman saw that the interest of his rising country required that she should remain disengaged from the destructive quarrels of the European nations. The restless spirit of the French, however, on the one hand, and the eagerness of Great Britain to force an universal combination against them on the other, rendered the preservation of neutrality no easy task. He saw a confederacy of all Europe formed against France; and he could scarcely avoid supposing that it must be successful against an anarchy stained with crimes and blood, assailed by choice troops, and having nothing to oppose this force but new soldiers and inexperienced generals, supported by a treasury furnished only with a paper currency, which must speedily be discredited. At the same time, the American commerce was greatly harassed by Great Britain, whose ships, with a view to distress France, seized all vessels going thither with provisions, which formed the chief article of American export. The debates which occurred in the house of representatives in congress in consequence of this state of affairs were extremely violent; and the people without doors were greatly agitated throughout the whole extent of the United States. The general wish was, to preserve peace and neutrality; but the complaints against Britain were very loud, especially as the extensive traders who were most attached to the British interests were the chief sufferers by the interruption of commerce. The antifederalists on this occasion became still more attached to France, the contagion of whose anarchy among a virtuous people they declared they did not fear. If satisfaction could not be obtained from Britain, they proposed a sequestration of British property in America, an interruption of all commerce with Britain; and they imagined, that by arming American privateers, prohibiting the conveyance of provisions to the British islands, and seizing on Canada, they possessed more certain means of injuring Britain, if she was resolved upon war, than any she had with which to make reprisals upon the states. The federalists, on the other hand, were eager to avoid all connexion with France, and proposed the mildest measures of remonstrance and negociation with regard to England, deprecating the idea of entering into a contest with her; and the president appears at length to have adopted the resolution of going fully into the measures of this last party. He dismissed Thomas Jefferson from the office of secretary of state, he being of that party that had always avowed an attachment to pure republicanism, and that was at present most hostile to Great Britain. He at the same time resolved to send Mr Jay to England for the purpose of negociating with the British government. This last gentleman being known to be decidedly attached to the federalist party, indicated to the public in very clear terms the measures which the government had resolved to adopt.

409 Conduct of the president.

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410 Rebellion at Pitsburg.

About this time some internal disorders broke out in one part of America, and, as political factions render every event subservient to their mutual hatred, the federalists accused their adversaries, though evidently without reason, of being the contrivers and authors of the disturbance, the history of which was this:—Among the differents objects of taxation which presented themselves to congress during the session of 1790, none had appeared more proper than the distilleries throughout the United States. As a revenue from this source could only be collected by an excise, this form was adopted: The duty was light, and the object unexceptionable. But at all times this form of collecting a revenue has been unacceptable to the people in general. By fixing the duty not on the raw material, but on the manufactured commodity, the capital of the trader is less deeply involved, and the price is commonly rendered less burdensome to the consumer; but from the right which, under this form of taxation, it is necessary to confer upon the revenue officers, of entering into private buildings, and of interfering with the operations there going on, it has always been submitted to with reluctance at its first introduction. This tax, however, was peaceably submitted to throughout the whole American continent, excepting in one quarter, that is say, in the four western counties of Pennsylvania beyond the Alleghany mountains, near the junction of the three great rivers Alleghany, Yohogany, and Monongahela, whose confluence at Fort Pitt forms the river Ohio. This district had been settled for a considerable time, and is tolerably populous. The inhabitants at first refused to pay the tax, but they were not altogether unanimous in this respect; and government for some time avoided to press the matter by prosecutions, in the hopes that by degrees the authority of law would be established without trouble or alarm. Petitions in the mean time were transmitted to congress against the tax, and some modifications of it had taken place; so that the government at last endeavour-

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ed generally to put it in force. The marshal was ordered to proceed by legal process against all rioters and delinquent distillers who should be found to resist or evade the tax; but no sooner was he understood to be engaged in this duty than the vengeance of armed men was aimed at his person, and the person and property of the inspector of the revenue. They fired on the marshal, arrested him, and detained him some time as a prisoner. The house and papers of the inspector of the revenue were burnt; and both these officers were obliged to fly to Philadelphia. In a few days thereafter, in the month of August 1794, a general meeting was held at Pitsburg, consisting of six or seven thousand men in arms. A strong remonstrance was drawn up, to be presented to congress. Committees were appointed to correspond with the counties of Washington, Fayette, and Alleghany; and a resolution was entered into, against having any intercourse or dealings with any man who should accept of any office for the collection of the duty.

The American government on this emergency acted with much prudence. Commissioners were dispatched to confer with the leaders of the opposition in the disaffected counties, but the conference was unfortunately without effect. A committee of 60 persons was elected to confer with the commissioners, but of these only a small number voted in favour of the conciliatory proposition. The others threatened, that if the tax was not repealed, the people of the western counties would separate from the American union, and place themselves under the protection of Great Britain. The conduct of the populace was still more outrageous. They surrounded the house where the commissioners resided, broke the windows, and grossly insulted them; so that they were under the necessity of departing without effecting an accommodation.

Nothing now remained but to repeal the tax, or to reduce the refractory counties by force. The former was neither judged prudent nor safe; and as a trifling force might have been ineffectual, and therefore extremely pernicious, by encouraging and extending the insurrection, the militia of all the adjacent states were embodied, and different detachments, amounting in all to 15,000 men, were ordered to rendezvous at Carlisle, the principal town of Cumberland county. Governor Mifflin, formerly general, marched thither in the middle of September, at the head of 6000 volunteers, who, for the honour of their country, engaged on this occasion to support the laws of the federal government. In the beginning of October, the president joined the army at Carlisle, of which Governor Lee of Virginia was commander in chief; and Governor Mifflin was second in command. From Carlisle the army proceeded immediately, amounting in all to 15,000 men in two divisions; and the result was, that the insurgents, after a variety of consultations by representative committees, came to a resolution to disband, and submit to the law; and their leaders disappeared. On the 25th of October, a considerable meeting was held at Pitsburg, of the inhabitants of the western counties, in which they entered into a solemn engagement to support order and obedience to the laws of the republic by every means in their power. A small force was, however, stationed in the counties in which the disturbance had taken place. A considerable number of the insurgents who had been made prisoners were tried, and convicted of high treason; but they were all afterwards pardoned. Thus did this rebellion, which at one time exhibited a formidable aspect, terminate without bloodshed, and almost without violence or damage to the public.

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411 War with the Indians.

During the same summer, a part of the western territory of the United States was ravaged by a desperate incursion of the Indians. To repel this attack, Major General Wayne was despatched with a moderate force early in the summer, and about the middle of August he penetrated to the Miami river, where the British had lately re-occupied a fort within the territory which, according to the treaty of 1783, undoubtedly belonged to the American states. Along with the Indians General Wayne found a number of Canadian settlers encamped without the fort; and he asserted in his correspondence, that Colonel M'Hee, the British Indian agent, was the principal instigator of the war between the savages and the United States. The savages, with a few white auxiliaries, amounted to 2000 men, while General Wayne had only 900; but he resolved not to retreat, and, after a last overture for peace, which was rejected, he advanced to the attack on the 20th of August. His advanced guard was at first thrown into disorder by a severe fire from the Indians, but the second line was immediately brought forward, while the first line was directed to rouse the Indians from their coverts by the bayonet; and the cavalry were directed to turn their flank. The effect of the charge of the infantry, however, was, that the savages were routed and immediately dispersed, the battle terminating under the guns of the British garrison, commanded by Major Campbell. This last gentleman and General Wayne now reciprocally accused each other as guilty of hostility in time of peace. The one complained that a fort was occupied within the American territory; and the other, that so near an approach was made to a garrison possessed by the troops of his Britannic majesty. It was agreed, however, that the point should be left to be discussed by the ambassadors of their different nations; and General Wayne retired. These occurrences excited strong apprehensions in the American government that the British ministry seriously meditated hostilities against the United States.

412 Jay's treaty.

These apprehensions, however, were soon done away by the treaty which Mr Jay concluded with Great Britain in the end of the year 1794. By this treaty the British government agreed to indemnify the American merchants for the illegal seizure of their ships and property that had taken place during the war; the forts within the American territory which had been occupied by the British, and which had never been evacuated, were agreed to be given up, and the boundary line to be clearly ascertained. On the other hand, the American government consented, that French property on board American vessels might be lawfully seized, and that no privateers belonging to a nation at war with either party should be allowed to bring their prizes into the ports of the other, unless forced by stress of weather; and at all events, that they should not be allowed to sell their prizes there. Various articles favourable to the American commerce were at the same time stipulated in the treaty.

When this treaty was laid before the legislature of the

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the United States, it occasioned the most violent debates. The senate, however, approved of it, which was all that was necessary, according to the constitution, to render it binding. The house of representatives at first refused to concur in the arrangements necessary for carrying it into effect, though they at last agreed to depart from their opposition, from the dread of involving their country in a war with England, and from the great respect which the country at large entertained for the judgment of the president.

413 Disputes with France.

In the mean time, this treaty, along with other events, had nearly involved the United States in what was undoubtedly at that time less formidable; a war with France. The French had repeatedly made remonstrances to the American government against the conduct of the British, in seizing American vessels, even in their own rivers and bays, when they found either French persons or French property, without any resistance being made on the part of the American states. When the above treaty, authorizing such seizures, in a manner so hostile to the interests of France, and even to the spirit of neutrality which it was the interest of the American government to observe, came to be publicly known, the French at first entertained hopes that it would not be sanctioned by the American legislature. Their indignation was greatly roused when they understood that a legalized preference was shown to the English interest, by allowing them to seize French property in American vessels; while France stood engaged by treaty, not to seize American property in English vessels, or in the vessels of any other nation with which France might happen to be at war. Still, however, the French government regarded less the treaty itself, than the spirit from which it rose, of a greater attachment to Great Britain than to France. Their indignation in this respect was increased, by an intercepted letter from the president of the United States addressed to Mr Morris, who had lately been the American ambassador in France, and who was then the private agent of the American government in London. This letter, dated, at Philadelphia, December 2. 1795, was a detailed answer to various letters of Mr Morris. The president complained highly of the haughty conduct of the English administration, and of the arbitrary measures which they were continuing to pursue with respect to American navigation. He requested Mr Morris to represent to the minister not only the injustice, but the impolicy of this conduct; particularly at a moment when it was so much the interest of England to conciliate the minds of the inhabitants of the United States to the acceptance of the treaty. He detailed the efforts he had made, and the difficulties he had encountered to overcome the wayward disposition of his countrymen towards French politics, the abbetors of which were the chief opponents of the treaty in question; which, however, he said, had the approbation and sanction of the greater and more respectable part of the community. His only object, he observed, was peace, which he was most anxious to preserve; and if America was happy enough to keep herself out of European quarrels, she might, from the increase of her trade, vie in 20 years with the most formidable powers of Europe.

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This letter, saved from the wreck of the Boston packet, which had foundered on the coast of France, was considered as decisive evidence of the dispositions of the American government towards the French republic. Their ambassador, M. Adet, was therefore directed to make strong representations against the privileges granted to Great Britain, of seizing French property in American vessels. The answer given by the American government stated, in justification of their conduct, that a special treaty made with France in 1778, formally expressed, that neutral vessels should neutralize the cargo; whereas the treaty lately concluded between the United States and England, contained no similar regulation. The American government therefore asserted, that it acted in perfect conformity to both treaties; and though it was lawful for the English to seize French property on board American vessels, the French, without a breach of their treaty with America, could not be permitted to make reprisals in similar circumstances on the English. This mode of reasoning, which was undoubtedly consistent with the letter of the treaties, if not with political honesty, did not satisfy the French directory; and, accordingly, they entered into a formal resolution to suspend the execution of their treaty with America, and declared, that they would treat all neutral vessels in the same manner, as they should suffer the English to treat them. The only effect of this threatening, was to augment the maritime power of Great Britain; merchants belonging to neutral states being thereby induced on all occasions to entrust their goods to the British flag, as the only power capable of affording them full protection. Still, however, by the management of the American ambassador Mr Munroe, who was known to belong to the antifederalist party, the French directory was preserved in tolerable temper with the Americans; but upon his being recalled, and Mr Pinckney, a man of the opposite faction, appointed his successor, they manifested their indignation, by refusing to receive him, or even to suffer him to reside as a private citizen at Paris. They proceeded to no further hostility, however, in expectation that a change favourable to their interests might occur in the American government. For now in the month of October 1796, George Washington, the president, publickly announced his resolution of retiring from political affairs on account of the infirmities of age, and requested his friends not to nominate him in the next election of president.

414 New president.

The election of a new president to succeed a man of such distinction as George Washington, afforded abundant aliment for the animosity of the political parties in America. The federalists wished to advance to the office of president Mr Pinckney of South Carolina, a man whose personal character was much respected, and who had lately been ambassador in England. He had also been engaged in some negotiations with Spain, in which his conduct gave general satisfaction. His name was associated by the federalists, in their votes, along with that of John Adams, the vice-president. They considered it as probable, that he would have the second greatest number of votes in the north, where it was expected that John Adams would have the majority; and it was hoped, that he would at least have the second number of votes in the southern states,

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if Mr Jefferson should have the majority. Upon the whole, however, the federalists generally professed a wish that Mr Adams should be president, although it is said, that the views of their leaders were privately directed to procure the elevation of Mr Pinckney.

The antifederalists, on the contrary, openly and unanimously supported Mr Jefferson. He was well known to the public as a man of letters. He had been secretary of state and ambassador in France, and was active in procuring the original declaration of independence. The two parties strained every nerve to support their respective candidates. They mutually accused each other of tricks to invalidate votes, of frauds in the returns, and of all the other unfair proccedings so well understood in the parent state of which they are colonists. The leaders of the federalists were deceived in their expectation of gaining a majority for Mr Pinckney. John Adams had only one vote beyond an absolute majority of the whole which is required by the constitution, and was declared president; and Mr Jefferson having the second greatest number of votes, or three votes fewer than Mr Adams, was declared vice-president.

When the news arrived in America of the French directory's refusal to receive Mr Pinckney as minister from the United States, their conduct was represented by Mr Adams the president, in a speech to congress, as a high and aggravated insult to the dignity of the American people. The federalist party, by whom he was supported, had a majority in congrees, and some preparations for war were voted; but as the parties were nearly balanced, the opinions of the opposition very frequently prevailed, and the mission of three ambassadors to demand an explanation from the French government was scarcely followed by any preparations for hostility. But by this time the persons who retained the possession of the supreme power in France, under the appellation of an executive directory, had displayed a character which deeply wounded the interests of their country with all foreign nations, and ultimately overturned the republican constitution which had been attempted to be established. Their conduct was insolent and corrupted, while at the same time they were unable to compensate these defects by the ability of their management. Their negotiation with the American ambassadors terminated in an obscure and unprincipled intrigue, in which it appeared that the directory wished to levy a sum of money upon America, as the price of their forbearance; a part of which sum was to go into the public treasury, and a part was to be received privately by the individual members of the directory. They also, from a short-sighted policy, authorized their privateers and cruizers to seize all neutral vessels in which any article of British produce or manufacture should be found, to whomsoever it belonged. As the British manufactures were in great demand in every country, this was equivalent to a declaration of hostility against all nations, while, at the same time, the absolute dominion which the British navy had at this period acquired over the ocean, converted it into an impotent menace.

In consequence of these events, the American congress, towards the end of their session in 1798, by a small majority, enacted a law, to break off all commercial relation with France or its dependencies, and to forbid the entrance of French vessels into the American ports till the end of the sittings of next congress. A premium was also offered for the capture of French armed ships by American vessels. Still, however, though the president, Mr Adams, supported by the leaders of the federalist party, continued to urge the necessity of a war with France, yet, as the majority of the people appeared decidedly averse to this measure, he had the good sense to depart from his own sentiments, and to attempt a new negotiation. As the French directory, by their misconduct, speedily brought their country to the greatest embarrassments, by once more arming all Europe against France, that nation found it necessary, for the sake of its safety, to relinquish those hopes of freedom for which it had made so many sacrifices, and to submit the whole power of the state to Bonaparte, who had been the most successful commander of its armies. He repaired the errors in the directory by more moderate and better management, and settled all differences with the American states.

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415 Yellow fever.

During these political transactions, the two greatest cities of these states, Philadelphia and New York, had suffered very severely by a pestilential disorder called the *yellow fever*. It is understood to have been brought originally by vessels employed in the slave-trade on the western coast of Africa to the West India islands. After producing the most dreadful mortality in that quarter, it was conveyed to the two great cities in America already mentioned, in consequence of their frequent intercourse with the islands. From them it at times extended itself to the other maritime towns. Having once begun, it returned during different seasons towards the end of summer, and many thousand persons perished by it, besides those whose health was permanently injured. More than half the inhabitants fled from the cities; but those infected fortunately either did not infect the inhabitants of the country to whose houses they went, or the infection produced a less dangerous form of disease. The rents of houses sunk about one half in Philadelphia and New York, and their rapid increase was considerably retarded. In consequence, however, of the adoption of those measures of precaution which have been so long practised in Europe, but which have been neglected in America, the danger of a return of the same calamity seems to be somewhat diminished, though from the latest accounts it is by no means done away.

416 Washington, or the federal city.

It has been already mentioned, that a resolution was very early adopted in America of endeavouring to establish a federal city, as it is called, as the capital of the United States, which should be the seat of government independent of every particular state, and having its sovereignty vested in the whole union; and we have stated the circumstances which led to its establishment on the banks of the Potowmack. Congress accordingly commenced its sittings at Washington at the end of the year 1800. For several years preceding that period the commissioners of congress had been employed in making out a plan of the city, and in erecting public buildings for the accommodation of the government. As the desire of wealth is a prevailing passion in America, and as the people there readily engage in extensive speculations upon every subject, the federal city of Washington was for some time made the object of an endless variety of purchases and sales of lots of building

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building ground. The city, however, has not advanced so rapidly as was expected, and many of the speculators have suffered severely. In 1810, the city contained 8208 inhabitants, and Georgetown 4948. In 1817, the two places contained about 20,000.

417 State of parties.

The strong party spirit which raged in America was rather inflamed by some measures of Mr Adams's administration. The new alien law, which required 14 years residence before a foreigner could be naturalized, and the sedition bill, which rendered it penal to use expressions tending to bring the government into contempt, were peculiarly offensive. Under the latter bill, some individuals were tried and punished for speaking disrespectfully of the president. The republicans resented these proceedings as inconsistent with the democratic spirit of the government; regarding them as the introduction of a system of violence and coercion, borrowed from the despotisms of Europe. These feelings operated powerfully at the election of a president in 1801, when, after a keen contest, the democratic party prevailed; Mr Adams was set aside, and Mr Jefferson raised to the presidency. The virulence of party continued for some time, but gradually subsided under the moderate and conciliatory measures of the new administration. The obnoxious laws were repealed or suffered to expire; the military establishment was reduced; the expenses of the government diminished, and in 1802 all internal duties were abolished; the revenue derived from the customs, and from the sale of lands, being found sufficient for the support of the public establishments. Since this period the democratic party has been continually increasing in strength. The history of the crisis in 1801 cannot indeed be too much studied by public men. For some years previous, the American government, supported and strengthened by adventitious circumstances, was pursuing a course certainly at variance with the opinions of the great mass of the people. The resentment which this excited rendered measures of a coercive nature necessary: these measures inflamed still farther the spirit they were meant to repress; and had the government been independent of the people, still stronger measures would have been resorted to under the pretext of extirpating a turbulent and dangerous spirit, till liberty would have expired under the increasing weight of the restrictions imposed on it. But the purity of the representation enabled the people to arrest the government in its career, and to bring it back to a course, which whether wiser in itself or not, was more consonant to the opinions of the people, and therefore preferable. From that period the public discontents ceased, and the government has been administered with a degree of tranquillity, prudence, and moderation, of which it would be difficult to find a parallel instance in the same period.

In 1803, the United States acquired Louisiana by purchase from France, to which it had been ceded by Spain in 1801. The French government received for this country 60,000,000 of francs, in which, however, was included the amount of debts due by France to citizens of the United States.

The vexations to which the American commerce was exposed from the long hostilities of France and England, were greatly aggravated by Bonaparte's famous Berlin decree, (21st November 1806), and that of Milan, (17th December 1807), and by the British orders in council. To avoid being embroiled in the quarrels of these states, congress passed embargo and non-intercourse laws in December 1807; but the mercantile interest, who suffered severely under this system, were so loud in their complaints, that the acts were repealed in March 1809. This same year Mr Madison succeeded Mr Jefferson as president; but this made no change in the course of policy pursued by the government. Circumstances in the mean time were gradually widening the breach between Britain and America. The attack on the Chesapeake vessel of war, the mission of Henry, the numerous seizures of vessels under the orders in council, and the standing grievance of the impressment of American seamen, were all inflaming the public mind in the United States. The orders in council were recalled in June 1812, but before intelligence of this reached America, war had been declared against Britain. The first campaign commenced very disastrously for the Americans. General Hull, who had crossed into Upper Canada at Detroit with 2300 militia, surrendered without resistance on the 16th August 1812. Another expedition into Canada, under General Von-Rensclaer, was equally unfortunate; the army, after carrying the forts opposite Lewistown, being forced to capitulate. A third army, under General Winchester, was defeated by the British under Colonel Proctor, near Detroit, and also capitulated on the 27th January. The Americans had some compensation for these defeats by land in their unexpected success by sea. The capture of the British frigate Guerrier of 49 guns, by the Constitution of 54 guns; of the Frolic of 22 guns, by the Wasp of the same force; of the Macedonian and Java of 49 guns each, by the United States and Constitution of 54, all in the course of 1812, tended greatly to cheer the Americans under their reverses, and to stimulate them to new efforts. The actual difference of force, however, between the vessels, was greater than appears from the enumeration of the guns, as the American ships carry more men and heavier metal.

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In February 1813, the British crossed the St Lawrence and captured Ogdenburg; and the Americans on the other hand took York the capital of Upper Canada by storm in April. In order to destroy the American naval resources on Lake Ontario, Sir George Prevost made an attack on Sackets harbour, but was repulsed with considerable loss. The Americans in the mean time were making great exertions to equip a naval force to command the lakes, and the British had been equally diligent. On Lake Erie, the two flotillas, consisting each of six or seven small vessels, fought an obstinate battle on the 10th September, which terminated in the capture of the whole of the British vessels. This enabled the American general Harrison to drive the British from Malden, Detroit, and all the Michigan territory. On Lake Ontario, the force of the parties was more equally balanced. Sir James Yeo, and Commodore Chauncey chaced one another alternately, each being unwilling to fight unless under peculiar advantages. An expedition was undertaken by General Wilkinson against Montreal, but after some unimportant fighting the enterprise was abandoned. Little more was done during this campaign, except that some American villages along the Niagara frontier were destroy-

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ed by the British. The most important naval action in 1813 was that between the American frigate Chesapeake, and the British frigate Shannon, nearly equal in force, in which the former was taken.

The third campaign threatened to prove much more serious for the Americans; the overthrow of Bonaparte's government in April 1814, having released the British force which had been acting in France. The United States were now assailed at both extremities, and on the sea coast, at the same time. In the month of July, Sir George Prevost having received reinforcements from England, advanced along the western shores of Lake Champlain, with 15,000 men, with the view of gaining possession of Plattsburg. He had advanced to the vicinity of the town, and from the feeble means of resistance it possessed would most probably have carried it; but the British and American fleets on the lake were in the mean time engaged, and Sir George, with every prospect of success, had the mortification to see his fleet defeated, and nearly all captured by the enemy. Considering the co-operation of the fleet as essential to his plan, he abandoned the enterprise, and withdrew to Canada. On the Niagara frontier where the forces were nearly equal, there was much hard fighting. The American general Brown fought two battles with General Rial, and one with General Drummond, in July and August, in all of which the Americans claimed the victory, though no beneficial result followed. The British fleets in the mean time had closed up the Chesapeake and Delaware bays, the Hudson river, and all the other considerable inlets on the coast. By this blockade the American commerce was much harassed and ultimately almost annihilated. The revenue, depending chiefly on their imports, was greatly reduced; and though internal taxes of various kinds were imposed, the supplies were so inadequate, that the government was forced to depend chiefly on loans. At last money could not be raised even in this way. Most of the banks stopped payment, and general distrust and alarm prevailed. To add to the perplexities of the government, Massachusetts and some other of the New England states, took a perfidious advantage of the difficulties of the country, and not only opposed the measures of the general government with the most factious zeal, but actually held a convention with the view of dissolving the union. There is no doubt that many of the leading men in these states corresponded secretly with the British commanders, and were guilty of actions for which in any other country they would have forfeited their lives.

In August 1814, a large British fleet with 6000 troops on board entered the Chesapeake bay, and ascended the Patuxent river, as high as Benedict. The army having disembarked, advanced to Bladensburg, defeated a body of American militia posted there, took possession of Washington, and after burning the president's house, the capitol, navy yard, bridge, and public offices, retired next day to their ships. Alexandria, situated a few miles below Washington, at the same time capitulated; but an attack made on Baltimore on the 12th September, was repelled with great spirit, with the loss of 250 men to the assailants, including the commander in chief General Ross. The destroying of public works at Washington, unconnected with the purposes of war, was represented with some justice by the Americans, as a flagrant violation of the laws of nations; and the keen resentment these acts excited, healed in some measure the party divisions among the leading men, and made them more ardent in the prosecution of the war. While these occurrences were passing on the east coast, a small British force in the gulf of Mexico attacked Fort Bowyer on Mobile point, but was repulsed by General Jackson. The Creek Indians also in the Alabama territory, who had taken arms, were subdued. A more formidable British force, consisting of about 5000 men, under General Packenham, was subsequently assembled in the bay of Mexico, to attack New Orleans. After destroying an American flotilla of gun boats in lake Borgne, a landing was effected. General Jackson was now placed in critical circumstances. To oppose this force, consisting of veterans, he had only about 4700 men, chiefly militia who had never been in battle; and a part of the inhabitants, who were Spaniards, were secretly disposed to favour the enemy. His prudence, judgment, and decision, supplied all deficiencies, and saved Louisiana. He seized certain suspected individuals, and put the town under martial law on his own responsibility. His troops, a part of whom were from Tenessee and Kentucky, though unaccustomed to face an enemy, were admirably skilful in the use of the rifle. Taking a position about five miles below New Orleans, with the river on one flank, and a marsh on the other, he threw up a temporary entrenchment, and waited the attack. The British accordingly advanced on the 8th January 1815, early in the morning. But the riflemen, protected by their breastwork, poured in such a destructive fire upon the assailants, that in the space of one hour the British, though they reached the entrenchment, were compelled to fly, with the enormous loss of 2500 men killed and wounded, besides the general in chief, and the two officers next in command. The loss of the Americans, according to their own accounts, was only six killed and seven wounded. The British reimbarked about a fortnight afterwards. This was the last action of the war by land. Several actions between single ships took place by sea in 1815; of which the most important was that between the President and Endymion, in which the former was taken; and that betwixt the Constitution and two British vessels of inferior size, in which the latter were captured.

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Negotiations had been carrying on for some months at Ghent in the Netherlands; and they were brought to a close by a treaty signed the 24th December 1814. In this treaty it was agreed that the disputes as to boundaries should be settled by a special commission; and that peace should be made with the Indians; but the discussion of the questions relative to impressment and the rights of neutrals was waived as the new circumstances of Europe rendered it unnecessary to stir them.

After the conclusion of the peace, a naval force was sent to chastise the Barbary powers, who had renewed their depredations on the American commerce during the war with Britain. Captain Decatur, after taking an Algerine frigate, dictated a peace to that power, in June 1815, compelling the Dey to give up all slaves, and make reparation for past injuries. Tunis and Tripoli were treated in the same way.

Mr Madison retired from office in 1817, and Mr Munroe,

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Munroe, who had been employed in many foreign missions, and in various public situations within the states, was elected president. Mr Munroe came in on the democratic interest, which seems now to have acquired an immense preponderance; but it is to the credit both of the man and the party, that the public measures have been conducted with singular prudence and moderation; and with much less of party spirit than could have been expected in a government rested entirely on party support.

The Seminoles, a tribe of southern Indians, having committed some excesses in 1817, General Jackson was employed to reduce them; and, in the course of his operations, having formed an idea that they were secretly encouraged by the Spanish authorities in Florida, he advanced into that province, and took Pensacola by force on the 24th May 1818. The United States however restored the place to Spain some time after; but being anxious to gain possession of both Floridas, they continued to treat with Spain for their cession. A treaty to this effect was accordingly signed at Washington, 22d February 1819; but when transmitted to Spain, Ferdinand refused to ratify it. In this state the matter rests.

In 1816, after the close of the war, the debt of the United States amounted to 123,630,691 dollars. During the four years of peace since elapsed, this debt has been reduced to 88,885,203 dollars, or about 19,300,000l. sterling. In 1817 the internal duties were again abolished; and the United States were thus put into a condition which presents a singular contrast with that of every other civilized power. The revenue for 1818 amounted to about 25,000,000 dollars, exclusive of arrears of internal duties; but the shock which trade has received there, from the numerous failures among the banks, and the mercantile interest generally, in 1818 and 1819, renders it probable that the customs and sale of lands will be no longer sufficient to meet the annual expenditure. (*Warden's Account of the United States, Nile's Register.*)

418 Description of the boundaries of the United States.

The territory of the United States over which the population is at present spread, may be compared to a slender cone, the axis of which passes through the Alleghany mountains, bounded by the sea on the south-east and south sides, and on the north-west and west sides by the Canadian lakes, the Wabash, part of its course, and the Mississippi. In this way, excepting on the corners touching New Brunswick belonging to Britain on the north-east, and Florida belonging to Spain on the south-east, the United States are almost entirely surrounded by water. Parallel to the Atlantic ocean, from Georgia on the south to the most northern states, runs a tract of mountainous country, which receives the general appellation of the *Alleghany mountains*. The principal chain of these mountains is crossed by no river. On the eastern side of it a vast variety of streams of the greatest magnitude are formed, which descend into the Atlantic ocean. Beyond this chain of mountains, and parallel to it, at a considerable distance, is the great river Ohio. All the rivers that take their origin among the Alleghany mountains, beyond the principal ridge, flow westward into the Mississippi or Ohio. This last river, after passing along the western side of the Alleghany mountains, falls into the Mississippi, which passes round the southern extremity of these mountains, into the Atlantic ocean at the gulf of Mexico. The territory of the United States west of the Ohio may also be considered as forming a triangle, of which the river Ohio, on the east, forms the base; while the two sides are formed by the chain of lakes already mentioned, and by the river Mississippi. A considerable part of this western territory is still possessed by the Indians. The whole territory of the United States, eastward of the Mississippi, contains, by computation, a million of square miles, in which are - - 640,000,000 of acres,
Deduct for water, - 51,000,000

Acres of land in the United States, 589,000,000

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419 Louisiana acquired.

By the acquisition of Louisiana in 1803, the United States obtained a prodigious accession of territory. The whole surface west of the Mississippi is estimated by Mr Warden at 1,800,000 square English miles; and though there is in this space great tracts of barren mountains and sands, the greater part of it consists of excellent soil, well watered, and abundantly supplied with coal, lime, and salt.

420 The country well watered.

No part of the world has so many navigable waters adjoining to its territory, or passing through it, as the United States of America. The Atlantic ocean, which forms their eastern boundary, is indented with numerous bays, some of which are of very considerable extent, and advance to a considerable distance into the country. On the northern or north-easterly part of the states is the bay of Fundy, between Nova Scotia and New England, chiefly remarkable for its tides, which rise to the height of 50 or 60 feet, and flow so rapidly as to overtake animals that feed upon the shore. Next to it, on the southward, are the bays called *Penobscot* and *Casco*, extending along the coast of the province of Maine, which is the most northern territory of the United States. Massachusets bay follows these, which washes the town of Boston, and is comprehended between Cape Ann on the north, and Cape Cod on the south. Various small bays succeed to these, to the southward, after which is Long Island sound. This is a kind of inland sea, from three to 25 miles broad, and about 140 miles long, extending the whole length of the island, and dividing it from Connecticut. It communicates with the ocean at both ends of Long Island, and affords a very safe inland navigation. Near the west end of this sound, about eight miles eastward of the city of New York, is the strait called *Hell Gate*. It is remarkable for its whirlpools, which make a tremendous roaring at certain times of the tide. They are occasioned by the narrowness and crookedness of the pass, and by a bed of rocks that extends quite across it; but a skilful pilot can with safety conduct a ship of any burden through this strait, with the tide, or at still water, with a fair wind. Still proceeding to the south, is Delaware bay, 60 miles in length, which is so wide in some of its parts, that a ship in the middle cannot be seen from the land. But of all the American bays, the Chesapeak is the largest. Its entrance is between Cape Charles, and Cape Henry in Virginia, 12 miles wide, and it extends 270 miles to the northward, dividing Virginia from Maryland. It is from seven to 18 miles broad, and generally as much as nine fathoms deep, affording many commodious harbours and

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and a safe and easy navigation. It receives the waters of the Susquehannah, Potowmack, Rappahannock, York, and James's rivers, which are all large and navigable. To the south of the Chesapeak, on the coast of North Carolina, are the three bays or sounds called *Albemarle*, *Pamlico*, and *Core*. Of these Pamlico sound, which lies between the other two, is the greatest. It is a kind of lake, or inland sea, from 10 to 20 miles broad, and nearly 100 miles in length. It is separated from the sea in its whole length by a beach of sand, hardly a mile wide, and generally covered with small trees and bushes. Through this bank are several small inlets by which boats may pass. But Ocrecok inlet is the only one that will admit vessels of burden into the most important districts of Edenton and Newbern. This inlet is in lat. 35° 10′, and opens into Pamlico sound, between Ocrecok island and Core bank; the land on the north is called *Ocrecok*, and on the south *Portsmouth*. A bar of sand having 14 feet water at low tide crosses this inlet; and six miles within this bar the channel is crossed by a shoal called the *Swash*, having only eight or nine feet water at full tide. Few mariners, though acquainted with the inlets, choose to bring in their own vessels, as the bar often shifts during their absence on a voyage. To the north of Pamlico sound, and communicating with it, Albemarle sound extends 60 miles in length, and is from eight to 12 in breadth. Core sound, which lies to the south of Pamlico, likewise communicates with it. These sounds are so large, when compared with their inlets from the sea, that no tide can be perceived in any of the rivers which empty into them, nor is the water salt even in the mouths of these rivers. A tract of low marshy territory between Pamlico and Albemarle sounds is called *Dismal Swamp*. The same name, however, is also given to another tract at some distance to the northward of Albemarle sound. A part of this last tract is in North Carolina, and the rest within the boundaries of Virginia.

As already stated, the northern or north-western boundary of the United States, consists almost entirely of a chain of lakes dividing the country from Canada. These lakes consist of by far the largest collections of fresh water that are to be found in the world. The uppermost or most westerly is called the *Lake of the Woods*, from the great forests upon its banks. Its length from east to west is about 70 miles, and in some places it is 40 miles wide. To the eastward of it is Rainy or Long Lake, which is nearly 100 miles long, but never more than 20 miles wide. To the eastward of this is Lake Superior, justly termed the *Caspian of America*. It is undoubtedly the largest bason of fresh water in the world, being 1500 miles in circumference. The water is pure and transparent, and appears generally to rest upon a bed of huge rocks. A great part of its coast is likewise rocky and irregular. It contains many islands, two of which are very considerable. The one, called *Isle Royal*, is about 100 miles long, and in many places 40 miles broad. The lake abounds with fish, particularly trout and sturgeon. It is affected by storms in the same manner as the ocean. Its waves run as high, and the navigation is equally dangerous. It discharges its waters from the south-east corner, by a strait called *St Marie*, of about 40 miles long, into Lake Huron; but this strait is not navigable, on account of its having at one part what the Americans call a *rapid*, that is, a quick descent of the waters among rugged rocks. It does not appear, however, that above one-tenth of the waters which are conveyed by about 40 rivers into Lake Superior, pass out of it by the strait of St Marie, which nevertheless is its only visible outlet. Considerable quantities of copper ore are found in beds upon many small islands in Lake Superior, but it has not hitherto become an object of commerce.

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Lake Huron is next in magnitude to Lake Superior, being about 1000 miles in circumference. On the north side of it is an island 100 miles in length, and no more than eight miles broad. This island is considered as sacred by the Indians. On its south-west side Lake Huron sends out a bay, called *Saganum bay*, into the country, of about 80 miles in length, and about 18 in breadth. At its north-west corner, this lake communicates with Lake Michigan by the straits of Michillimakinac.

Lake St Claire receives the waters of the three great lakes, Superior, Michigan, and Huron, and discharges them, through a river or strait called *Detroit*, into Lake Erie. It is about 90 miles in circumference. Its navigation is obstructed by a bar of sand near the middle, which prevents loaded vessels from passing.

Lake Erie is nearly 300 miles long from east to west, and about 40 in its broadest part. Its islands and banks are much infested with rattle-snakes. Near the islands the water is covered for many acres together with the large pond lily, on the leaves of which, in the summer season, lie myriads of water snakes basking in the sun. The American geographers tell us of a remarkable snake found in this lake, called the *hissing snake*. It is about 18 inches long, and small and speckled. When approached, it flattens itself, and the spots upon its skin become visibly brighter. At the same time it blows from its mouth with great force a subtile wind, said to be of a nauseous smell, which, if drawn in by the breath of the traveller, infallibly brings on a decline, that in a few months proves fatal. This lake is of more dangerous navigation than any of the others, on account of the many perpendicular sharp rocks which it contains. It communicates with Lake Ontario by the river Niagara, which is about 30 miles in length; and which being crossed by a branch of the Alleghany mountains, consisting of lime-stone rock, forms the celebrated falls of Niagara, one of the most wonderful natural objects in the world, on account of the immense weight of water that is at once precipitated from a height which different travellers have estimated variously, from 137 to 160 feet. It has been often described; but as every traveller seems to view it with greater astonishment than his predecessors, we shall state the terms in which it is mentioned by the duke de la Rochefoucault Liancourt, who visited it in 1795. "At Chippaway the grand spectacle begins. The river, which has been constantly expanding from Fort Erie to this place, is here upwards of three miles wide; but on a sudden it is narrowed, and the rapidity of the stream redoubled by the declivity of the ground on which it flows, as well as the sudden contraction of its bed. The channel is rocky; and the interspersed fragments of rocks increase the violence of the stream. The country is flat and even to this point; but here a range of white rocks arises

422 Description of Niagara.

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on each side of the river, which is contracted to half a mile's breadth. This range is a branch of the Alleghany mountains, which proceeding from Florida, previously to their reaching this point, intersect the whole continent of America. The river, more closely hemmed in by the rocks on the right encroaching upon its channel, branches into two arms, one of which flows along the bank formed by the rocks on the right; and the other, far more considerable, being separated by a small island, makes straight on to the left, and sweeps through a bason of stone which it fills with much foam and noise. At length, being again obstructed by other rocks which it meets on its right, it alters its course, with redoubled violence; and, along with the right arm, rushes down a perpendicular ledge of rocks 160 feet high, nearly half concave, and probably worn out by the incessant impetuosity of the waters. Its width is nearly equal to that of its bed, the uniformity of which is only interrupted by an island which separates the two arms, rests unshaken on its rocky basis, and seems, as it were, to swim between the two streams which rush down at once into this stupendous chasm. The waters of the lakes Erie, Michigan, St Claire, Huron, and Lake Superior, and of the numerous rivers emptying themselves into these lakes, incessantly replace the water that thus dashes down. The water of the fall tumbles perpendicularly on the rocks. Its colour is at times a dark green; at others a foaming white, brilliant throughout, and displaying a thousand variegations as it is struck by the rays of the sun, or, according to the time of the day, the state of the atmosphere, the force of the wind, &c. The water which rushes down the rocks rises in part in a thick column of mist, often towering above the height of the falls and mixing with the clouds. The remainder, broken in its perpendicular descent by fragments of rocks, is in continued agitation, spouts and foams, and casts on shore logs of wood, whole trees, boats, and wrecks, which the stream has swept along in its course. The bed of the river formed by the two ridges of rocks, which extend a great way farther, is still more narrowed, as if part of this mighty stream had vanished during the fall, or were swallowed up by the earth. The noise, agitation, irregularity, and rapid descent of the stream, continue seven or eight miles farther on; and the river does not become sufficiently placid for a safe passage, till it reaches Queenstown nine miles from the falls. It is superfluous to mention, that notwithstanding the severity of the winter in this country, the *cataract* as well as the river above it are never frozen. But this is not the case with the lakes and smaller rivers that supply it with water. Enormous flakes of ice rush constantly down this cataract when the thaw sets in, without being entirely dashed to pieces on the rocks; and thus are frequently piled in huge masses up to half its height. With the noise occasioned by the falls, we were less struck than we expected; and Mr Guillemard, as well as myself, who had both seen the Rhine fall near Schafhausen, could not but acknowledge that the noise it produces is far more striking. Yet I must repeat it again and again, that nothing can stand the test of comparison with the falls of Niagara. Let no one expect to find here something pleasing, wildly beautiful, or romantic; all is wonderfully grand, awful, sublime: every power of the soul is arrested; the impression strikes deeper the longer you contemplate, and you feel more strongly the impossibility of doing justice to your perceptions and feelings."

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Lake Ontario, which is the lowest of the great lakes that form the northern frontier of the United States, is of an oval form, and abounds with fish of an excellent flavour. It discharges itself on the north-east into the river Iroquois, which, at the town of Montreal, takes the name of the river St Lawrence; and passing by Quebec, falls into the Atlantic ocean at the gulf of St Lawrence.

The river Mississippi is supposed, when its windings are included, to be upwards of 3000 miles in length, and to extend nearly 2000 in a direct line. It is navigable to the falls of St Anthony in about lat. 44° 30′. About lat. 29°, a large river called the *Illinois*, belonging to the United States, falls into it; and it is soon afterwards joined by a larger river than itself from the south, called the *Missouri*, which has a greater length of navigation. At the distance of 230 miles below its junction with the Missouri, the river Ohio, which is a mile in breadth, falls into the Mississippi. From the mouth of the Ohio it continues to descend 1005 miles to the town of New Orleans, after passing which it falls into the gulf of Mexico. In spring floods the Mississippi rises to a great height, and overflows its banks, depositing upon them immense quantities of fertilizing mud or slime. After its junction with the Missouri, its waters become so loaded with the earthy particles, that in a half-pint tumbler they have been found to deposite a sediment of two inches of slime. Its banks, to a great distance from its mouth, appear to have been gradually formed by the deposition of trees and mud, which its floods bring down from the higher country. The soil is accordingly extremely soft, rich, and moist. It is apt to be broken up by the periodical floods of the river, which sometimes appears to alter its channel.

When in flood, the current of the Mississippi is so strong that with difficulty it can be ascended. The current descends at the rate of five miles an hour; but it is observed, that at this period there is a counter current which runs at the rate of about two miles an hour, close to the banks of the river, which greatly assists the ascending boats. In autumn, when the waters are low, it does not descend faster than two miles an hour, unless where the stream is narrowed by clusters of islands, shoals, and sand banks. The upper parts of the Mississippi are usually navigated in vessels carrying about 40 tons, and rowed by 18 or 20 men; and what is remarkable, the depth of the river increases as it is ascended. The voyage from New Orleans, near the mouth of the Mississippi, upwards to the river Illinois, is usually performed in eight or ten weeks; but the steam-boats recently introduced have rendered the communication vastly more rapid. According to a recent statement, there were in 1819 about 35 steam-boats on the Mississippi, which generally sail at the rate of 60 miles a-day against the stream.

The Missouri exceeds 3200 miles in length, reckoning from the Mississippi; and it is navigable for boats about 3090 miles. The whole extent of navigable waters in the Missouri, and its branches, is estimated at 15,000 miles: that of the Mississippi and its tributaries

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ries at 8500 miles. For an account of the territory watered by the Missouri, see AMERICA, SUPPLEMENT.

422 Lakes in the interior.

The lakes in the interior are by no means equal in extent to those upon the frontier. They are chiefly situated in the state of New York, or in its vicinity. Lake Champlain is the largest. It lies nearly to the east of Lake Ontario, and is about 80 miles in length from north to south, and 14 miles over at its broadest part. The others most considerable in size, are Lake George, which is about 55 miles long from north-east to south-west, but narrow; the Seneca and Cayoga, each about 30 or 40 miles in length; and Lake Oneida, which extends to 25 miles.

423 Eastern rivers.

It has been already mentioned, that, to the eastward of the Alleghany mountains, all the rivers flow into the Atlantic ocean. Of these, beginning with the north, and going southward, the following are the most remarkable. In the states to the eastward of New York, which were formerly called the *New England colonies*, and which are now divided into the five states of New Hampshire, Massachusets, Rhode Island, Connecticut, and Vermont, there is only one river of any importance, called *Connecticut river*. It rises in lat. 45° 10′, long. 71° west from London. Its length in a straight line is nearly 300 miles. At its mouth is a bar of sand which obstructs the navigation. Ten feet water at full tides is found upon this bar. The river is navigable to Hartford, which is upwards of 50 miles from its mouth, and the produce of the country for 200 miles above is brought thither in boats. The boats which are used in this business are flat-bottomed, long, and narrow, for the convenience of going up the stream, and of so light a make as to be portable in carts. They are taken out of the river at different carrying-places.

To the south of Connecticut river is Hudson's river, one of the largest and finest in the United States. It rises in the mountains between the lakes Ontario and Champlain, and is 250 miles in length, falling into the ocean near New York, which stands upon it. About 60 miles above New York the water becomes fresh; but the tide flows a few miles beyond the flourishing town called *Albany*, 160 miles above New York, and to this distance the river is navigable by sloops of 80 tons burden. From Albany to the neighbourhood of Lake George is 65 miles, and to this distance the river is navigable by light boats; but there are two portages, or carrying-places, in the way, of half a mile each. By this river the produce of the remotest farms is easily and speedily conveyed to a certain and profitable market at the great trading city of New York. Its banks are populous to a considerable distance, and a flourishing inland trade is carried on upon it between Albany and New York in nearly 100 vessels of about 70 tons burden, the greater part of which belong to the inhabitants of Albany. They make ten voyages in a year, are navigated by a master, a mate, and two men. The steam boats, however, now furnish a much more speedy conveyance.

The next great river to the southward is the Delaware. It rises in the state of New York in Lake Utstayantho, and takes its course south-west, till it crosses into Pennsylvania, in latitude 42°. Thence it still proceeds southward, dividing the states of New York and New Jersey, passing into the ocean through Delaware bay, having New Jersey on the north-eastern side, and Pennsylvania and Delaware on the west. From the mouth of Delaware bay, between Cape Henlopen and Cape May, to the city of Philadelphia, is about 118 miles. So far there is a sufficient depth of water for a 74 gun ship. At Philadelphia the river is extremely beautiful, passing through a rich and populous country. It is three miles broad, and the water is perfectly fresh. From Philadelphia upwards to Trenton Falls, where the sloop-navigation ends, is 35 miles. The river is navigable 40 miles farther for boats that carry eight or nine tons; and, with some carrying-places, it is navigable for Indian canoes, or such boats as we have already mentioned to be in use upon Connecticut river, for 150 miles. The tide reaches Trenton Falls, and rises six feet at Philadelphia. Three miles below this city, the Delaware receives the river Schuylkill, which is navigable about 85 or 90 miles.

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The Susquehannah river also rises in the state of New York, crosses the state of Pennsylvania, and flows into the great bay of Chesapeak, after receiving many large streams, several of which are navigable for 50 miles; this river itself being navigable to an immense extent, though sometimes interrupted by rocks, which form troublesome rapids.

Next to these follow the Virginian rivers, the greater part of which flow into the bay of Chesapeak. The value of these streams can only be understood by an inspection of the map of the country. Almost every farm house, to the eastward of the Alleghany mountains, has a navigable river at its door: the result of which has been, that few towns of any consequence exist there, and every planter is in some measure a merchant as well as a cultivator of the soil. The most northerly of the Virginian rivers is the Potowmack, upon which the federal city of Washington is placed. It is seven miles and a half broad at the mouth. The distance from the capes of Virginia to the termination of the tide-water in this river is above 300 miles, and it is navigable for ships of the greatest burden nearly to that extent. Thereafter it is obstructed by four considerable falls, or rather rapid descents of the stream among rocks, which for a few miles interrupt the navigation. At these falls, however, navigation is continued, by means of canals supplied with locks; so that this river affords a water communication for many hundred miles above the termination of the tide. It also receives a great variety of navigable streams; one of which is the Shenandoah, which is said to be navigable for small vessels for upwards of 100 miles. The Rappahannock, York river, and James's river, with their various tributary streams, follow in succession. In a multitude of directions, they afford a communication across the first ridge of mountains, called the *Blue mountains*, to the foot of the great middle ridge, or the proper Alleghany mountains. In their course they not only facilitate the intercourse of the inhabitants, but, in several situations, exhibit instances of splendid and beautiful scenery. The junction of two of these rivers presents some beautiful scenery.

To the southward of Virginia, that is, in the states of North Carolina and Georgia, a great variety of rivers flow into the ocean. As the face of the country, however, is very level, the sand which they bring down in spring floods, or which is cast up by the ocean upon the

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the coast, is apt to obstruct the entrance into them; so that they are deeper within the country than at the shore. One general rule obtains with regard to them: They are navigable by any vessel that can pass the bar at their mouths; and while a river continues broad enough for a vessel to turn round, there is generally a sufficient depth of water for it to proceed. In North Carolina, the principal rivers are, the Roanoke, which is navigable for small vessels about sixty or seventy miles; the Pamlico, which is navigable for 90 miles; Neus river, which carries small boats to the distance of 250 miles; and Trent river, which is navigable for 40 miles. In South Carolina are the Sante, the Savannah, and the Pedee, which rise from various sources in that ridge of mountains which divides the waters which flow into the Atlantic ocean from those which fall into the Mississippi. They are navigable to a great distance, as well as a variety of others of less note. In Georgia there are also several rivers, which are navigable to the distance of eighty or ninety miles; but the entrance into them from the ocean is very difficult, as the extreme flatness of the country prevents the stream from having sufficient force to keep their current clear of obstructions at their confluence with the sea-tides.

424 Western waters.

The western waters of the United States, or those beyond the Alleghany range, are not less abundant, or less convenient for navigation, than those on the eastern side of the mountains. We have already remarked, that at Pittsburg the great river Ohio commences; being there formed by the confluence of two, or rather three rivers, the Alleghany, the Monongahela, and the Yohogany; which last runs into the Monongahela, about fifty miles above Fort Pitt. These three rivers, previous to their junction, afford an inland navigation of many hundred miles. The Monongahela is no less than 400 yards wide at its mouth. At the distance of 100 miles above this, it is still 300 yards in breadth, and affords good navigation for boats. For 50 miles higher it is still navigable; though the navigation is apt to be interrupted during dry seasons. The Alleghany also affords a very distant navigation, extending at times, in very small vessels, to within 15 miles of Lake Erie, on the northern boundary of the United States. The Ohio, being formed by the junction of these rivers, proceeds along the back, or western side, of the Alleghany, to the distance of 1188 miles before it falls into the Mississippi, receiving in its course a great variety of tributary streams, both from its eastern and western sides. It is said to be one of the most beautiful rivers on earth; its current is gentle; its waters are clear; and its bosom smooth and unbroken by rocks and rapids, a single instance excepted. It is one quarter of a mile wide at Pittsburg, and increases gradually to one mile in width at its mouth; though at various places it is occasionally broader and narrower. At the rapids, or rocky part of its channel, which for about a mile disturb the navigation, it is only a quarter of a mile in breadth. These rapids are in latitude 38° 8′. It affords at all times a sufficiency of water for light boats to Pittsburg. The inundations of the river begin about the last of March, and subside in July. During these, were it not for the rapidity of the current, and the sudden turns of the river, a first rate man of war might ascend from the ocean to the rapids. But at this place the rise of the water does not exceed ten or twelve feet. The water there descends about thirty feet in a mile and a half. The bed of the river is a solid rock, and is divided by an island into two branches. But it is said that the southern branch is at most seasons navigable in small boats, when conducted by skilful pilots.

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The following are the chief rivers which flow into the Ohio from the east: The Great Kanhaway, and the Little Kanhaway; the navigation of which last is much interrupted by rocks. The former, however, affords a tolerable navigation of about 90 miles, and is 280 yards wide at its mouth. The Little Kanhaway is 150 yards broad; but it is navigable only for 10 miles.—After these are the rivers called Sandy, Licking, and Kentucky. The former constitutes the eastern boundary of Kentucky, and reaches the Alleghany mountains. It is of no great size. Licking river is 100 miles in length, and 100 yards broad at its mouth. The Kentucky is a very crooked stream, of 200 miles in length. It falls into the Ohio by a mouth of 100 yards broad.

Below the rapids of the Ohio, in the rich country of Kentucky, is Salt river, 90 miles in length, and 80 yards wide. Green river falls into the Ohio 120 miles below the rapids. Its course is upwards of 150 miles. Cumberland river falls into the Ohio 413 miles below the rapids. Its length is upwards of 550 miles. These rivers are navigable for boats almost to their sources, without rapids or interruptions, for the greatest part of the year. Their banks are generally high, and composed of limestone. Below these is the Tenessee, which runs into the Ohio a short way below the mouth of the Cumberland. The Tenessee is 600 yards wide at its mouth, and upon ascending it, to the distance of 200 miles, it widens to between two and three miles; which width it continues for nearly thirty miles. Thus far it is navigable by vessels of great burden. Here, however, it is interrupted by certain shoals, called the *Mussel Shoals*, from the great quantity of shell fish with which they are covered. These shoals can only be passed in small boats; above which, however, the river again becomes navigable for boats of forty or fifty tons burden for some hundred miles; and it is easily navigated at least 600 miles above the Mussel Shoals.

Of the rivers that flow into the Ohio from the west the following are the chief: The Muskingum, which is a gentle stream, confined by high banks. With a portage or carrying-place of about one mile, it affords a communication with a small navigable stream called the *Cayahoga*, which flows into Lake Erie. Thereafter is the river Hockhocking, inferior to the Muskingum, but navigable for large boats about seventy miles, and for small ones much farther, through a country abounding with coal, iron, stone, and other minerals. Next is the Sioto, which can be navigated with large barges for 200 miles. Then follows the Great Miami, which is navigable to an immense distance, even to the neighbourhood of Lake Erie. The Wabash falls into the Ohio by a mouth 270 yards wide, 1020 miles below Pittsburg. The Wabash is a beautiful river, with high and fertile banks. It can be navigated with boats drawing three feet water, 412 miles, and by large canoes 167 miles farther. Besides these streams which fall into the Ohio, a variety of

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rivers of great size and importance are to be found still farther to the westward within the territories of the United States. They either fall into the Mississippi on the south-west, or into the great northern lakes; but a particular description of them here is unnecessary. One of the chief of them is the Illinois, which falls into the Mississippi, 176 miles above or to the westward of the Ohio, by a mouth about 400 yards wide. It is navigable to a great distance, and interlocks with the rivers that fall into the northern lakes, in such a way as to furnish a communication with Lake Michigan, with the aid of two portages, the longest of which does not exceed four miles. It receives a number of rivers, which are navigable for boats from 15 to 180 miles.

One general remark must be made with regard to all the American rivers; that, in consequence of the immense torrents of rain which fall at certain seasons of the year, they are liable to swell, and to overflow their banks in a most violent manner; arising, in a short time, 10, or even 20 or 25 feet in height. This renders their navigation not a little difficult, on account of the great force that is necessary to convey a vessel upwards against the rapidity of the stream. These great floods also render it difficult to establish canals at those parts of any river where falls, or, as the Americans stile them, rapids, occur; because the locks, which, in such situations, are necessary upon the canals, to raise and let down the vessels, are in great danger of being swept away by the sudden swelling and overflowing of the river. Notwithstanding this inconvenience, however, it is abundantly evident, that no country on earth possesses the same advantages, in point of internal communication, with the United States of America. Even the great Alleghany ridge, which seems to form a barrier between the east and the west, is so closely approached on both sides by navigable streams, that the land carriage necessary in crossing it extends, in some situations, to little more than 40 miles; and, when the increasing population of the country shall have rendered such a measure useful or necessary, it will probably be found not difficult to complete the communication by water by the aid of artificial canals.

425 Face of the country.

With regard to the general face of the country within the territory of the United States, it is very various. We have already stated, that a great chain of mountains runs from the state of Georgia northward, parallel to the Atlantic ocean, all the way to the great northern lakes. These mountains are not solitary, or scattered in a confused manner; but are formed into different ridges, receiving various appellations in different states. In Pennsylvania, Virginia, and North Caroliua, the principal ridges, beginning on the east, are called, first, the *Kittatinny* or *Blue Mountain*, at the distance of from 120 to 130 miles from the sea. It is about 4000 feet high, and the country rises from the sea so slowly and gradually towards it, as to appear altogether level. Back from the first ridge, and nearly parallel to it, are the ridges called *Peters*, *Tuscorara*, and *Nescopek;* but these names are not in all places adhered to. Then follow the ridges called in Pennsylvania *Shareman's hills*, *Sidelong hills*, *Ragged*, *Great-warriors*, *Erits and Wills mountains;* then the great Alleghany ridge which gives its name to the whole. Beyond it are the Laurel and Chesnut ridges, and various others. These ridges being parallel to each other are themselves incapable of cultivation; but they are divided by rich plains of various breadth and of immense length, containing rivers of different degrees of magnitude. On the east of the mountains, from the lowest ridge to the ocean, the country, as already mentioned, descends very gradually; and in the southern states, for 150 miles from the ocean, is almost entirely level, consisting of a low flat country, apparently formed by sand thrown up by the tides, and by particles of mud deposited by the rivers in their spring floods. In the southern states, that is, those to the south of New York, the soil near the rivers is coarse or fine, according to its distance from the mountains. Near them it contains a large mixture of coarse sand; but on the banks of the rivers towards the sea, it consolidates into a fine clay; which, when exposed to the weather, falls down into a rich mould. In the states of South Carolina and Georgia, for many miles from the ocean, when a pit is dug to the depth of 20 feet, every appearance of a salt marsh is usually found, such as marsh grass, marsh mud, and brackish water.

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Beyond the Alleghany mountains the country to the westward is irregular, broken, and variegated, but without great mountains. Various small ridges, however, descend to the westward, between which flow the rivers that run into the Ohio. In some situations, particularly in the neighbourhood of Pittsburg, the variety of ite surface is said to render the country extremely beautiful.

Towards the north part of the state of New York, and in the New England states, the country, different from the rest of America, is rough and hilly, or even mountainous, though, upon the whole, their mountains are trifling when compared to those in other parts of the world. Nor does it appear, that in almost any part of the United States, any such thing is to be met with as mountains entirely rugged and barren, rearing their naked summits to the clouds. Even to the top of the Alleghany ridge the whole country is one waving forest, though the trees are of different size and species, according to the variety of soil upon which they stand. Notwithstanding this general regularity of the surface of the country, to the eastward of the mountains, it is not destitute of objects which mark it to have undergone convulsions or changes. Of these we may mention one instance, being a curiosity worthy of attention, in the state of Virginia, called *Natural Bridge* or *Rockbridge*. It is on the ascent of a hill which seems to have been cloven through its length by some great convulsion. The fissure just at the bridge is, by some admeasurements, 270 feet deep, by others only 205. It is about 45 feet wide at the bottom, and 60 feet at the top. The breadth of the bridge in the middle is about 60 feet, but more at the ends, and the thickness of the mass at the summit of the arch is about 40 feet. A part of this thickness consists of a coat of earth which gives growth to many large trees. The residue, with the hill on both sides, is one solid rock of limestone. Though the sides of this bridge are provided in some places with a parapet of fixed rocks, yet few men have resolution to advance, without creeping upon their hands and feet, to look over into the abyss. To a spectator from the low ground, the arch appears beautiful and light, as if springing

426 Natural bridge.

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springing towards heaven; affording through it a pleasing view of the mountains at five miles distance. The water passing under the bridge is called *Cedar Creek*, and the bridge itself is a part of a public road, as it affords a commodious passage across a valley. The county, in which it is situated, is called from it the *County of Rockbridge*.

427 Caverns.

In the same state of Virginia, there are some caverns mentioned by the American geographer, Dr Morse, which are not unworthy of notice as natural curiosities. The most noted is that called *Maddison's Cave*, on the north side of the mountains denominated the *Blue Ridge*, near the river Shenandoah. It is in a hill of about 200 feet perpendicular height, the ascent of which on one side is so steep, that you may pitch a biscuit from its summit into the water which washes its base. The entrance of the cave is in this side, about two-thirds of the way up. It extends into the earth about 300 feet, branching into subordinate caverns, sometimes ascending a little, but more generally descending, and at length terminates in two different places, at basons of water of unknown extent, nearly on a level with the water of the river, of which, however, they do not seem to be refluent water, as they are never turbid, and do not rise and fall in correspondence with it, in seasons of rain or drought. The vault of the cave is of solid limestone, from 20 to 40 and 50 feet high, through which water is continually percolating. This water has deposited a crust, forming the appearance of an elegant drapery on the sides of the cave, and, in dropping from the roof of the vault, generates, on that and on the base, stalactites of a conical form, some of which have met and formed massy columns.

There is another cave, in the North Ridge or North Mountain, which enters from the summit of the ridge. The descent is at first 30 or 40 feet perpendicular, as into a well, from whence the cave extends nearly horizontally 400 feet, preserving a breadth of from 20 to 50 feet, and a height of from five to 12 feet. The heat of the cave is permanently at about 47° of Fahrenheit's thermometer.

In another ridge is a blowing cave in the side of a hill. It is about 100 feet diameter, and constantly emits a current of air, of such force, as to keep the weeds prostrate to the distance of 20 yards before it. The current is strongest in frost, and weakest after long rains. It probably communicates with a waterfall in the bowels of the earth, the dashing of which generates the current of air, as we know that at the mines, called *Lead Hills*, in Scotland, for more than a century past, a small waterfall at the bottom of a mine, has been used for the purposes of ventilation, the air generated from the water being conveyed in large tubes to any place where it is wanted. The blowing engine, called the *trompe*, which is used at some founderies, is also constructed on the same principle.

Rochefoucault's Travels, vol. ii.

On the first of June 1796, a pretty remarkable phenomenon occurred in the vicinity of the town of Katskill, in the state of New York. The country in the neighbourhood is a succession of little hills, or rather small elevations, detached from each other, and only connected a little at the basis. One of these hills, the nearest to Katskill Creek, and elevated about 100 feet above the level of the creek, suddenly suffered a sinking of more than half its declivity. It might have measured about 150 feet, from its summit to the extremity of its base, following the line of inclination. A breadth of about 80 fathoms fell in, beginning at about 3 or 4 fathoms from the top. The sunken part gave way all of a sudden, and fell so perpendicularly that a flock of sheep feeding on the spot, went down with it without being overturned. The trunks of trees that remained on it in a half rotten state, were neither unrooted, nor even inclined from their former direction, and now stand at the bottom of this chasm, of above four acres in extent, in the same perpendicular position, and on the same soil. However, as there was not sufficient space for all this body of earth, which before had lain in a slope, to place itself horizontally between the two parts of the hill that have not quitted their station, some parts are cracked, and as it were furrowed. But a more striking circumstance is, that the lower part of the hill, which has preserved its former shape, has been pushed and thrown forward by the sinking part making itself room; that its base has advanced five or six fathoms beyond a small rivulet, which before flowed at the distance of above 10 fathoms from it; and that it has even entirely stopped the course of its stream. The greatest elevation of the chasm is about 50 or 60 feet: in its sides it has discovered a blue earth, exhibiting all the characteristics of marl. In some of the strata of the marl is found sulphate of lime in minute crystals. The sinking of the hill made so little noise, as not to be heard at the proprietor's house, at the distance of 300 fathoms, nor at the town, which is separated from the hill only by the narrow stream of the creek.

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428 Soil.

The soil of the United States is not less various than in other countries. In the New England states, in consequence of the irregularity of the surface, rich and poor territory are interspersed; but in the southern states, the limits of the fertile and of the more unproductive parts of the country are more distinctly marked. In general the soil is less deep and rich as the land approaches towards the mountains. The neighbourhood of the sea consists of great swamps, which being overflowed by the adjoining rivers, render the land unhealthy, though fit for the cultivation of rice and other valuable productions. Hence, as the first or lowest ridges of mountains possess a considerable degree of fertility, they are better inhabited, because more healthful than the low country. The long valleys between the ridges of the Alleghany mountains are everywhere fertile; but they are sometimes very narrow. Beyond the mountains from Pittsburg to the northern lakes in the back parts of the state of New York, the country is fertile but moist, and lies low. Around Pittsburg itself, as already mentioned, to a considerable distance, the country has a beautiful variegated aspect. On the eastern side of the Ohio, however, below Pittsburg, the country speedily becomes rugged; and, for some hundred miles, is little inhabited, to the borders of the fertile country of Kentucky, which in a few years has been settled, rendered populous, and assumed into the number of the United States. To the westward of the Ohio river the soil is generally rich, but in some places rather marshy. The surface has an agreeable undulation, and there are extensive tracts of land called *prairies*, which are found naturally clear of wood, and ready for cultivation. In general, concerning the

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whole American territory, it may be observed, that wherever the land is tolerably level, it must have been originally fertile. Being covered with forests, it received every year a bed of leaves spread over its surface; which, by continually rotting in succession, have formed a vegetable mould of great fertility.

429 Minerals.

The mineral productions of the territory of the United States are various, as in other parts of the world. The form of mountains, rocks, and beds of different minerals, is the same here as elsewhere. There are found different species of granite, combined and varied as in the mountains of Europe; innumerable kinds of schists, of limestones, more or less perfect, and minerals of almost every species. In general, however, it may be remarked, that American mineralogy offers few varieties for observation, as the same substances usually pervade a considerable tract of country. The great mountains, that is to say, the most elevated, particularly the central ridge of the Alleghany, and the highest mountains of New England, are generally formed of granite. Those of inferior altitude successively exhibit schistus more or less perfect, slate, feldtspath, calcareous stone, and some sand stones of extreme hardness, and in a state of great perfection. The whole territory to the eastward of the Alleghany mountains, appears to embosom vast quantities of iron ore. The iron ore is of two kinds: one is capable of being manufactured into malleable iron, and is found in the mountains, and also in low barren soils. The other kind of iron is called *bog-ore*. It is produced in rich valleys. It is said to consist of iron united with the phosphoric acid. In the furnace it yields iron of a hard brittle quality. In consequence of the abundance of timber still to be found in the country, a considerable number of iron mines are wrought to the eastward of the mountains; the fuel used in which consists of charcoal. Their produce, however, is very trifling; none of them make more than to the amount of 1600 tons of pig iron annually, and about 150 of bar iron. The toughness of the cast iron manufactured in some of the Virginian furnaces, is said to be very remarkable. Pots and other utensils, cast thinner than usual, of this iron, may be safely thrown into or out of the waggons in which they are transported. Salt pans made of it, and no longer wanted for that purpose, cannot be broken up to be melted again, unless previously drilled in many parts. Coal mines are wrought in the eastern part of Virginia; but, upon the whole, little coal is found in the United States to the eastward of the mountains, where iron ores are extremely abundant. On the contrary, to the westward of these mountains, iron has scarcely been perceived; whereas coal is in the greatest plenty. In the fine country round Pittsburg, at the head of the Ohio, 320 miles west from Philadelphia, coal is not only extremely plentiful, but of a very superior quality. A bed of it in that neighbourhood was on fire for about twenty years, but little damage appears to have been produced. Coal has been discovered in so many places to the eastward of the Ohio, as to produce an opinion, that the whole tract of country beyond the mountains, from Pittsburg to the Mississippi, abounds with it. Immense beds of limestone rock are to be found in the most eastern tract of mountains. Below these mountains it seldom appears; but in Virginia, from the Blue Ridge westward, the whole country seems to be founded on a rock of limestone, besides great quantities on the surface both loose and fixed. It is formed into beds which range as the mountains and sea coast do, from south-west to north-east; the laminæ of each bed declining from the horizon towards a parallelism with the axis of the earth. In some instances, however, but rarely, they are found perpendicular and even reclining the other way. But such cases are always attended with signs of convulsion, or other circumstances of singularity. Limestone is also found on the Mississippi and Ohio. Indeed that mineral appears to pervade the whole length of the ridges of the Alleghany mountains; and towards the lakes Eric and Ontario, the whole country rests upon limestone. It is not found on the high ridges themselves of the Alleghany mountains; but it occupies the fertile valleys between them, and is seen at the banks of the rivers which pass along these valleys. It sometimes appears to the eastward, in the form of very fine marble, chiefly coloured, quarries of which are wrought to adorn the houses of the wealthier citizens in the great towns.

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Copper has been found in a variety of situations to the eastward of the mountains. At the distance of eight or ten miles from New York is a pretty rich copper mine. The ore is irregularly scattered through a kind of sand-stone, often resembling grit, and sometimes the pudding-stone. It yields from 60 to 70 pounds of fine copper per cwt. Previous to the revolution it used to be carried to England, where it bore a higher price than any other ore of the same metal. The mine has been several times wrought, abandoned, and resumed. Some workmen, mostly Germans, were brought over from Europe for the purpose within these few years, and paid from 15 to 20 dollars per month. But the high price of labour and the difficulty of obtaining well executed machinery, impose in the United States great difficulties upon all mineralogical enterprises. At New Brunswick in New Jersey, a copper mine was at one time wrought, in which large quantities of virgin copper were discovered. In particular, in the year 1754, two lumps of virgin copper are said to have been found, which together weighed 1900 pounds. In the course of a few years preceding, within a quarter of a mile of New Brunswick, several pieces of virgin copper, from five to thirty pounds weight, in whole upwards of 200 pounds, were even turned up in a field by the plough; but the mine has ceased to be wrought, and the search for the metal discontinued.

Considerable quantities of black lead are found, and occasionally taken for use from a place called *Winterham*, in the county of Amelia in Virginia. No work is established there; but those who want the mineral go and procure it for themselves.

To the westward of the mountains some lead mines have been found, which will probably hereafter become valuable. In the western part of the state of Virginia, one mine has been for some time wrought by the public. The metal is mixed sometimes with earth, and sometimes with rock, which requires the force of gunpowder to open it. The proportions yielded are from 50 to 80 pounds of pure metal, from 100 pounds of worked ore. The most common proportion is that of 60 to 100 pounds. The lead contains a portion of silver, too small to be worth separation under any process known

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to the American workmen. The veins are at times very flattering, and afterwards disappear suddenly and totally. They enter the side of the hill and proceed horizontally. Only about 30 labourers have been employed, and they cultivate their own corn. They have produced 60 tons of lead in a year, but the general quantity is from 20 to 25 tons. Lead mines are also said to have been discovered on the upper parts of the Mississippi, extending over a great length of country; but they are not wrought. Silver mines are also said to have been found in the territory of New York, and in the western country, particularly on the Wabash river; but they are too poor to be worth working. In the territory of New York zinc has been found, and likewise manganese, with various kinds of pyrites, and petrified wood, plaster of Paris, talc, crystals of various kinds and colours, asbestos, and several other fossils; also a small black stone, which vitrifies with little heat, and makes good glass.—A kind of mica, called by the Americans *isinglass*, has also been found, which is transparent, and capable of being divided into thin laminæ or sheets, which may be used as a convenient substitute for window glass. Amethysts have been frequently found in Virginia; and even the emerald is not unknown. In the north mountains are immense bodies of schist, containing impressions of shells of various kinds. Petrified shells are also found in very elevated situations at the first sources of the Kentucky river. On the banks of Savannah river in South Carolina, about 90 miles from the sea in a direct line, and 150 or 200 as the river runs, there is a remarkable collection of oyster shells of an uncommon size. They run in a north-east and south-west direction, nearly parallel with the sea-coast, in three distinct ridges, which together occupy a space of seven miles in breadth. Such a phenomenon cannot easily be accounted for in any other way than by supposing the whole of this flat country to have been at one period an appendage of the ocean.

430 Sulphur and nitre found in the western territory.

Sulphur is said to be found in several places of the western territory; and nitre is obtained, as in Spain, by lixiviating the fat earth that is found upon the banks of the rivers. But the most valuable mineral that has hitherto been found in Kentucky and other parts of the western territory, consists of the salt that is obtained by the evaporation of the water of certain springs. Such springs appear to be unknown to the eastward of the mountains; but they abound upon the Ohio, where they are more necessary on account of the great distance from the sea. They were discovered in the following curious manner:—The first inhabitants found, that the wild beasts of the forest, especially the buffaloes and deer, were accustomed to come in great crowds to certain spots, and there to employ themselves, apparently with much pleasure, in licking the ground. On examining the soil at these places, it was found to possess a considerable impregnation of sea salt, of which almost all animals that feed upon vegetables are known to be fond. The want of this commodity was a source of much distress to the first emigrants to Kentucky, and was one of the chief obstacles to the settlement of the country; but the example of the inferior animals, indicated a mode of relieving their wants. The spots frequented by the buffaloes were called *licks*, and at every lick it was found that an area of from five to ten acres is impregnated with common salt; so that by digging wells salt water might be obtained, from which salt can be extracted by evaporation. At least 12 of these licks, or salt springs, have been found in the new state of Kentucky; the principal of which are, Bullet's Lick, or Salt River, 20 miles from the rapids of the Ohio; Drinnon's Lick, about a mile and a half from the mouth of the Kentucky. On what is called *Licking Creek* there are two springs, called the *Upper* and *Lower Blue Licks;* and there is one called *Great Bone Lick*, from the bones of animals of a monstrous size, of a species that no longer exists, that have been found scattered in its neighbourhood. The water obtained from these springs is by no means so strong as sea water. It requires nearly 400 gallons to make one bushel of salt, which is more by one half than would be wanted of sea water in the same latitude to produce that quantity. In consequence, however, of the abundance of fuel that exists in a country where the finest timber is still considered as a nuisance, salt is here manufactured in plenty, and is sold tolerably cheap,

431 Salt springs, or licks, in Kentucky.

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432 Names of the salt springs.

433 Mineral springs.

Various springs of water impregnated with other mineral ingredients have been found in the territory of the United States, some of which are much frequented by valetudinarians. In 1794, a sulphureous spring was discovered at a few yards distance from the banks of the river Chippaway, which falls into the Niagara, a little above the falls. On the approach of a firebrand, the vapour or steam kindles, assumes the form of burning spirit of wine, and burns down to the bottom. In the state of New York, the springs of Saratoga are much noted. They are eight or nine in number, situated on the margin of a morass, about twelve miles west from the confluence of a stream called *Fish Creek* with Hudson's river. They are surrounded by a limestone rock, apparently formed of petrifactions deposited by the water. One of the springs particularly attracts attention: It sometimes rises above the earth in the form of a pyramid. The aperture in the top which discovers the water is perfectly cylindrical, about nine inches diameter. In this the water is about twelve inches below the top, except at its annual discharge, which is commonly at the beginning of summer. At all times it appears to be in as great agitation as if boiling in a pot, although it is extremely cold. The same appearances obtain in the other springs, except that the surrounding rocks are of different figures, and the water flows regularly from them. The air which rises in the springs, and causes the ebullition, appears to consist in part at least of carbonic acid gas, with which the water is strongly impregnated, as well as with lime, dissolved by the acid. It also contains a chalybeate impregnation. In the chain of the Alleghany mountains called *Laurel Ridge*, about latitude 36°, there is a spring of water 30 feet deep, very cold, and as blue as indigo; but the nature of the impregnation has not been ascertained.

There is in Pennsylvania, beyond the mountains, a stream called *Oil Creek*, which flows into the Alleghany river. It issues from a spring, on the top of which floats an oil similar to that called *Barbadoes tar*, and from which one man may gather several gallons in a day. The troops sent to guard the western post halted at this spring, collected some of the oil, and bathed their

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their joints with it. This gave them great relief from the rheumatic complaints with which they were affected. The waters, of which the troops drank freely, operated as a gentle purge.

In the county of Augusta in Virginia, near the sources of James's river, are two springs, distinguished by the appellation of *Warm* and *Hot*. They are eight miles distant from each other, and are strongly impregnated with sulphur. They are said to be useful for rheumatic, and some other complaints. The *warm spring* issues with a very bold stream, sufficient to work a grist mill, and to keep the waters of its bason, which is 30 feet in diameter, at blood heat, or 96° of Fahrenheit. The *hot spring* is much smaller, and has been so hot as to boil an egg. Some believe its degree of heat to be lessened. It raises the mercury in Fahrenheit's thermometer to 112°. It sometimes relieves where the warm spring fails. A fountain of common water issuing near its margin gives it a singular appearance. What are called the *sweet springs* are in the county of Botetourt in the same state, at the eastern foot of the Alleghany, 42 miles from the warm springs. They are quite cold, like common water, and their nature is little known; but all the three sorts of springs are much frequented. On the Potowmack, and on York river, are also some springs, supposed to be medicinal; but in favour of whose virtues little is known.

In the low grounds of the river called Great Kanhaway, 67 miles above the mouth, is a hole in the earth, of the capacity of thirty or forty gallons, from which issues constantly a bituminous vapour, in so strong a current as to give to the sand about its orifice the motion which it has in a boiling spring. On presenting a lighted candle or torch within 18 inches of the hole, it flames up in a column of 18 inches diameter, and four or five feet in height, which sometimes burns out within 20 minutes, and at other times has been known to continue three days, and then has been left still burning. The flame is unsteady, of the density of that of burning spirits, and smells like burning pit-coal. Water sometimes collects in the bason, which is remarkably cold, and is kept in ebullition by the vapour issuing through it. If the vapour be fired in that state, the water soon becomes so warm that the hand cannot bear it, and evaporates wholly in a short time. On Sandy river there is a similar hole that sends forth a bituminous vapour, the flame of which is a column of about twelve inches diameter and three feet high.

In the state of Georgia, in the county of Wilkes, about a mile and a half from the town of Washington, a spring rises from a hollow tree, four or five feet in length. The inside of the tree is incrusted with a coat of nitre an inch thick, and the leaves round the spring are incrusted with a substance as white as snow, which has not been analyzed. It is recommended for scurvy and scrophulous disorders.

434 Vegetables.

The vegetable kingdom in the United States of America is so extremely rich, that even an enumeration of its remarkable objects would greatly exceed the bounds which we have here prescribed to ourselves. Indeed, it does not appear that, excepting the sugar cane, any valuable vegetable production is known which cannot be reared within some part of the territory of the states. With regard to the natural growth of these countries, it consists of an endless variety of trees and shrubs, and lesser plants. Each tract of different soil is usually distinguished by its peculiar vegetation, and is pronounced good, middling, or bad, from the species of trees which it produces; and one species generally predominating in each soil, has produced the descriptive name of *Oak Land*, *Birch*, *Beech*, and *Chesnut Lands*, *Pine Barren Land*, *Maple*, *Ash* and *Cedar Swamps*. Intermingled with these, which in the New England states are the predominating species, we find in that northern territory others, as walnut, firs, elm, hemlock, moose wood, sassafras, and many others. Walnut and chesnut trees indicate the best lands; beech and oak grow upon the second; the fir and pitch pine upon the third; barberry and other bushes upon lands of the next quality; and marshy shrubs upon the worst. Along with these are found a variety of flowering trees and shrubs, including all those known in Europe. Among the fruits which grow wild in all the states are several kinds of grapes, which are small, sour, and thick skinned. The vines on which they grow are very luxuriant, and often overspread the highest trees of the forest. They are extremely tough, and possess almost the strength of cordage. On the more fertile soils, the largest trees seldom push their roots into the earth beyond the depth of one foot, being no doubt fed by the rich mould which is formed on the surface by the perpetual shedding of the leaves and the rotting of the grass. In the northern states, the fragrance of the woods from flowering shrubs and trees is not so remarkable as in the south; nor is the timber so valuable. In South Carolina, indeed, the luxuriance of the woods stands unrivalled. There are 18 different species of oak, particularly the live oak, palmetto or cabbage tree, cucumber tree, deciduous cypress, liquid amber, hiccory, &c.; in short, all the species of trees which are so excessively dear in Europe, ten of which are planted to save one, for which both situation and soil are carefully selected, and which yet never attain any considerable height, are here the natural produce of the country, and vegetate with the utmost rapidity. Equally striking to Europeans is the pleasing luxuriance of shrubs, plants, and various kinds of grass; most of which diffuse an exquisite fragrance.

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Of the smaller vegetables, maize, or Indian corn, is a native of America. It agrees with all climates, from the equator to latitude 45°, but flourishes best between latitudes 30° and 40°. The wild rice is a grain which grows in great plenty in some of the interior parts of the states, and seems the most valuable of the spontaneous productions of the country. It grows in the water, where it is about two feet deep, with a rich muddy bottom. In its stalk, ears, and manner of growing, it very much resembles oats. It is gathered by the Indians in the following manner: About the time that it begins to turn from its milky state, and to ripen, they run their canoes into the midst of it, and, tying bunches of it together, just below the ears, they leave it in this situation for three or four weeks, till it is perfectly ripe. At the end of this time, commonly about the last of September, they return to the river, and, placing their canoes close to the bunches of rice, in such a position as to receive the grain when it falls, they

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they beat it out with pieces of wood. Thereafter they dry it with smoke, and, lastly, tread or rub off the outside husk; after which it is fit for use.

435 American birds.

We have already enumerated the American quadrupeds, and have seen, that of these a considerable number is peculiar to America. Upwards of 130 American birds have been enumerated, and many of them described by Catesby, Jefferson, and Carver. The following catalogue will show the astonishing variety that exists in the American states, of this beautiful part of the creation:

Blackbird.
Razor-billed do.
Baltimore bird.
Bastard Baltimore.
Blue bird.
Buzzard.
Blue jay.
Blue grosbeak.
Brown bittern.
Crested do.
Small do.
Booby.
Great booby.
Blue Peter.
Bullfinch.
Bald coot.
Cutwater.
White curlew.
Cat bird.
Cuckow.
Crow.
Cowpen bird.
Chattering plover or kildee.
Crane or blue heron.
Yellow-breasted chat.
Cormorant.
Hooping crane.
Pine creeper.
Yellow-throated creeper.
Dove.
Ground dove.
Duck.
Ilathera duck.
Round-crested do.
Sheldrake or canvass do.
Buffels-head do.
Spoonbill do.
Summer do.
Blackhead do.
Blue-winged shoveller.
Little brown duck.
Sprigtail.
White-faced teal.
Blue winged teal.
Pied-bill dobchick.
Eagle.
Bald eagle.
Flamingo.
Fieldfare of Carolina, or robin.
Purple finch.
Bahama finch.
American goldfinch.
Painted finch.
Crested fly-catcher.
Black-cap do.
Little brown do.
Red-eyed do.
Finch creeper.
Storm finch.
Goatsucker of Carolina.
Gull.
Laughing gull.
Goose.
Canada goose.
Hawk.
Fishing hawk.
Pigeon do.
Night do.
Swallow-tailed do.
Hangbird.
Heron.
Little white heron.
Heath cock.
Humming bird.
Purple jackdaw or crow blackbird.
King bird.
Kingfisher.
Loon.
Lark.
Large lark.
Blue linnet.
Mock bird.
Mow bird.
Purple martin.
Nightingale.
Noddy.
Nuthatch.
Oyster-catcher.
Owl.
Screech owl.
American partridge or quail.
Pheasant or mountain partridge.
Water pheasant.
Pelican.
Water pelican.
Pigeon of passage.
White-crowned pigeon.
Parrot of paradise.
Paroquet of Carolina.
Raven.
Rice bird.
Red bird.
Summer red bird.
Swan.
Soree.
Snipe.
Redstart.
Red-winged starling.
Swallow.
Chimney do.
Snow bird.
Little sparrow.
Bahama do.
Stork.
Turkey.
Wild turkey.
Tyrant.
Crested titmouse.
Yellow do.
Bahama do.
Hooded do.
Yellow rump.
Towhe bird.
Red thrush.
Fox-coloured thrush.
Little thrush.
Tropic bird.
Turtle of Carolina.
Water wagtail.
Water hen.
Water witch.
Wakon bird.
Whetsaw.
Large white-billed woodpecker.
Large red-crested do.
Gold-winged do.
Red-bellied do.
Hairy do.
Red-headed do.
Yellow-bellied do.
Smallest spotted do.
Wren.

Of all these, it has been remarked, that the birds of America generally exceed those of Europe in the beauty of their plumage; but are much inferior to them in the melody of their notes. The buzzard, commonly called the turkey buzzard, from its resemblance to a turkey in plumage and shape, is very common all over South Carolina. It appears that the police of Charlestown is extremely deficient in those measures which should not be neglected in a populous town, in so hot a climate. Hence the bodies of dead animals are frequently left exposed in the neighbourhood, together with the refuse of slaughter-houses. But the voracity of the turkey buzzard alleviates the effects of this negligence. It speedily devours every thing, and leaves only the bones of any carcase that it finds. Hence it is accounted a kind of sacred bird: no law has been enacted prohibiting it to be killed; but among the whole inhabitants of the town, the public opinion sufficiently protects its safety.

436 The turkey buzzard.

In all parts of the United States, considerable numbers of snakes are found. But they are neither so numerous nor so venomous in the northern as in the southern states. The following is given as a list of them.

437 American snakes.

Rattlesnake.
Small rattlesnake.
Yellow rattlesnake.
Water viper.
Black do.
Brown do.
Copper-bellied snake.
Bluish-green do.
Black do.
Ribbon do.
Spotted ribbon do.
Chain do.
Joint do.
Green-spotted do.
Coachwhip do.
Corn snake.
Hognose do.
House do.
Green do.
Wampum do.
Glass do.
Bead do.
Wall or house adder.
Striped or garter snake.
Water do.
Hissing do.
Thorn-tailed do.
Speckled do.
Ring do.
Two-headed do.

438 The joint snake.

The joint snake is a curiosity. Its skin is as hard as parchment, and as smooth as glass. It is beautifully striped

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striped with black and white. Its joints are so few and stiff, that it can hardly bend itself into the form of a hoop. When struck, it breaks like a pipe's stem, and with a whip it may be broken from the tail to the bowels into pieces not an inch long, without producing the least tincture of blood. It is not venomous. It is not known whether the two-headed snake be a distinct species, or only a monstrous production, very few of them having ever been seen. But of all the American snakes, the rattlesnake is the chief, as being the most frequent and the most dangerous. It is a peaceful animal, however, and never bites but on being irritated. In the northern states it is little regarded, and its bite seems not to be fatal. "We found (says the duke de la Rochefoucault Liancourt), a young man, who, about six weeks before, had been bitten on the knee by a rattlesnake, while he was fishing on the banks of Lake Cauandaqua. At first he did not feel much pain in the part affected; but an hour afterwards a swelling appeared, which gradually extended all along the leg to the foot, and both became so stiff that he was unable to move them. A cure was effected within the space of only six days by the juice of snake root laid on the wound and swelling, as a poultice, mixed with milk, together with a few drops of that juice, pure and unmixed, taken internally. Instances of such bites occur but very seldom, and only, it seems, when the animal has been touched; otherwise it constantly retires, and may be killed by a blow with the slenderest stick." But in the southern states, particularly in South Carolina, the inhabitants are more afraid of these animals than in New York or Pennsylvania; as instances are known in that southern climate of people having died a quarter of an hour after they were bitten by the rattlesnake. The juice of *plantago Virginiana, Linn.* or the root and branches of mahuba bruised, are the remedies most commonly applied. Either of these plants is sufficient; but they are deemed more efficacious when they are applied jointly. A tobacco leaf, steeped in rum, or a single leaf of one of the above plants, takes off the pain and swelling. Cæsar, a negro, discovered this cure in South Carolina; he proved its efficacy to the assembly of the states, in 1780, by causing a rattlesnake to bite him; and obtained for this arcanum his liberty, and a pension of 100 guineas a-year.

439 Rattlesnake.

440 Insects.

An astonishing variety of insects is found in the United States. Of these, during the summer, the musketo is the most troublesome. In the back parts of the state of New York, the lands are frequently visited by a species of locusts which fix chiefly on the trees and consume the leaves. They are so extremely numerous, that every attempt to destroy or remove them is apparently fruitless. Flies, likewise, in moist situations, are very troublesome, being found in such prodigious swarms, especially about noon, that the farmers are obliged to keep large fires burning near their houses, where the cattle find shelter from these tormenting insects till the cool of the evening, when the latter disappear, and retire into the woods.

441 Bees.

Bees are found in the woods in swarms, which produce large quantities of honey, of different qualities, according to the kinds of flowering shrubs and plants that prevail in the neighbourhood. It is said, however, that this valuable insect is most usually found in the vicinity of cultivated places, where a part at least of the timber has been cut down, and that hence, when the savages perceive a swarm of bees, they say, that it is time for them to remove, as the approaches of cultivation not only bring white men, who are always in some measure their enemies, but also tend to narrow their hunting grounds. The planters not only rear enough of bees to supply themselves with honey of an excellent quality, but considerable quantities are brought to the coast for exportation.

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442 Poisonous honey. *Philosoph. Mag.* March 1802.

An account has been given by an American physician, Dr Benjamin Smith Barton, of a poisonous or injurious kind of honey collected by bees in the territory of the United States, which is, perhaps, worthy of attention both for philosophical and for commercial reasons. "The honey which I call *deleterious* (says he) or *poisonous honey*, produces, as far as I have learned, the following symptoms, viz. In the beginning a dimness of sight, or vertigo succeeded by a delirium, which is sometimes mild and pleasant, and sometimes ferocious, ebriety, pain in the stomach and intestines, profuse perspiration, foaming at the mouth, vomiting and purging, and, in a few instances, death. In some persons a vomiting is the first effect of the poison. When this is the case, it is probable that the persons suffer much less from the honey than when no vomiting is induced. Sometimes the honey has been observed to produce a temporary palsy of the limbs: an effect which I have remarked in animals that have eaten of one of those very vegetables, the *kalmia latifolia*, from whose flowers the bees obtain a pernicious honey. Death is very seldom the consequence of eating this kind of honey. The violent impression which it makes upon the stomach and intestines often induces an early vomiting or purging, which are both favourable to the speedy recovery of the patient. The fever which it excites is frequently relieved, in a short time, by the profuse perspiration, and perhaps by the foaming at the mouth. I may add, that, as the human constitution resists to an astonishing degree the effects of the narcotic or other poisonous vegetables that are best known to us, so we need not wonder, that it also resists the effects of the deleterious honey that is produced from such vegetables.

"It deserves to be mentioned, that the honey which is formed by two different hives of bees in the same tree, or at a little distance from each other, often possesses the most opposite properties. Nay, the honey from the same individual combs is sometimes not less different in taste, in colour, and in its effects. Thus one stratum or portion of it may be eaten without the least inconvenience, whilst that which is immediately adjacent to it shall occasion the several effects which I have just enumerated. I have taken some pains to learn what are the signs by which the deleterious honey may at first view be distinguished from innocent honey. I am informed that there is no difficulty in the matter.

"The poisonous honey is said by some to be of a crimson colour; by others, it is said to be of a reddish brown colour, and of a thicker consistence than common innocent honey. These are the signs by which I am told the most experienced hunters in the southern parts of North America are enabled to distinguish pernicious from innocent honey."

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Dr Barton, however, justly doubts the infallibility of these signs, so far as they depend upon the colour of the honey, as Mr Bruce found honey red like blood at Dixan in Abyssinia, which he does not say was poisonous; and the honey collected in Scotland from the flowers of the *erica*, or blooming heather, is usually of a dirty brown colour, though it was never known to possess any noxious property. He proceeds to state, that a friend of his, Mr William Bertram, who has written upon the natural productions of North America, informed him, that "in the Carolinas and Floridas the poisonous honey is often so similar in colour, taste, and odour, to the common or innocent honey, that the former cannot be distinguished from the latter. It is owing, he says, to this circumstance, that so many accidents daily happen from the use of the wild honey. He was informed, that it is experience alone which enables the hunters and others to determine whether the honey which they find in the woods be poisonous or innocent. They have observed that the injurious effects manifest themselves in a short time after the honey is taken into the stomach. They are accustomed, therefore, to eat a small quantity before they venture to satisfy their appetite. Should this produce any disagreeable effect, they do not think it prudent to continue the use of it: but, if in a short time it should occasion no inconvenience, they think they may, with perfect safety, indulge their appetite to the full.

"I have been informed, that the poisonous honey, by boiling and straining, may be rendered as innocent as any honey whatever. It is likewise said, that, by long keeping, it becomes harmless. It is poisonous to dogs as well as to men. Hitherto I have not been able to obtain any certain information concerning the means to be pursued in the treatment of persons labouring under the effects of the poisonous honey. It is said, that the Indians and some of the whites use cold bathing with advantage. As the effects produced by this honey are similar to those produced by several narcotic vegetables that are well known to us, such as opium, *hyosciamus niger* or henbane, *datura stramonium* or thorn-apple, &c. it is probable that the same means of treatment will apply to both cases. In South Carolina, Georgia, and the two Floridas, but more especially in East Florida, the instances of injury from the eating of wild honey are more numerous than in any other parts of North America that are known to us. There is a tract of country, included between the rivers St Illa and St Mary's in East Florida, that is remarkable for immense numbers of bees. These insects, which were originally introduced into Florida by the Spaniards, have increased into innumerable swarms, from the facility with which they procure their food, in, perhaps, the richest flowered country of North America. In this tract of country the alarming effects of the wild honey are often experienced by the settlers, by wandering hunters, and by savages.

"It is highly probable that this poisonous honey is procured from a considerable number of the flowers of the countries which I have mentioned. A complete list of these flowers would be acceptable; but such a list it will be difficult to procure at present. Meanwhile I am happy to have it in my power to mention some of the vegetables from whose flowers the bees extract a deleterious honey, not only in the country between the St Illa and St Mary's, but also in some other parts of North America. These vegetables are the *kalmia angustifolia* and *latifolia* of Linnæus, the *kalmia hirsuta* of Walter, the *andromeda mariana*, and some other species of this genus.

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Flora Caroliniana, p. 138.

"Every American has heard of the poisonous properties of the *kalmia angustifolia* and *latifolia*. The former of these plants is known in the United States by the names of *dwarf laurel*, *ivy*, *lambkill*, &c. It has long been known that its leaves, when eaten by sheep, prove fatal to them. The following fact likewise will shew, that the flowers also are endued with a poisonous property. About 20 years since, a party of young men, solicited by the prospect of grain, moved with a few hives of bees from Pennsylvania into the Jerseys. They were induced to believe, that the savannahs of this latter country were very favourable to the increase of their bees, and consequently to the making of honey. They accordingly placed their hives in the midst of these savannahs, which were finely painted with the flowers of the *kalmia angustifolia*. The bees increased prodigiously; and it was evident, that the principal part of the honey which they made was obtained from the flowers of the plant which I have just mentioned. I cannot learn that there was any thing uncommon in the appearance of the honey; but all the adventurers, who ate of it, became intoxicated to a great degree. From this experiment they were sensible that it would not be prudent to sell their honey; but unwilling to lose all their labour, they made the honey into the drink well known by the name of *metheglin*, supposing that the intoxicating quality, which had resided in the honey, would be lost in the metheglin. In this respect, however, they were mistaken: the drink also intoxicated them, after which they removed their hives. In North Carolina, this species of kalmia, and the *andromeda mariana*, are supposed to be the principal vegetables from which the bees prepare the poisonous honey that is common in that part of the United States.

"The *kalmia latifolia*, known in the United States by the names of *laurel*, *great laurel*, *winter green*, *spoon haunch*, *spoon wood*, &c. is also a poison. Its leaves indeed are eaten with impunity by the deer, and by the round-horned elk; but they are poisonous to sheep, to horned cattle, and to horses. In the former of these animals they produce convulsions, foaming at the mouths, and death. Many of General Braddock's horses were destroyed by eating the leaves and the twigs of this shrub in the month of June 1755, a few days before this unfortunate general's defeat and death. In the severe winter of the years 1790 and 1791, there appeared to be such unequivocal reasons for believing that several persons in Philadelphia had died in consequence of their having eaten our pheasant, in whose crops the leaves and buds of the *kalmia latifolia* were found, that the mayor of the city thought it prudent, and his duty, to warn the people against the use of this bird by a public proclamation. I know, that by many persons, especially by some lovers of pheasant flesh, the circumstance just mentioned was supposed to be destitute of foundation: but the foundation was a solid one. This might be shown by several well authenticated facts. It is sufficient for my present purpose to

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observe, that the collection of a deleterious honey from the flowers of this species of kalmia gives some countenance to the opinion, that the flesh of pheasants that had eaten the leaves and the buds of this plant may have been impregnated with a pernicious quality.

"In Georgia and Florida the *kalmia hirsuta* is supposed to be the principal vegetable from which the deleterious honey in those parts of our continent is procured. The andromeda mariana or broad-leaved moorwort, is a very common plant in many parts of North America. The leaves are poisonous to sheep. The petioli or footstalks of the leaves, and the seeds within the seed-vessel, are covered with a brown powder similar to that of the kalmia. This powder, applied to the nostrils, occasions violent sneezing. From the flowers of this plant the bees extract considerable quantities of honey; and it deserves to be mentioned, that this honey, as well as that obtained from some other American species of andromeda, has frequently the very smell of the flowers from which it is obtained."

In addition to the above plants, from whose flowers the bees are known to obtain poisonous honey, the same writer mentions some others which are suspected to be dangerous, as the *rhododendron maximum* or Pennsylvania mountain laurel. The seeds of this plant and the footstalks of the leaves are covered, like some of the andromedæ and kalmiæ, with a brown powder which excites sneezing; and, it is singular, that Dioscorides mentions sneezing as one of the symptoms produced by honey made about Heraclea Pontica. The *azalea nudiflora*, called in the United States the *wild honeysuckle*, is also suspected of producing poisonous honey. A species of this genus, the *azalea pontica* of Linnæus, is supposed to be the *ogolethron* of Pliny, who mentions it as the plant from which the poisonous honey about Heraclea Pontica is prepared. The datura stramonium, called in America *James-town weed*, *gymsin*, *stink-weed*, or *French chesnut*, produces in the tube of its flower a considerable quantity of honey, which is suspected to be of a bad quality; because the plant itself is known to possess poisonous properties. Upon the whole, from what is known upon the subject in America, Dr Barton is led to suspect, that every flower that is poisonous to man may produce a honey injurious to man, since the properties of the fluid are so dependent upon the properties of the plant from which it is produced. Hence he thinks, that there is more of poetry than philosophy in the following lines of Pope.

> In the nice bee, what sense so subtly true,
> From poisonous herbs extracts the healing dew?
> *Essay on Man.*

443 The kaiman.

The *kaiman*, a species of the alligator or crocodile, is also found in the southern rivers of the United States. Some of the kaimans are of so monstrous a size as to exceed five yards in length. They devour all living animals that they can catch. They are fond of the flesh of hogs and dogs. When basking on the shore, they keep their huge mouths wide open, till they are filled with musquetoes, flies, and other insects; when they suddenly shut their jaws, and swallow their prey. They are great destroyers of fish in the rivers and creeks, which they catch with the same address. Eight or ten of them lie at the mouth of the river or creek, whilst others go to a distance up the river, and chase the fish downwards; by which means, none of any bigness escape them. They are said, however, to remain torpid during the winter in dens which they find in the banks of the rivers, having previously swallowed a large number of pine knots, which forms their only sustenance till the period of their revival or wakening. The kaiman seldom touches a man, however near it may lie to him. It constantly flees when at land; but in the water it is fiercer, and has been known to bite off the leg of a person bathing. It more frequently attacks dogs. Sometimes when hounds, in pursuit of a stag, swim through the water, the kaimans seize both hounds and deer, and pull them down to the bottom without their ever appearing again. The scales with which they are coated render them invulnerable, unless the wound be inflicted in the insterstices of the scales, or at the extremities.

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444 Climate.

The climate of the great territory belonging to the United States, must necessarily be various, in consequence of the difference of latitude and soil that takes place in it. The snow covers Vermont and the province of Maine, during five or six months of the year; and the winter there lasts seven months, while there is hardly any winter in South Carolina, and still less in Georgia. Should any snow fall in the latter of these states, it does not remain two days upon the ground. The sudden variation of temperature which frequently occurs, is the most remarkable characteristic of the climate of the whole states. It is usual to see the thermometer rise or fall 25° of Fahrenheit's scale in 24 hours. In April 1796, it fell in 12 hours from the 77th degree of Fahrenheit to 44½°, and this observation was made at Wilmington in Delaware, and in Baltimore. The river Delaware at Philadelphia, three miles in breadth, is sometimes frozen over in one night, and the same thing occurs in all the rivers of Virginia and to the northward. The seasons, in the United States, are only three: summer, winter, and autumn, or what the Americans more expressively call the fall, from the falling of the leaves in the forests. The transition, from the locking up of all vegetation in winter to the sudden burst of it again to life at the beginning of summer, is so rapid as utterly to exclude that progressive and delightful season, which, in the more moderate climate of Europe, receives the appellation of spring. Within a week or ten days after the melting of the snow, the woods and orchards are in full bloom. Both the heat and cold are more intense in America than in Europe. The frost is stronger and more durable. The sunshine is more ardent and permanent, and the heat is far more oppressive and insupportable. It may be remarked, that in the different latitudes of the United States, the heat differs more in its duration than in its power. In 1795 at Newark, on the frontiers of Upper Canada, the duke de la Rochefoucault Liancourt saw the thermometer of Fahrenheit rise in July to 92°. In the month of August the same year he saw it at 96° at Albany in the state of New York. At Savannah in Georgia, it seldom rises above that height; though from Newark or Albany, to Savannah, there is a difference of 14° of latitude. But the thermometer remains during a month or two at Savannah at this height, and very seldom two days together in the northern states. The following

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following remarks and facts, relative to the climate and seasons in America and Europe, are given by Dr Holyoke of Salem in the state of Massachusets; and completely demonstrate the intenseness both of the heat and the cold that are experienced in the most northerly states of the American union.

"The following table exhibits the mean or medium degree of greatest heat and cold by Fahrenheit's thermometer:

	Lat. north.	Mean of gr. heat	Mean of gr. cold.
Stockholm	59° 20′	83.98	10.19*b*
Copenhagen	55 40	81.77	2.98*a*
Berlin	52 32	89.37	0.62*a*
Mons	50 25	89.15	1.18*a*
Prague	50 4	92.7	12.77*b*
Wurtzburg	49 46	93.87	4.*b*
Manheim	49 27	89.6	1.2*a*
Ratisbon	48 56	79.7	2.42*b*
Buda	47 40	90.7	4.26*a*
Geneva	46 12	88.9	10.2*a*
Rochelle	46 0	90.5	19.93*a*
Padua	45 22	91.4	16.93*a*
Marseilles	43 17	89.6	27.5*a*
Rome	41 53	85.43	33.46*a*
Salem in Massachusets	42 31	97.2	2.42*b*

"These European cities, except Rome, are all north of the latitude of Salem. But in the whole middle region of Europe, which is from 7 to 10 degrees north of Salem, the heat in summer and cold in winter are, on an average, less than at Salem by a difference of 5, 8, and 10 degrees. Comparing the temperature of the European atmosphere under nearly the same parallel of latitude with Salem, viz. at Rome, Padua, and Marseilles, it is found that the mean of greatest heat in Europe falls short of ours by 8 degrees, and the mean of greatest cold by more than 30 degrees. It is also found, by observations made at different times and places, that in America there falls a greater quantity of rain annually than in Europe; we have notwithstanding more fair weather, and fewer cloudy, foggy, and rainy days. The medium quantity of rain that falls yearly in Europe does not exceed 30 inches of water, whereas in America the medium quantity is at least 50 inches.

"The mean number of fair days, according to observations made in 20 cities of Europe, amounts only to 64. Several observations in America make the mean number of fair days to be about 130. The mean number of cloudy days in the same cities of Europe (all which are upon the continent) was, in 1785, 113; in America there are about 80 or 90. The number of rainy days in the same cities was, on a mean, 122; the number in America is 85 or 90. These facts seem to prove that the atmosphere of Europe is more humid than that in America; and this may be one cause why the European climate is more temperate under the same parallels of latitude, and less subject to extremes of heat and cold.

"The following facts concerning the temperature of our own climate are extremely curious. From observations made at four different hours in the day for seven years, it is found that the mercury in Fahrenheit rose to 80° and upwards. United States.

In 1786. Days.	In 1787. Days.	In 1788. Days.
June 13	June 10	June 5
July 11	July 13	July 13
Aug. 8	Aug. 13	Aug. 8
Sept. 2	Sept. 2	Sept. 1
Oct. 1		
35	38	27

In 1789. Days.	In 1790. Days.	In 1791. Days.	In 1792. Days.
May 1	May 1	May 7	May 7
June 12	June 5	June 15	June 10
July 13	July 14	July 16	July 15
Aug. 11	Aug. 7	Aug. 15	Aug. 10
Sept. 1	Sept. 2	Sept. 1	Sept. 2
		Oct. 1	
38	29	55	44

The thermometer was at and above 90°,

In 1786, 4 days	1790, 2 days.
1787, 2 do.	1791, 12 do.
1788, 1 do.	1792, 8 do.
1789, 4 do.	

During the same years in winter, the thermometer was at and below 32°, the freezing point;

In 1786, 108 days,	and below 0,	4 days.
1787, 111 do.	do.	4 do.
1788, 108 do.	do.	6 do.
1789, 105 do.	do.	3 do.
1790, 119 do.	do.	5 do.
1791, 111 do.	do.	1 do.
1792, 102 do.	do.	3 do.

The mean of the mean temperature of each month during the seven years is as follows:

Jan.	24.8 tenths	July	71.
Feb.	25.	Aug.	69.7
Mar.	36.	Sept.	61.
April	45.	Oct.	49.5
May	56.8	Nov.	40.
June	67.	Dec.	27.

Mean temperature of each season.

	Winter.	Spring.	Summer.	Autumn.
1786,	25°7	45°9	70°6	50°9
1787,	25.8	45.7	68.1	50.3
1788,	25.5	45.2	68.9	52.1
1789,	24.9	43.9	70.2	49.5
1790,	29.2	43.6	67.9	49.5
1791,	23.3	48.6	71.0	49.0
1792,	25.5	49.4	68.7	51.3

Total mean temperature of each year:

1786,	48°53	1790,	46°43
1787,	47.88	1791,	48.96
1788,	47.67	1792,	48.44
1789,	47.68		

Total mean temperature of the seven years, 47.94.

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As the observations in the morning were not made at sunrise, but at eight o'clock, Dr Holyoke supposes a small abatement must be made; and the mean temperature of the seven years fixed at 47.5.

Mean temperature at the time of each observation:

At eight o'clock A. M.	46.55.
At noon, - - -	54.15.
Sunset, - - -	47.60.
At ten o'clock P. M. -	43.7.

"Whence it appears that the mean temperature of the day is at sunset, and that the temperature of the month of April is very little below the mean temperature of the year."

The very great variations of climate here indicated are said not to extend themselves in an equal degree beyond the tract of the Alleghany mountains; so that in the same latitude the climate is much more mild upon the banks of the Ohio than on the shores of the Atlantic ocean. As that part of the country, however, is yet less inhabited, or has only been so for a short period, very few authentic documents have reached us concerning it.

445 Effect of the climate on the inhabitants.

The extremes of heat and cold which so rapidly succeed each other in America at different seasons, and which persevere so steadily when they are once begun, do not fail to affect very sensibly the health of the inhabitants of the United States. In general, people become old in America sooner than in Europe. In the more northern parts of the country, that is, in the New England States, and also near the mountains, this is less sensibly the case; but excepting in these situations, it is more rare to see men of a great age there than in Europe. The influence of the climate upon females is still more sensible. When young, they are generally beautiful, and more particularly so at Philadelphia, and in the other middle states. But after 20 years of age they soon begin to lose their fresh colour. At 25, many of them might be taken for Europeans of 40; as their bloom is faded, and their form has already suffered a change. If they have previously been mothers, which in this rising country is usually the case, their alteration is still more premature. Yet, it is admitted, that neither nightly revels, the abuse of spirituous liquors, the want of exercise, nor an excess of it, can be brought to account for this early change. In the northern states, the period of their beauty is indeed lengthened, but only for a few years. Whereas, in the southern states it is shortened. In South Carolina, at the age of 30, a woman appears old; and both men and women soon lose the bloom of youth, and feel the infirmities of age. At the age of 50, in that exhausting climate, the hair becomes entirely white. The number of children that die in their infancy is said to be proportionally much greater than in Europe; though this does not prevent the population from advancing with nearly twenty times the rapidity that it does with us. Colds, hooping-coughs, and disorders of the throat, carry off great numbers of children. The most common mortal diseases in all the states are dropsies of the chest, consumptions, and bilious and putrid fevers. Of diseases that are not mortal, the most frequent of all is the ague or intermitting fever, which, however, sometimes degenerates into a bilious fever. These intermitting fevers are undoubtedly the result of a climate abounding in moisture, arising from immense rivers, swamps, and forests, acted upon by the intense heat of a burning sun. In such a situation the human strength is exhausted, so as to be at all times liable to fall into this simplest and least dangerous form of fever. Though it is experienced by almost every stranger, and at times by most of the natives, it is seldom hazardous; but at the same time it undoubtedly enfeebles the constitution, and prepares it for sinking under other diseases. It is always towards the end of summer, when the heat is most intense, and the health of the people most weakened by the hot and moist climate of America, that the dreadful disease, the yellow fever, makes its appearance. It thus comes at a period when intermittent fevers at all times abound; and the extreme mortality which it produces is probably to be accounted for, not less from the state of debility and relaxation with regard to general health, than from any peculiar malignity of the distemper, which never fails to yield to the restorative and strengthening power of a few frosty days, or even of rainy. It is a singular circumstance, that of the great number of French who were in Philadelphia during the different periods at which it was desolated by this fatal scourge, sometimes none, and never more than four or five in a season, suffered by the yellow fever, though none of them deserted the city on that occasion. The only plausible, though probably inadequate, account which has ever been given of the cause of their escaping that calamity, is their habitual abstinence from spirituous liquors; in the use of which the Americans of all ranks, that is the men, not the women, indulge very freely, and thereby no doubt increase the degree of debility which the climate has a tendency to produce, and consequently expose themselves in a greater degree to the influence of any contagious distemper. Under all its disadvantages, however, the climate of America allows the full exertion and enjoyment of all the human faculties. Men of sound constitutions in every part of it attain to old age. Even in South Carolina in 1787, of the 9600 white inhabitants of Charlestown 200 were above 60 years; and in the New England states instances of great longivity abound.

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446 American manufactures.

Till the late war the manufactures carried on in the United States were very few. A year seldom passed away without attempts being made by individuals to establish cotton-works, glass-houses, and other extensive manufactories, but without success. Sometimes particular states assist in the most liberal manner, with the public money, the undertakers of these plans; but the money is soon spent, and the work obliged to be dropped. The reason is obvious. In the European nations, men and women abound, and the lower classes are, therefore, under the necessity of giving their industry, and the result of their skill, for little more than what is barely sufficient to afford them subsistence. In America the case is different. Men are few, the soil is fertile and unoccupied, and subsistence is easily procured. Every man aspires, therefore, to the possession of something beyond the gratification of his present wants, or the mere necessaries of life. He endeavours to become independent, by obtaining and cultivating a portion of the soil for his

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his own use. To withdraw him from an enterprise of this kind, which is so flattering to the passions of all men, a large reward is necessary, or, in other words, if an ordinary tradesman in America do not receive high wages, he will go to the woods, and settle as a farmer, or small proprietor, which in that country he can do upon easy terms. Hence it happens, that the manufacturers of Europe find it easy to undersell all those who attempt to rival them in America. Even, when a skilful European manufacturer conveys his capital and his tools across the Atlantic, the case is not altered. His servants and labourers must be carried along with him. Supposing this difficulty to be surmounted, he must immediately give them three times the wages that they received in Europe, or they will not remain in his service, as they can easily obtain such a price for their industry there. In consequence of high wages, they are enabled, in a year or two, to accumulate enough of money to enable them to purchase or obtain credit for a small farm, in a fertile though remote part of the country. They never fail, therefore, speedily to desert the business to which they were originally educated, and to betake themselves to agriculture, which, from the independence it affords, is of all occupations the most grateful to the human mind. Thus, any great manufacture carried on in America, could only be supported by a succession of emigrant workmen, receiving exorbitant wages, and having the prospect of immediately deserting it; a situation, in which it evidently could not prosper. Hence, to a very remote period, that is, till land shall become scarce and precious, in consequence of an overflowing population, the United States of America must chiefly depend upon Europe for their most valuable manufactures. Neither is this a misfortune to America. Men there, as elsewhere, in following out their own private intents, contribute most effectually to advance the prosperity of their country. Agriculture is there pursued because it is the most profitable of all employments to those who engage in it, and leads them most rapidly to the possession of property and independence; at the same time, by providing in abundance the means of subsistence, it facilitates to the community the acquisition of what chiefly it wants, a numerous population, which, by the natural progress of things, will ultimately bring in its train the cultivation of all the arts.

The Americans, however, are not destitute of a considerable variety of such manufactures, as their peculiar situation has naturally led them to establish. We have already mentioned, the manufacture of iron from the ore, which they practise in several situations to the eastward of the mountains, though not to such extent as to supply the wants of their country. They also tan leather, which they are induced to do from the abundance of oak-bark that they possess; and they manufacture hats in considerable quantities. They have distilleries for the preparation of spirituous liquors, and of late they have spinning machinery to a considerable extent. Tradesmen in the towns, and private families in remote situations, prepare soap, candles, and malt liquors. In the remoter districts, the women also prepare a considerable part of the clothing of their families. Upon the rivers, great numbers of saw mills are erected, for the purpose of converting to profit the timber, which they are under the necessity of cutting down, before the lands can be brought into cultivation. Connected with this operation, of clearing the land of timber, is the preparation of pot and pearl ashes. As this forms a considerable branch of the trade of many American towns, the back country of which has been recently settled, we shall here state the mode of preparing this salt, which has been generally adopted.

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Potash works.

Large tubs with a double bottom are filled with the ashes of wood: the uppermost bottom, which contains several holes, is covered with ashes, about 10 or 11 inches deep, while the under part of the tub is filled with straw or hay. Water being poured over the ashes extracts the particles of salt, and discharges all the heterogeneous matter which it may yet contain on the layer of hay or straw. The ley is drawn off by means of a cock, and if it should not yet have attained a sufficient degree of strength, poured again over the same or over fresh ashes. The ley is deemed sufficiently strong when an egg swims on it. This ley is afterwards boiled in large iron caldrons, which are constantly filled out of other caldrons, in which ley is likewise boiling. If the ley begins to thicken in the caldron, no fresh ley is added, but the fire is well fed with fuel until all the aqueous particles are separated, and the whole is completely inspissated and indurated. This salt is of a black colour, and called *black potash*. Some manufacturers leave the potash in this state in the caldron, and increase the fire, by means of which the oil is disengaged from the salt in a thick smoke, and the black potash assumes a gray colour, in which state it is packed up in the barrels for sale.

The process of preparing the potash requires more or less time according to the quality of the ashes and the ley, and to the degree of strength of the latter: the medium time is 24 hours. The ashes of green wood, and especially of oak, are preferred. No potash can be prepared from the ashes of resinous trees, and ashes which are five or six months old are better than those that are new.

Some manufacturers use only one caldron for boiling, which they fill with cold ley as it comes from the tubs, and others put the salt, as soon as it begins to coagulate, into smaller caldrons to complete the process.

In many parts of the state of New York, especially in the north, and the vicinity of Albany, the inhabitants who fell the wood prepare the potash. But there are also large manufactories, where from 30 to 40 tubs are used for preparing the ley, and from 10 to 12 caldrons for its evaporation. The manufacturers buy the ashes from private families. The tubs and caldrons are of different sizes, in proportion to the greater or less extent of the manufactory. By a general estimate, from five to six hundred bushels of ashes yield a ton of potash.

The barrels in which the potash is packed up, must be made of white oak, or, if this cannot be had, of wood which is but little porous. The staves ought to be far more durable than for casks in which other dry goods are packed, the hoops also must be more numerous; for the least fissure would expose the potash to humidity, to the air, and consequently to deliquescence and dissolution. Instances have occurred, when

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when barrels badly made and hooped, and which had been filled with potash, were soon after found to be half empty.

448 Pearl-ashes.

Pearl-ash is well known to be potash purified by calcination. To this end the potash is put into a kiln, constructed in an oval form, of plaster of Paris; the inside of which being made otherwise perfectly close, is horizontally intersected by an iron grate, on which the potash is placed. Under this grate a fire is made; and the heat reverberated by the arched upper part of the kiln, completes the calcination, and converts the potash into pearl-ash, which is taken out of the kiln, and, when completely cooled, packed in barrels. The process of calcination lasts about an hour. Pearl-ash is proportionally more heavy than potash, on account of its greater compactness, and the loss of weight experienced by the latter, though the calcination is very trifling. Although pearl-ash is less liable to deliquesce by the air than potash, yet the barrels in which it is packed are of the same sort and structure with those in which the latter salt is barrelled. They are of different sizes, and contain from 200 to 300 pounds. Potash as well as pearl-ash is sold by tons in the course of trade; and it is not lawful to export either before it is duly inspected by the public searchers, who are appointed for this purpose in all the states where pearl or potash is manufactured.

449 Maple sugar.

The manufacture of sugar from the maple tree, *acer saccharinum Linn.* called by the Indians *ozeketa*, is peculiar to the United States of America. The whole country to the northward of Pennsylvania abounds with these trees, and also to the southward upon approaching the mountains. In the western territory they everywhere abound. Very considerable quantities of sugar are made from them; so as to afford to the inhabitants an abundant supply of that valuable commodity. The medium produce of a tree standing in the midst of a wood, is three pounds of sugar. The average produce of trees standing on ground which has been cleared of all other woods, is from six to seven pounds per tree. A barrel of the first juice which comes from the maple tree will yield seven pounds of sugar, and four if it stand in the midst of other wood. The ordinary price of this sugar is 1s. per pound. A barrel of the second juice will yield three gallons and a half of treacle. Four or five barrels of the third juice will yield one barrel of a good and pleasant vinegar. The vinegar is found to be better in proportion as the juice is more concentrated by boiling. Hence some persons brew but one barrel of vinegar from 10 barrels of the third juice. To clarify this vinegar it must be boiled with leaves. The third juice, when not used for vinegar, yields, if mixed with an equal quantity of water, a fermented liquor of an excellent flavour. The longer the first juice is boiled, the better and finer the sugar becomes. In order that the trees may continue productive, they require to be tapped with extraordinary care, that is, the fissures or wounds made in them for extracting the juice, must neither be too deep nor too wide; so that no water may settle in them, and that the wood may close again in the space of a twelvemonth. During the time the juice is flowing out, which lasts about six weeks, and generally begins about the commencement of the month of February, all the days on which it freezes or rains are lost; so that the number of days on which the business can be pursued to advantage, is frequently from these circumstances much diminished. Yet during the above time, two persons can often make from 500 to 600 pounds of good sugar, and this quantity is increased in proportion to the number of workmen employed. Since 1812 they have made great progress in the cultivation of the cane, particularly in Louisiana and Georgia. It has been stated, that sixteen million of pounds of sugar, from the cane, were produced in Louisiana in 1814.

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450 Ship-building.

Ship-building is an art much practised in the northern states upon the sea coast. The Americans are understood to possess considerable skill in this branch of business, and to perform their work both in a substantial and frugal manner. In building vessels in New England, they make the beams which support the deck from the trunk of the spruce fir; taking care that these, and some other parts which are framed of this timber, have a sufficient thickness of wood, and be strongly rivetted together. The rest of the vessel is made of oak planks. It is only of late that the spruce fir has been used in building ships in this quarter. The ship-builders affirm, that it is an improvement to the vessels; though, in all probability, the scarcity of oak which now begins to be felt on the sea coast of New England, has been the chief cause of the innovation. It is said, however, that the spruce fir resists, better than almost any other kind of wood, the action of the sun and the weather, which in the American climate put all kinds of timber to a severe trial. The planks of the body of their ships, to the water's edge, are often made, not of oak but of beech wood, or of the wood of the black birch, which is reckoned equally hard and durable. The keel is of the wood of the beech, of the sugar maple, or of what is called the *rock maple*. By using these kinds of wood for so many purposes, there is often not above a fifth-part of the ship made of oak. The ship-builders maintain, that the beech, the black birch, and the maple, are very serviceable for the preservation of iron, which the saline particles of the oak are apt to consume. Instead of using tallow for those purposes in ship-building, to which it has been usually applied, all the ship-carpenters in America make use of train oil very plentifully laid on. By these devices, they have reduced the expence of ship-building to half of what it formerly was, to the great emolument of the persons engaged in it.

451 Fisheries of cod.

The fisheries are a branch of industry in which the Americans engage to a considerable extent. The whole coast of Massachusets, and especially of the district of Maine, is inhabited by fishermen engaged in the fishing of cod upon the great bank of Newfoundland, or in the sea in their own neighbourhood. They bring all the fish on shore, where they receive the last dressing. The fish are washed and laid in heaps, that the water may run off. Thereafter they are exposed for two or three days to the air: after which they are placed on hurdles that are about four or five feet in breadth, three or four feet above the ground, and as long as the field on which they are erected. The fish are laid separately, and frequently turned, that they may get thoroughly dry; which happens under a bright

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bright American sun in about six days. At last they are packed in cases, pressed down, and exported either to the West Indies or to Europe. The best fish, that is, those caught in the first fishing months, are superior to the rest, from being dried more slowly. They are sent to Spain, excepting a few that are usually bespoke by the better sort of people in the neighbourhood, and are sold at double the price of those which are caught later in the year, when the heat is more intense. The fish caught on the coasts of Massachusets and of Maine are neither so large nor so plentiful as those taken at the Great Bank near Newfoundland; yet this fishery employs a considerable number of vessels, which proceed only five or six miles from the coast, and return home every week.

452 Whale fishery.

Besides this, and the salmon and herring fisheries, which are considerable, the Americans also engage extensively in the whale fishing, on the coast of Brazil, and in the Pacific ocean in the same latitude, and in the West Indian seas, as far eastward as to the Cape of Good Hope, from the 18th to the 25th degree of latitude. The business is sometimes also prosecuted in Hudson's bay, and the seas adjacent to the coast of Greenland and Labrador, which abound more than the southern seas in whales, and those of a larger size, and such as afford oil of a better quality. But as the vast masses of ice which infest the seas in these northern latitudes render the fishing dangerous, the Americans in general abandon the fishery in the north to the European fishermen. Of late years, the whales have altogether abandoned the coasts of the United States, though they were formerly found in considerable numbers in that quarter. The spermaceti whales are chiefly found in the Indian ocean, on the coasts of Africa and Madagascar, in the Pacific ocean, and on the coasts of Peru and Chili. A voyage to this fishing occupies from ten to eighteen months. The crew receive no wages, but have a certain share of the blubber; the captain has a fifth; the pilot a five-and-fortieth or a sixtieth part of what is taken. The owners never make less than 20 per cent. upon the adventure; and the captain, from a successful voyage, in common years, and at ordinary prices, usually receives about eight or nine hundred dollars. A ship of 160 tons has a crew of 15 persons and two boats. At their return, the blubber which has been barrelled at sea is put into fresh barrels, and cleared from its sediment before it is carried to market; for though the sediment be as fit as the rest for use in the soap-works, yet the oil in which it appears is regarded as of inferior quality in the European market. This sediment, and a sort of white flesh which is found in the head and belly of the whale, are then squeezed in a press. A new quantity of oil

453 Spermaceti candles.

of the best quality is thus obtained. The residue which remains after the first pressing is put again into the press, and more forcibly squeezed than before. It affords a certain quantity of oil; and it is the produce of this last squeezing which, after undergoing a boiling, is poured into moulds, and forms spermaceti candles: These are sold for half a dollar a pound. Those which are called spermaceti fishes yield this matter in great quantity. In their heads alone there are often five or six tons of this matter; though the other whales have the head differently composed, and do not afford above a quarter of a ton out of each head. Thus all whales yield more or less of this matter, which is so much valued as a material for candles.

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Though the Americans have few manufactures, they engage extensively in every kind of trade. In the interior of the country, almost every person who can command the requisite capital is an innkeeper, or keeps a store. The employment of innkeeper is there perfectly respectable, and is carried on by persons of distinguished character. What is called a store in America is a shop or place where all kinds of commodities intended for consumption are to be found and sold by retail. Nothing is excluded from it. Train oil and candles, stationary wares, hardwares, and cloth, together with distilled spirits, sugar, wines, and coffee, are all kept in it in the same manner as in the shops of some of the remote villages in Scotland. In some situations in America, these stores produce considerable profit, and are made subservient to other speculations. When a man engages in the clearing of land, and can at the same time afford to lay in the goods necessary for keeping a store, he is enabled to get back from the workmen whom he employs the greatest part of the wages he has paid them, in the form of profit upon the goods which they purchase at his store. In this way, he contrives to have his work performed at a price which ultimately does not amount to more than a half of what is paid by others for the same labour.

454 American trade.

455 Foreign trade.

With regard to foreign trade, the United States have of late years possessed a very great proportion of that which has been carried on among civilized nations. The vast extent of sea coast, amounting to nearly 2000 miles, which spreads before the United States, the number of excellent harbours, the numerous creeks and immense bays which indent the coast, and the rivers and lakes which peninsulate the whole country, so habituate all young persons in America to the idea of a maritime life, and to a fondness for navigation, that great numbers of them are at all times found ready to engage in it. The enterprising spirit of the people favours this tendency; and accordingly, every kind of commercial speculation easily finds men ready to embark in it. For some time after the treaty of peace with Britain, by which their independence was acknowledged in 1783, while each state continued to have its particular laws, prohibitions, and regulations; while the customhouse rates changed every year, according to momentary considerations; and while an active jealousy and rivalship subsisted between the different states, the commerce of the whole remained on a very precarious footing. It was only from the period of the establishment of their new constitution that a consistent system of national commerce could be adopted. It so happened, that this period proved extremely favourable to their engaging extensively in foreign trade. The violent shock, or rather the utter ruin, which the revolution brought along with it to the manufactures and commerce of France, forced her to open the ports of her colonies to the vessels of neutral powers. From that moment, the Americans engrossed all the commerce of the French colonies, which they were so well situated to carry on to advantage. The other powers of Europe, which had also colonies in the West Indies, being all successively engaged in the war, opened the ports of their colonies in like manner to the Americans, or at least considerably diminish-

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ed their prohibitive regulations. Thus the commerce of the United States had the victualling of the West India islands, as well as an exclusive trade with the French and Dutch colonies, not only in provisions, but also in commodities of every kind. Their ships were freighted to carry West India produce to Europe, and to bring back in return the articles necessary for the consumption both of the United States and of those same colonies. Add to this, that, in consequence of the great scarcity of provisions that during various years prevailed either in France or in Great Britain, the Americans found in these countries a ready and profitable market for all the productions of their country. By these means, aided by the establishment of banks, and by an unexpensive, though efficient, government, the commerce of the United States soon became extremely extensive. It reached the East Indies, China, and every part of the known world. It is true, that by the rashness of their speculations, many American merchants suffered; but the tide of commercial prosperity was very great upon the whole, and almost unexampled. The whole exports of the United States in 1818 amounted to 93,281,153 dollars.

Whether this commercial prosperity will be permanent, now that the European nations have returned to the enjoyment of peace, and consequently have recovered the power of carrying on their own commerce without danger or interruption, with all the advantages of an abundant population, and of inferior wages of labour, is a question about which many doubts have been entertained. It remains, however, with men of sound reflection in America, a question of some difficulty, whether, in the present state of their affairs, the attempt that has been made to conduct an extensive foreign commerce, is, upon the whole, favourable to the prosperity of their empire. Distant navigations are undoubtedly unfavourable to the progress of population, by the great number of men which they consume, and by preventing the increase of families. This kind of commerce, also, by keeping up a taste for foreign luxuries, induces a people that have no manufactures to lavish away the necessaries of life on the purchase of superfluities, and thus to introduce a costly style of living, which is said already to prevail too much in the United States, and which in every country has been found to be the greatest enemy to the increase of the people.

One circumstance in the mode of managing the American commerce ought not to pass unnoticed. In Europe, we are accustomed to imagine that a man cannot be qualified to act as captain of a ship till he has made a number of voyages, and passed through a regular course of study; whereas, in New England, the merchants do not hesitate to entrust their ships to young persons, who have frequently been only one year at sea. As they have grown up in the business of the counting-house, they are perfectly acquainted with the price, the quality, and the sale of each different commodity. The first year they are associated with a skilful steersmate, and act at once in the capacity of captain and supercargo. Their vessels do not suffer shipwreck more frequently than other ships which are more cautiously navigated. In the course of a few years, these young people become merchants themselves, the captain's profits being alwas considerable. As they are generally appointed from the families of merchants, they receive assistance from their employers.

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456 Traffic of land.

There is one kind of commerce which, in speaking of the trade of the United States, ought not to be omitted, as it is altogether peculiar to North America, that is, the traffic of land. This trade is founded upon the considerable mass of land in the territory of the United States, in comparison with their present population, and upon the probability of the rapid augmentation of that population, either by the natural and ordinary means of reproduction, or by foreign emigrations. This, like all other branches of trade, and more than any other, is a traffic of speculation. At the end of the revolution, the waste lands, which amounted to more than four-fifths of the American empire, were found to belong to different states, which, as sovereigns, now inherited this property from the sovereignty of the crown of Great Britain. The lands granted by the kings of Great Britain have, with some exceptions, remained in the possession of the grantees; but the amount of these was infinitely small in proportion to the mass of the uncultivated land. The small states near the sea having been longer inhabited, possessed but a small portion; and some had none at all; while the great states, whose territory extended far into the interior, such as Georgia, the Carolinas, Virginia, Pennsylvania, and New York, were in possession of immense quantities of forest lands. It was necessary for these states to sell the waste lands, to afford encouragement to their growing population, to present a bait to foreign emigration, and to liquidate the debts resulting from the war without burdening the people with new taxes, which at that time they were little able to bear. Among the lands to be sold were the confiscated estates of the royalists, who had given assistance to the British during the war. To bring these lands to sale, the states opened land offices, where persons who meant to purchase received warrants to have the lands they pointed out surveyed by the surveyor of the state, possession being delayed till payment of the price, or fulfilment of some part of the conditions of the transference. Great speculations immediately began, land being purchaseable of all the states at a very low price. The states were then inundated with paper money, peculiar to each, and all in a state of depreciation. By buying up this paper at a trifling price throughout the country, and delivering it to the states as the price of territory, many speculators acquired land with a real value of two or three cents or hundredth parts of a dollar per acre, payable in six or eight years, with a discount from the treasury of the state for prompt payment, according to the value at which the land was rated by the law. Other speculators, without adopting such a mode of payment, made purchases merely upon the hope entertained by every American of an immediate increase of population, by emigration and otherwise, which would necessarily soon raise the price of lands. Considerable quantities of land were also bestowed by the states upon the officers and soldiers who had been employed in their armies during the war, as a remuneration for their services. By these grants, and by purchases made by individuals from the land offices of the several states, or from commissioners appointed

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pointed to put up large portions to public sale, a great extent of territory in all the states soon came to be held, and continues to this day to be speculated upon, by private persons. The speculators in land who hold great quantities of that commodity, endeavour to turn it to account chiefly in three ways: 1st, By selling the land in large parcels to men of fortune in Europe or America; 2dly, By selling it in small parcels to families who mean to settle upon it; and, lastly, By preserving it till time and a diminution of the quantity of this sort of merchandise have raised the value of it to a price answerable to their expectation.

457 Sales of land in large portions.

The first of these modes, is that which is most generally desired. To accomplish it, agents have at different times been sent to Europe. Several great sales were by their means effected in England upon advantageous terms, which raised the price of the remaining lands, increased the confidence of the speculators, added to their numbers, and extended their schemes. The opinion of an immense emigration, to which the French revolution and the situation of Europe gave rise, conspired for some time to give confidence to these speculators. The great sales to Europeans were facilitated by the periods of the payments to be made to the states, which were always distant, and by the delays of these payments, which could not be obtained without much difficulty. In the states of Pennsylvania and Maryland, every foreigner could buy and possess land as well as a citizen. In some others, although this privilege was not given by law to foreigners in general, yet it was readily permitted by the legislature when applied for. In all the states, a foreigner may hold land in the name of an inhabitant; and the great interest the states had in selling, and in buying foreign capitals into their territory, has always given entire security to this borrowed right of possession. In making bargains of this kind, the conditions are various according to the views of the parties. The periods of payment are generally short: at least a large part of the purchase money is paid down when the bargain is concluded. The conditions imposed by the states in the contracts of sale, are binding by law upon the new purchasers; but very often the old purchaser remains responsible, in case of their not being fulfilled by the new one. The new purchasers become speculators themselves, and in order to turn their new property to account, have recourse to the same means that were employed by those of whom they bought it.

458 Sales of land in small parcels.

Land is sold in small parcels in several ways: either out and out for ready money, a mode of sale which, though not unfrequent, is not the most common; or out and out, but to be paid for by instalments; in which case the title deeds are not delivered till after the purchase money is entirely paid; and the seller retains a right of ejecting the new settler from his land, if the conditions of payment be not fulfilled. Sometimes the seller only requires a small part of the price of the land in ready money; and the land remains subject to a perpetual rent, payable in money or in produce, which the purchaser is not always left at liberty to redeem. Sometimes the seller endeavours to let his lands, for a certain number of years, for an annual rent, or under condition of clearing annually a certain number of acres, the whole improvements being to return to himself at the termination of the lease: But such bargains are unusual; settlers being unwilling to accept of a temporary right. Almost all the great landed proprietors, therefore, endeavour to get some persons to accept, upon moderate terms, of small lots, and to settle upon their estates; because by clearing some portions of it, they enhance the value of the rest.

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459 Land withheld from sale in the hope of a rise of its price.

The third mode of deriving advantage from purchases of land, by waiting till time has raised its price, is the resource of great proprietors who have not been able to employ the two others. Some persons, however, with little capital, endeavour to wait upon the mere calculation of the rise that will probably take place in a given time. In these calculations, men of a sanguine temper are frequently deceived; and there are many examples of proprietors, who in the following year, would be extremely glad to sell at the price that they had refused the year before. These speculations in land, however, have been the means of making great fortunes in America; but they have also, when engaged in without sufficient capital, occasioned more distress and greater and more disastrous bankruptcies than any other kind of commercial adventures. The lands in America are also the branch of trade which has given occasion to the greatest number of law suits, as well on account of the titles as of the boundaries of estates, and of the fulfilment of the conditions of sale. The most certain, as well as the most advantageous means of deriving profit from a great extent of new lands in America, is said to be for the purchaser to begin clearing it himself; to attract inhabitants as speedily as possible, by giving them, at a low rate, and even for nothing, if necessary, a number of acres sufficient for the maintenance of their families; to erect mills, make bridges and roads, even to build a few houses, and to encourage in every way the efforts of the new settlers. There is no example of these first sacrifices, when made with intelligence and to a suitable extent, having failed rapidly to increase the value of the land reserved by the proprietor, and speedily to enrich him by attracting great numbers of emigrants from other countries. As the subduing of a vast wilderness, and filling it with men of a civilized race and character, is an event of much importance in the history of mankind, we shall here take notice of one of the instances of great success in an undertaking of this kind, that occurred to an European speculator.

460 Remarkable speculation in the purchase of land.

The district called *Genessee* on the southern shore of Lake Ontario, or rather that part of the district which was not then sold, was in 1791 purchased, in London, from Mr Morris for 1s. per acre. He had bought it from Mr Phelps for 5d. per acre. The contract was concluded on the supposition that this tract of land contained 1,000,000 of acres: and a condition was added that the price or sum of 50,000l. sterling, which was to be paid immediately, should be returned by Mr Morris, provided that Captain Williamson, the ostensible purchaser, who was to view the lands, should not find them answerable to the description given of them. The purchaser was satisfied with the lands, and on surveying them a surplus was discovered of no less than 120,000 acres. But Mr Morris made no difficulty on transferring them, together with the rest, to Captain Williamson, without the least remuneration, because, as he observed, he had intended to sell the whole with-

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out any reservation. Captain Williamson is suspected to have been only the agent of a very wealthy British baronet. But in every respect he has acted as proprietor. The district bought by him, bounded on one side by Lake Ontario, and on the other by the river Genessee, extends 20 miles in length by 30 or 40 in breadth. To preserve the continuity of his lands, he made several additional purchases, so that his estate soon amounted to 1,500,000 acres. After surveying the whole, he fixed on spots for building towns, as central points to a system of settlements. These towns, were, Bath on the creek of Conhoctoon, Williamsburgh on the river Genessee, and Great Sodus on Lake Ontario. He immediately established a mode of communication between Philadelphia and this new tract, by forming roads in a direct line, so as to shorten the journey at least 300 miles. These new roads were made merely by felling the trees to the breadth of an ordinary road, in as straight a line as possible through the forest, and by removing them to one side of the path; their stumps to the height of several feet being still left standing. He also erected seven saw mills, and three corn mills. He built a great number of such houses as the first settlers upon lands usually require; and he began in several places to clear the woodlands. His first labourers were Germans, brought from Hamburgh; but they spent their time in idleness and drunkenness, and soon left him. They were replaced by Irishmen, by whose assistance his roads were soon put into what the Americans account good condition in such a situation; that is, he made lanes through the woods in the way already mentioned. The result was, that his lands, which at first sold at one dollar per acre, in two years time, sold for three dollars. The produce of about 800,000 acres disposed of in this way, not only refunded the purchase money, and the whole amount of the other expences incurred, but is also understood to have yielded a nett profit of 50,000l. sterling. To obtain this success, however, Captain Williamson found it necessary to reside in the woods in the midst of his possessions. When he sold small shares of 500 or 1000 acres, he always stipulated that one family should come to settle upon each share within 18 months, under the penalty of a forfeiture of the bargain. When larger portions were sold, he stipulated, that a proportional number of acres should be cleared of wood. His terms of payment were, to discharge half the purchase money in three years, and the remainder at the expiration of six years; the payment of interest to commence within 18 months after the bargain. Thus, a purchaser who instantly set about clearing the ground, could easily obtain its produce before the interest became due; and his crops frequently assisted him towards the payment of the first instalment. He also established stores of provisions in different places; but these he never opened for sale unless the settlers could not otherwise supply themselves, that the sale of the produce of their lands might not be injured. He likewise built a school at Bath, and endowed it with some hundred acres of land. He gradually built inns, and even a sessions house and a prison, for the public use. By all these efforts, added to great care in preventing litigation among the settlers; by fixing in a precise manner the boundaries of the several pieces of property sold, these extensive forests were in a few years reduced under the dominion of man, and put into a train of speedily becoming populous and valuable.

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461 State of agriculture.

From what has been already said concerning the state of manufactures in America, and the general situation of the country, it will easily be conceived, that the greater number of the people must be still engaged in agriculture. Indeed, it is understood, that nine-tenths of the inhabitants of the United States follow this employment. Concerning the state of it, when considered as an art, it is difficult to speak with precision, on account of the variety of forms in which it is practised in different districts of that great country. It may justly be said, that the art of agriculture exists in America in all its known degrees and varieties, both of perfection and of imperfection. The ancient state of Massachusets is as much cultivated as France or England. The houses stand near to each other, in the midst of the fields and farms to which they belong; some of the roads seem to be one continued village; and to support this population much industry is exerted upon the soil. Most of the fences are made of stone. The harvest is always completely secured in houses, and a great part of the ground is always periodically laid down in grass. Numbers of horses employed in country labour are seen in the fields; but they are not remarkable for beauty. The cattle are of a fine breed, and all the pasture grounds are covered with them. But the agriculture of Massachusets, and of some other parts of the New England states, affords no proper criterion by which to judge of the state of this important art in the greater part of America. The general rule with regard to husbandry in that country is, that it is extremely defective and slovenly. This does not arise so much from the want of skill on the part of the Americans, as from the nature of their situation. In that country, land is plentiful and cheap; but men are few, and labour is consequently dear. An American husbandman, therefore, is more studious to make the most of the labour that he can command, than to raise great crops from a small portion of soil. Having abundance of fertile land to waste, he finds it more profitable to turn over negligently, with as little toil as possible, a large portion of it, than to labour any part of it perfectly. In this way he derives the greatest benefit from his own personal industry, or from the labour of those persons whom it is in his power to engage for hire. This negligent mode of cultivation, however, is laid aside in the neighbourhood of the great towns, where land is valuable and dear; and it prevails in proportion to the remoteness of the situation, and the facility with which land is obtained.

462 They flood the land.

In some places, in consequence of the multitude of streams that are to be found in America, the valuable practice of flooding land is adopted; and the American husbandmen are said to practise this branch of the art of agriculture with considerable ingenuity and industry. Instead of attempting to level their ground, however, they manage to convey considerable streams of water through the valleys to the summits of the eminences, or high grounds, by means of tubes or pipes, formed of the trunks of trees bored or hollowed out. In other respects, however, the practice of American husbandry is undoubtedly very imperfect. Even in those parts of the country in which timber has become dear, the

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463 No hedges.

the Americans still continue from habit to use wooden fences. No such thing as a hedge is to be seen in any of the states. The farmers say, that the thorn does not thrive in their climate. This point has not perhaps been well ascertained by experiments; but there can be no doubt, that out of the endless variety of native plants and shrubs, some might easily have been found that are capable of being used as a living fence. All the cultivated fields, at the first clearing of the ground, are inclosed with fences, which consist of poles of wood once split and laid zig-zag upon one another without any stakes These fences are afterwards exchanged for regular palings of different kinds of wood, which are necessarily attended with all the defects of that mode of attempting to secure either corn or stock; running rapidly into decay, and requiring constant repairs.

464 No stacks of grain.

The Americans have an expensive mode of securing their grain. Instead of building it up in stacks, they are at the trouble of bringing it all into houses or barns. They say, that it would not be secure in stacks against the sudden and violent torrents of rain that occur in their climate: an error into which they have undoubtedly been led by building and covering their stacks in an unskilful and improper manner. They do not reap their grain with the sickle, but cut it down with the scythe, which must undoubtedly produce considerable waste. But this is perhaps done from necessity, in consequence of the high price of labour, or rather the difficulty of obtaining a sufficient number of labourers to perform the work in another manner. Instead of thrashing, they use in many places, and particularly in Virginia, the ancient custom of treading out the corn by means of cattle, by whose feet it must, no doubt, be considerably bruised and damaged.

465 New settlements, how formed.

The simplest and least artful kind of American husbandry is that practised in the formation of new settlements. When a family have come to a resolution to settle in a particular district, they usually proceed in the following manner: The husband, in the latter end of summer, repairs to the spot where the settlement is to be made. The first thing he does is to cut down the small trees on one or two acres. He next barks the larger trees. This last operation consists of cutting off a circle of bark from the tree all round with a hatchet, penetrating at the same time a short way into the wood; the effect of which operation is, that on the following year, the tree produces few or no leaves to prevent the sun from reaching the soil. In that climate, trees thus barked or girdled, speedily decay, and in a few years are overturned by any storm; after which they can be burnt with little trouble on the ground. Among the trees thus barked, and upon the ground that has been cleared, the new settler breaks up the soil, by dragging along it a common harrow with iron teeth. Without farther preparation, and without the use of a plough, he sows wheat or rye. Wheat thus sown produces from 20 to 25 bushels an acre, of an excellent quality; and, in consequence of the great fertility of the soil, and its natural softness, being wholly formed of rotten leaves and grass, good crops of wheat are obtained with no greater degree of industry during several years in succession. Having sown his grain in this way, the settler, with the wood which he has felled, constructs a small log-house, and makes suitable fences around it; a labour which may be performed in about a month's time; after which the new plantation is left to itself for the winter. It is to be observed that a log-house is built by laying trees upon each other at right-angles in such a way as to enclose a square space; the interstices being filled up with stone and clay, or only with loam, and the roof covered with trees and turf. A chimney is usually built, in one corner, of stones and clay. In the beginning of spring, this adventurer brings his family and the best of his cattle to his new settlement. His cows are turned into the woods to graze. He plants potatoes, and sows Indian corn, and thus is enabled to provide for the first year's maintenance. While thus employed, he is at the same time clearing more ground, burning the trees he has already felled, and, as far as may be, even those which he has barked. The ashes afford a very useful manure; and in the opinion of the best judges, are employed in this way to much greater advantage than when converted into potash, the making of which is with the new settlers merely the result of necessity. For if a saw-mill be at hand, the large trees are conveyed thither by oxen. Thus, within the space of twelve months, a man may clear 15 acres; and few families cultivate more than 30. The barked trees are left standing for a longer or shorter time, according to circumstances, viz. the species of the tree, the nature of the soil, and the degree of the wetness of the season. The hemlock fir will stand eight or nine years, the oak four or five, the maple three or four; and trees, all the branches of which have been burnt off, seldom fall before this time. The stumps of the felled trees, generally two or three feet high above the ground, hardly rot sooner than the barked trees which have been left standing on the lands. Salt pork and beef are the usual food of the new settlers. Their drink is water and whisky; but there are few families unprovided with coffee and chocolate. The axe which the Americans use in felling trees has a shorter handle and a smaller head than that of European wood-cutters; and they assert, that they can do more work with this short-handled light axe than with the European one.

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The Americans appear to entertain fewer local attachments than the peasants of Europe; and, accordingly, emigration with them is extremely common. Some families make a business of forming new settlements in the way now mentioned. After building a house, forming enclosures, cutting down a part of the wood, and putting every thing into a decent train of cultivation, they sell the settlement which they have formed with so much labour, and proceed farther into the woods, to commence anew the same career of hardship and of industry. By these operations, they never fail to earn a very considerable profit, on account of the additional value which the land acquires by their efforts in the eyes of persons of greater property. The same kind of undertakings, however, are also engaged in by men of a vagrant and restless character, who delight in an idle life, the greatest part of which is spent in hunting. These men keep upon the frontiers of every new colony; and as soon as their amusements begin to be restrained by settlers occupying the country round them, they immediately sell their plantations, and proceed to more remote situations: thus becoming a kind of voluntary outcasts

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from civilized society. In these undertakings, there is usually little personal hazard, as the wild animals are less fieree in Americe than in other parts of the globe. Wolves, bears, nay even panthers, usually fly before man; and the instances of their doing mischief are so rare, that the very reality of it might be doubted. The severest misfortune to which the inhabitants of the American forests are liable, is the loss of their children in the woods. These unfortunate infants, over whom it is almost impossible to keep constantly a watchful eye, are apt to run out of the house, whieh is seldom feneed the first year, and, straying from their houses, are unable to find them again. In such cases, however, all the neighbours join in the search, and sometimes the children are found. But there are also instanees of their being totally lost, or discovered only when dead of hunger or fear.

466 Children apt to be lost in the woods.

467 Cattle used in agriculture.

Both horses and oxen are used in agriculture in Ameriea. In some places, however, they have at times found it necessary to confine themselves exclusively to the use of the latter, beeause they are subject to no disease in that country. Whereas in Pennsylvania, New York, and elsewhere, almost the whole horses are sometimes carried off by a weakness which destroys them in the course of two months. The liver is blown up by a swelling, which extends into the legs and the whole mass of blood, and is called the yellow water. It is said, that in the state of Virginia, the Arabian horse, with a very moderate degree of attention, thrives as in his native climate, and without degenerating. Southwardly, the heat of the sun occasions a deficieney of pasture; and northwardly the winters are too eold for the short and fine hair, and the partieular sensibility of constitution of that race. Their patience of heat fits them, in that and the southern climates, even for the drudgeries of the plough; and numbers of them are exported from thenee to the West India islands, as articles of luxury to the wealthy planters.

468 Sheep.

Very few sheep are reared by the American farmers. The wool is of a good enough quality; but there is little or no demand for it, unless for the supply of some manufactories of hats. The mutton is in general not good; the careases being very large, and the flesh coarse from being fed on the high rank grass of the American pastures. Accordingly, few farmers keep more than 18 or 20 to supply wool to be manufactured in their own families.

469 Swine.

Great numbers of swine are kept by the Americans. This is said to have soon beeome a very favourite kind of stock amongst the earliest settlers in the country; from the delight whieh they found the swine took in hunting out and devouring all kinds of serpents, with whieh the eountry abounded, and which were objects of great terror to persons newly arrived from the eultivated countries of Europe, in which these reptiles are more rare.

470 Grain.

The kinds of grain cultivated in Ameriea are nearly the same with those reared in Europe, with some additions. A regular sueeession of crops is deseribed by an Ameriean writer, as used in recruiting worn-out lands. In Maryland and Virginia, they have long been in the praetiee of sowing a pint of the beans of the *cassia chamæcrista* with every bushel of oats on poor lands. The oats ripen, and are cut in July, when the beans are young, and escape the injury of the scythe. They flower in August and September. In Oetober the leaves fall off; the seeds ripen, and the pod opens with sueh elasticity as to scatter the beans to some distanee around. The year following the field is cultivated with Indian corn, which is sown in drills. The beans whieh sprout early are all destroyed by the plough and the hoe; but the more numerous part not making their appearance above ground, till the culture of the corn is ended, spring up unhurt by the instruments of agriculture, and furnish seed for the ensuing year, when the field is again sown with oats. By this alternate eultivation of Indian eorn and oats with beans, the land is so far improved by the rotting of leaves and stalks of the beans, that the product is 15 bushels to the acre, on such as prior to this management would not have produced more than five. The American husbandmen are also of opinion, that the common field pea is preferable to every thing else for improving land, if the vines or straw be left to rot on the ground, instead of being given to cattle for fodder.

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471 Indian corn.

Indian corn or maize everywhere forms a considerable article of the produee of American husbandry. The mode of rearing it is simple. Holes are made in the field, four feet asunder every way, and so as to form straight lines, for the convenieney of hoeing, or ploughing. In every hole are put five or six grains previously steeped in water, to make them spring up the quicker. By day people are plaeed for a short time to guard them against birds, and by night, fires are kept up till the corn has sprung, to frighten away the fox, who would otherwise turn up the ground, and eat the corn of all the rows one after another. As soon as the corn has shot out of the earth, when it mounts up, the earth is drawn towards its root, to strengthen it against the wind. Five or six ears are commonly found on each stalk. The grains are nearly the size of a pea, and 700 grains are commonly found upon one ear. A light black soil agrees better with it than a strong and rich one. The grain is used in various ways, but chiefly in the form of a kind of porridge or gruel. Bread is also made from it, and it is sometimes used in distillation.

472 Wheat.

As in Europe, wheat is regarded as the most valuable kind of grain. In Virginia, however, near the sea coast, the cultivation of it is not a little discouraged by an insect called the *weevil*. This is a worm whose eggs are almost constantly deposited in the ear of the grain. A slight degree of heat greater than that of the common atmosphere in summer kills it, and is endeavoured to be obtained in the following way: The grain is thrashed as soon as it is cut, and laid up in its chaff in large heaps. The heat whieh is speedily produced destroys the vital prineiple of the egg, and protects the corn from the inconveniences of its being hatched, while at the same time the chaff sufficiently restrains the heat from rising into putrefaction. If the grain continued in the ears without being speedily thrashed, it would be destroyed by the worm which would he excluded from the eggs. This scourge, however, spreads no farther northwards than the Potowmack, and is bounded to the west by the ridge called the Blue Mountains. A few weeks after the wheat has been beaten or trodden out by horses, it is free from all danger, is winnowed, and sent to market.

473 Tobacco.

Tobacco continues to be cultivated to a considerable extent.

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extent in Virginia, and the states to the southward. It is yearly, however, giving place to wheat, which is of infinitely more value to the country, as having a less tendency to impoverish the soil, and contributing in a more direct manner to the encouragement of population. The culture of tobacco, on account of the constant attention and labour which it requires under a burning sun, is chiefly performed by negroes. It is difficult, troublesome, and uncertain. It is sown in the month of March, in a fat and rather moist soil. Before the time of sowing, the land is covered with small branches of trees, which are burnt for the purpose of destroying the herbs and roots that might injure the growth of the plant, and also in order to increase the fertility of the soil by their ashes. The tobacco is thickly sown on a bed in the most sheltered corner of the field. This bed is covered with branches, lest the frost should hinder the unfolding of the seed, and prevent the sprouting of the plants. When they are three or four inches high, they are transplanted into a field, which has been well manured and prepared for their reception. A negro heaps earth around the plants, which are set four feet distant from each other on all sides. The ground is constantly kept clear of weeds, and all the leaves are taken from the plant, which it is thought might injure its perfect growth, beginning always with those that are next the ground, and which might be affected by the wet. More earth is heaped around the stalk, and its head bruised with the nail to prevent its running up too high. All the sprouts which shoot forth below the leaves are cut away, and all the leaves successively torn off, except eight or nine, which alone are left on the stalk. At last, when the plant is supposed to be ripe, which happens in the month of August, it is cut, left several days in the field to dry in the sun, and then carried into the barns, where every plant is suspended by its undermost part. In this position the leaves attain by desiccation the last degree of maturity, but not all of them at the same time; for this desiccation, which, in regard to some, is completed within two days, takes, with respect to others, several weeks. When the leaves are perfectly dry, they are taken from the stalk, and laid one upon another in small parcels. The most perfect leaves must be put together, and those of an inferior quality separated into different classes: this is at least the method followed by such planters as pay most attention to the fabrication of their tobacco. These small parcels of leaves, tied together by their tails, are then brought under the press, and afterwards pressed down into hogsheads. This process varies more or less in the different plantations, but the variations are not by any means considerable. The seed for the next year is obtained from 40 or 50 stalks per acre, which are suffered to run up as high as they will grow without their heads being bruised.

The sorts of tobacco cultivated in Virginia, are the *sweet-scented*, the most esteemed of all; the *big* and *little*, which follow next; then the *Frederick*; and, lastly, the *one-and-all*, the largest of all, and which yields most in point of quantity. A negro can cultivate two acres and a half; and, as each acre yields, upon an average, 1000 pounds of tobacco, each negro can consequently produce 2500 pounds. But the culture of this plant is, as has already been stated, extremely troublesome. It is exposed to a great variety of accidents, which cannot always be avoided, and which destroy many stalks, or spoil at least many leaves. After the plant has been transplanted, the root is frequently attacked by a small worm, which causes the leaf to turn yellow, and which must be taken out of the ground with the fingers, to save the plant. Humidity communicates *the rot* to the plant, that is, covers it with red spots, which cause it to moulder away, and the stalk is lost. Violent winds are apt to break the stalk. When the leaves are at the point of attaining their maturity, horn-worms nestle in them, attack them, and completely destroy the plant, unless they can be torn off. Lastly, When the tobacco is cut and spread on the ground to dry, the wet impairs its quality.

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Indigo and cotton.

Indigo and cotton are also cultivated in some of the southern states. Cotton in particular is exported from Charlestown in considerable quantities; and of late it has been brought down the river Mississippi, from Kentucky and other settlements to New Orleans, in such abundance as to form an important article of commerce.

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Rice.

In South Carolina, rice is cultivated to a great extent. That country is divided by nature into Upper and Lower. The latter, which is the eastern part, adjoining to the Atlantic ocean, extends inward almost 100 miles. The land in this low district consists of marshes and swamps, interspersed with a little high land. The marshes are a second-rate land, which produces a coarse kind of grass in very great abundance. Little attention is paid to them, though they could in general be drained and cultivated. The high land is also neglected for the sake of the swamps, which are the most valuable kind of soil, consisting of a rich blue clay, or fine black earth, to the greatest depth. The rice which is cultivated upon them is sown in April and May. The ground is turned up eight or nine inches deep in furrows, into which the rice is thrown by a woman; and the negroes, who alone are employed in this cultivation, fill up the furrows. The seed shoots up in 10 or 12 days, according as the ground is more or less wet. When the blade is from six to seven inches high, and after the negroes have cleared away the weeds, the water is made to flow over the field, so that no more than the tops of the blades can be seen. In three or four weeks the water is let off, and the negroes take away the remaining weeds. The field is covered again with water, which is drawn off when the yellow colour of the ear and the hardness of the stalk denote the ripeness of the rice. It is then cut and kept in stacks till winter. It is afterwards thrashed, and put into a small wooden house, which is some feet high, and rests upon four pillars; and in the ceiling of which is fastened a large sieve, which separates it from the other parts, and the wind clears it perfectly before it falls to the ground. The rice, after being thus cleared, must be freed from the first shell that surrounds it. For this purpose, it is carried to a mill, the grinders of which are made of fir, and are about four inches thick, and two and a half in diameter. One is moveable, the other fixed. They are both scooped out in an oblique but concentric form. Against the edges thus formed, the rice is pressed; and by that means separated from the husks. These mills are turned by a negro. On account of the rapid motion

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tion and the soft wood of which they are made, they do not last longer than one year. The rice is winnowed as soon as it comes from the mill, but still it has a second shell which must be taken off, and this is done by the negroes pounding it with clubs. These clubs, however, are sometimes put in motion by machinery turned by oxen. After the rice is pounded, it is winnowed again to cleanse it from the second shell; and it is put into another sieve for the purpose of separating the small from the larger grains. The last only are saleable. Whether the separation is carefully made or not, must depend on the honesty of the planter; and, during the late dearth of provisions in Europe, when the rice bore a high price, it is said that they were not very scrupulous in this respect. The rice destined for sale is packed up in barrels, offered for the inspection of the officer appointed for that purpose, and then exported. During its growth, the rice is exposed to several dangers, which render the crop uncertain. Before the blade grows up, it is attacked by small worms, which gnaw the root. It is also frequently injured by little fishes that live in the water which covers the swamps. Against them the rice is only defended by the heron (*ardea alba minor*) which feeds on these little fishes and worms; and on this account is spared by the planters, as the turkey-buzzard is by the town's people. When the rice is ripe, it is assailed by innumerable quantities of small birds, which are known in Carolina by the name of *rice birds*. The young negroes are continually kept beside the fields to frighten them away; but these voracious birds cannot be entirely kept off. The rice swamps yield between 70 and 80 bushels of rice an acre, according to the quality of the soil. Sometimes 120 bushels have been produced from an acre: but instances of this kind have been rare. Twenty bushels of rice, with the shells, weigh about 500 pounds. Without the shells, these 20 make but eight bushels; without, however, losing much in weight. The straw is given to oxen and horses.

It will easily be believed, that the cultivation of rice has a tendency to render a hot climate, in which alone it can be practised, extremely unhealthful. The inhabitants accordingly, in the warm and damp climate of South Carolina, suffer severely every autumn from malignant bilious fevers, which cut them off in great numbers. When originally introduced, this consequence was not foreseen; but it now maintains its ground, from the difficulty of altering an established system of industry. It will probably, however, be suppressed in the course of time, as white men will not engage in the operative part of the cultivation; and the unskilful labour of negroes is always expensive, which prevents the cultivation of it from being attended with any great degree of profit. The American rivers also being subject to violent inundations, which they call *freshes*, often sweep away the whole harvest, together with the woods and fences which surround the rice fields.

476 The country irregularly settled.

The lands that have been brought under cultivation in America do by no means extend in a regular progress at equal distances from the sea coast or from the older settlements. In consequence of the superior goodness of the soil, of the supposed salubrity of particular parts of the country, or of speculations by purchasers of land, who have held out unusual encouragements to new settlers; very remote districts are in many places inhabited, while others at a less distance from the seat of the original colonies, still remain in a state of nature. In general, however, the progress of emigration necessarily must be towards the west, and from choice it usually is from the north to the south. The shortness of the winter in the southern territories of the union, affords a great temptation to this course of things, on account of the heavy tax which is imposed upon human industry, by the necessity of storing up great quantities of fuel for man, and food for cattle, in the more northern regions. In general, the great tract of the Alleghany mountains is left unsettled, and emigrants from the eastern parts of the union usually proceed altogether beyond them before they think of settling. It has been computed that, in some years lately, no less than 30,000 persons have crossed these mountains in search of new habitations. The state of Kentucky, adjoining to the Ohio, has been the chief point towards which these emigrants have directed their course. They usually proceed by land, across the mountains, to Fort Pitt, which is 320 miles from Philadelphia. Families are conveyed thither in waggons, by persons who engage in this employment, and take whole families of men, women, and children, and their goods, at so much *per cwt.* Near Fort Pitt, where many of the emigrants remain, boats are obtained at a trifling price, in which travellers commit themselves to the stream of the Ohio, which conveys them downwards to these remote regions. Other emigrants travel towards the same place by land, through the high country of Virginia, some of whom advance into the new state of Tenessee, that has been formed in the back parts of Carolina. Of the immense territory beyond the Ohio, very little is yet occupied, though the superior mildness of the climate and the fertility of the soil begin to draw emigrants thither from the western states.

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477 Houses.

Of the principal cities and towns of the American union, we shall take notice in separate articles. In the mean time, it may be observed, that the kinds of houses used in America are no less various than the situations of men in that country, from remote and solitary families in the woods, to wealthy citizens who inhabit elegant dwellings in the streets and squares of populous towns. In general, however, houses of all kinds throughout the country of America are formed of timber. We have mentioned the log-houses which the first settlers erect. These are substantial habitations, though usually very clumsy. They are generally replaced by handsome houses, finished by carpenters, with chimneys and ovens formed of brick. The towns in the southern states, being built in this way, have repeatedly suffered great calamities by fire. The fear of this evil, together with the increasing price of timber, has introduced in the northern states very extensively the use of brick for building. Accordingly the city of Philadelphia, containing nearly 80,000 inhabitants, and which is said to be one of the most regular and beautiful in the world, has now a very great proportion of its houses built with brick. They are still, however, not a little exposed to accidental fires, as their roofs are formed of shingles or boards, so placed as that the lower edge of each overlaps the upper part of the board immediately below it, in the way that slates or tiles

are

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are laid upon each other, to cover the roofs of houses in Europe. These roofs, and also the whole outside of the wooden houses, are usually very neatly painted. One convenience that attends the use of wooden houses is, that as they are not lofty, and their structure is very slight, if a man who has only a small house dislikes the place of the town in which he lives, he can remove his dwelling to a more agreeable neighbourhood. The furniture is taken out, the brick chimneys are taken down, and the house is mounted upon very low but very strong carriages, formed for the purpose, and is wheeled away to its new situation in any other street, where ground for the purpose has been procured. When the chimneys are erected, the transference is complete.

478 Religion.

In the United States, religion does not form, as elsewhere, a part of the political establishment of the country, but is rather to be regarded as connected with the state of manners, science, and character of the people. In consequence of the entire freedom of religious opinion and worship which has for many years been enjoyed in America, all the varieties of sects have established themselves there, though nobody has departed from the public profession of Christianity. In general, however, religion is considered as an object of more importance in the northern than in the southern states. Accordingly, the emigrants from the New England colonies, who are the most numerous of all, never fail very speedily to establish religious meetings or churches in their new settlements. Throughout the states, the prevailing forms of religious worship are those of the Church of England, and of the Presbyterians. The Independents are also numerous. In Pennsylvania, the greatest variety of religious denomination prevails; but the Quakers are the most numerous. They were the first settlers in that state in 1682, under William Penn; and maintain in that country the reputation which they have acquired in England, of soberness, industry, humanity, punctuality in their dealings, and strictness in the observance of all the peculiarities of dress, speech, and manners, that their religious opinions enjoin.

479 Moravians.

The Moravians (see *Unitas Fratrum*), have made several establishments in Pennsylvania and elsewhere. That at *Bethlehem*, 53 miles north of Philadelphia, is the oldest and the most considerable. In 1740, Count Zinzendorff purchased the district, and soon brought to it 140 Moravian brethren and sisters from Germany. They had every thing in common: but such was their zeal, that the men soon cleared the woods, made roads, and reduced the lands into cultivation, while the women prepared their clothes and victuals. The system of common property was afterwards done away, excepting as to certain objects, such as corn mills, a tannery, a tavern and buildings, which belong to the whole community. The town of *Bethlehem* is inhabited by 500 or 600 persons, all of the brother or sisterhood. They are divided into five departments, each under the direction of an inspector or inspectress; and the temporal administration of the society is in some degree mixed with its discipline. The unmarried brethren live together in a separate house; that is, they eat and sleep there, but they do not work there if they can work elsewhere. The money they earn is their own, but they must pay for their board and the proportion of the public taxes. The inspectors supply them with work if they cannot find it elsewhere. Thus these brethren cost nothing to the society at large. The same is the case with regard to the unmarried sisters, some of whom are employed as servants and cookmaids in the houses of the town, where they receive board and lodgings. They pay a certain sum to the society, which preserves their right of entering into the unmarried sisters house when they please. In this house most of the sisters are employed in sewing and embroidery, and are paid for their work by the inspectress, who sells it for the benefit of the house. The widows house is supported by the brethren, and the widows themselves contribute their whole labour, which is not sufficient for its support. They have a school or academy which enjoys some reputation. The married people live in their own houses. No communication is allowed between the young men and the young women. When a young man wishes to marry, he mentions to the inspector the girl of whom he has made choice, but to whom he has never spoken. The inspector applies to the inspectress of the girls, and if she judge the young woman's character not incompatible with that given of the young man by the inspector, the girl is applied to, who may refuse, but is not allowed to say whom she would prefer. If an unmarried brother and sister are detected in a correspondence without marriage, the matter is kept secret by the rulers of the society, but the parties are never allowed to marry each other. They are all of German extraction, and speak that language; but their numbers are not increasing, notwithstanding the fecundity of the American women, of which the Moravian married sisters have their share. They have other settlements in the same state, particularly one at Nazareth, 10 miles north from Bethlehem, and another at Litiz, in Lancaster county. They are also settled in New Jersey and North Carolina. There is a general directory of the whole society for America, which corresponds with the general college of the society in Europe, that meets at Hernhutt in Upper Lusatia.

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480 Shakers.

At Lebanon, in the state of New York, a religious society is established, of a singular nature, called the *Shakers*. This society is a republic governed in a despotic manner. All the members work for the benefit of the society, which supplies them with clothes and victuals, under the direction of the chief elder, whom they elect, and whose power is unlimited. Subordinate to him are inspectors of all classes, invested with different degrees of authority. The accounts reach him in a certain regular gradation, and his commands are conveyed in the same manner. It would be an unpardonable breach of order to address the chief elder himself, unless the addresser belongs to a class which enjoys this privilege. Marriage is prohibited in this society, which has been recruited merely by proselytes for 80 years. Married men and women are admitted into the society, on condition that they renounce each other; and they frequently bring their children with them, who in this case are considered as belonging to the society. They make cloth, gauze, shoes, saddles, nails, cabinet work, and in short every article that finds a ready market. They sell their commodities in the neighbouring towns, and the women perform such business as is generally allotted to their sex. The society possesses considerable property,

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property, the amount of which, however, is known to none but the chief elder. They are an honest, good-natured people, are faithful workmen, and very moderate in their prices. Of any peculiar doctrines entertained by them little is known, excepting, that the sect was founded by a woman, called *Anna Leese*, whom they styled the *Elect Lady*. They assert, that she was the woman spoken of in the 12th chapter of the Revelations, that she spoke 72 tongues, and could converse with the dead. Their worship consists of little more than a set of whimsical gesticulations performed upon a signal given by the chief elder, along with the chanting of some hymns known only to themselves. This society has nothing in common with the Quakers.

481 Tunkers.

At Ephrata, 60 miles westward of Philadelphia, is the settlement of what are called the *Tunkers*, or *Dunkers*, (see TUNKERS, or DUMPLERS). They are a kind of Baptists, but profess a strange medley of tenets. They were instituted in this place by one *Conrad Peysel*, a German. He collected them into a society, and conducted them to Pittsburg, which at that time was a wild uninhabited place. The chief of the community who succeeded Peysel, having made some alterations in their discipline, dissensions took place; they dispersed, but afterwards united again in the same place where they were first established. A community of property is observed among them, and they make a vow of poverty and chastity. This vow is not always kept; as some of them quit the society and marry, which it cannot prevent their doing, as the law regards such vows as not obligatory. They lament the fall of our first parent, who would rather have for his wife a carnal being, Eve, than let the celestial Sophia, a being thoroughly divine, bear a child. She would have communicated only with the spiritual nature of Adam, and thus a race would have been engendered all pure and without the least corporeal ingredient. They lament the indulgence which God showed in regard to this desire of Adam; however, God, according to their doctrine, has merely deferred the period of this state of perfection. It is certainly to arrive, and the Tunkers foresee the time, when, after the general resurrection, the divine Sophia will descend into every one of us.

482 Indians.

Three distinct races of men continue to inhabit the territory of the United States. These are the Indians; the Negroes, who were introduced as slaves from the coast of Africa; and the Whites, of European extraction. The Indians, who were the original inhabitants of the country, have now been expelled from a very large portion of it, and their numbers are rapidly declining. "It is a melancholy reflection, (says the American secretary at war, in a memorial addressed to the president in 1794), that our modes of population have been more destructive to the Indian natives than the conduct of the conquerors of Mexico and Peru. The evidence of this is the utter extirpation of nearly all the Indians in the most populous parts of the union. A future historian may mark the causes of this destruction of the human race in sable colours." The government of the United States has made some humane attempts to regulate the intercourse of their people with the unfortunate original inhabitants of the country. In 1796, a law was passed, with this view, which contains many salutary provisions. It ordains, that the boundaries of the Indian territory shall be ascertained and marked as clearly as possible. All persons are prohibited to hunt upon the territory acknowledged by treaty to belong to the Indians, or to carry off cattle from it, on pain of a fine of 100 dollars, and six months imprisonment. None are allowed to enter the Indian territory without a passport. Any fraud, robbery, or other crime, committed against an Indian, is to be punished by a fine and restitution, and the United States bind themselves to see the restitution made, providing the Indian do not himself take vengeance for the injury; in which case he loses his claim. To kill an Indian of any tribe in amity with the United States, is declared a capital crime. None are allowed to trade with the Indians without a license, and those to whom the privilege is granted, are prohibited to purchase any implements of hunting, agriculture, or household economy; and the troops of the United States are authorised to apprehend white men, who trespass against these laws, even upon the Indian territory; and they may also be apprehended in any part of the United States where they are found. An Indian guilty of any crime may be apprehended within the territory of the United States. If he escape, the person injured by him may state his complaint to the agent of the United States on the frontier of the Indian territory, who is to demand reparation from the tribe to which the offending Indian belongs, and to acquaint the president with the result of his demand. If reparation be not made, the injured party is indemnified from the treasury of the United States; and the sum thus applied is deducted from the subsidies granted by the United States to that tribe. The courts of the United States, and also, when the cause is not capital, the courts of the individual states, take cognizance of offences against this law, even when they have been committed within the territories belonging to the Indians.

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Another law enacted in the same year, 1796, with a view to secure to the Indians fair treatment in their commercial dealings with the white people, establishes a trade with them to be carried on under the authority of the president. One hundred and fifty thousand dollars are appropriated to the trade, of which the objects are, to furnish the Indians with such supplies and implements as their wants require, and to purchase from them skins and furs. The law directs, that the prices of the articles sold to the Indians be so regulated as barely to prevent the United States from losing any part of their capital. It restrains the agents employed in their trade from trafficking directly or indirectly on their own account. It forbids them to cheat the Indians, and subjects them to fines of different magnitudes, in proportion to the nature of the offences by which they transgress these regulations. The district courts of the state, where the storehouses are established for the commerce with the Indians, take cognizance of these offences.

It is understood, that the just and liberal provisions of these laws have never been punctually reduced to practice. The extremity of the United States, bordering on the territory of the Indians, is inhabited by a set of men who are in constant hostility with them. This class of inhabitants is universally admitted to consist of the very worst men in all America. The kind

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kind of persons who in Europe become robbers, thieves, poachers and smugglers; in short, the restless spirits, of whom some exist in every community, who can never be confined to regular habits of industry, emigrate in America to the frontiers, and become voluntary exiles from society and civilization. They live, like the savages, by hunting and fishing, or by other trifling exertions of industry; but more frequently, when they find it practicable, they engage in plundering the neighbouring Indians. Accordingly, where these are concerned, the sentiments, and even the idea of honesty and humanity, are unknown to those remote settlers. With very slight shades of discrimination between them, they are uniformly a plundering and ferocious banditti, who consider an Indian as a being not belonging to the human species, and whom they may justly plunder or destroy. Hence it most commonly happens, in those quarters, that neither accusers, witnesses, nor juries, can be found to convict a white man guilty of a trespass or crime against an Indian. The oppressions, the usurpations, and the crimes committed by the whites against the Indians are therefore never punished, or at least the instances of punishment are so rare, that it would be difficult to find an example of its having occurred.

The Indian, on the other hand, harassed and plundered by a set of men, the meanest of whom possesses more art and more powerful means of doing mischief than himself, contracts the habit of robbery and pillage, of which he sees the example, and is the constant victim. As he extends, according to the practice of savages, his vengeance to every individual of the same colour with the person who has injured him, the whites, even of the best character, are compelled, as a measure of safety, to hold themselves in a state of hostility against the Indians, and thus acquire a spirit of enmity towards them. This hostility uniformly ends to the disadvantage of the original inhabitants of this great country, not only because they are less skilled in war, but because the losses of men which they sustain are not rapidly repaired by reproduction, as happens to a civilized people, who know how to rear upon a fertile soil all the means of subsistence in abundance. It is not a little remarkable, that the Indians say, it is the worst class of their whole tribes that habitually continue near the frontiers, engaged in a constant state of fraud and violence.

The government of the United States does not possess upon its remote frontier sufficient strength to repress the irregularities now mentioned. The governments of the individual states do not attend to them. Every person admits, that the evil arises principally and originally from the lawless aggressions of the whites; but as the evil is become habitual, and so inveterate that it is not easy to discover a remedy, it is usually spoken of by the white Americans without horror. In the mean time, the Indians as a people are the only sufferers by it. They are the weaker party. Every contest ends in their discomfiture, and every transaction tends to their disadvantage; whereas the wandering and restless class of white men that constantly keep upon the frontier of the settled country are of essential service to their country. They act as a kind of pioneers in preparing the way for the establishment of persons of better character, who gradually succeed them.

It is an established opinion in America, among the most exempt from prejudices, that the Indians never can be civilized; that the strictest education, the most assiduous and persevering cares, cannot destroy their savage habits, to which they recur with the most ardent passion, from the tranquillity and from the manners of the white people; and an infinite number of examples are cited, of Indians brought up at Philadelphia and New York, and even in Europe, who never ceased to sigh after their tribe. The opinion that has been reared upon these facts has, no doubt, had a considerable effect in diminishing the exertions of benevolent persons towards their civilization. It has been justly remarked, however, that we have no reason to be surprised by the conduct of those educated Indians who resumed their original habits. "The Indians," says the duke de la Rochefoucault Liancourt, "whose education has been attempted, or said to be, had already passed some years of their life in the tribe to which they belonged. Transported alone from their species into the midst of white people, different in language, habits, and in colour, and often even in clothing, they became as it were insulated; they were regarded by the whites as a different species of men; they did not even attempt to make them forget that they were from a nation still existing, whose manners and habits had rivetted their first attention, and made the deepest impression upon them. If, when arrived at the age of manhood, they should have imbibed for a white woman that affection which naturally created the desire of an union with her, the difference of colour became an almost insurmountable obstacle. Is it to be wondered at, then, that these Indians should wish to return to their tribe, of which they had still the most lively memory, and where alone they were able to find companions of similar manners to their own, and those pleasures which cause in man an attachment to life?" There are, however, in Connecticut, and in the state of New York, a considerable number of Indians, both men and women, who serve as domestics in white American families, and who perform their duty as well and as faithfully as those of any other race. One tribe only of Indians, the *Oneidas*, in the back parts of the state of New York, on the shore of Lake Ontario, appears to have acquired what can be said to resemble civilization. They cultivate the ground with success, and have a considerable number of villages. They are mild and peaceful, and kindly officious in performing little services to the whites. On the whole, they are accounted excellent neighbours.

In the mean time it is evident, from the ordinary progress of things, that unless the other tribes of Indians shall resolve, which seems extremely unlikely, to subsist by agriculture, they must speedily yield to the encroachments of American population and industry. In the territory of the United States, beyond the Ohio, which, with some trifling exceptions, is still occupied by the Indians, it is believed there exists a population of about 50,000 souls. Between the head of the Ohio at Fort Pitt and the northern lakes, a few thousands more are to be found. In the states of Carolina and of Georgia, and Florida belonging to Spain, about ten or twelve thousand are still to be found; so that, in the territory of the United States there is probably, in all, between sixty and seventy thousand Indians. The ter-

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ritories occupied by the Indians are acknowledged to be their own, and that they cannot be taken away by force. But this affords no protection to these people. A little whisky will bribe their chieftains to give their consent to the largest transferences. It is perfectly common for great tracts of the finest territory in the world to be bartered away, with the consent of all parties, for a few rings, a few handkerchiefs, some barrels of rum, and perhaps some money, which the unfortunate natives know not how to convert to any valuable use. The European nations and their descendants have long been accustomed to regard all the world as their property, and the rest of mankind as a kind of intruders, or an inferior race, whom they have a right to dispossess when it suits their conveniency. We are apt to treat as absurd the right which the pope, as high priest of the European states, once claimed, to give away at his pleasure whole empires and immense tracts of unknown territory which never belonged to him; but the conduct of the parties to the treaty of Paris in 1783 was probably neither less unjust nor less absurd, when the king of Great Britain gave up, and the American states were understood to acquire, a right of undisputed sovereignty over an immense territory inhabited by independent nations. The states of America, accordingly, consider themselves as possessing the supreme right to the property of the territory belonging to the Indians; and though they do not seize that territory by force, or transfer it by sale, they readily do what is nearly equivalent; they sell to private persons the right to purchase certain portions of it from the Indians. Thus the state of Massachusets sold to Messrs Phelps and Gorham the exclusive privilege of purchasing from the Indians a large territory upon the river Genessee, whenever they should consent to part with it. Messrs Phelps and Gorham sold this privilege of purchase to Mr Morris, who again sold it to the Dutch Company; binding himself at the same time to prevail with the Indians to relinquish their right to a certain part at least of the lands. Thus four different sets of purchasers succeeded each other in regard to an object, concerning the sale of which the consent of the true original owners had not yet been obtained; and four different contracts were entered into, founded on the supposition, that it would be an easy matter to remove the Indians from those distant corners to which they had retired; a point about which their more polished neighbours were well assured.

485 Smallpox and intemperance fatal to the Indians.

The smallpox has at different periods proved extremely fatal to the Indians, and has greatly diminished their numbers. But the most dangerous enemy which they have to encounter is their attachment to spirituous liquors, which the whites cannot be prevented from selling to them, and which they cannot restrain themselves from purchasing. These liquors are peculiarly fatal to their strength and health, and daily render their marriages less prolific.—So that, from a complication of evils, the hostility and oppression of the neighbouring white people, the imprudent sales which they make of their territory, and the diseases to which they are exposed, the Indian tribes are gradually expatriated and decreasing in number. Every nation is now divided into different branches; the families are dispersed abroad; and whisky is rapidly diminishing the number of those which yet remain. A few years more, and these nations will disappear from the surface of the earth, as civilized people approach. United States.

Negroes originally imported from the coast of Africa, and held in slavery or emancipated, form another part of the population of the United States. The British nation, which refused to pollute its population at home by the existence of domestic slavery, had nevertheless tolerated the practice in its distant colonies, where the character of the people was accounted of less importance to the empire, and where the interests of commerce were regarded as the primary object of attention. In the convention which formed the constitution of the American union, the southern states were successful in obtaining an enactment in favour of the slave trade, which was couched in the following ambiguous terms: "The migration or importation of such persons as any of the states now existing shall think proper to admit, shall not be prohibited by the congress prior to the year 1808; but a tax or duty may be imposed on such importation, not exceeding 10 dollars for each person." There are no slaves in the commonwealth of Massachusets; and this is the only state in the union that is entirely exempt from the disgrace of personal slavery. It was abolished in the following manner: No law in New England had positively authorized slavery; but it prevailed under the sanction of custom and of public opinion. Several laws indeed presupposed it; as they authorized the reclaiming of negroes who quitted their masters, enjoined the necessity of restoring them, and prohibited the intermarriage of blacks with free people. The new constitution of Massachusets, like those of the other states, declared an equality of rights for all men. In 1781, some negroes, prompted by private suggestion, maintained that they were not slaves, and they found advocates who brought their cause before the supreme court. Their counsel pleaded, 1st, That no law established slavery, and that the laws supposing it were the result of error in the legislators who had an authority to enact them; 2dly, They contended, that all such laws were annulled by the new constitution. They gained the cause upon both these principles; and, as there were only few slaves in Massachusets, all further idea of slavery was banished. But in the other New England states, under similar laws, and in similar circumstances, a contrary decision was given.

It is to be observed, that in 1778, the general enumeration of the population of Massachusets, included 18,000 slaves; whereas, the census of 1790 exhibits only 6000 blacks, and at present there are none. It appears that a great proportion of the emancipated negroes went to the towns, where making an indiscreet use of their newly acquired freedom, many of them addicted themselves to the intemperate use of spirituous liquors, and died in consequence; others engaged as sailors even on board foreign ships. The generality of those who did not disappear became servants; some are tradesmen, or even farmers; but only a small number have attained to independence. They fall under the lash of public justice more frequently than the whites, in proportion to the numbers of each class; and indeed the free blacks are generally held to be thievish and disorderly.

In the eastern part of Virginia, one-third of the population consists of Negro slaves, and farther south, where

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where rice is cultivated, the proportion of negroes is still greater. In New York, and the other middle or northern states, measures have been adopted for their gradual emancipation. Such measures have become popular, not only from the general temper of the age, but from the conviction, now generally diffused, of the tendency of domestic slavery to degrade the character of the free white men.

486 Whites.

With regard to the whites, who form the third and last class of the people of this great country, it may be observed, that when the American constitution ordained the enumeration of the inhabitants of the United States, within three years after its acceptance, it enacted also, that the same enumeration should be renewed every 10 years, and left it to the congress to make a law for regulating the manner of performing it. A law was necessarily passed for this purpose in 1790. The marshal of every district, who is a kind of sheriff, is ordered to superintend the enumeration. In this work he may call in what aid he thinks proper. He must make a return to the president of the United States, distinguishing in the table of population, the number of free males under and over the age of 16 years; and also the free women and girls; and the slaves. The Indians are not included in the list of population. The lists are exhibited upon public places, for the correction of the inhabitants; and the heads of families are required, under a pecuniary penalty, to state correctly the number of their families.

The enumeration of the people taken in 1790, by virtue of this law, announced a population of 3,929,326 inhabitants, of whom 3,231,629 were free. In 1800 the population amounted to 5,308,666, of whom 896,849 were slaves; and in 1810, the population amounted to 7,239,903, of whom 1,191,364 were slaves. The present population (1820) is estimated at ten millions; and the period of doubling is found to be about twenty-three years.

487 National character.

The character of the inhabitants of the United States of America, is necessarily various, according to the climate which they inhabit, and the laws and history of the different states. The use of slaves, in particular, has of itself produced a considerable effect upon the character and habits of the free men of those parts of the empire in which they abound. Certain features of character, however, are in some measure common to the whole inhabitants of the states; and it may be observed in general, that the British nation, which was the founder and the parent of these people, has no reason to be ashamed of them. Indeed, in a country which belonged to Great Britain for a long time, which was peopled from it, of which the most numerous and nearest connections are yet with Great Britain, and which carries on with us almost all its commerce, the manners of the people must necessarily in a great degree resemble our own. Accordingly, the American manners, particularly those relative to living, are the same as in England, or the south of Scotland; and New York and Philadelphia are faithful copies, in this respect, of Liverpool and of Glasgow. As to the dress, the English fashions are as faithfully copied, as the transmissions of merchandise from England, and the correspondence of tailors and mantua-makers, will admit of. The distribution of the apartments in their houses is like that of Great Britain. The furniture is British; the town carriages are either British or in the British taste, and it is no small merit in the fashionable world, to have a coach newly arrived from London, of the newest fashion there. The cookery is British; and as in Britain, after dinner, the ladies withdraw, and give place to drinking wine, a custom which the Americans carry at least to as great a length as the natives of the parent state. Indeed, frequent and sumptuous dinners are said to be held in as high consideration in the new, as in the old world.

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In the United States, the British character is modified by the situation in which the inhabitants of this new empire find themselves. The most general qualities common to all Americans, are understood to be, intrepidity, an ardour for enterprise, a high opinion of themselves, humanity, and a boundless love of gain. These qualities, some of which are so apparently discordant, are nevertheless found to unite in the American character. They who consider candidly the history of the war of the revolution, the instances of individual courage which they exhibited in it, and the perseverance which the whole people displayed under repeated discomfiture, will be fully satisfied concerning their firmness and courage. Habituated to fatigue from their infancy, having for the most part made their fortunes by their labour and their industry, fatigue and labour are not yet become repugnant, even to those in easy circumstances. While they wish to enjoy the luxuries of life, they do not regard them as absolute wants. They know how to dispense with them, and to quit them and to travel in the woods whenever their interest requires it. They can forget them whenever a reverse in the current of their affairs takes them away. They are not depressed by disappointment, but instantly resume the pursuit of fortune when she has most cruelly deceived them.

Great pride of spirit, and a high notion of their own worth, are also striking parts of the American character. A committee of the house of representatives of the United States, appointed to prepare an answer to the address of the president, in December 1796, gave a notable instance of this. These gentlemen very modestly thought fit to call their countrymen *the most enlightened nation of the whole world;* and very great labour and long discussions were necessary before the majority of the house could be prevailed upon to sacrifice this superlative, which it is said would not have embarrassed the modesty of their constituents. No white American will so far degrade himself, as to consent to accept of the situation of a domestic menial servant or footman. Hence it is said, that throughout the whole extent of the United States, 20 native Americans are not to be found in the state of domestic servants. This class of domestics in America is composed of emigrant priests, Germans, and negroes or mulattoes. As soon as the former of these have acquired a little money, they quit a station which they find to be regarded with such contempt, and establish themselves in a small trade, or upon land which they clear and cultivate. Hence it may easily be inferred, that a good domestic man-servant is not easily to be found in America.

The prejudice which causes the men in America to have so great a repugnance to the state of domestic

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servitude, does not influence the women in the same degree. And accordingly, nothing is more common than to see young women of good families, in the situation of servants during the first years of their youth.

At the same time, it must not be imagined, that pure republican manners prevail in America. Though there are no distinctions of rank, formally acknowledged by law in the United States, yet fortune and the nature of professions form different classes. The first class is occupied by the great merchants, the lawyers, the physicians, the clergy, and the land-owners who do not cultivate their land themselves; the number of whom is small from the state of Delaware to the north, but is great in the states of the south, where slavery prevails. The second class consists of the inferior merchants, the farmers, and the artisans. And the third class is composed of workmen, who let themselves to labour by the day, the month, &c. In balls, concerts, and public amusements, these classes do not mix; though, except ordinary labourers, and common sailors, every one calls himself, and is called by others, a gentleman. A small income is sufficient for the assumption of this title, as it easily carries men from one class to another. It is said, indeed, that the struggle for rank between different classes produces, in the great towns, a very ruinous degree of ostentation. In New York and Philadelphia, luxury is very high, and makes a dangerous progress every year, by increasing the expence of living, and altering the public opinion with regard to what constitutes easy circumstances and a competent fortune. Still, however, the inferior class of workmen entertain a higher opinion of themselves than elsewhere. They find the road to independence more practicable, and as the price of their labour is high, their circumstances are easy, and they endeavour to throw aside, as far as possible every appearance of rusticity. They see all ranks of men engaged in business; they do not therefore account themselves degraded by being compelled to labour, especially as they find their skill and industry sought after by others, while it is productive of affluence to themselves; for in the United States there is not a family, even in the most miserable hut, who do not eat butchers meat twice a-day at least, and drink tea and coffee; nor is there a man who drinks pure water. Having heard much of the modes of living usual among persons of their rank in other nations, they are led to entertain an unbounded value for themselves and their country.

Did not the practice of slavery still stand in the way, the Americans would not be surpassed in the reputation of generosity and humanity. When a brother or a sister dies, leaving orphan children, they are readily adopted into the families of their uncles and other kindred, who treat them entirely as their own. This conduct is so common in America, that it meets with no praise, and is considered merely as the performance of the most ordinary duty, and as requiring no effort. Hospitality to strangers is also exerted to a great extent, and in a way that even perplexes for some time the modesty of an European. In cases of unusual calamity also, great liberality is displayed by them. The unfortunate sufferers by the fires of Charlestown and Savannah, and by the dreadful disease which raged at Philadelphia, New York, and other cities, were relieved by the abundant subscriptions of the citizens of all the American towns where these disasters did not occur. The inhabitants of the French West India islands who fled to the shores of America, in consequence of the events of the late terrible revolution, were relieved by voluntary contributions, to the amount of more than 200,000 dollars. Whole families of them were supported for one or two years, according to their necessities, by individual Americans, in their houses, merely because they were unfortunate. There also exists a very considerable number of charitable societies for various purposes, in the United States. Some of these are marine societies, whose purpose is in some towns to provide a subsistence for the wives and children of those who die at sea, or to provide assistance to all vessels wrecked upon their coasts. There are also societies for the assistance of emigrants, that is to say, for assisting with advice and succours those strangers who arrive from Europe, with an intention of establishing themselves in America. Others subscribe for the support of hospitals and schools, and for the distribution of proper medicines. There are societies for the civilization of the Indians, and others for the purposes of ameliorating the situation of prisoners. Indeed, it is with regard to this last subject that the Americans are entitled to boast that the triumph of humanity has been more complete in some parts at least of their country than anywhere else in the world. At Philadelphia, the administration of the prisons has been established upon the most enlightened and benevolent principles, and is conducted with a degree of advantage to the public, and to imprisoned criminals, that has hitherto been unknown in the history of mankind. The jailors receive ample salaries; a constant inspection is exerted over them, by the most respectable characters in the state; the convicts are treated with the utmost mildness; yet licentiousness is banished, they are enabled to support themselves, and sometimes to carry out with them a sum of money, or to support their families during their confinement; and in almost all cases, the much wished-for, but hitherto unattainable end, is said to be gained, of rendering punishment the means of accomplishing the reformation of the criminal. Such is said to be the admirable effect of the humane and skilful management which has been here adopted, chiefly, it is understood, by means of the members of the sect of Quakers; that, instead of the prisons containing what are called old offenders, it usually happens, that of 100 convicts discharged, either in consequence of pardons, or at the expiration of the term of their sentence, there are never above two committed for new crimes, although imprisonment for a longer or shorter period is the only punishment adopted for all great crimes; no crime being capital excepting only wilful murder.

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But the most remarkable feature in the American character, and indeed their ruling passion, is a boundless thirst after gain. This passion, however, is in them altogether different from that timid and hoarding appetite which with us is sometimes seen to quench all the energies of the human mind, and to extinguish every generous and liberal sentiment. In truth, the avarice of an American is nothing more than the passion of ambition directed to the acquisition of wealth

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as the only means of attaining distinction in the state of society in which he is placed. Accordingly he endeavours to gratify his love of riches, not so much by the slow and sure mode of saving what he already possesses, and of suffering it to accumulate, as by entering into bold and hazardous speculations, with a view to the sudden acquisition of fortune. If his speculation is unsuccessful, he thinks not the worse of himself on that account, nor is discouraged from repeatedly encountering similar hazards. If he is at last successful, his wealth is used in such a manner as evidently demonstrates that the love of riches has not fully engrossed his mind. He is luxurious, ostentatious, generous to the unfortunate, and ready to contribute to every scheme of public beneficence or utility. Still, this ardent passion for the acquisition of money, which occupies so much of the thoughts of every American, never fails to appear disgusting to men of letters, or to men of rank who have at any time gone from Europe to America. They are astonished to find physicians, lawyers, and priests, deeply engaged in stock-jobbing and commercial speculations, and that every part of society is composed of men whose ruling passion and great subject of meditation is, the sudden acquisition in some way or other of great pecuniary gain.

The Americans marry very young, especially in the country. Young men, who generally establish themselves very early either in some new lands or in some trade, have occasion for a wife to assist them in their labours; and this conduces to their early marriages as much as the general purity of manners. If a wife die, she is, for the same reason, very speedily replaced by another. Both in town and country, she is an indispensable resource for domestic affairs, when her husband is engaged in his own affairs, as every one is in America. She is also necessary as a companion, in a country where the children soon quit their parents, and where the men, constantly engaged in some kind of business, find it inconvenient to leave their own families in search of society. The manners of the Americans in their conduct towards the other sex are represented as very pure. Young women of uncommon beauty travel alone from 15 to 25 miles to Philadelphia to market with eggs, fowls, butter, and other commodities, beginning their journeys at the commencement of the night, without finding that their youth and beauty expose them to any hazard or inconvenience.

All travellers agree in representing the American women as highly virtuous and respectable; as faithful and industrious wives, and affectionate mothers. The young women enjoy entire freedom, and the commerce of the sexes is free from gallantry and from jealousy, The crime of adultery, which attacks society in its first elements, is said to be unknown. One quality ascribed in a remarkable degree to the American women ought not to pass unnoticed, which is, a remarkable attention to cleanness, both in their persons and their houses. The French who took refuge in the United States during the revolution, though attentive enough in this respect to the appearance of their persons, were regarded as so slovenly and dirty in the management of their houses and furniture, that they soon rendered themselves altogether odious to the Americans.

The state of education and of literature is still defective in most parts of America. The physical or natural part of the education of the Americans is said to be excellent. Left to themselves from their tenderest age, they are exposed without precaution to the rigour of heat and cold, with their feet and legs bare, and with few clothes. The children of the rich are not brought up much more tenderly than those in less easy circumstances. In the country they often go alone twice a-day to schools, two or three miles distant from home. There are few American children who cannot swim boldly, and at ten years of age manage a gun and hunt without danger; and not one who does not ride with great courage, or who fears fatigue. This liberty given to children teaches them to take care of themselves, and bold as they are, they avoid dangers better than children brought up with much greater care. They become strong and enterprising men, whom no difficulties dishearten; and produce a growing generation, which will be as invincible in its territory, as that which preceded it was found to be.

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The instructive part of education has not attained the same perfection. Massachusets is the state in which a system of education has been most regularly established by law. It was enacted in 1789, that each town or township containing 50 families or houses shall have a schoolmaster of good character, to instruct the children in the English language, reading, writing, and arithmetic. The school to be open six months in the year. The towns or townships of 100 families, are to have schools of the same kind, which are to be open during the whole year. Those of 150 families are bound to have two schools, one for 12 months and one for six. Those of 200 families, or more, are bound to have two schools, one for 12 and one for six months, and in addition to these, a grammar school, in which the Greek, Latin, and English languages are to be taught grammatically. The expence of supporting the schoolmasters, together with the school-houses, the fuel, and ink that may be necessary, are defrayed by a general tax or assessment upon the whole people. The parents pay their share of this assessment, in proportion only to their wealth, and not to the number of their children. They supply their children with the necessary books, and with pens and paper. Colleges are also established; but in these the professors receive fees from the students. The books read at the schools are regulated by law; and we are informed, that the Latin grammar which the state of Massachusets has preferred is that of Dr Alexander Adam, rector of the High School of Edinburgh, author also of the celebrated treatise upon Roman antiquities, and other works illustrative of classical literature.

Though the state of Massachusets has the most complete system of education, the manners of the people in the whole New England states have produced such a degree of attention to literature, that there are few or no white persons there who cannot read the English language, and the people at large possess a considerable degree of literature. In proportion, however, to the distance from New England southward, education becomes gradually defective, and in the Carolinas and Georgia, schools are scarcely to be found. In different states, however, there are colleges and universities, in which the sciences are taught, and degrees conferred.

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The education of youth in America is conducted as in Scotland, with a view rather to introduce young persons quickly into life, than to render them men of profound learning. A young man in America hardly arrives at the age of 16 years before his parents are desirous of planting him in the counting-house of a merchant, or in the office of a lawyer: Hence he is never likely to resign himself to the sciences and to letters. He soon loses all other ideas than those which can hurry him on to the acquisition of a fortune. He sees no other views in those around him, or in society; and that his whole consideration is attached to this kind of success. Hence it will not appear surprising, that there should be few learned men in the United States. Indeed, the number of learned, ingenious, and well-informed individuals, which is very considerable, that have appeared there, must be ascribed rather to their own native energy of character than to their education, or the state of society in which they were placed.

In the American schools, the instruction in Latin is seldom extended farther than the first classic authors, including Cornelius Nepos, Ovid, and some orations of Cicero. A little of Virgil and Horace are read in the colleges. The New Testament in Greek, and a little of Homer in some colleges, is the limit of classical instruction in that language. Mathematical instruction is usually confined to the Elements of Euclid, and the first principles of conic sections. Practical geometry, however, for the purposes of land-surveying and navigation, is much valued, on account of its connexion with those branches of business which lead to riches. Mechanics, hydrostatics, and hydraulics, are taught after the works of Nicolson, Ferguson, or Enfield. Medicine, however, and the branches of science connected with it, are said to be well taught in some American universities; and that profession has produced many respectable and well-informed men. Still it is probable, that however enlightened the Americans may account themselves, the nature of their pursuits is such, that a considerable time will elapse before they can exhibit any great number of men of profound and extensive learning. Such accomplishments, however, as their situation requires they possess in much perfection. In the debates of congress, speeches full of correct reasoning, drawn from a knowledge of mankind and of history, and expressed with purity and eloquence, are often heard; and almost all persons engaged in business aspire in their correspondence to display much elegance of expression, though their style is apt to swell out into verbosity. United States.

The most common vices of the American people are, an ostentatious luxury, on the part of the rich in great towns; and of the inferior class, a too free use of spirituous liquors. This they are led to by their easy circumstances, and by a great fondness for society. These vices are greater and more remarkable in the southern states than in the northern. In the south, also, men are more fond of gaming than in the north, and the energetic qualities of the American character are less conspicuous; a circumstance which is supposed to arise from the existence of slavery, which in these states renders labour and personal industry less respectable. But in general the character of the Americans is rendered pure by the train of constant industry in which all persons are engaged. One of the most troublesome of their faults, however, ought not to pass unnoticed: They are, upon the whole, a very litigious people, and lawyers abound and flourish among them to a great degree. But, in common with all the countries that have derived any part of their constitution or their laws from England, they possess a very pure administration of justice. This has always been the singular privilege and the glory of the English nation. No people that attains to it can fail to possess sound morals, or consequently to enjoy all the prosperity of which a nation is capable. To the habits of integrity, and a respect for the laws and the magistrates, which it produces, we must ascribe the internal tranquillity of America. Politics form the only science which all men study there; and political zeal hurries the different parties into the most uncharitable misrepresentations of each others views and conduct. But no man has preferred his own personal aggrandisement to the authority of the law or the welfare of his country; no usurpation has defaced the fair page of the American history; and if rebellion has occurred, it has been bloodless, and has only afforded to all ranks of men an opportunity of displaying their attachment to public order.

Upon the whole, though men exclusively attached to the pursuits of literature, and to the enjoyment of idle but polished society, would find themselves ill situated in America, yet we must undoubtedly regard the United States as forming at this moment the most prosperous empire upon the globe. It contains an active people, easy in their circumstances and happy; and every day gives an accession of population and of strength to this new country. See AMERICA, SUPPLEMENT.

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American

From Arrowsmith

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American ‖ Amethyst.

AMERICAN NIGHT-SHADE. See PHYTOLACCA, BOTANY *Index*.

AMERICAN *Ground-nut*. See ARACHIS, BOTANY *Index*.

AMERICUS VESPUCIUS. See VESPUCCI.

AMERSFORT, a city in the Dutch province of Utrecht, seated on the river Ems. E. Long. 5. 4. N. Lat. 52. 14. The most remarkable objects are, the townhouse; the grand palace, which is triangular; the public walk, planted with trees; and the great church, dedicated to St George. The land to the east and south of this city is very fruitful; on the north there is nothing but pasture ground, and on the west it is woody. Not far from hence is a mountain called *Amersfort-berg*, on which is planted a vista of trees, which reaches to Utrecht.

AMERSHAM, or AGMONDESHAM, a market town in Buckinghamshire, with a free-school, and four almshouses. It sends two members to parliament, and has a market on Tuesday. It is a rectory rated at 48l. 16s. 8d. in the king's books. The market-house is a very handsome structure. Population in 1811, 2259. W. Long. 0. 35. N. Lat. 51. 47.

AMES, WILLIAM, D. D. a learned independent divine, celebrated for his controversial writings, was born in 1576, and educated at Christ's college, in Cambridge. In the reign of King James I. he left the university, and soon after the kingdom, on account of his being unwilling to conform to the rules of the church; and retired to the Hague, where he had not been long before he was invited to accept of the divinity chair in the university of Franeker, in Friesland, which he filled with admirable abilities for above twelve years. He from thence removed to Rotterdam for a change of air which his health required; and here he continued during the remainder of his life. His controversial writings, which compose the greatest part of his works, are chiefly against Bellarmine and the Arminians. He also wrote, 1. A fresh Suit against the Ceremonies. 2. *Lectiones in Psalmos Davidis*. 3. *Medulla Theologiæ;* and several pieces relative to the sciences. He died of an asthma at Rotterdam, in November 1633.

AMES, *Fisher*, an American political writer. See SUPPLEMENT.

AMESTRATUS, a town of Sicily (Cicero); *Amestratos* (Stephanus); *Amastra* (Silius Italicus); *Multistratos* (Polybius): Now *Mistretta*, in the Val di Demona, on the river Halesus. It was a very strong fort of the Carthaginians, besieged in vain by the Romans for seven months with considerable loss; at length, after another siege, taken and razed (Diodorus Siculus).

AMETHYST, a transparent gem of a purple colour, which seems composed of a strong blue and a deep red; and, according as either of these prevails, affording different tinges of purple, sometimes approaching to violet, and sometimes even fading to a pale rose colour. Though the amethyst is generally of a purple colour, it is nevertheless sometimes found naturally colourless, and may at any time be easily made so by putting it into the fire; in which pellucid or colourless state, it so resembles the diamond, that its want of hardness seems the only way of distinguishing it. Some derive the name *amethyst* from its colour, which resembles wine mixed with water; whilst others, with more probability, think it got its name from its supposed virtue of preventing drunkenness; an opinion which, however imaginary, prevailed to that degree among the ancients, that it was usual for great drinkers to wear it about their necks. Be this as it will, the amethyst is scarcely inferior to any of the gems in the beauty of its colour; and in its purest state is of the same hardness, and at least of equal value, with the ruby and sapphire. It is found of various sizes, from the bigness of a small vetch to an inch and a half in diameter, and often to much more than that in length. Its shape is extremely various, sometimes roundish, sometimes oblong, and at others flatted, at least on one side; but its most common appearance is in a crystalliform figure, consisting of a thick column, composed of four planes, and terminated by a flat and short pyramid of the same number of sides; or else, of a thinner and longer hexangular column; and sometimes of a long pyramid, without any column. It makes the gayest figure in the last of these states, but is hardest and most valuable in the roundish and pebble-like form. The amethyst is found in the East and West Indies, and in several parts of Europe; the oriental ones, at least some of the finer specimens, being so hard and bright as to equal any of the coloured gems in value. However, by far the greater number of amethysts fall infinitely short of these; as all the European ones, and not a few of those brought from the East and West Indies, are very little harder than common crystal.

Amethyst ‖ Amhar.

Counterfeit or Factitious AMETHYST. Spars and crystals tinged red and yellow, &c. are sold for amethysts. The false ones come from Germany, are tinged by vapours in the mines, and contain lead.

Amethysts may be counterfeited by glass, to which the proper colour or stain is given. There were fine ones made in France about the year 1690, which may even impose on connoisseurs, unless the stone be taken out of the collet.—The method of giving this colour to glass is directed as follows: Take crystal frit, made with the most perfect and fine tarso: Then prepare a mixture of manganese in powder, one pound; and zaffre prepared, one ounce and a half: Mix these powders well together; and add to every pound of the frit an ounce of this powder. Let it be put into the pots with the frit, not into the prepared metal. When the whole has stood long enough in fusion to be perfectly pure, work it into vessels, and they will resemble the colour of the amethyst.

AMETHYST, in *Heraldry*, a term for the purple colour in the coat of a nobleman, in use with those who blazon with precious stones, instead of metals and colours. This, in a gentleman's escutcheon, is called *Purpure;* and in those of sovereign princes, *Mercury*.

AMETHYSTEA, AMETHYST. See BOTANY *Index*.

AMETHYSTINE is applied, in antiquity, to a kind of purple garment dyed of the hue of amethyst. In this sense amethystine differed from *Tyrian* as well as from *hyacinthine* purple, being a kind of medium between.

AMHAR, or AMHARA, a province of Abyssinia, said to extend 40 leagues from east to west. It is considered as the most noble in the whole empire, both on account of its being the usual residence of the A-

Amhar || Amicable.

byssinian monarchs, and having a particular dialect different from all the rest, which, by reason of the emperors being brought up in the province, is become the language of the court and of the politer people. Here is the famed rock Amba-geshen, where the young monarchs were formerly confined. See AMBA and ABYSSINIA.

AMHURST, NICHOLAS, an English poet and political writer of the 18th century, was born at Marden in Kent, and entered of St John's college, Oxford; from whence he was expelled for irregularity of conduct and libertine principles. Retaining great resentment against the university on this account, he abused its learning and discipline, and some of the most respectable characters in it, in a poem published in 1724 called *Oculus Britanniæ*, and in a book entitled *Terræ Filius*. He published, A Miscellany of Poems, sacred and profane; and, The Convocation, a poem in five cantos, which was a satire on the bishop of Bangor's antagonists. But he is best known for the share he had in the political paper called *The Craftsman*: though, after having been the drudge of his party for near 20 years, he was so much forgotten in the famous compromise of 1742 as if he had never been born; and, when he died in that year of a broken heart, was indebted to the charity of his booksellers for a grave.

AMIANTHUS, or EARTH-FLAX, in *Mineralogy*, a fibrous, flexible, elastic, mineral substance, consisting of short, abrupt, and interwoven filaments. It is found in Germany, in the strata of iron ore, sometimes forming veins of an inch in diameter. Its fibres are so flexible that cloth has been made of them, and the shorter filaments that separate in the washing of the stone may be made into paper in the common manner. For the method of its preparation for manufacture into cloth, see ASBESTOS.

Amianthus is classed by Mr Kirwan in the muriatic genus of earth, because it contains about a fifth part of magnesia. Its other constituents are, flint, mild calcareous earth, barytes, clay, and a very small proportion of iron. It is fusible *per se* in a strong heat, and also with the common fluxes. See MINERALOGY *Index*.

AMICABLE, in a general sense, denotes any thing done in a friendly manner, or to promote peace.

AMICABLE Benches, in Roman antiquity, were, according to Pitiscus, lower and less honourable seats allotted for the *judices pedanei*, or inferior judges, who upon being admitted of the emperor's council, were dignified by him with the title *amici*.

AMICABLE Numbers, denote pairs of numbers, of which each of them is mutually equal to the sum of all the aliquot parts of the other. So the first or least pair of amicable numbers are 220 and 284; all the aliquot parts of which, with their sums, are as follows, viz.

of 220, they are 1, 2, 4, 5, 10, 11, 20, 22, 45, 55, 110, their sum - - - - - - 284;

of 284, they are 1, 2, 4, 71, 142, and their sum is 220.

The 2d pair of amicable numbers are 17296 and 18416, which have also the same property as above.

And the third pair of amicable numbers are 9363584 and 9437056.

These three pairs of amicable numbers were found out by F. Schooten, sect. 9. of his *Exercitationes Mathematicæ*, who, it is said, first gave the name of *amicable* to such numbers, though such properties of numbers, it seems, had before been treated of by Rudolphus, Descartes, and others.

Amicable || Amida.

To find the first pair, Schooten puts $4x$ and $4yz$, or a^2x and a^2yz for the two numbers where $a=2$; then making each of these equal to the sum of the aliquot parts of the other, gives two equations, from which are found the values of x and z, and consequently assuming a proper value for y, the two amicable numbers themselves $4x$ and $4yz$.

In like manner for the other pairs of such numbers; in which he finds it necessary to assume $16x$ and $16yz$ or a^4x and a^4yz for the 2d pair, and $128x$ and $128yz$ or a^7x and a^7yz for the third pair.

Schooten then gives this practical rule, from Descartes, for finding amicable numbers, viz. assume the number 2, or some power of the number 2, such that if unity or 1 be subtracted from each of these three following quantities, viz.

from three times the assumed number,

also from 6 times the assumed number,

and from 18 times the square of the assumed number,

the three remainders may be all prime numbers; then the last prime number being multiplied by double the assumed number, the product will be one of the amicable numbers sought, and the sum of its aliquot parts will be the other.

That is, if a be put $=$ the number 2, and n some integer number, such that $3a^n-1$, and $6a^n-1$, and $18a^{2n}-1$, be all three prime numbers; then is $\overline{18a^{2n}-1} \times 2a^n$ one of the amicable numbers; and the sum of its aliquot parts is the other.

AMICTUS, in Roman antiquity, was any upper garment worn over the tunica.

AMICTUS, among ecclesiastical writers, the uppermost garment anciently worn by the clergy; the other five being the alba, singulum, stola, manipulus, and planeta. The amictus was a linen garment, of a square figure, covering the head, neck, and shoulders, and buckled, or clasped before the breast. It is still worn by the religious abroad.

AMICULUM, in Roman antiquity, a woman's upper garment, which differed from the pala. It was worn both by matrons and courtezans.

AMICUS CURIÆ, a law term, to denote a by-stander who informs the court of a matter in law that is doubtful or mistaken.

AMID-AMID, in *Geography*, a lofty ridge of mountains in Abyssinia. See ABYSSINIA.

AMIDA, a god worshipped by the Japanese, who has many temples erected to him in the island of Japan, of which the principal is at Jeddo. The Japanese have such a confidence in their idol Amida, that they hope to attain eternal felicity by the frequent invocation of his name. One of the figures of this idol is represented at Rome.

AMIDA, in *Ancient Geography*, a principal city of Mesopotamia, otherwise called *Ammæa*; situated on a high mountain, on the borders of Assyria, on the Tigris, where it receives the Nymphius. It was taken from the Romans, in the time of the emperor Constans, by Sapores king of Persia. The siege is said to have cost him 30,000 men; however, he reduced

Amida, Amiens.

ced it to such ruin, that the emperor afterwards wept over it. According to Ammianus Marcellinus, the city was razed; the chief officers were crucified; and the rest, with the soldiers and inhabitants, either put to the sword or carried into captivity, except our historian himself, and two or three more, who, in the dead of the night, escaped through a postern unperceived by the enemy. The inhabitants of Nisibis, however, being obliged to leave their own city by Jovian's treaty with the Persians, soon restored Amida to its former strength, but it was again taken by Cavades in 501, but was restored to the Romans in 503. On the declension of the Roman power, it fell again into the hands of the Persians; but was taken from them by the Saracens in 899. It is now in the possession of the Turks. Here are above 20,000 Christians, who are better treated by the Turks than in other places. A great trade is carried on in this city of red Turkey leather, and cotton cloth of the same colour. The Arabian name of Amida is *Diarbekir*, and the Turkish one *Kara-Amed*. E. Long. 39. 0. N. Lat. 36. 58.

AMIENS, a large handsome city of France, capital of the department of Somme. It is agreeably situated on the river Somme, and said to have received its Latin name *Ambianum* from being everywhere encompassed with water. It is a place of great antiquity; being mentioned by Cæsar as a town that had made a vigorous resistance against the Romans, and where he convened a general assembly of the Gauls after having made himself master of it. The emperors Antoninus and Marcus Aurelius enlarged it; and Constantine, Constans, Julian, and several others, resided here a considerable time. The town is encompassed with a wall and other fortifications; and the ramparts are planted with trees, which form a delightful walk. The river Somme enters Amiens by three different channels, under as many bridges; and these channels, after washing the town in several places, where they are of use in its different manufactures, unite at the other end by the bridge of St Michael. Here is a quay for the boats that come from Abbeville with goods brought by sea. At the gate of Noyon there is a suburb remarkable for the abbey of St Achen. Next to this gate you come to that of Paris, where they have a long mall between two rows of trees. The houses are well built; the streets spacious, embellished with handsome squares and good buildings; and the number of inhabitants in 1817 was 39,000. The cathedral, dedicated to our Lady, is one of the largest and most magnificent churches in France; adorned with handsome paintings, fine pillars, chapels, and tombs; particularly the nave is greatly admired. The other places worth seeing are the palace of the bailiwick, the town-house, the square *des Fleurs*, and the great market place.

Amiens was taken by the Spaniards, in 1597, by the following stratagem: Soldiers, disguised like peasants, conducted a cart laden with nuts, and let a bag of them fall just as the gate was opened. While the guard was busy in gathering up the nuts, the Spaniards entered and became masters of the town. It was retaken by Henry IV. who built a citadel here. The definitive treaty of peace, entered into by the different European powers in 1802, was negociated here.

The town is the seat of a bishop, suffragan of Rheims, as also of a presidial, bailiwick, vidam, a chamber of accounts, and a generality. The bishop's revenue is 30,000 livres. They have some linen and woollen manufactures, and they also make a great quantity of black and green soap. It lies in E. Long. 2. 18. N. Lat. 49. 53.

Amilcar || Amman.

AMILCAR, the name of several Carthaginian captains. The most celebrated of them is Amilcar Barcas, the father of Hannibal, who, during five years, infested the coast of Italy; when the Romans sending out their whole naval strength defeated him near Trapani, 242 years before Christ; and this put an end to the first Punic war. Amilcar began the second, and landed in Spain, where he subdued the most warlike nations; but as he was preparing for an expedition against Italy, he was killed in battle, 218 years before the Christian era. He left three sons, whom he had educated, as he said, like three lions, to tear Rome in pieces; and made Hannibal, his eldest son, swear an eternal enmity against the Romans.

AMILICTI, in the Chaldaic theology, denote a kind of intellectual powers, or persons in the divine hierarchy. The amilicti are represented as three in number; and constitute one of the triads, in the third order of the hierarchy.

AMIRANTE, in the Spanish polity, a great officer of state, answering to our lord high admiral.

AMISUS, in *Ancient Geography*, the chief city of the ancient kingdom of Pontus. It was built by the Milesians, and peopled partly by them and partly by a colony from Athens. It was at first a free city, like the other Greek cities in Asia; but afterwards subdued by Pharnaces king of Pontus, who made it his metropolis. It was taken by Lucullus in the Mithridatic war, who restored it to its ancient liberty. Close by Amisus stood another city called *Eupatoria*, from Mithridates Eupator its founder. This city was likewise taken by Lucullus, who levelled it with the ground; but it was afterwards rebuilt by Pompey, who united it with Amisus, giving them the name of *Pompeiopolis*. It was taken during the war between Cæsar and Pompey, by Pharnaces king of Pontus, who put most of its inhabitants to the sword; but Cæsar, having conquered Pharnaces, made it again a free city.

AMITERNUM, a town of the Sabines, in Italy (Livy, Pliny); now extinct. The ruins are to be seen on the level ridge of a mountain, near St Vittorino, and the springs of the Aternus; not far from Aquila, which rose out of the ruins of Amiternum.

AMITTERE LEGEM TERRÆ, among lawyers, a phrase importing the loss of liberty of swearing in any court: The punishment of a champion overcome or yielding in battle, of jurors found guilty in a writ of attaint, and of a person outlawed.

AM-KAS, in *History*, a name given to a spacious saloon in the palace of the Great Mogul, where he gave audience to his subjects.

AMMA, among ecclesiastical writers, a term used to denote an abbess or spiritual mother.

AMMAN, JOHN CONRAD, a Swiss physician. See SUPPLEMENT.

AMMAN, *Paul*, a German physican and botanist. See SUPPLEMENT.

AMMAN or *Ammant*, in the German and Belgic polity, a judge who has the cognizance of civil causes.

It

Ammian || Ammianus.

—It is also used among the French for a public notary, or officer, who draws up instruments and deeds.

AMMANIA. See BOTANY *Index*.

AMMI, BISHOP'S-WEED. See BOTANY *Index*.

AMMIANUS MARCELLINUS, a Roman historian of the fourth century, was a native of Greece, born in the city of Antioch. Having served several years in the early part of his life in the army, he was afterwards promoted to the honourable station of *protector domesticus*. In the year 350 he entered the service of Constantius, the emperor of the east, and, under the command of Ursicinus, a general of the horse, he served during several expeditions. According to his own modest relation, it appears that he acquired considerable military fame, and that he deserved well of his sovereign. He attended the emperor Julian in his expedition into Persia, but history is silent whether or not he rose to any higher military rank than that which has already been mentioned. He was either in the city or the vicinity of Antioch when the conspiracy of Theodorus was discovered, under the reign of Valens, and was an eye-witness of the severe torments to which many persons were exposed by the emperor on that account.

But his lasting reputation was not to be acquired from military exertions. He left the army, and retired to Rome, where he employed his time and talents in writing the history of that empire during the period of three centuries. Though a native of Greece, he wrote in the Latin language; but, according to the remark of Vossius, his Latin shows that he was a Greek, and also a soldier. His history begins with the reign of Nerva, and continues to the death of Valens; and the work was originally divided into 31 books. Of these the first 13 have perished, and the 18 which remain commence with the 17th year of the reign of Constantius, and terminate at the year 375. But there are several facts mentioned in the history which prove that the author was alive in the year 390. Of this number are the accession of Theodosius to the eastern empire, the character of Gratian, and the consulate of Neothorius. Similar to the manner in which Herodotus, the father of Grecian history, read his history, Marcellinus read his books in public with general approbation. Some have reckoned the style harsh and redundant, but this may easily be excused, from his education and military life; and the valuable information communicated abundantly compensates for that defect. Candour and impartiality are leading features in his history. The character given him by Mr Gibbon appears to be accurate, when he says that he is "an accurate and faithful guide, who composed the history of his own times without indulging the prejudices and passions which usually affect the mind of a contemporary."

A difference of opinion has obtained, whether or not our historian was a Christian or a Pagan. But the respectful manner in which he speaks of Pagan deities, and of the advantage of heathen auguries to foretel future events, render it abundantly evident that he was a heathen. The favourable account which he gives of the religion, manners, and fortitude of Christians, are the result of his candour and impartiality as an historian. The work of Marcellinus has passed through several editions; but that printed at Leyden in 1693, with explanatory notes, is esteemed the best. (*Gen. Biog.*). Ammianus || Ammon.

AMMIRATO, SCIPIO, an eminent Italian historian, born at Lecca in Naples in 1531. After travelling over great part of Italy, without settling to his satisfaction, he was engaged by the great duke of Tuscany to write *The History of Florence;* for which he was presented to a canonry in the cathedral there. He wrote other works while in this station: and died in 1600.

AMMOCHRYSOS, from *αμμος sand*, and *χρυσος gold*, a name given by authors to a stone very common in Germany, and seeming to be composed of a golden sand. It is of a yellow gold-like colour, and its particles are very glossy, being all fragments of a coloured talc. It is usually so soft as to be easily rubbed to a powder in the hand; sometimes it requires grinding to powder in a mortar, or otherwise. It is used only as sand to strew over writing. The Germans call it *katzengold*. There is another kind of it less common, but much more beautiful, consisting of the same sort of glossy spangles; not however of a gold colour, but of a bright red like vermilion.

AMMODYTES, or SAND-EEL. See ICHTHYOLOGY *Index*.

AMMON, anciently a city of Marmarica (Ptolemy). Arian calls it a *place*, not a city, in which stood the temple of Jupiter Ammon, round which there was nothing but sandy wastes. Pliny says, that the oracle of Ammon was 12 days journey from Memphis, and among the *Nomi* of Egypt he reckons the *Nomos Ammoniacus:* Diodorus Siculus, That the district where the temple stood, though surrounded with deserts, was watered by dews which fell nowhere else in all that country. It was agreeably adorned with fruitful trees and springs, and full of villages. In the middle stood the Acropolis or citadel, encompassed with a triple wall; the first and inmost of which contained the palace; the others the apartments of the women, the relations and children, as also the temple of the god, and the sacred fountains for lustrations. Without the Acropolis stood, at no great distance, another temple of Ammon, shaded by a number of tall trees: near which there was a fountain, called that of the sun, or *Solis Fons*, because subject to extraordinary changes according to the time of the day; morning and evening warm, at noon cold, at midnight extremely hot. A kind of fossil salt was said to be naturally produced here. It was dug out of the earth in large oblong pieces, transparent as crystal. It was thought to be a present worthy of kings, and used by the Egyptians in their sacrifices.—From this our sal ammoniac has taken its name. See SIWAH.

AMMON, or HAMMON, in heathen mythology, the name of the Egyptian Jupiter, worshipped under the figure of a ram.

Bacchus having subdued Asia, and passing with his army through the deserts of Africa, was in great want of water: but Jupiter, his father, assuming the shape of a ram, led him to a fountain, where he refreshed himself and his army; in gratitude for which favour, Bacchus built there a temple to Jupiter, under the title of *Ammon*, from the Greek *αμμος*, which signifies *sand*, alluding to the sandy desert where it was built. In this

Ammon ‖ Ammoniac.

this temple was an oracle of great note, which Alexander the Great consulted, and which lasted till the time of Theodosius.

Hammon the god of the Egyptians, was the same with the Jupiter of the Greeks; for which reason these latter denominate the city which the Egyptians call No-Hammon, or the habitation of Ammon, *Diospolis* or the city of Jupiter. He is thought to be the same with Ham, who peopled Africa, and was the father of Mizraim, the founder of the Egyptians.

AMMON, or BEN-AMMI, the son of Lot, was the father of the Ammonites, and dwelt to the east of the Dead sea, in the mountains of Gilead. See AMMONITIS and AMMONITES.

AMMON, or AMMONIUS, *Andreas*, an excellent Latin poet, born at Lucca in Italy, was sent by Pope Leo X. to England, in the characters of prothonotary of the apostolic see, and collector-general of that kingdom. He was a man of singular genius and learning, and soon became acquainted with the principal literati of those times; particularly with Erasmus, Colet, Grocin, and others, for the sake of whose company he resided some time at Oxford. The advice which Erasmus gives him, in regard to pushing his fortune, has a good deal of humour in it, and was certainly intended as a satire on the artful methods generally practised by the selfish and ambitious part of mankind: "In the first place (says he), throw off all sense of shame; thrust yourself into every one's business, and elbow out whomsoever you can, neither love nor hate any one; measure every thing by your own advantage; let this be the scope and drift of all your actions. Give nothing but what is to be returned with usury, and be complaisant to every body. Have always two strings to your bow. Feign that you are solicited by many from abroad, and get every thing ready for your departure. Show letters inviting you elsewhere, with great promises." Ammon was Latin secretary to Henry VIII. but at what time he was appointed does not appear. In 1512 he was made canon and prebendary of the collegiate chapel of St Stephen, in the palace of Westminster. He was likewise prebendary of Wells; and in 1514 was presented to the rectory of Dychial in that diocese. About the same time, by the king's special recommendation, he was also made prebendary of Salisbury. He died in the year 1517, and was buried in St Stephen's chapel in the palace of Westminster. He was esteemed an elegant Latin writer, and an admirable poet. The epistles of Erasmus to Ammon abound with encomiums on his genius and learning. His works are, 1. *Epistolæ ad Erasmum*, lib. i. 2. *Scotici conflictus historia*, lib. i. 3. *Bucolicæ vel eclogæ*, lib. i. Basil, 1546, 8vo. 4. *De rebus nihil*, lib. i. 5. *Panegyricus quidam*, lib. i. 6. *Varii generis epigrammata*, lib. i. 7. *Poemata diversa*, lib. i.

AMMONIA, or VOLATILE ALKALI. See CHEMISTRY *Index*.

AMMONIAC, a concrete gummy resinous juice, brought from the East Indies, usually in large masses, composed of little lumps or tears, of a milky colour, but soon changing, upon being exposed to the air, to a yellowish hue. We have no certain account of the plant which affords this juice: the seeds usually found among the tears resemble those of the umbelliferous class. It has been, however, alleged, and not without some degree of probability, that it is an exudation from a species of the FERULA, another species of which produces the asafœtida. The plant producing it is said to grow in Nubia, Abyssinia, and the interior parts of Egypt. It is brought to the western parts of Europe from Egypt, and to England from the Red sea, by some of the ships belonging to the East India Company trading to those parts. Such tears as are large, dry, free from little stones, seeds, or other impurities, should be picked out, and preferred for internal use: the coarser kind is purified by solution and colature, and then carefully inspissating it; unless this be artfully managed, the gum will lose a considerable deal of its more volatile parts. There is often vended in the shops, under the name of strained gum ammoniacum, a composition of ingredients much inferior in virtue. Ammoniac.

Ammoniac has a nauseous sweet taste, followed by a bitter one: and a peculiar smell, somewhat like that of galbanum, but more grateful; it softens in the mouth, and grows of a whiter colour upon being chewed. Thrown upon live coals, it burns away in flame: it is in some measure soluble in water and in vinegar, with which it assumes the appearance of milk; but the resinous part, amounting to about one half, subsides on standing.

Ammonium is a useful deobstruent, and frequently prescribed for opening obstructions of the abdominal viscera, and in hysterical disorders occasioned by a deficiency of the menstrual evacuations. It is likewise supposed to deterge the pulmonary vessels; and proves of considerable service in some kinds of asthmas, where the lungs are oppressed by viscid phlegm; in this intention, a solution of gum ammoniac in vinegar of squills proves a medicine of great efficacy, though not a little unpleasant. In long and obstinate colics proceeding from viscid matter lodged in the intestines, this gummy resin has produced happy effects, after the purges and the common carminatives had been used in vain. Ammoniac is most commodiously taken in the form of pills; about a scruple may be given every night, or oftener. Externally, it softens and ripens hard tumors: a solution of it in vinegar stands recommended by some for resolving even scirrhous swellings. A plaster made of it and squill-vinegar is recommended by some in white swellings. A dilute mixture of the same is likewise rubbed on the parts, which are also fumigated with the smoke of juniper berries. In the shops is prepared a solution of it in pennyroyal water, called from its milky colour *lac ammoniaci*. It is an ingredient also in the squill pills.

Sal AMMONIAC, the old name of *muriate of ammonia*, a native salt, composed of ammonia, or volatile alkali, and muriatic acid, which was generated in those large inns or caravanseras where the crowd of pilgrims coming from the temple of Jupiter Ammon used to lodge; who, in those parts, travelling upon camels, and those creatures when in Cyrene, a province of Egypt, where that celebrated temple stood, urining in the stables, or (say some) in the parched sands, out of this urine, which is remarkably strong, arose a kind of salt, denominated sometimes (from the temple) *Ammoniac*, and sometimes (from the country) *Cyrenaic*. Since the cessation of these pilgrimages, no more of this salt is produced there; and, from this deficiency,

Ammoniac ‖ Ammonites.

ficiency, some suspect there never was any such thing: But this suspicion is removed, by the large quantities of a salt, nearly of the same nature, thrown out by Mount Ætna. The modern sal ammoniac is entirely factitious. See CHEMISTRY *Index*, and SAL AMMONIAC, SUPPLEMENT.

AMMONIAN PHILOSOPHY. See AMMONIUS.

AMMONITÆ, in *Natural History*. See *CORNU Ammonis*.

AMMONITES, a people descended from Ammon the son of Lot. The Ammonites destroyed those giants which they called Zamzummims (Deut. ii. 19—21.), and seized upon their country. God forbade Moses, and by him the children of Israel (*id.* 19.), to attack the Ammonites; because he did not intend to give their lands unto the Hebrews. Before the Israelites entered the land of Canaan, the Amorites had by conquest got great part of the countries belonging to the Ammonites and Moabites. This Moses retook from the Amorites, and divided between the tribes of Gad and Reuben. In the time of Jephtha, the Ammonites declared war against the Israelites (Judg. xi.), under pretence that they detained a great part of the country which had formerly been theirs before the Amorites possessed it. Jephtha declared, that as this was an acquisition which the Israelites had made in a just war, and what they had taken from the Amorites, who had long enjoyed it by right of conquest, he was under no obligation to restore it. The Ammonites were not satisfied with this reason; wherefore Jephtha gave them battle and defeated them. The Ammonites and Moabites generally united whenever there was any design set afoot of attacking the Israelites. After the death of Othniel (*id.* iii.), the Ammonites and Amalekites joined with Eglon king of Moab to oppress the Hebrews; whom they subdued, and governed for the space of 18 years, till they were delivered by Ehud the son of Gera, who slew Eglon king of Moab. Some time after this, the Ammonites made war against the Israelites, and greatly distressed them. But these were at last delivered by the hands of Jephtha; who having attacked the Ammonites, made a very great slaughter among them (Judges xi.). In the beginning of Saul's reign (1 Sam. xi.), Nahash king of the Ammonites having sat down before Jabesh-gilead, reduced the inhabitants to the extremity of demanding a capitulation. Nahash answered, that he would capitulate with them upon no other conditions than their submitting to have every one his right eye plucked out, that so they might be made a reproach to Israel: but Saul coming seasonably to the relief of Jabesh, delivered the city and people from the barbarity of the king of the Ammonites. David had been the king of Ammon's friend; and after the death of this prince, he sent ambassadors to make his compliments of condolence to Hanun his son and successor; who, imagining that David's ambassadors were come as spies to observe his strength, and the condition of his kingdom, treated them in a very injurious manner (2 Sam. x. 4.). David revenged this indignity thrown upon his ambassadors, by subduing the Ammonites, the Moabites, and the Syrians their allies. Ammon and Moab continued under the obedience of the kings David and Solomon; and, after the separation of the ten tribes, were subject to the kings of Israel till the death of Ahab in the year of the world 3107. Two years after the death of Ahab, Jehoram his son, and successor of Ahaziah, defeated the Moabites (2 Kings iii.); but it does not appear that this victory was so complete as to reduce them to his obedience. At the same time, the Ammonites, Moabites, and other people, made an irruption into the lands belonging to Judah; but were forced back and routed by Jehoshaphat (2 Ch. xx. 1, 2.). After the tribes of Reuben, Gad, and the half tribe of Manasseh, were carried into captivity by Tiglath-pilneser in the year 3264, the Ammonites and Moabites took possession of the cities belonging to these tribes. Jeremiah (xlix. 1.) reproaches them for it. The ambassadors of the Ammonites were some of those to whom this prophet (chap. xxvii. 2—4.) presented the cup of the Lord's fury, and directed to make bonds and yokes for themselves; exhorting them to submit themselves to Nebuchadnezzar, and threatening them, if they did not, with captivity and slavery. Ezekiel (xxv. 4—10.) denounces their entire destruction; and tells them that God would give them up to the people of the east, who should set their palaces in their country, so that there should be no more mention of the Ammonites among the nations. It is believed that these misfortunes happened to the Ammonites in the fifth year after the taking of Jerusalem, when Nebuchadnezzar made war against all the people that dwelt upon the confines of Judea, in the year of the world 3420.

Ammonites ‖ Ammonius.

It is also thought probable, that Cyrus gave the Ammonites and Moabites the liberty of returning into their own country, from whence they had been removed by Nebuchadnezzar; for we see them in the place of their former settlement, exposed to those revolutions which were common to the people of Syria and Palestine; subject sometimes to the kings of Egypt, and at other times to the kings of Syria. We are told by Polybius, that Antiochus the Great took Rabboth, or Philadelphia, their capital, demolished the walls, and put a garrison in it in 3806. During the persecutions of Antiochus Epiphanes, Josephus informs us, that the Ammonites showed their hatred to the Jews, and exercised great cruelties against such of them as lived about their country. Justin Martyr says, That in his time there were still many Ammonites remaining; but Origen assures us, that when he was living they were known only under the general name of Arabians. Thus was the prediction of Ezekiel (xxv. 10.) accomplished; who said that the Ammonites should be destroyed in such a manner as not to be remembered among the nations.

AMMONITIS, in *Ancient Geography*, a country of Arabia Petræa, occupied by the children of Ammon, whence the appellation. Its limits partly to the west and partly to the north were the river Jabbok, whose course is nowhere determined; though Josephus says, that it runs between Rabboth-Ammon or Philadelphia, and Gerase, and falls into the Jordan.

AMMONIUS, surnamed SACCAS, was born in Alexandria, and flourished about the beginning of the third century. He was one of the most celebrated philosophers of his age; and, adopting with alterations the Ecclectic philosophy, laid the foundation of that sect which was distinguished by the name of the *New Platonics*. See ECCLECTICS and PLATONISM.

This

Ammonius. This learned man was born of Christian parents, and educated in their religion; the outward profession of which, it is said, he never entirely deserted. As his genius was vast and comprehensive, so were his projects bold and singular: For he attempted a general coalition of all sects, whether philosophical or religious, by framing a system of doctrines which he imagined calculated to unite them all, the Christians not excepted, in the most perfect harmony. In pursuance of this design, he maintained, that the great principles of all philosophical and religious truth were to be found equally in all sects; that they differed from each other only in their method of expressing them, and in some opinions of little or no importance; and that, by a proper interpretation of their respective sentiments, they might easily be united into one body. Accordingly all the Gentile religions, and even the Christian, were to be illustrated and explained by the principles of this universal philosophy; and the fables of the priests were to be removed from Paganism, and the comments and interpretations of the disciples of Jesus from Christianity. In conformity to this plan, he insisted, that all the religious systems of all nations should be restored to their original purity, and reduced to their primitive standard, viz. the ancient philosophy of the east, preserved uncorrupted by Plato: and he affirmed, that this project was agreeable to the intentions of Jesus Christ; whose sole view in descending upon earth was to set bounds to the reigning superstition, to remove the errors that had blended themselves with the religions of all nations, but not to abolish the ancient theology from which they were derived. He therefore adopted the doctrines which were received in Egypt concerning the universe and the Deity, considered as constituting one great whole; concerning the eternity of the world, the nature of souls, the empire of Providence, and the government of the world by demons. He also established a system of moral discipline; which allowed the people in general to live according to the laws of their country and the dictates of nature; but required the wise to exalt their minds by contemplation, and to mortify the body, so that they might be capable of enjoying the presence and assistance of the demons, and of ascending after death to the presence of the Supreme Parent. In order to reconcile the popular religion, and particularly the Christian, with this new system, he made the whole history of the Heathen gods an allegory; maintaining that they were only celestial ministers, entitled to an inferior kind of worship. And he acknowledged that Jesus Christ was an excellent man, and the friend of God; but alleged that it was not his design entirely to abolish the worship of demons, and that his only intention was to purify the ancient religion. This system, so plausible in its first rise, but so comprehensive and complying in its progress, has been the source of innumerable errors and corruptions in the Christian church. At its first establishment it is said to have had the approbation of Athenagoras Pantænus, and Clemens the Alexandrian, and all who had the care of the public school belonging to the Christians at Alexandria. It was afterwards adopted by Longinus the celebrated author of the treatise on the Sublime, Plotinus, Herennius, Origen, Porphyry, Jamblichus the disciple of Porphyry, Sopater, Edisius, Eustathius, Maximus of Ephesus, Priscus, Chrysanthius the master of Julian, Julian the Apostate, Hierocles, Proclus, and many others both Pagans and Christians. Ammonius II Amontons.

The above opinions of Ammonius are collected from the writings and disputations of his disciples the modern Platonics: for he himself left nothing in writing behind him; nay, he imposed a law upon his disciples not to divulge his doctrines among the multitude; which injunction, however, they made no scruple to neglect and violate.

AMMUNITION, a general name for all warlike provisions; but more particularly powder, ball, &c.

Ammunition, arms, utensils of war, gunpowder, imported without license from his majesty, are, by the laws of England, forfeited, and triple the value. And again, such license obtained, except for furnishing his majesty's public stores, is to be void, and the offender to incur a premunire, and to be disabled to hold any office of the crown.

Ammunition Bread, Shoes, &c. such as are served out to the soldiers of an army or garrison.

AMNESTY, in matters of policy, denotes a pardon granted by a prince to his rebellious subjects, usually with some exceptions; such was that granted by Charles II. at his restoration.—The word is formed from the Greek αμνηστια, the name of an edict of this kind published by Thrasybulus, on his expulsion of the tyrants out of Athens.

AMNIOS, in *Anatomy*, a thin pellucid membrane which surrounds the fœtus in the womb. See Fœtus.

AMOEBÆUM, in ancient poetry, a kind of poem representing a dispute between two persons, who are made to answer each other alternately; such are the third and seventh of Virgil's eclogues.

AMOL, a town of Asia, in the country of the Usbecks, seated on the river Gihon. E. Long. 64. 30. N. Lat. 39. 20.

AMOMUM, Ginger. See Botany *Index*.

Amomum Vulgare. See Sium, Botany *Index*.

AMONTONS, William, an ingenious experimental philosopher, the son of a lawyer of Normandy, was born at Paris in the year 1663. From his childhood he laboured under the infirmity of extreme dulness, which led him to amuse himself, in the want of society, by studying geometry and mechanics. He learned designing and surveying, and was employed in many public works. He presented to the Academy of Sciences, in the year 1687, an hygrometer upon a new construction, which was highly approved. In 1696, he published in French, a treatise, entitled, "Observations on a new Hour-Glass, and Barometers, Thermometers, and Hygrometers." This work was dedicated to the Academy of Sciences, of which he became a member in the year 1699. Upon his admission, he read a paper on friction, in which a new theory upon that subject is proposed: the paper will be found in the memoirs of the academy. He discovered a method of conveying intelligence speedily to a great distance by means of signals, from one person to another, placed at as great a distance as they could be seen by means of telescopes: he may therefore be esteemed the inventor of the telegraph. This ingenious man, who was distinguished for his ingenuity in inventing, and his accuracy in executing experiments, died in the year 1705. His pieces, which are numerous,

Amoræans ‖ Amortization.

and on various subjects, as air, fire, barometers, pumps, &c. may be found in the volumes of the Memoirs of the Academy of Sciences. (*Gen. Biog.*).

AMORÆANS, a sect or order of Gemaric doctors, or commentators on the Jerusalem Talmud. The Amoræans succeeded the Mischnic doctors. They subsisted 250 years; and were succeeded by the Seburæans.

AMORGOS, or AMURGUS, in *Ancient Geography*, now *Morgo*, not far from Naxus to the east, one of the European Sporades; the country of Simonides the iambic poet. To this island criminals were banished. It was famous for a fine flax called *Emorgis*.

AMORITES, a people descended from Amorrhæus, according to the Septuagint and Vulgate; Emoræus, according to other expositors; Hæmori, according to the Hebrew; or Emorites, according to our version of the Bible, who was the fourth son of Canaan, Gen. x. 16.

The Amorites first of all peopled the mountains lying to the west of the Dead sea. They had likewise establishments to the east of the same sea, between the brooks of Jabbok and Arnon, from whence they forced the Ammonites and Moabites, Numb. xiii. 30. xvi. 29. Josh. v. 1. and Judges xi. 19. 20. Moses made a conquest of this country from their kings Sihon and Og, in the year of the world 2553.

The prophet Amos (ii. 9.) speaking of the gigantic stature and valour of the Amorites, compares their height with that of cedars, and their strength with that of an oak. The name *Amorite* is often taken in Scripture for all Canaanites in general. The lands which the Amorites possessed on this side Jordan were given to the tribe of Judah, and those which they had enjoyed beyond this river were distributed between the tribes of Reuben and Gad.

AMORIUM, a town of Phrygia Major, near the river Sangarius, on the borders of Galatia.—It was taken from the Romans by the Saracens in 668; but soon after retaken by the Romans. A war breaking out again between these two nations in 837, the Roman emperor Theophilus destroyed Sozopetra the birthplace of the caliph Al' Motasem, notwithstanding his earnest entreaties to him to spare it. This so enraged the caliph, that he ordered every one to engrave upon his shield the word *Amorium*, the birthplace of Theophilus, which he resolved at all events to destroy. Accordingly he laid siege to the place, but met with a vigorous resistance. At length, after a siege of 55 days, it was betrayed by one of the inhabitants who had abjured the Christian religion. The caliph, exasperated at the loss he had sustained during the siege, put most of the men to the sword, carried the women and children into captivity, and levelled the city with the ground. His forces being distressed for want of water on their return home, the Christian prisoners rose upon some of them and murdered them; upon which the caliph put 6000 of the prisoners to death. According to the eastern historians, 30,000 of the inhabitants of Amorium were slain, and as many carried into captivity.

AMORPHA, FALSE INDIGO. See BOTANY *Index*.

AMORTIZATION, in *Law*, the alienation of lands or tenements to a corporation or fraternity and their successors. See MORTMAIN.

Amos.

AMOS, the fourth of the smaller prophets, who in his youth had been a herdsman at Tekoa, a small town about four leagues southward of Jerusalem, was sent to the king of Bashan, that is, to the people of Samaria, or the kingdom of Israel, to bring them back to repentance and an amendment of their lives; whence it is thought probable that he was born within the territories of Israel, and only retired to Tekoa on his being driven from Bethel, by Amaziah the priest of the golden calves at Bethel.

The prophet being thus returned to Tekoa, in the kingdom of Judah, continued to prophesy. He complains in many places of the violence offered him, by endeavouring to oblige him to silence. He boldly remonstrates against the crying sins that prevailed among the Israelites, as idolatry, oppression, wantonness, and obstinacy. He likewise reproves those of Judah, such as their carnal security, sensuality, and injustice. He terrifies them both with frequent threatenings, and pronounces that their sins will at last end in the ruin of Judah and Israel, which he illustrates by the visions of a plumb-line and a basket of summer-fruit. It is observable in this prophecy, that as it begins with denunciation of judgment and destruction against the Syrians, Philistines, Tyrians, and other enemies of the Jews, so it concludes with comfortable promises of restoring the tabernacle of David, and erecting the kingdom of Christ. Amos was chosen to the prophetic office in the time of Uzziah king of Judah, and Jeroboam the son of Joash king of Israel, two years before the earthquake (Amos i. 1.), which happened in the 24th or 25th year of Uzziah, according to the rabbins and most of the modern commentators; or the year of the world 3219, when this prince usurped the priest's office, and attempted to offer incense to the Lord: but it is observed, that this cannot be the case, because Jotham the son of Uzziah, who was born in 3221, was of age to govern, and consequently was between 15 and 20 years of age, when his father undertook to offer incense, and was struck with a leprosy. The first of the prophecies of Amos, in order of time, are those of the 7th chapter: the rest he pronounced in the town of Tekoa, whither he retired. He foretold the misfortunes which the kingdom of Israel should fall into after the death of Rehoboam II. who was then living; he foretold the death of Zechariah, the invasion of the lands belonging to Israel by Pul and Tiglath-pilneser kings of Assyria: and he speaks of the captivity of the ten tribes, and their return.

The time and manner of this prophet's death are not known. Some old authors relate that Amaziah, priest of Bethel, provoked by the discourses of the prophet, had his teeth broke, in order to silence him. Others say, that Hosea or Uzziah, the son of Amaziah, struck him with a stake upon the temples, knocked him down, and wounded him much; in which condition he was carried to Tekoa, where he died, and was buried with his fathers; but it is generally thought that he prophesied a long time at Tekoa, after the adventure which he had with Amaziah; and the prophet himself taking no notice of the ill treatment

Amoy || Amphiaraus.

ment which he is said to have received, is an argument that he did not suffer in the manner they relate.

St Jerome observes, that there is nothing great or sublime in the style of Amos. He applies the words of St Paul (2 Cor. vi. 6.) to him, 'rude in speech though not in knowledge.' And he farther observes, that he borrows his comparisons from the state and profession to which he belonged.

AMOY, an island in the province of Fokien, in China, where the English had a factory: but they have abandoned it on account of the impositions of the inhabitants. E. Long. 118. 0. N. Lat. 24. 30. It has a fine port, that will contain many thousand vessels. The emperor has a garrison here of 7000 men.

AMPELIS, the VINE. See VITIS, BOTANY *Index*.

AMPELIS, the *Chatterer*. See ORNITHOLOGY *Index*.

AMPELITES, CANNEL-COAL, or CANDLE-COAL, a hard, opaque, fossil, inflammable substance, of a black colour. It does not effervesce with acids. The ampelites, though much inferior to jet in many respects, is yet a very beautiful fossil; and, for a body of so compact a structure, remarkably light. Examined by the microscope, it appears composed of innumerable very thin and small plates, laid closely and firmly on one another; and full of very small specks of a blacker and more shining matter than the rest, which is evidently a purer bitumen than the general mass. These specks are equally diffused over the different parts of the masses. There is a large quarry of it near Alençon in France. It is dug in many parts of England, but the finest is in Lancashire and Cheshire; it lies usually at considerable depths. It makes a very brisk fire, flaming violently for a short time, and after that continuing red and glowing hot a long while; and finally is reduced into a small proportion of gray ashes, the greater part of its substance having flown off in the burning. It is capable of a very high and elegant polish; and in the countries where it is produced, is turned into a vast number of toys, as snuff-boxes and the like, which bear all the nicety of turning, and are made to pass for jet. Husbandmen smear their vines with it, as it kills the vermin which infests them. It is likewise used for the dyeing of hair black. In medicine, it is reputed good in colics, against worms, and as being in general an emollient and discutient; but the present practice takes no notice of it.

AMPELUSIA, in *Ancient Geography*, a promontory of Mauritania Tingitana, called *Cottes* by the natives, which is of the same signification with a town of the same name not far from the river Lixus, near the straits of Gibraltar, now Cape Spartel. W. Long. 6. 30. N. Lat. 36. 0.

AMPHERES, in antiquity, a kind of vessels wherein the rowers plied two oars at the same time, one with the right hand and another with the left.

AMPHIARAUS, in *Pagan Mythology*, a celebrated prophet, who possessed part of the kingdom of Argos. He was believed to excel in divining by dreams, and is said to be the first who divined by fire. Amphiaraus knowing, by the spirit of prophecy, that he should lose his life in the war against Thebes, hid himself in order to avoid engaging in that expedition: but his wife Eriphyle, being prevailed upon by a present, discovered the place in which he had concealed himself; so that he was obliged to accompany the other princes who marched against Thebes. This proved fatal to him; for the earth being split asunder by a thunderbolt, both he and his chariot were swallowed up in the opening. Amphiaraus, after his death, was ranked among the gods; temples were dedicated to him; and his oracle, as well as the sports instituted to his honour, were very famous.

Amphiarthrosis, Amphibia.

AMPHIARTHROSIS, in *Anatomy*, a term for such junctures of bones as have an evident motion, but different from the diarthrosis, &c. See DIARTHROSIS.

AMPHIBIA, in *Zoology*, the name of Linnæus's third class of animals; including all those which live partly in water and partly on land. This class he subdivides into four orders, viz. the amphibia reptiles; the amphibia serpentes; the amphibia nantes; and the amphibia meantes.

It has been a question whether the animals commonly called *amphibious*, live most in the water or on land. If we consider the words αμφι (*utrinque*, both ways) and βιος (*vita*, life), from which the term *amphibious* is derived; we should understand, that animals, having this title, should be capable of living as well by land, or in the air, as by water; or of dwelling in either constantly at will: but it will be difficult to find any animal that can fulfil this definition, as being equally qualified for either. An ingenious naturalist *, therefore, from considering their economy respectively, divides them into two orders, viz. 1. Such as enjoy their chief functions by land, but occasionally go into the water. 2. Such as chiefly inhabit the water, but occasionally go ashore. What he advances on this subject is curious, and well illustrates the nature of this class.

* Dr *Parsons*, in a paper read before the Royal Society.

1. Of the first order, he particularly considers the phocæ; and endeavours to show, that none of them can live chiefly in the water, but that their chief enjoyment of the functions of life is on shore.

These animals (he observes) are really quadrupeds; but, as their chief food is fish, they are under a necessity of going out to sea to hunt their prey, and to great distances from shore; taking care that, however great the distance, rocks or small islands are at hand, as resting places when they are tired, or when their bodies become too much macerated in the water; and they return to the places of their usual resort to sleep, copulate, and bring forth their young, for the following reasons, viz. It is well known, that the only essential difference (as to the general structure of the heart) between amphibious and mere land animals, or such as never go into the water, is, that in the former the oval hole remains always open. Now, in such as are without this hole, if they were to be immersed in water for but a little time, respiration would cease, and the animal must die; because a great part of the mass of blood passes from the heart by the pulmonary artery through the lungs, and by the pulmonary veins returns to the heart, while the aorta is carrying the greater part of the mass to the head and extremities, &c.

Now, the blood passes through the lungs in a continual uninterrupted stream, while respiration is gentle and moderate; but when it is violent, then the circulation is interrupted, for inspiration and expiration are now carried to their extent; and in this state the blood cannot pass through the lungs either during the total

Amphibia. inspiration or total expiration of the air in breathing: for, in the former case, the inflation compresses the returning veins; and in the latter, by the collapsion of the lungs, these veins are interrupted also; so that it is only between these two violent actions that the blood can pass: and hence it is, that the lives of animals are shortened, and their health impaired, when they are subjected to frequent violent inspiration; and thus it is, that when animals have thus breathed, they must continue to respire ever after, for life is at an end when that ceases.

There are three necessary and principal uses of respiration in all land animals, and in those kinds that are counted amphibious. The first is that of promoting the circulation of the blood through the whole body and extremities. In real fishes, the force of the heart is alone capable of sending the blood to every part, as they are not furnished with limbs or extremities; but in the others mentioned, being all furnished with extremities, respiration is an assistant force to the arteries in sending blood to the extremities; which, being so remote from the heart, have need of such assistance, otherwise the circulation would be very languid in these parts: thus we see, that in persons subject to asthmatic complaints, the circulation grows languid, the legs grow cold and œdematous, and other parts suffer by the defect in respiration.—A second use of breathing is, that in respiration, the variety of particles, of different qualities, which float always in the air, might be drawn into the lungs, to be insinuated into the mass of blood, being highly necessary to contemperate and cool the agitated mass, and to contribute refined pabulum to the finer parts of it, which, meeting with the daily supply of chyle, serves to assimilate and more intimately mix the mass, and render its constitution the fitter for supporting the life of the animal. Therefore it is, that valetudinarians, by changing foul or unwholesome air for a free, good, open air, often recover from lingering diseases.—A third principal use of respiration is, to promote the exhibition of voice in animals: which all those that live on the land do according to their specific natures.

From these considerations it appears that the phocæ of every kind are under an absolute necessity of making the land their principal residence. But there is another very convincing argument why they reside on shore the greatest part of their time; namely, that the flesh of these creatures is analogous to that of other land animals; and therefore, by over long maceration, added to the fatigue of their chasing their prey, they would suffer such a relaxation as would destroy them. It is well known, that animals which have lain long under water are reduced to a very lax and even putrid state; and the phoca must bask in the air on shore: for while the solids are at rest, they acquire their former degree of tension, and the vigour of the animal is restored; and while he has an uninterrupted placid respiration, his blood is refreshed by the new supply of air, as explained above, and he is rendered fit for his next cruise: for action wastes the most exalted fluids of the body, more or less, according to its duration and violence: and the restorative rest must continue a longer or shorter time, according to the quantity of the previous fatigue.

Let us now examine by what power these animals are capable of remaining longer under water than land animals. Amphibia.

All these have the oval hole open between the right and left auricles of the heart; and in many, the canalis arteriosus also; and while the phoca remains under water, which he may continue an hour or two more or less, his respiration is stopped; and the blood, not finding the passage through the pulmonary artery free, rushes through the hole from the right to the left auricle, and partly through the arterial canal, being a short passage to the aorta, and thence to every part of the body, maintaining the circulation: but, upon rising to come ashore, the blood finds its passage again through the lungs the moment he respires.

Thus the fœtus in utero, during its confinement, having the lungs compressed, and consequently the pulmonary arteries and veins impervious, has the circulation of the blood carried on through the oval hole and the arterial canal. Now, so far the phoca in the water, and the fœtus in utero, are analogous; but they differ in other material circumstances, One is, that the fœtus having never respired, remains sufficiently nourished by the maternal blood circulating through him, and continues to grow till the time of his birth, without any want of respiration during nine months confinement: the phoca, having respired the moment of his birth, cannot live very long without it, for the reasons given before; and this hole and canal would be closed in them, as it is in land animals, if the dam did not, soon after the birth of the cub, carry him so very frequently into the water to teach him; by which practice these passages are kept open during life, otherwise they would not be capable of attaining the food designed for them by Providence.

Another difference is, that the phoca, as we have said before, would be relaxed by maceration in remaining too long in the water; whereas the fœtus in utero suffers no injury from continuing its full number of months in the fluid it swims in: the reason is, that water is a powerful solvent, and penetrates the pores of the skins of land animals, and in time can dissolve them; whereas the *liquor amnii* is an insipid soft fluid, impregnated with particles more or less mucilaginous, and utterly incapable of making the least alteration in the cutis of the fœtus.

Otters, beavers, and some kind of rats, go occasionally into the water for their prey, but cannot remain very long under water. "I have often gone to shoot otters (says our author), and watched all their motions; I have seen one of them go softly from a bank into the river, and dive down: and in about two minutes rise at 10 or 15 yards from the place he went in, with a middling salmon in his mouth, which he brought on shore: I shot him, and saved the fish whole." Now, as all fœtuses have these passages open, if a whelp of a true water spaniel was, immediately after its birth, served as the phoca does her cubs, and immersed in water, to stop respiration for a little time every day, it is probable that the hole and canal would be kept open, and the dog be made capable of remaining as long under water as the phoca.

Frogs, how capable soever of remaining in the water, yet cannot avoid living on land, for they respire; and if a frog be thrown into a river, he makes to the shore as fast as he can.

Amphibia. The lizard kind, such as may be called water lizards (see LACERTA), are all obliged to come to land, in order to deposit their eggs, to rest, and to sleep. Even the crocodiles, who dwell much in rivers, sleep and lay their eggs on shore; and, while in the water are compelled to rise to the surface to breathe; yet, from the texture of their scaly covering, they are capable of remaining in the water longer by far than any species of the phoca, whose skin is analogous to that of a horse or cow.

The hippopotamus, who wades into the lakes or rivers, is a quadruped, and remains under the water a considerable time; yet his chief residence is upon land, and he must come on shore for respiration.

The testudo, or sea-tortoise, though he goes out to sea, and is often found far from land; yet being a respiring animal, cannot remain long under water. He has indeed a power of rendering himself specifically heavier or lighter than the water, and therefore can let himself down to avoid an enemy or a storm: yet he is under a necessity of rising frequently to breathe, for reasons given before; and his most usual situation, while at sea, is upon the surface of the water, feeding upon the various substances that float in great abundance everywhere about him: these animals sleep securely upon the surface, but not under water; and can remain longer at sea than any other of this class, except the crocodile, because, as it is with the latter, his covering is not in danger of being too much macerated; yet they must go on shore to copulate and lay their eggs.

2. The consideration of these is sufficient to inform us of the nature of the first order of the class of amphibious animals; let us now see what is to be said of the second in our division of them, which are such as chiefly inhabit the waters, but occasionally go on shore;

These are but of two kinds: the eels, and water serpents or snakes of every kind. It is their form that qualifies them for loco-motion on land, and they know their way back to the water at will: for by their structure they have a strong peristaltic motion, by which they can go forward at a pretty good rate: whereas all other kinds of fish, whether vertical or horizontal, are incapable of a voluntary loco-motion on shore; and therefore, as soon as such fish are brought out of the water, after having flounced a while, they lie motionless and soon die.

Let us now examine into the reason why these vermicular fish, the eel and serpent kinds, can live a considerable time on land, and the vertical and horizontal kinds die almost immediately when taken out of the water: and, in this research, we shall come to know what analogy there is between land animals and those of the waters. All land animals have lungs, and can live no longer than while these are inflated by the ambient air, and alternately compressed for its expulsion; that is, while respiration is duly carried on, by a regular inspiration and expiration of air.

In like manner, the fish in general have, instead of lungs, gills or branchiæ: and as in land animals the lungs have a large portion of the mass of blood circulating through them, which must be stopped if the air has not a free ingress and egress into and from them; so, in fish, there is a great number of blood-vessels that pass through the branchiæ, and a great portion of their blood circulates through them, which must in like manner be totally stopped, if the branchiæ are not perpetually wet with water. So that, as the air is to the lungs in land animals a constant assistant to the circulation; so is the water to the branchiæ of those of the rivers and seas: for when these are out of the water, the branchiæ very soon grow crisp and dry, the blood-vessels are shrunk, and the blood is obstructed in its passage; so, when the former are immersed in water, or otherwise prevented from having respiration, the circulation ceases, and the animal dies. Amphibia.

Again, as land animals would be destroyed by too much maceration in water; so fishes would, on the other hand, be ruined by too much exsiccation: the latter being, from their general structure and constitution, made fit to bear, and live in, the water; the former, by their constitution and form, to breathe and dwell in the air.

But it may be asked, Why eels and water snakes are capable of being longer in the air than the other kinds of fish! This is answered, by considering the providential care of the great Creator for these and every one of his creatures: for since they were capable of loco-motion by their form, which they need not be if they were never to go on shore, it seemed necessary that they should be rendered capable of living a considerable time on shore, otherwise their loco-motion would be in vain. How is this provided for? Why, in a most convenient manner; for this order of fishes have their branchiæ well covered from the external drying air; they are also furnished with a slimy mucus, which hinders their becoming crisp and dry for many hours; and their very skins always emit a mucous liquor which keeps them supple and moist for a long time: whereas the branchiæ of other kinds of fish are much exposed to the air, and want the slimy matter to keep them moist. Now, if any of these, when brought out of the water, were laid in a vessel without water, they might be preserved alive a considerable time, by only keeping the gills and surface of the skin constantly wet, even without any water to swim in.

It has been advanced, that man may, by art, be rendered amphibious, and able to live under water as well as frogs. As the fœtus lives *in utero* without air, and the circulation is there continued by means of the foramen ovale; by preserving the passage open, and the other parts *in statu quo*, after the birth, the same faculty would still continue. Now, the foramen, it is alleged, would be preserved in its open state, were people accustomed, from their infancy, to hold their breath a considerable time once a-day, that the blood might be forced to resume its pristine passage, and prevent its drying up as it usually does, This conjecture seems, in some measure, supported by the practice of divers, who are taught from their childhood to hold their breath, and keep long under water, by which means the ancient channel is kept open.—A Calabrian monk at Madrid laid claim to this amphibious capacity, making an offer to the king of Spain, to continue twice twenty-four hours under water, without ever coming up to take breath. Kircher gives an account of a Sicilian, named the *fish Colas*, who by a long habitude from his youth, had so accustomed himself to live in water, that his nature seemed to be quite altered; so that he lived rather after the manner of a fish than a man.

Amphibole || Amphictyons.

AMPHIBOLE. See MINERALOGY *Index*.

AMPHIBOLOGY, in *Grammar* and *Rhetoric*, a term used to denote a phrase susceptible of two different interpretations. Amphibology arises from the order of the phrase, rather than from the ambiguous meaning of a word.

Of this kind was that answer which Pyrrhus received from the oracle: *Aio te, Æacida, Romanos vincere posse;* where the amphibology consists in this, that the words *te* and *Romanos*, may either of them precede, or either of them follow, the words *posse vincere*, indifferently. See ORACLE.

The English language usually speaks in a more natural manner, and is not capable of any amphibologies of this kind: nor is it so liable to amphibologies in the articles as the French and most other modern tongues.

AMPHIBRACHYS, in Greek and Latin poetry, the name of a foot consisting of three syllables, whereof that in the middle is long, and the other two short; such are the words [ăbīrĕ, ămārĕ].

AMPHICOME, in *Natural History*, a kind of figured stone, of a round shape, but rugged, and beset with eminences, celebrated on account of its use in divination. The word is originally Greek, αμφικομη, *q. d. utrinque comata*, or, "hairy on all sides." This stone is also called *Erotylus*, Ερωτυλος, *Amatoria*, probably on account of its supposed power of creating love. The amphicome is mentioned by Democritus and Pliny. Mercatus takes it for the same with the *lapis lumbricatus*, of which he gives a figure.

AMPHICTYONS, in Grecian antiquity, an assembly composed of deputies from the different states of Greece; and resembling, in some measure, the diet of the German empire. Some suppose the word Αμφικτιονες to be formed of αμφι, "about," and κτιειν or κτιζειν, in regard the inhabitants of the country round about met here in council: others, with more probability, from Amphictyon, son of Deucalion, whom they suppose to have been the founder of this assembly; though others will have Acrisius, king of the Argives, to have been the first who gave a form and laws to it.

Authors give different accounts of the number of the Amphictyons, as well as of the states who were entitled to have their representatives in this council. According to Strabo, Harpocration, and Suidas, they were twelve from their first institution, sent by the following cities and states; the Ionians, Dorians, Perrhæbians, Bœotians, Magnesians, Achæans, Phthians, Melians, Dolopians, Ænianians, Delphians, and Phocians. Æschines reckons no more than eleven: instead of the Achæans, Ænianians, Delphians, and Dolopians, he only gives the Thessalians, Oetians, and Locrians. Lastly, Pausanias's list contains only ten, viz. the Ionians, Dolopians, Thessalians, Ænianians, Magnesians, Melians, Phthians, Dorians, Phocians, and Locrians.

In the time of Philip of Macedon, the Phocians were excluded the alliance, for having plundered the Delphian temple, and the Lacedæmonians were admitted in their place; but the Phocians, 60 years after, having behaved gallantly against Brennus and his Gauls, were restored to their seat in the Amphictyonic council. Under Augustus, the city Nicopolis was admitted into the body; and to make room for it, the Magnesians, Melians, Phthians, and Ænianians, who till then had distinct voices, were ordered to be numbered with the Thessalians, and to have only one common representative. Strabo speaks as if this council were extinct in the times of Augustus and Tiberius: but Pausanias, who lived many years after, under Antoninus Pius, assures us it remained entire in his time, and that the number of Amphictyons was then 30. Amphictyons || Amphilochia.

The members were of two kinds. Each city sent two deputies, under different denominations; one called Ιερομνημον, whose business seems to have been more immediately to inspect what related to sacrifices and ceremonies of religion; the other, Πυλαγορας, charged with hearing and deciding of causes and differences between private persons. Both had an equal right to deliberate and vote, in all that related to the common interests of Greece. The *hieromnemon* was elected by lot, the *pylagoras* by plurality of voices.

Though the Amphictyons were first instituted at Thermopylæ, M. de Valois maintains, that their first place of residence was at Delphi; where, for some ages, the tranquillity of the times found them no other employment than that of being, if we may so call it, church-wardens of the temple of Apollo. In after times, the approach of armies frequently drove them to Thermopylæ, where they took their station, to be nearer at hand to oppose the enemies progress, and order timely succour to the cities in danger. Their ordinary residence, however, was at Delphi.

Here they decided all public differences and disputes between any of the cities of Greece; but before they entered on business, they jointly sacrificed an ox cut into small pieces, as a symbol of their union. Their determinations were received with the greatest veneration, and even held sacred and inviolable.

The Amphictyons, at their admission, took a solemn oath never to divest any city of its right of deputation; never to avert its running waters: and if any attempts of this kind were made by others, to make mortal war against them: more particularly, in case of any attempt to rob the temple of any of its ornaments, that they would employ hands, feet, tongue, their whole power to revenge it.—This oath was backed with terrible imprecations against such as should violate it; *e. g.* May they meet all the vengeance of Apollo, Diana, Minerva, &c. their soil produce no fruit, their wives bring forth nothing but monsters, &c.

The stated terms of their meeting were in spring and autumn: The spring meeting was called Εαρινη Πυλαια, that in autumn Μετοπωρινη. On extraordinary occasions, however, they met at any time of the year, or even continued sitting all the year round.

Philip of Macedon usurped the right of presiding in the assembly of the Amphictyons, and of first consulting the oracle, which was called Προμαντεια.

AMPHIDROMIA, a feast celebrated by the ancients on the first day after the birth of a child.

AMPHIDRYON, in ecclesiastical writers, denotes the veil or curtain which was drawn before the door of the *bema* in ancient churches.

AMPHILOCHIA, in *Ancient Geography*, the territory of the city of Argos in Acarnania: *Amphilochium*, (Thucydides); called *Amphilochi* (from the people), in the lower age, (Stephanus). A town also of Spain, in Galicia, built by Teucer, and denominated

Amphilochius ‖ Amphisbæna.

nated from Amphilochus one of his companions, (Strabo): now *Orense*. W. Long. 8. 20. Lat. 42. 36.

AMPHILOCHIUS, bishop of Iconium, in the fourth century, was the friend of St Gregory Nazianzen and St Basil. He assisted at the first general council of Constantinople in 381; presided at the council of Sidæ; and was a strenuous opposer of the Arians. He died in 394; and his works were published in Greek and Latin at Paris, 1644, by Francis Combesis.

AMPHILOCHUS, son of Amphiarans and Eriphyle, was a celebrated diviner. He had an altar erected to him at Athens, and an oracle at Mallus in Cilicia, which city was founded by him and Mopsus. The answers of this oracle were given by dreams; the party inquiring used to pass a night in the temple, and that night's dream was the answer. Dion Cassius mentions a picture done by order of Sextus Condianus, representing the answer he received of the oracle, in the reign of the emperor Commodus.

AMPHIMACER, in ancient poetry, a foot consisting of three syllables; whereof the first and last are long, and that in the middle short; such is the word [cāstĭtās.]

AMPHION, son of Jupiter and Antiope; who, according to the poets, made the rocks follow his music; and at his harp the stones of Thebes danced into walls and a regular city.

AMPHIPOLES, in antiquity, the principal magistrates of Syracuse. They were established by Timoleon in the 109th Olympiad, after the expulsion of the tyrant Dionysius. They governed Syracuse for the space of 300 years: and Diodorus Siculus assures us, that they subsisted in his time.

AMPHIPOLIS, in *Ancient Geography*, a city of Macedonia, an Athenian colony, on the Strymon, but on which side is not certain: Pliny places it in Macedonia, on this side; but Scylax, in Thrace, on the other. The name of the town, *Amphipolis*, however, seems to reconcile their difference; because, as Thucydides observes, it was washed on two sides by the Strymon, which dividing itself into two channels, the city stood in the middle, and on the side towards the sea there was a wall built from channel to channel. Its ancient name was Ἐννεα ὁδοι, the *Nine ways* (Thucydides, Herodotus). The citizens were called *Amphipolitani*, (Livy). It was afterwards called *Christopolis;* now *Christopoli*, or *Chisopoli*, (Holstenius).

AMPHIPOLIS, in *Ancient Geography*, a town of Syria, on the Euphrates, built by Seleucus, called by the Syrians *Turmeda*, (Stephanus): the same with *Thapsacus*, (Pliny); and supposed to have been only renewed and adorned by Seleucus, because long famous before his time, (Xenophon).

AMPHIPPII, in Grecian antiquity, soldiers who, in war, used two horses without saddles, and were dexterous enough to leap from one to the other.

AMPHIPRORÆ, in the naval affairs of the ancients, vessels with a prow at each end. They were used chiefly in rapid rivers and narrow channels, where it was not easy to tack about.

AMPHIPROSTYLES, in the architecture of the ancients, a temple which had four columns in the front, and as many in the aspect behind.

AMPHISBÆNA. See OPHIOLOGY *Index*.

AMPHISBÆNA Aquatica. See GORDIUS, HELMINTHOLOGY *Index*.

Amphisbæna ‖ Amphitheatre.

AMPHISCII, among geographers, a name applied to the people who inhabit the torrid zone. The Amphiscii, as the word imports, have their shadows one part of the year towards the north, and the other towards the south, according to the sun's place in the ecliptic. They are also called *Ascii*. See ASCII.

AMPHISSA, in *Ancient Geography*, the capital of the Locri Ozolæ, 120 stadia (or 15 miles) to the west of Delphi, (Pausanias). So called, because surrounded on all sides by mountains, (Stephanus). Hence *Amphissæi*, the inhabitants; who plundered the temple at Delphi (Demosthenes).—Also a town of Magna Græcia at the mouth of the Sagra, on the coast of the Farther Calabria, situated between Locri and Caulona; now called *Rocelia*. *Amphissius* the epithet, (Ovid).

AMPHITHEATRE, in ancient architecture, a building of an elliptic form, of two or more stories of open arcades, with a number of interior galleries and arched passages, which served both as a communication and support to several rows of seats which rose above each other, and were arranged round a large space called the *arena*. The derivation of the word *amphitheatre*, indicates that it is a place where the spectators, circuitously arranged, saw the performance equally well on all sides.

The history of amphitheatres is of considerable importance, in consequence of its connexion with ancient manners. These structures owed their origin to the barbarity of the ancients, and their ruin to the humanity of the moderns. They are the production of Roman invention in the last ages of the republic. The ferocious disposition of the Romans was immoderately fond of every species of amusement; but especially that which was of a bloody and horrible nature. The political rulers improved this general feature in the Roman character, to rouse and foster that martial spirit which rendered them masters of the world. After the Samnite war had extended the Roman sceptre over Etruria and the whole peninsula of Italy, the first gladiatory conflicts were exhibited in Rome in the year of the city 490. Lucius Metellus brought into the circus the elephants which were part of the spoil of the Carthaginians, in the year 502, and this proved the introduction of wild beasts into the spectacles of Rome. This addition was equally agreeable to the Roman taste; and those who courted the popular favour, vied with each other in entertaining the people in this barbarous manner. This soon gave birth to a profession of men denominated *gladiators*, who were trained to the combat, and for reward slaughtered one another in the forum, whilst every devouring animal which the wilds of Asia or Africa produced, added to the horrid scene.

In the days of Pompey and Cæsar these barbarous amusements were given with an astonishing profusion. In these games given by Pompey, the elephants attempted to break down the barrier between them and the people, and the situation of the circus prevented the people from seeing equally well: this induced Cæsar to alter the original form, and construct edifices where the people might be entertained without danger or interruption. Amphitheatres were suited

Amphitheatre.

to this purpose; therefore they were adopted, and became the common place for the exhibitions both of gladiators and wild beasts.

It is supposed that the first amphitheatre was composed of those singular machines, formed by Caius Curio, for the games which Cæsar presented among the funeral honours of his father. In a semicircular form Caius made two large theatres, and opposed their backs to each other: and, having amused the people in these the one half of the day, then they wheeled round, forming one spacious theatre where the gladiators contended during the remainder of the day. Pliny is the only one who makes mention of this amphitheatre; and from his account it is difficult to ascertain whether this was the first idea of an amphitheatre, or whether the previous sight of one had suggested this huge and wonderful structure. It is reported, that Julius Cæsar, a few years after, formed a hunting theatre of wood; and, in consequence of the circular position of the seats, it obtained the name of an *amphitheatre*. This appears to have been of very superior kind and in great estimation.

In the reign of Augustus, Statilius Taurus erected one of stone, but it seems to have been seldom used; and, from its being consumed by fire in the time of Nero, it is evident that it was not wholly of stone. These wooden buildings appear to have been temporary, and a few of them permanent from the establishment conferred upon them. The politic spirit of Augustus induced him to erect several of these, and Caligula began one, which he left unfinished. Nero formed a large and spacious one, which is said to have been a year in building. Herod of Judea erected amphitheatres both in Jerusalem and in Cæsarea. During the reign of Tiberius, one was built at Fidenæ, which Tacitus informs us fell while the games were performing, and slew or hurt about 50,000 persons. There was another at Placentia, reported to have been the most spacious in Italy; but it was destroyed by fire in the contest between Vitellius and Otho.

The unfortunate accidents, which happened to these wooden buildings, led the public to construct others of a more durable and stronger nature, where the crowd might be entertained without danger. This honour was reserved to Vespasian and Titus. In his eighth consulate, the former began the amphitheatre, which the latter finished during his reign. It is said, that the expence of this building would have erected a capital city, and it is deservedly esteemed one of the most celebrated edifices of ancient times. Dio says, that 9000 wild beasts were destroyed at the dedication of this huge building, but Eutropius restricts their number to 5000. After the hunting of these ferocious animals was ended, instantly the arena was filled with water, and sea animals were made to contend, and a sea-fight exhibited. This immense building obtained the appellation of the *Coliseum*. See Plate XX. fig. 1.

This amphiteatre became the model of other amphitheatres throughout the empire. Compared with the original model, these were natural valleys, with seats formed in the surrounding heights similar to the amphitheatre at Corinth. On the declivity of two hills seats of stones were sometimes placed, and the extremes formed by regular works of stone. Of this kind was that of Gortyna in Candia. One in the vicinity of Sandwich in Kent had its benches formed of turf; and similar must have been those amphitheatres, which were formed along with the camps and military stations of the Roman soldiers.

Amphitheatre.

When Christianity became the religion of the empire, it meliorated the dispositions of the Romans, and induced them to lay aside this barbarous custom. Constantine the Great terminated the gladiatory combats in the east during his reign; but they were not finally abolished at Rome until the beginning of the fifth century, in the reign of Honorius. The combats of wild beasts continued, however, some time longer; but during the progress of the fifth century these gradually declined, until they were finally abolished, and the amphitheatres were abandoned to the ravages of time and accident. During the middle ages they were sometimes employed for judicial conflicts, tilts, and tournaments; but these practices having been discontinued, the amphitheatres experienced universal neglect and ruin.

It is very difficult to give an accurate description of an amphitheatre. It is scarcely possible to give a clear idea of the manner in which such immense crowds of people were seated and arranged, and how they had a convenient entrance and a returning. It has already been mentioned, that these buildings were circuitous, and that the exterior circuit was composed of two or more stories of arcades; and it may now be added, that the number of these stories varied according to the nature of the building. A corresponding number of arched passages and staircases opened upon the ground floor towards these stories in the direction of radii towards the arena. These communications were again intersected by arched passages which encircled the whole structure, and afforded an uninterrupted entrance to every part of the amphitheatre. Sometimes an intermediate gallery surrounded the whole in the centre of the fabric, and served as a common place of resort to all the stairs which led to the higher galleries. This was the form of one at Nismes. Sometimes each staircase had its distinct communication by itself. Such was the case with one at Verona. See Plate XX. fig. 2.

The four radiating entries on the diameter were usually more capacious; and by the two principal of these the emperor, the senate, and other persons of distinction, were conducted to their seats on a place which was called the *podium*. The other two led to the arena, and by these the gladiators and beasts made their entrance. The various ranks of the people passed by the staircases, which led to their respective seats. The doors which opened from the staircases were called *vomitories*, and varied in magnitude, according to the extent of the amphitheatre, and the number of exterior arches. The number of seats between the several vomitories was unequal, and seems to have been subject to no positive regulation. These benches were about one foot and eight inches in height, and about two feet four inches in breadth. A platform four feet eight inches broad was formed of one of these benches, which served as a circular communication to the whole building. These obtained the name of *precinctions*, and the boundaries on the side were called *belts*. The latter were surrounded by ballustrades, to protect the persons from falling who occupied

Amphitheatre.

occupied the benches in the vicinity. The podium was more spacious than the precinctions, and was a platform encircling the arena. From one precinction to the belt of another, a flight of stairs two feet six inches in breadth descended opposite to every vomitory. Small canals were cut in the tops of the benches, by which the rain and urine were conducted from bench to bench, until they reached the instruments prepared to convey them to the drains below. These stairs radiated from the highest bench to the podium; so that, with the precinctions, they separated the whole cavity into wedge-like divisions, which the people occupied according to their rank.

The amphitheatre called the *Coliseum*, was of an elliptical form, whose longest diameter was about 615 English feet six inches, and the shortest 510. The length of the diameter of the arena was about 281 feet, and the breadth 176, reserving a space for the seats and galleries of about 157 feet in breadth. The external circumference covered a superficies of about five acres and a half, and could scarcely be included in a parallelogram of seven acres. Three stories of arcades, adorned with columns of the Doric, Ionic, and Corinthian orders, and enclosed with a pilastrade of the Corinthian order, composed the external elevation. The first story rose about four feet from the ground, and the pavement supported the basis of the columns. The columns which supported the upper stories were placed upon pedestals. A stylobata supported the pilastrade, in which were the windows of an intermediate gallery, and in every second interpilaster was a window to illuminate the highest gallery. A cantaliver cornice, perforated with square holes, through which the erect pieces of wood passed that supported the awning to a range of corbels, about the centre of the pilastrade, crowned the building. These various columns, pilasters, and stories, appear to have been continued without interruption around the whole edifice. The height of the first story is about 33 feet six inches, the second about 39, and the third about 38; the pilastrade about 46; and the whole, including the blocking course and the steps, was about 164 feet in height.

An ellipsis of 80 open aches formed the exterior circuit of the ground plan; the piers, with three-quarter columns in front, of about two feet 10 inches diameter. The four which corresponded to the four semi-diameters formerly mentioned, were about 14 feet two inches, and 76 of the arches were about 13 feet eight inches. These arches led to a large double corridor, that encircled the whole; this corridor is a magnificent and distinguishing feature in the Coliseum theatre. Square openings in the precinction above, illuminated the interior corridor; and the corridor which was united with the wall of the podium appears to have been illuminated in a similar manner. A double corridor was seen on the floor of the second story directly above the corridor of the lower floor, and an interior corridor which sent forth stairs leading to a range of vomitories on the one hand, and on the other hand an intermediate corridor which formed a mezzanine floor above the double corridor of the interior circuit. Here the stairs began to ascend to the next story, and square holes in the upper floor enlightened this gallery. A double corridor formed the third story, and it appears that here the stairs commenced that led to the galleries above. There were also some windows in the interior wall, and vomitories which opened to the uppermost cunei of benches. In a similar manner were other three stories constructed and filled above, the whole composing a most magnificent and spacious structure.

Amphitheatre.

Justus Lipsius supposes that this amphitheatre was capable of containing 87,000 spectators on the benches; and Fontana adds 22,000 for the galleries and other passages. Upon a fair calculation it appears that if all was crowded, it might contain about 80,000. This magnificent structure certainly excelled the monuments both of Grecian and Egyptian genius which have reached our times. When this amphitheatre was in its glory, and crowded with Romans, the sight must have been magnificent and striking. If the report is accurate, that this was completed in two years and nine months, it affords an astonishing instance of Roman vigour and persevering industry. Besides former depredations, Michael Angelo removed near the one half of the external wall to build the Palazzo Farnese. To prevent these depredations, Pope Benedict XIV. consecrated these ruins, and erected several altars, which were much frequented on the Sundays and Fridays, before the revolution in France. To guard these relicks, a hermit was stationed in a small dwelling near the centre.

Amusements.

The different kinds of amusement have already been mentioned during the progress of the history. Gladiators contended together, or entered the lists with wild beasts. These wild animals were hunted or encountered, or left to devour each other, according to the humour of the times or the taste of him who gave the entertainment. It appears also, that criminals were sometimes forced to fight with these ferocious creatures for the entertainment of the people of Rome; and, in the dawn of Christianity, many of the Christians suffered death in this brutal manner. It is also reported, that artificial mountains were sometimes constructed with caves below, from whence these devouring animals rushed forth to attack their prey.

Information concerning the laws that regulated the amphitheatre is rather scanty; but the following are among the number. In the centre of one side of the podium was the emperor's seat, called the *suggestum*, and highly adorned. The remainder of the podium was occupied by senators; and when this space was not sufficient, several of the adjacent wedges were appropriated to the other senators and to persons of distinction. The equestrians, and the civil and military tribunes, had their places next assigned them. From this order both the liberti and the legati were excluded. The married men sat by themselves. The young men were also arranged by themselves, and their tutors sat near them to observe their conduct. The attendants and servants occupied the highest gallery. The vestals were seated, and frequently the princesses and the ladies of distinguished rank sat along with them. The front of the gallery was assigned to the women, who were placed on chairs, and the lowest order of plebeians stood behind them. It appears also, that for the better accommodation of the people, the different tribes had particular wedges allotted to them. It is also proper to remark, that the arrangement in the different provinces was different from that of Rome

Amphitheatre || Amphorarium.

as circumstances varied. The general direction of the amphitheatre was under the care of an officer, named *villicus amphitheatri*; and different officers, who were called *locarii*, had the direction of the cunei. By carefully preventing any person from occupying a place to which he was not entitled, all confusion was prevented, and strict order maintained.

Remains.

The means used by Pope Benedict to preserve the Coliseum at Rome, have already been mentioned. Of one which was erected at Verona, only four arches of the external circuit remained at the commencement of the eighteenth century. These consist of three stories of about 90 English feet. The whole building was erected without cement, and joined and secured by iron cramps, overlaid with lead. The whole superficies is about four acres and nearly one-third. One has been erected at Nismes, which has suffered much dilapidation; but the remains are yet worthy of the attention of the traveller. In the year 1533, Francis I. gave orders to have the rubbish removed; but his misfortunes prevented this order from being carried into execution. Louis XVI. issued a similar order, but the work is not yet finished. This amphitheatre is said by Governor Pownall, to be occupied with houses arranged in the form of streets, and resembles a small walled town. The galleries are converted in wretched dwellings, but the exterior gallery of the second story, and that of the attic, were in their original state.

At Pola in Istria, there are the remains of an amphitheatre built on the declivity of a hill. The whole of the exterior circuit was standing, except a few yards of the parapet, when Maffei visited these remains. It was erected of stone, with cramps of iron; and all the benches and other parts constructed of wood, have been destroyed.

AMPHITHEATRE, in *Gardening*, certain dispositions of trees and shrubs on the sides of hilly places, which, if the hill or rising be naturally of a circular figure, always have the best effect. They are to be formed of evergreens, such as hollies, phillereys, laurustines, bays, and such plants, observing to plant the shortest growing trees in the front, and those which will be the tallest behind, such as pines, firs, cedars of Lebanon, &c.

Amphitheatres are also sometimes formed of slopes on the sides of hills, covered only with turf; and, when well kept, they are a great ornament to large gardens.

AMPHITRITE, (from *αμφιτρειτη*, *circumferendo*), in the heathen mythology, the wife of Neptune, and goddess of the sea, sometimes taken for the sea.

AMPHITRYON, son of Alcæus, and the father of Hercules, less known by his own exploits than from his wife Alcmena's adventure. See ALCMENA.

AMPHORA, in antiquity, a liquid measure among the Greeks and Romans. The Roman amphora contained 48 sextaries, equal to about seven gallons one pint English wine measure; and the Grecian or Attic amphora contained one-third more.

AMPHORA was also a dry measure used by the Romans, and contained about three bushels.

AMPHORA, among the Venetians, is the largest measure used for liquids, containing about 16 quarts.

AMPHORARIUM VINUM, in antiquity, denotes that which is drawn or poured into *amphoræ* or pitchers; by way of distinction from *vinum doliare*, or cask wine.—The Romans had a method of keeping wine in *amphoræ* for many years to ripen, by fastening the lids tight down with pitch or gypsum, and placing them either in a situation within reach of smoke, or under ground.

Amphorarium || Ampsaga.

AMPHOTIDES, in antiquity, a kind of armour or covering for the ears, worn by the ancient pugiles, to prevent their adversaries from laying hold of that part.

AMPHRYSUS, or AMPHRYSSUS, in *Ancient Geography*, a river of Phthiotis, a district of Thessaly, running by the foot of Mount Othrys, from south to north, into the Enipeus at Thebes of Thessaly; where Apollo fed the herds of King Admetus (Virgil, Lucan). Another Amphrysus in Phrygia, rendering women barren, according to Pliny: Hence the epithet *Amphrysiacus* (Statius). Also a town of Phocis, at the foot of Mount Parnassus, encompassed with a double wall by the Thebans in the war with Philip (Pausanias): *Amphrysia Vates*, in Virgil, denotes the Sibyl.

AMPHTHILL, a town of Bedfordshire in England, situated pleasantly between two hills, near the centre of the county, but in a barren soil. Population 1277 in 1811. W. Long. 0. 29. N. Lat. 52. 2.

AMPLIATION, in a general sense, denotes the act of enlarging or extending the compass of a thing.

On a medal of the emperor Antoninus Pius, we find the title *Ampliator civium* given him, on account of his having extended the *jus civitatis*, or right of citizenship, to many states and people before excluded from that privilege. In effect, it is generally supposed to have been this prince that made the famous constitution, whereby all the subjects of the empire were made citizens of Rome.

AMPLIATION, in Roman antiquity, was the deferring to pass sentence in certain causes. This the judge did, by pronouncing the word *amplius*; or by writing the letters N. L. for *non liquet*; thereby signifying, that, as the cause was not clear, it would be necessary to bring farther evidence.

AMPLIFICATION, in *Rhetoric*, part of a discourse or speech, wherein a crime is aggravated, a praise or commendation heightened, or a narration enlarged, by an enumeration of circumstances: so as to excite the proper emotions in the souls of the auditors. Such is the passage in Virgil, where, instead of saying merely that Turnus died, he amplifies the circumstances of his death:

—Ast illi solvuntur frigore membra,
Vitaque cum gemitu fugit indignata sub umbras.

The masters of eloquence make an amplification to be the soul of discourse. See ORATORY.

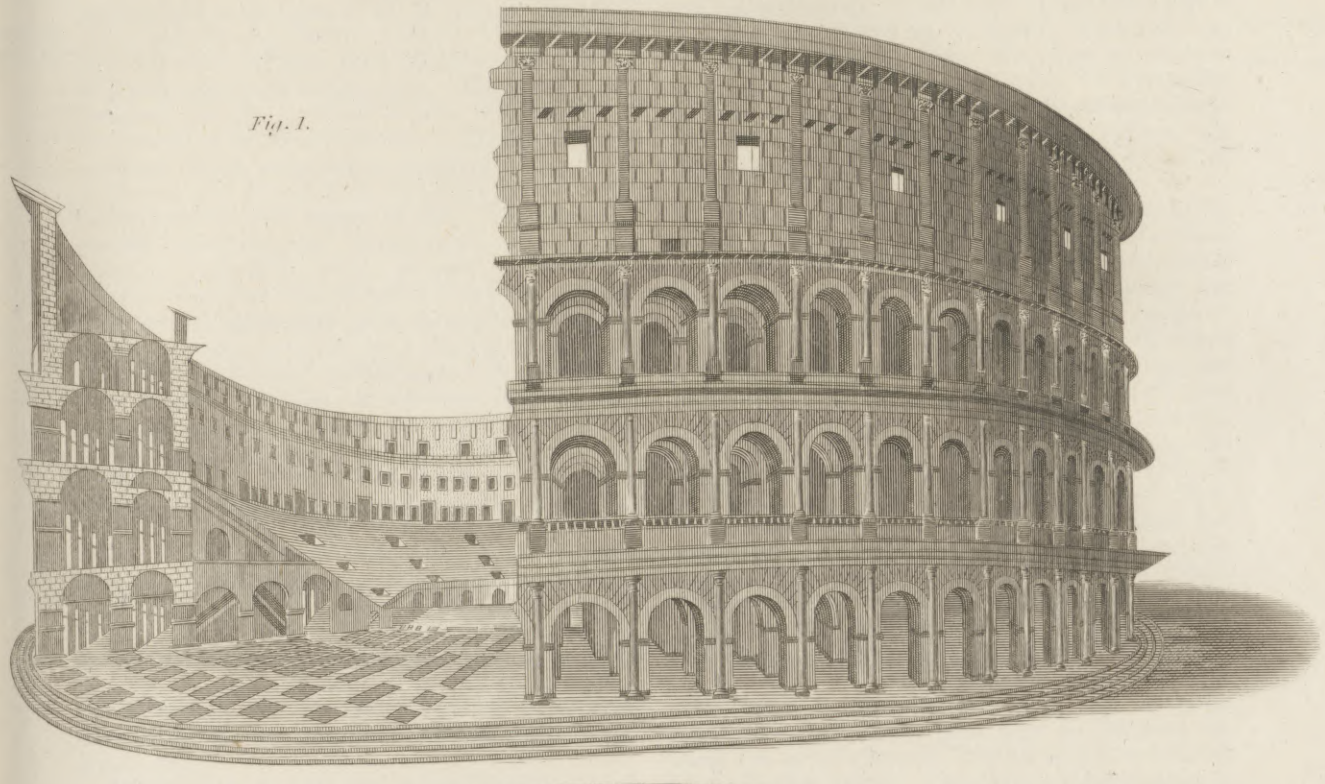
AMPLITUDE, in *Astronomy*, an arch of the horizon intercepted between the east or west point and the centre of the sun or a planet, at its rising or setting; and so is either north and south, or ortive and occasive.

Magnetical AMPLITUDE, the different rising or setting of the sun from the east or west points of the compass. It is found by observing the sun, at his rising and setting, by an amplitude compass.

AMPSAGA, a river of ancient Numidia. See ALGIERS.

VESPASIAN'S AMPHITHEATRE WHICH CONTAIN'D EIGHTYSEVEN THOUSAND SPECTATORS.

Fig. 1.



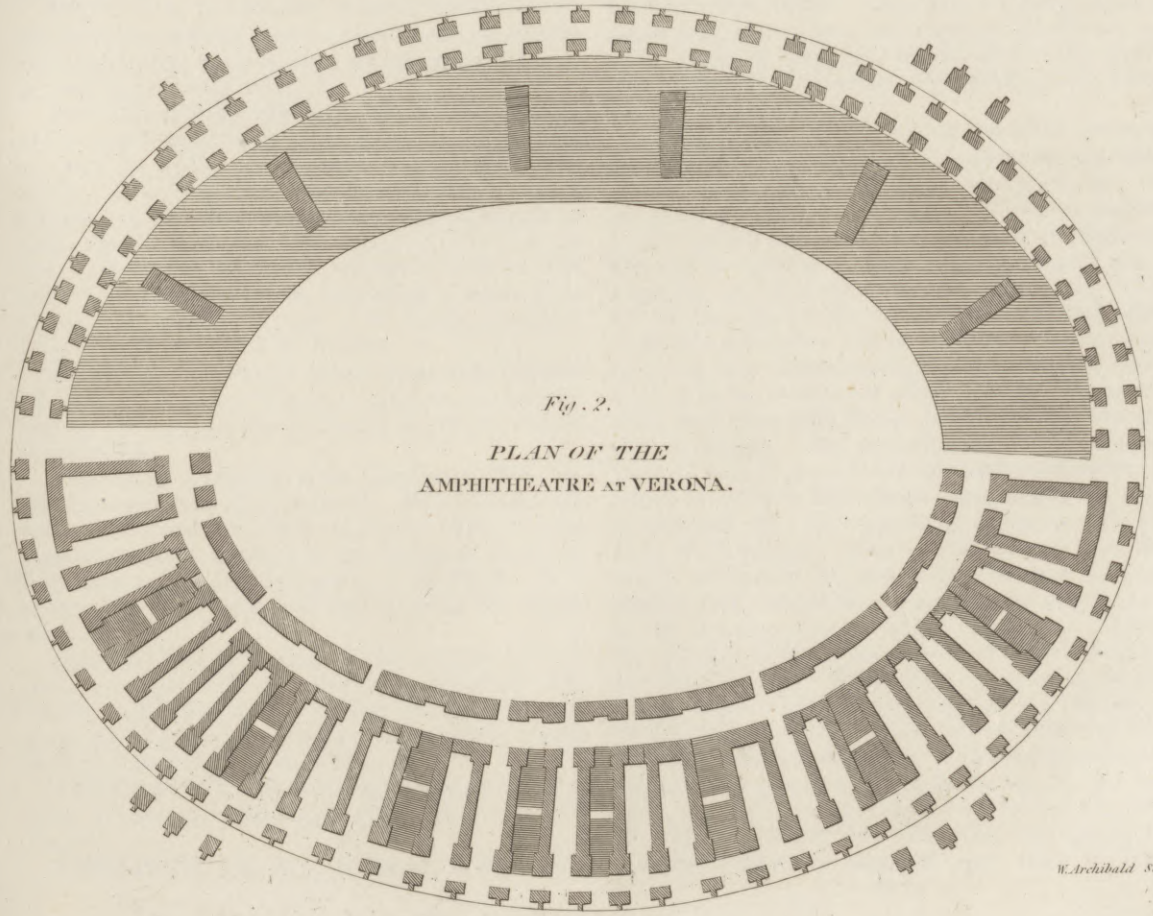


Fig. 2.

PLAN OF THE
AMPHITHEATRE AT VERONA.

W. Archibald Sculp.

Ampsancti | Amraphel.

AMPSANCTI VALLIS, or AMPSANCTI LACUS, a cave or lake in the heart of the Hirpini, or Principato Ultra, near the city Tricento (Cicero, Virgil, Pliny); it is now called *Moffeta*, from Mephitis, the goddess of stench, who had a temple there. The ancient poets imagined that this gulf led to hell. The Moffeta is thus described by Mr Swinburne: "We were led into a narrow valley, extending a considerable way to the south-west, and pressed in on both sides by high ridges thickly covered with copses of oak. The bottom of the dell is bare and arid: in the lowest part, and close under one of the hills, is an oval pond of muddy ash-coloured water, not above fifty feet in diameter: it boils up in several places with great force in irregular fits, which are always preceded by a hissing sound. The water was several times spouted up as high as our heads in a diagonal direction; a whirlpool being formed round the tube, like a bason, to receive it as it fell. A large body of vapour is continually thrown out with a loud rumbling noise. The stones on the rising ground that hangs over the pool are quite yellow, being stained with the fumes of sulphur and sal ammoniac. A most nauseous smell rising with the steam obliged us to watch the wind, and keep clear of it, to avoid suffocation. The water is quite insipid both as to taste and smell; the clay at the edge is white, and carried into Puglia to rub upon scabby sheep, on which account the lake is farmed out at 100 ducats a-year. On a hill above this lake stood formerly a temple dedicated to the goddess Mephitis: but I perceived no remains of it."

AMPULLA, in antiquity, a round big-bellied vessel which the ancients used in their baths, to contain oil for anointing their bodies; also the name of a cup for drinking out of at table.

AMPULLA, among ecclesiastical writers, denotes one of the sacred vessels used at the altars. Ampullæ were also used for holding the oil used in chrismation, consecration, coronation, &c. Among the ornaments of churches we find frequent mention made of ampuls or vials. In the inventory of the cathedral of Lincoln we meet with ampuls of crystal, variously enriched with silver feet and covers; one containing a tooth of St Christopher, another a tooth of St Cecily, another a bone of the head of St John Baptist.

Knights of St AMPULLA, belong to an order instituted by Clovis I. king of France; at the coronation they bear up the canopy under which the ampulla is carried in procession.

AMPURA, a province of the kingdom of Peru, before its conquest by the Spaniards. Here the inhabitants worshipped two lofty mountains from a principle of gratitude, because of the descent of the water from them by which their lands were fertilized. It is said to have been conquered by Viracocha the eighth inca.

AMPURIAS, the capital of the territory of Ampurdan, in Catalonia, seated at the mouth of the river Fluvia, in E. Long. 2. 56. N. Lat. 42. 5. The land about it is barren, full of briars and bulrushes, except in some places which produce flax.

AMPUTATION, in *Surgery*, the cutting off a limb, or any part, from the body. See SURGERY *Index*.

AMRAPHEL, the king of Shinar, or Babylonia, confederated with Chedorlaomer, king of the Elamites, and two other kings, to make war against the kings of Pentapolis; that is to say, of Sodom, Gomorrah, and the three neighbouring cities. The kings who were in league with Amraphel worsted those of Pentapolis, plundered their city, and carried off abundance of captives, among whom was Lot, Abraham's nephew: but Abraham pursued them, retook Lot, and recovered all the spoil. See ABRAHAM. Amraphel | Amru-ebn-al-as.

AMRAS, a strong castle of Germany, seated in Tirol; by some German writers called *Arx Ambrosiana*, which was a house of pleasure for the archdukes to retire to in the heat of the summer. By others this fort is called *Ombrass;* a name derived from the design of it, which was to be a shady summer-house. It is most delightfully situated at the foot of a mountain, but has no great external beauty. All the furniture of ordinary use has been carried away; yet it is still remarkable for its galleries, which contain a very large collection of antiquities, and both natural and artificial curiosities. It excels all others in its curious collection of armour and coats of mail, many of which belonged to very great men. There is also a great collection of gold medals, which weigh, as they affirm, about 16 pounds; there are also 3000 cameos and intaglios, but few of them very fine. A great part of these antiquities were sent to this place by Charles V. On the walls and ceiling there are some very good paintings; and, among the rest, they have an admirable picture of Noah's ark, done by Bassano, for which the grand duke of Tuscany is said to have offered 100,000 crowns. They have a library, which is not in very good order; and a gallery full of busts and other pieces of antiquity, besides many other apartments adorned with pictures of great value. E. Long. 11. 40. N. Lat. 47. 0.

AMRU-EBN-AL-AS, one of the most famous of the first race of Saracen leaders, was descended of Aasi, of the tribe of Koreish, by a notorious prostitute. In his youth he indulged in poetry, and wrote satirical verses against the person and doctrine of Mahomet. His zeal in opposing the new religion prompted him to undertake an embassy to the king of Ethiopia, to stimulate him against the converts whom he had taken under his protection. It is uncertain by what arguments he was induced to change his religious sentiments; but he returned a convert to the Mahometan faith, and, along with Caled, joined the fugitive prophet at Medina. The military talents of Amru had begun to attract general attention, when Abubeker resolved to make a new attack upon Syria, in which he obtained the chief command. After several displays of his military valour and address in some successful enterprises, he rose to the elevated station of chief in Irak, when Caled requested the attendance of all the Arabian generals before Damascus. During the caliphate of Omar, he also served in Palestine, under Abu Obeidah. While besieging Cæsarea, he held a memorable conference with Constantine, the son of the emperor Heraclius. Historians mention that their time was chiefly occupied in producing genealogical arguments to prove the affinity of the Greeks and Arabians, and the consequent rights of the latter as their descendants. Amru concluded with the candid declaration "That the Arabians were tired of living

Amru-ebn-al-as.

in their scorching deserts, and were resolved to re-enter into the possession of the delightful country which was the inheritance of their forefathers." He withdrew from the conference, after denouncing perpetual enmity against the Greeks, unless they should either become converts to the Mahometan faith or tributaries to that government. In the year of the Hegira 17, A. D. 638, Amru took Cæsarea, and reduced to subjection all the maritime towns of Syria.

After the death of Obeidah, Amru assumed the chief command in Syria, in which he was confirmed by the caliph, notwithstanding the opposition of Othman. An expedition against Egypt being formerly resolved upon, Amru wrote to the caliph, informing him that he would instantly march into Egypt. During the progress of his march, attended only by 4000 Arabs, a messenger from Omar arrived with a letter, containing directions to return, if he should receive this letter in the territories of Syria; but if he should receive it in those of Egypt, he might advance, and all needful assistance would be instantly sent him. Anticipating the contents, he hastened on to the frontiers of Egypt, and read the instructions of the caliph. Then requesting some of the inhabitants to be brought before him, and inquiring at them in what country they were, and being informed that they were in Egypt, Amru replied, "Let us, then, continue our march." Having taken Pharma, he advanced to Misrah, the ancient Memphis, and besieged it during the space of seven months. Although numerous reinforcements arrived, he would have found it very difficult to storm the place previous to the inundation of the Nile, if Mokawkas had not treacherously lessened the forces of the citadel, which was accordingly taken by storm; and the Greeks who remained there were either made prisoners or put to the sword. On the same spot Amru erected a city named Fostat, the ruins of which are now known by the name of Old Cairo. The Coptic Christians, who composed the great majority of the Egyptian natives, and who were enemies to the Catholic Greeks, after this victory submitted to Amru, and engaged to provide quarters and support for the Mussulman army.

Amru pursued the Greeks to Alexandria, and, after an obstinate and bloody siege of 14 months, the city was taken, A. D. 640. During the siege, the general, along with one of his officers and a slave, was taken prisoner, and brought before the governor, who was at that time ignorant of the value of his prisoner. The manner, however, in which the general at first conducted himself induced the governor to suppose that he was a person of rank, therefore he ordered him to be beheaded. This order would have immediately been carried into effect, had not the slave, who understood the Greek tongue, in which the command was given, fortunately chastised the imprudent language of Amru by giving him a box on the ear. This circumstance changed the mind of the governor, and obtained a repeal of his order. By an engagement to propose an accommodation, the captive officer obtained the release of all the three; and the acclamations of the army on the return of their general first informed the governor of his egregious mistake. Amru prevailed upon his soldiers to refrain from the pillage of Alexandria, and to content themselves with the preservation of the money, jewels, and other valuable articles, to defray the expence of the war. Amru was disposed to preserve the famous library, and to have given it in a present to John the grammarian, but, by the command of the caliph, he was obliged to commit it to the flames. If the relation is not exaggerated, such was the number of books in that famous library, that they afforded fuel to 5000 baths during the space of six months.

Amru-ebn-al-as.

The capital being taken, all Egypt soon fell into the hands of the conqueror. Amru observed a wise and equitable policy, although his pecuniary demands were great. Egypt became the storehouse to famishing Arabia, and camels carrying provisions covered the whole road from Memphis to Medina. Amru also employed his army in opening the canal from the Nile to the Red sea. The adjacent parts of Africa next felt the conquering power of Amru, but, upon the elevation of Othman, he was succeeded in the government of Egypt by Abdallah-ebn-Said. The inhabitants were so displeased with this change, that they formed a confederacy, and delivered up the city to a Grecian fleet. Amru was dispatched in haste to retake Alexandria, which, after an obstinate defence, was taken with great slaughter. The general at length interposing his authority, the slaughter was stopped, and upon the spot where the massacre ceased the *Mosque of Mercy* was erected. To prevent future rebellion, he dismantled the town, and was again superseded by Abdallah; and he himself retired to Medina.

When Ali ascended the throne, he became an adversary, and united himself to the interest of Moawiyah, whom he acknowledged caliph, and swore allegiance to him. Ali proposed to decide the quarrel by single combat, and the valour of Amru inclined him to urge his master to accept of the proposal; but Moawiyah positively declined the challenge. Amru, however, continued firm to the interest of Moawiyah, and took possession of Egypt in his name, having defeated the governor of Ali. About this time, he fortunately escaped assassination by the hands of the frantic Charegites, who had marked him out as one of the three who, by their death, were to restore peace to the contending parties. The assasin waited his arrival at the mosque, but being prevented by a fit of the colic, his friend who was sent to officiate for him was slain in his stead.

In the year 663, of the Hegira 43, he died in his government of Egypt, highly esteemed, and much regretted by his countrymen. In a pathetic oration to his children on his deathbed, he bitterly lamented his youthful offence in satirizing the prophet, although Mahomet had forgiven the offence, and had frequently affirmed "that there was no Mussulman more sincere and stedfast in the faith than Amru." It is reported, that one day the caliph desired to see the sword of Amru, which had cut in pieces so many Christians. Amru drew his sword, which was a short and common scymitar; and when Omar manifested signs of unusual surprise, he exclaimed, "Alas! the sword itself, without the arm of its master, is neither sharper nor more weighty than the sword of Pharezdak the poet." The greatness of the man, the firmness of the friend, the valour of the general, the policy of the statesman, and the

msancti
Amsterdam.

the sanctity of the Mahometan moralist, were united in the character of Amru. (*Mod. Univ. Hist. Gen. Biog.*).

AMSANCTI. See AMPSANCTI.

AMSBURY, or AMBERSBURY. See AMBRESBURY.

AMSDORFIANS, in church history, a sect of Protestants in the 16th century, who took their name from Amsdorf their leader. They maintained, that good works were not only unprofitable, but were obstacles to salvation.

AMSTERDAM, the capital city of the province of Holland and of the United Netherlands, is seated on the river Amstel and an arm of the sea called the *Wye*. The air is but indifferent, on account of the marshes that surround it, and render the city almost inaccessible: but this inconvenience is abundantly recompensed by the utility of its commerce, which the port serves greatly to promote; for it will contain above 1000 large ships.

In 1204, it was nothing but a small castle, called *Amstel* from the name of the river, which its lords made a retreat for fishermen, who at first lived in huts covered with thatch; but it soon became considerable, and had a bridge and towers built upon it, insomuch that it rose to a small city; though, till the year 1490, it was surrounded with nothing but a weak pallisado. The walls were then built with brick, to defend it from the incursions of the inhabitants of Utrecht, with whom the Hollanders were often quarrelling; but some months afterwards it was almost reduced to ashes. In 1512, it was besieged by the people of Guelderland; who not being able to take it, set fire to the ships in the harbour. In 1525, an Anabaptist leader, with 600 of his followers, got into the city in the night-time, attacked the townhouse, and defeated those that made any resistance. At length they barricaded, with wool and hop sacks, the avenues to the market place, where these enthusiasts were posted; and so put a stop to their fury till day appeared, at which time the citizens fell upon them on all sides, and forced them to retire into the townhouse, where most of them were cut to pieces. About ten years after, there was another tumult raised by a parcel of fanatics, consisting of men and women, who ran about the streets stark naked, and had a design of making themselves masters of the townhouse. Their shrieks and cries, which were dreadful enough, soon alarmed the inhabitants, who seized the greatest part of them, and gave them the chastisement they deserved.

Amsterdam was one of the last cities that embraced the reformed religion. It was besieged by the Hollanders in 1578, and submitted after a siege of ten months. One article of the capitulation was, a free exercise of the Roman Catholic religion: but this was not observed by the Protestants; for they soon drove the ecclesiastics, monks, and nuns, out of the city, broke the images, and demolished the altars. From this time it became the general rendezvous of all nations and of every sect, which raised it to that degree of grandeur and opulence it long enjoyed. The inhabitants were often obliged to enlarge the bounds of their city, and in 1675 it was increased to its present extent. It was surrounded with a brick wall, and a large ditch 80 feet broad full of running water. The walls were fortified with 26 bastions, on each of which there is now a windmill. There are eight gates towards the land, and one towards the water. Amsterdam

Amsterdam being seated on a marshy soil, is built on piles of wood; for which reason no coaches are allowed, except to great men and physicians, who pay a tax for that privilege; and all kinds of goods are drawn on sledges. It stands so low, that they would be exposed to inundations, if they did not secure themselves by dykes and sluices. The finest streets are, the Keysar's Graft, or Emperor's Canal; the Heer Graft, or Lords Canal; the Cingel; and the street of Haerlem. The principal canal is remarkable for its houses, which are magnificent structures of an equal height. Here are three prodigious sluices, and a great number of canals which cross the city in many parts, and render the streets clean and pleasant. The canals are deep, their sides are lined with hewn stone, they have generally rows of trees planted on each side, and many stone bridges over different parts of them.

The finest is that called the *Amarrack*, which is formed by the waters of the Amstel, into which the tide comes up, and on the sides of which are two large quays. This canal has several bridges. The principal is that next the sea, called *Pont Neuf*, or the *New Bridge*: it is 600 feet long, and 70 broad, with iron ballustrades on each side; it has 36 arches, of which 11 are very high, and eight are shut up to enclose the yachts. From this bridge there is a most charming prospect of the city, port, and sea. The port is a mile and a half in length, and above 1000 paces in breadth. It is always filled with a multitude of vessels, which look like a forest, or rather a floating city. The streets in general are well paved, and the houses built of brick or stone. Towards the sides of the haven, the city is enclosed with great poles driven into the ground, which are joined by large beams placed horizontally. There are openings to let the ships in and out, which are shut every night at the ringing of a bell.

Amsterdam, including its fortifications, occupies a large space of ground; and is inhabited by very various population. There are people here of almost every nation and religion in Europe, who are all tolerated in their respective persuasions; but none admitted to any share in the government except the Calvinists. There are 11 churches for the Dutch of the established or Calvinistical religion, with two French and one High Dutch. The English have also three churches in this city: one for the Presbyterians, whose ministers are paid by the magistrates; a second for those of the church of England, whose minister is paid by his Britannic majesty; and a third for the Brownists, who maintain their own ministers. None but the Calvinists are allowed to have bells, and their ministers are maintained by the magistrates. All these churches or congregations make up only a third part of the inhabitants of the city. The Roman Catholics, who have 27 houses or chapels for their worship, form another third part. Here they have a long square of houses for their beguines (a kind of nuns) to live in; who are not shut up in cloisters as other nuns in Roman Catholic countries, but have liberty to walk abroad, and may even marry when they are tired of this kind of life. These chapels of the Roman Catholics have no bells allowed

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lowed them, being looked upon as conventicles, and may be shut up and opened according as the government pleases. The other third part of the city is made up of Jews, Lutherans, Arminians, Anahaptists, &c. none of whom, as was said of the Roman Catholics, are allowed to have bells in their churches. Those who marry, and are not of the established religion, are obliged to be joined first by the magistrates, and then they may perform the ceremony in their own assemblies. The Jews, who are very considerable in this place, have two synagogues; one of which, namely the Portuguese, is the largest in Europe. Within the court yard, where their synagogue stands, they have several rooms or schools, where their children are taught Hebrew, and very carefully instructed in the Jewish religion.

The most remarkable of the religious buildings is the New Church, dedicated to St Catharine. It was begnn in the year 1408, others say 1414; and was 100 years in building. It had the misfortune of being burnt in the year 1645, but was in a short time after built in a more magnificent manner. The foundation of a steeple is laid before this church, which was designed to be very high. The piles on which it was to be erected are not above 100 feet square, and yet they are 6334 in number, and those very large. Nevertheless it was thought that these vast piles, or rather the ground, were not able to support the prodigious weight they intended to lay upon it; for which reason the steeple remains unfinished. The pulpit is a masterpiece of the kind, where the four evangelists and many other curious pieces of sculpture are represented. The glass windows are adorned with paintings, among which the emperor Maximilian is described, presenting an imperial crown to the burgomasters of Amsterdam for the crest of the arms of this city. The organ is very large, and reckoned one of the best in the world. It has a set of pipes that counterfeit a chorus of voices, and has 52 whole stops besides half stops, with two rows of keys for the feet, and three rows of keys for the hands. Those who hear it play for the first time imagine they hear a human voice. The grate dividing the chancel from the body of the church is all of Corinthian brass. The branches of candlesticks are the richest in the Seven Provinces. There is a very fine marble monument erected to Admiral Ruyter, who was killed at Messina.

The public buildings of a civil nature are very magnificent. The stadthouse was founded in 1648. It is built upon 14,000 wooden piles; and its front is 282 feet long, its sides 255 feet, and its height to the roof 116. There is a marble pediment in the front, whereon a woman is carved in relievo, holding the arms of the city; she is seated in a chair, supported by two lions, with an olive branch in her right hand; on each side are four Naiads who present her with a crown of palm and laurel, and two other marine goddesses present her with different sorts of fruit; besides, there is Neptune with his trident, accompanied with Tritons, a sea-unicorn, and a sea-horse. On the top stand three statues in bronze, representing Justice, Strength, and Plenty. On the top of the structure is a round tower, 50 feet above the roof, adorned with statues, and an harmonious chime of bells, the biggest of which weighs about 7000 pounds, and the next 6000. They are made to play different tunes every month. It has not one handsome gate, but only seven doors to answer to the number of the United Provinces. On the floor of the great hall are two globes, the celestial and terrestrial, which are 22 feet in diameter and 69 in circumference. They are made of black and white marble, and are inlaid with jasper and copper. In general, all the chambers are enriched with paintings, carvings, and gildings. While this stadthouse was building, the old one was set on fire, and consumed with all the archives and registers.

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Under the stadthouse is a prodigious vault, wherein is kept the bank of Amsterdam, where there is a vast quantity of ingots both of gold and silver, as also bags which are supposed to be full of money. The doors are proof against petards, and are never opened but in the presence of one of the burgomasters. The prisons for debtors and criminals are likewise under the stadthouse; as also the guard room for the citizens, wherein the keys of the city are locked every night. At the end of the great hall is the schepens or aldermen's chamber, where civil causes are tried. Besides these, there are the chambers of the senate and council, the burgomasters chamber, the chamber of accounts, &c. In the second story is a large magazine of arms; and on the top of the building are six large cisterns of water, which may be conveyed to any room in the house in case of fire; to prevent which the chimneys are lined with copper.

The bourse, or exchange, where the merchants assemble, is all of free-stone, and built upon 2000 wooden piles. Its length is about 250 feet, and its breadth 140. The galleries are supported by 26 marble columns, upon each of which are the names of the people that are to meet there. They are all numbered; and there is a place fixed for every merchandise under some one of these numbers. On the right hand of the gate is a superb staircase which leads to the galleries; on one side of which there are several shops, and on the other a place to sell clothes. It is not unlike the royal exchange in London.

The admiralty office is a house which belonged formerly to the princes of Orange. The arsenal for their men of war is in the harbour. This is a very handsome building, 200 feet long and 22 broad. The ground floor is filled with bullets; the second floor contains the arms and cordage; the third their sails, pulleys, flags, &c. This arsenal contains a great many curiosities; among the rest an Indian canoe brought from the straits of Davis, and a conservatory of water on the top of the house that holds 1600 tuns of water, which may be distributed in case of fire into 16 different parts by leaden pipes. Hard by this edifice you see the dock or yard where they build their men of war. The dock is 508 feet long, and contiguous to it are houses for lodging the ship carpenters. The dock is plentifully supplied with every thing necessary for the construction of ships.

The East India Company occupy a large building divided into several offices or apartments. In some of those they have great stores of packed goods, and likewise a room with all sorts of drugs, tea, wax, ambergris, and musk. Here they have a magazine full of medicaments for surgeons chests, to furnish the Company's ships and garrisons in the Indies; as also large

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large magazines of nutmegs, cloves, mace, and cinnamon. In the court yard there is a guard chamber, where every night the housekeeper has a watch; and on the other side of the gate there is a chemist, who with his men prepares medicines for the Indies; and adjoining to this court-yard is their ware-house and packhouse for pepper and gross goods. In the new part of this city they have a magazine or palace, which may properly be called an *arsenal*. The ground on which this building stands is 2000 feet, and square every way, reckoning the moats or burgwall about it. The two rope-alleys are 1800 feet long, on the backside of which is a store of 500 large anchors besides small ones. In this arsenal they build the ships belonging to the Indian chamber of Amsterdam; for which reason they have all sorts of workhouses here for the artificers that serve the Company.

The academy called the *Illustrious School*, is likewise a very fine building. It was formerly a convent belonging to the Nuns of St Agnes. Here they teach Latin, the oriental languages, theology, philosophy, history, &c. The lawyers and physicians have likewise their schools.

Besides these, there are several hospitals or houses for orphans, for poor widows, for sick persons, and for mad people; all which are regulated with much prudence. The Rasp-house, which was formerly a nunnery, is now a sort of workhouse for men that behave ill. They are commonly set to saw or rasp Brasil wood; and if they will not perform their task, they are put into a cellar which the water runs into, where if they do not almost constantly ply the pump, they run the risk of being drowned. There is likewise a spin-house for debauched women, where they are obliged to spin wool, flax, and hemp, and do other work. All the hospitals are extremely neat, and richly adorned with pictures. They are maintained partly by voluntary contributions, which are raised by putting money into the poor's boxes fixed up all over the city; and partly by taxing all public diversions, as well at fairs as elsewhere. Likewise every person that passes through any of the gates at candle-light pays a penny for the same use. The charities are taken care of by certain officers called *deacons*. The governors are nominated by the magistrates out of the most considerable men in the city.

The common sort have places of diversion called *Spiel-houses*, where there are music and dancing. They are much of the same kind as the hops which were so frequent about London. If strangers go there, they must take care not to make their addresses to a woman that is engaged to any other man.

There are two suburbs to this city; one at the gate of the regulars; and the other goes as far as Overtoon, a village a little way from Amsterdam, where boats which come from Leyden are rolled over land upon wooden rollers. There is likewise in this city an hospital for those that are infected with the plague; which was built in the year 1630, and has 360 windows.

The city is governed by a senate and council, which consists of 36 persons, called a *Vroedshap*, who enjoy their places for life; and when any of them dies, the remainder choose another in his stead. This senate elects deputies to be sent to the states of Holland, and appoints the chief magistrates of the city called *Burgomasters* or *Echevins*, who are like our aldermen. The number is twelve; out of which some are chosen every year to execute the office, and are called *Burgomasters-regent*. Three of these are discharged every year, to make room for three others. One of the four is kept in to inform the new ones of the state of affairs, and also presides the three first months in the year, and the others three months each; so that when they are in this office, they may be compared to the lord mayor of the city of London. These alterations and appointments are made by their own body. They dispose of all inferior offices which become vacant during their regency. They have likewise the direction of all public works, which regard the safety, tranquillity, and embellishment of this city. The keys of the famous bank of this city are in the hands of these magistrates.

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The college consists of nine burgomasters or echevins, who are judges in all criminal affairs, without appeal; but in civil causes they may appeal to the council of the province. There are two treasurers, a bailiff, and a pensionary. The bailiff continues in his office three years; and searches after criminals, takes care to prosecute them, and sees their sentence executed. The pensionary is the minister of the magistracy, is well versed in the laws, makes public harangues, and is the defender of the interests of the city. The city of Amsterdam contributes to the public income above 50,000 livres per day, besides the excise of beer, flesh, and corn; which in all amounts to above 1,600,000l. a-year. This is more than is paid by all the rest of the provinces put together; and yet Amsterdam bears but the fifth rank in the assembly of the states of Holland, with this distinction, that, whereas other cities send two members, this sends four.

The militia of Amsterdam is very considerable. They have 60 companies, each of which has from 200 to 300 men. Jews and Anabaptists are excluded from this service, not being admitted to bear arms: But they are obliged to contribute to the maintenance of the city-guard, which consists of 1400 soldiers; as also to the night-watch, who patrole about the streets and proclaim the hour. Besides these, there are trumpeters on every church steeple who sound every half hour; and if there happens a fire, they ring the fire-bell, and show where it is. The inhabitants have excellent contrivances to extinguish it speedily.

The trade of Amsterdam was formerly very great: for almost the whole trade of the East India Company centred in this city, which besides carried on a commerce with all the rest of the world. The richest spices were entirely in the hands of the East India Company, who furnished all Europe therewith. They had vast quantities of military stores, with which they supplied several nations; which was owing to their engrossing most of the iron-works on the Rhine and other great rivers that run into Holland. Such was the state of Amsterdam before the late revolution. Since that period, however, its trade has greatly declined. The long war with England, the consequent blockade of the port, the loss of the colonies, and the harassing consequences of the French occupation, gave a blow to the prosperity of the city. Its population, which amounted to 230,000 in 1785, was reduced below 200,000 in 1812. The longitude of Amsterdam is 4. 30. E; the latitude, 52. 25. N.

AMSTERDAM, or *Tongataboo*, is also the name of an island

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island in the South sea, said to have been discovered by Tasman a Dutch navigator. It was also visited by Captain Cook. Its greatest extent from east to west is about 21 miles, and from north to south about 13. It is broad at the east end, and runs taper towards the west, where it turns, and runs to a point due north. It is about six leagues to the west of Middleburg. The shore is surrounded by a coral rock, and its most elevated parts are not above six or eight yards above the level of the sea. S. Lat. 21. 11. W. Long. 175. It is wholly laid out in plantations, in which are cultivated some of the richest productions of nature.

Here are bread-fruit, cocoa-nut trees, plantains, bananas, shaddocks, yams, and some other roots, sugar-canes, and a fruit like a nectarine, called by the natives *fighega*. There did not appear an inch of waste ground: the roads occupied no more space than was absolutely necessary: the fences did not take up above four inches each; and even these were not wholly lost, for in many grew some useful trees or plants; it was everywhere the same, change of place altered not the scene: nature, assisted by a little art, nowhere appeared with more splendour than on this island. Water is not so plentiful here as at the Society islands; but the chief pointed out a pool of fresh water unasked, to supply the ships with that necessary article. Casuarinas, pandangs, and wild sago palms, appear here with their various tints of green, and barringtoniæ as big as the loftiest oaks. The bread-fruit does not, however, thrive here with the same luxuriance as at the Society islands; the coral rock, which composes the basis of this spot, being much more thinly covered with mould.

Both men and women are of the common size of Europeans, and their colour is that of lightish copper; they are well-shaped, have regular features, are active, brisk, and lively. They have fine eyes, and in general good teeth, even to an advanced age. The women are the merriest creatures imaginable, and incessant talkers. In general they appear to be modest; although there was no want of those of a different stamp. Among the natives, who swam about the ship very vociferously, were a considerable number of women, who wantoned in the water like amphibious creatures, and were easily persuaded to come on board perfectly naked; but none of them ventured to stay there after sunset, but returned to the shore to pass the night, like the greater part of the inhabitants, under the shade of the wild wood which lined the coast. There they lighted great fires, and were heard conversing almost the whole night. The hair of both sexes in general is black, but especially that of the women; both sexes wear it short, except a single lock on the top of the head, and a small quantity on each side. The men cut or shave their beards quite close; which operation they perform with two shells. The hair of many was observed to be burnt at the ends, and strewed with a white powder, which was found, on examining it, to be lime made of shells or coral, which had corroded or burnt the hair; some made use of a blue powder, and others, both men and women, of an orange-coloured powder made of turmeric.

The dress of both sexes consists of a piece of cloth or matting wrapped round the waist, and hanging down below the knees. From the waist upwards they are generally naked; and it seems to be a custom to anoint these parts every morning. The practice of tattowing, or puncturing the skin, likewise prevails. The men are tattowed from the middle of the thigh to above the hips; the women have it only on their arms and fingers, and on these parts but very slightly. Their ornaments were amulets, necklaces, and bracelets, the bones, shells, and beads of mother-of-pearl, tortoise-shell, &c. which are worn by men as well as women. The women also wear on their fingers neat rings made of tortoise-shell, and pieces in their ears about the size of a small quill: but here ornaments are not commonly worn, though all have their ears pierced. They have also a curious apron, made of the cocoa-nut shell; and composed of a number of small pieces sewed together in such a manner as to form stars, half-moons, little squares, &c.; it is studded with beads and shells, and covered with red feathers, so as to have a pleasing effect. They make the same kind of cloth, and of the same materials, as at Otaheite, though they have not such a variety, nor do they make any so fine; but as they have a method of glazing it, it is more durable, and will resist rain for some time, which the other cloth would not. Their colours are black, brown, yellow, purple, and red; all made from vegetables. They make various sorts of matting, some of a very fine texture, which is generally used for clothing; and the thick and stronger sort serves to sleep upon, and to make sails for their canoes, &c. Among other useful utensils, they have various sorts of baskets, some made of the same materials as their mats, and others of the twisted fibres of cocoa-nuts. These are not only durable, but beautiful, being generally composed of different colours, and studded with beads made of shells or bones. They have many little nick-nacks among them, which show that they neither want taste to design, nor skill to execute, whatever they take in hand. Their fishing implements are much the same as in the other islands: here was purchased a fish-net made like our casting nets, knit of very firm though slender threads.

Amsterdam, Amulet.

Notwithstanding their friendly disposition, those people have very formidable weapons; some of their spears have many barbs, and must be very dangerous weapons when they take effect. A large flat shell or breast-plate was purchased, made of a roundish bone, white and polished like ivory, about 18 inches in diameter, which appeared to have belonged to an animal of the whale tribe.

AMULET, a charm, or preservative against mischief, witchcraft, or diseases.

Amulets were made of stone, metal, simples, animals, and in a word of every thing that imagination suggested.

Sometimes they consisted of words, characters, and sentences, ranged in a particular order, and engraved upon wood, &c. and worn about the neck, or some other part of the body. See ABRACADABRA.

At other times they were neither written nor engraved; but prepared with many superstitious ceremonies, great regard being usually paid to the influence of the stars. The Arabians have given to this species of amulet the name of TALISMAN.

All nations have been fond of amulets: the Jews, were extremely superstitious in the use of them, to drive

mulet, murath.

drive away diseases: and the Mishna forbids them, unless received from an approved man who had cured at least three persons before by the same means.

Among the Christians of the early times, amulets were made of the wood of the cross, or ribbands with a text of Scripture written in them, as preservatives against diseases. Notwithstanding the progress of learning and refinement, there is not any country in Europe, even at this day, where they do not believe in some charm or other. The pope is supposed to have the virtue of making amulets, which he exercises in the consecrating of *Agnus Dei's*, &c. The sponge which has wiped his table, was formerly in great veneration as a preservative from wounds, and from death itself: on this account it was sent with great solemnity by Gregory II. to the duke of Aquitain.

Amulets are now much fallen from the repute they were anciently in; yet the great Mr Boyle alleges them as an instance of the ingress of external effluvia into the habit, in order to show the great porosity of the human body. He adds, that he is persuaded some of these external medicines do answer; for that he himself, having been once subject to bleed at the nose, and reduced to use several remedies to check it, found the moss of a dead man's skull, though only applied so as to touch the skin till the moss was warm thereby, the most effectual of any. The same Mr Boyle shows how the effluvia, even of cold amulets, may, in course of time, pervade the pores of a living animal; by supposing an agreement between the pores of the skin and the figure of the corpuscles. Bellini has attempted to demonstrate the possibility of the thing in his last propositions *De Febribus;* and the like is done by Dr Wainwright, Dr Keill, &c.

AMURATH or AMURAT I. the fourth emperor of the Turks, and one of the greatest princes of the Ottoman empire, succeeded Solyman in 1390. He took from the Greeks Gallipoli in Thrace, and Adrianople, which last he chose for the place of his residence. He defeated the prince of Bulgaria, conquered Misnia, chastised his rebellious bashaws, and is said to have gained 36 battles. This prince, in order to form a body of devoted troops that might serve as the immediate guards of his person and dignity, appointed his officers to seize annually, as the imperial property, the fifth part of the Christian youth taken in war. These, after being instructed in the Mahometan religion, inured to obedience by severe discipline, and trained to warlike exercises, were formed into a body distinguished by the name of *Janizaries*, or *New Soldiers*. Every sentiment which enthusiasm can inspire, every mark of distinction that the favour of the prince could confer, were employed in order to animate this body with martial ardour, and with a consciousness of its own pre-eminence. The Janizaries soon became the chief strength and pride of the Ottoman armies, and were distinguished above all the troops whose duty it was to attend on the person of the sultan.—At length the death of Lazarus, despot of Servia, who had endeavoured in vain to stop the progress of Amurath's arms, touched Milo, one of his servants, in so sensible a manner, that, in revenge, he stabbed the sultan in the midst of his troops, and killed him upon the spot, A. D. 1389, after he had reigned 23 years.

AMURATH II. the 10th emperor of the Turks, was the eldest son of Mahomet I. and succeeded his father in 1421. He besieged Constantinople and Belgrade without success; but he took Thessalonica from the Venetians, and compelled the prince of Bosnia and John Castriot prince of Albania to pay him tribute. He obliged the latter to send his three sons as hostages; among whom was George, celebrated in history by the name of *Scanderbeg*. John Hunniades defeated Amurath's troops, and obliged him to make peace with the Christian princes in 1442. These princes afterwards breaking the peace, Amurath defeated them in the famous battle of Varna, November 10. 1444, which proved so fatal to the Christians, and in which Ladislaus king of Hungary was killed. He afterwards defeated Hunniades, and killed above 20,000 of his men; but George Castriot, better known by the name of *Scanderbeg*, being re-established in the estates of his father, defeated the Turks several times, and obliged Amurath to raise the siege of Croia, the capital of Albania. Amurath died, chagrined with his ill success, and infirm with age, February 11. 1451, at Adrianople. It is observed to this prince's honour, that he always kept his treaties with the greatest fidelity. Amurath.

AMURATH IV. surnamed the *Valiant*, was the son of Achmet I. and in the year 1622, at the age of 13, succeeded his uncle Mustapha. Bagdad fell into the hands of the Persians, and several other disastrous events clouded the commencement of his reign. The pacha of Erzerum had raised the standard of rebellion in the former reign; and, continuing his opposition, he overran many of the provinces of Lesser Asia. But the military talents of the sultan were soon roused to exertion; and, making peace with Germany, he hastened with a formidable army to regain Bagdad. But new rebellions in his Asiatic dominions, and several other causes, prevented him from recovering the city. The Spahis also rebelled at home, and several viziers were slain during the tumults of the Porte.

The natural dispositions of the young monarch were ill adapted to his situation, and extremely destructive to his people. It is reported, that a flash of lightning rushing into his chamber during the darkness of the night, strongly impaired his reason, and produced a violence and intemperance of character which remained to the end of his days. It was therefore nothing more than reasonable to expect that his policy should be variable and inconstant; it appears, however, that he actively resisted the foes who pressed upon his dominions from different quarters. The recovery of Bagdad being still his favourite object, in the year 1637, he again marched against it; and after 30 days of unremitting assault, with the expence of much blood, he took possession of the city. By pushing his men forward to the attack by the point of the scimitar, and by slaughtering 30,000 Persians in cold blood after their surrender, he displayed the brutal ferocity of his disposition. One person alone is reported to have moved his obdurate heart on the present occasion. A famous player upon the harp entreated those who were sent to massacre him, to allow him to speak to the sultan previous to his death. Informed who he was, the sultan requested him to give a specimen of his skill in his profession: with this he readily complied, and touched his harp so melodiously, and

Amurath, Amyclæ.

sung in such pathetic strains the lamentations on the tragedy of Bagdad, intermixed with the praises of Amurath, that the hard heart of the cruel monarch being at length softened, he melted into tears, and saved both the musician and the remaining inhabitants. The loss sustained by the Persians at this time, so reduced their military strength, that they were unable for a long period to attack the Ottoman empire.

The violence of Amurath soon enfeebled his constitution; and the fruits of his debaucheries and excesses were obvious even in the prime of life. At the age of 31, he fell a victim to an excess of revelling in the feast of Bairam, in the year 1640. Beholding his end approaching, he is reported to have given orders to assassinate his brother, in order to secure the throne for his favourite Mustapha; but the affection of his mother prevented the cruel mandate from being carried into effect. The manners and amorous adventures of this monarch have afforded materials for numerous Turkish descriptions full of extravagance, singularity, and cruelty. He surpassed all his predecessors in the abominable vice of intoxication, and even violated the established laws of the country, by issuing an edict permitting the sale and use of wine. But, as if it was not sufficient to violate the common law, he also opposed himself to the common usage of the country, by shutting up the coffeehouses, and prohibiting opium and tobacco upon the pain of death. The wanton cruelty of this prince was almost unexampled. During his hours of dissipation, he would rush forth into the streets with a drawn sword in his hand, and cut in pieces all the unhappy persons who chanced to be in his way. Nay, even in his calmest moments, he often discharged arrows from his upper windows at the innocent passengers as they went along. In short, to such extravagance did his cruelty extend, that the very name of Amurath carried terror along with it, and the opium-chewers fell into fits upon the simple mention thereof. The number of persons that fell victims to his cruelty during a reign of 17 years, amounted to no less than 14,000; among whom were many officers of high power and distinction in the state. The meanness of his dispositions, however, manifested themselves in his descending to familiarities with his favourites, and even joining in the meanest services. He also displayed a singular humour in making marriages between old men and girls, and young men and women of fourscore. It may, however, on the whole, be asserted, that if he had not been intoxicated with wine and power, the qualities of his mind and body might have rendered him a more respectable member of society. He was very remarkable for swiftness of foot and dexterity in drawing the bow. The reverses of fortune made small impression on his mind, and he pursued with resolute firmness any object in which he seriously engaged. Dissembling, avaricious, and blasphemous, he gave full proof, that his moral qualities were greatly depraved. (*Mod. Un. Hist. Gen. Biog.*).

AMYCLÆ, a city of Laconia, distant about 18 miles from the metropolis, founded by Amyclas the son of Lacedæmon, and famed afterwards for the birth of Castor and Pollux the sons of Tyndarus, eighth king of Sparta. It was afterwards famed for sending a considerable colony of its own inhabitants into Upper Calabria, who built there a city which they called by the same name. This last city was situated between Cajeta and Terracina, and gave its name to the neighbouring sea. According to Pliny and Solinus, the territory of Amyclæ was so infested with vipers and other serpents, that the inhabitants were obliged to abandon their dwellings and settle elsewhere. Among the ancient poets, the Amycli, or inhabitants of this city, obtained the epithet of *taciti*, "silent." The reason of this was, either because it was built by the Lacedæmonians, who, as they followed the doctrine of Pythagoras, were always inculcating the precept of silence, and thence called *taciti*: or because of a law which obtained in this place, forbidding any one, under severe penalties, to mention the approach of an enemy. Before this law was made, the city was daily alarmed by false reports, as if the enemy had been already at the gates. From terrors of this kind the above-mentioned law indeed delivered them; but, in the end, it proved the ruin of the city: for the Dorians appearing unexpectedly under the walls, no one ventured to transgress the law; so that the city was easily taken. They reduced it to an inconsiderable hamlet; in which, however, were seen some of the remains of its ancient grandeur. One of the finest buildings that escaped the common ruin, was the temple and statue of Alexandra, whom the inhabitants pretended to be the same with Cassandra the daughter of Priam.

Amyclæ || Amyot.

AMYGDALUS, the Almond and Peach. See Botany *Index*.

AMYLACEOUS, from *amylum*, "starch;" a term applied to the fine flour of farinaceous seeds, in which consists their nutritive part. See Bread.

AMYNTA, in literary history, a beautiful pastoral comedy, composed by Tasso; the model of all dramatic pieces wherein shepherds are actors. The *Pastor Fido*, and *Filli de Sciro*, are only copies of this excellent piece.

AMYNTOR, αμυντωρ, formed of the verb αμυνω, *I defend* or *avenge*, properly denotes a person who defends or vindicates a cause. In this sense, Mr Toland entitles his defence of Milton's life, *Amyntor*, as being a vindication of that work against Mr Blackhall and others, who had charged him with questioning the authority of some of the books of the New Testament, and declaring his doubt that several pieces under the name of Christ and his Apostles, received now by the whole Christian church, were supposititious.

AMYOT, James, bishop of Auxerre and great almoner of France, was born of an obscure family at Melun, the 30th of October 1514, and studied philosophy at Paris, in the college of Cardinal Le Moine. He was naturally dull and heavy; but diligence and application made amends for these natural defects. He left Paris at the age of 23; and went to Bourges with the Sieur Colin, who had the abbey of St Ambrose in that city. At the recommendation of this abbot, a secretary of state took Amyot into his house to be tutor to his children. The great improvements they made under his direction induced the secretary to recommend him to the Princess Margaret duchess of Berry, only sister of Francis I. and by means of this recommendation Amyot was made public professor of Greek and Latin in the university of Bourges. It was during this time he translated into French the

"Amours

Amyot ‖ Ana.

"Amours of Theagines and Chariclea," which Francis I. was so pleased with, that he conferred upon him the abbey of Bellosane. He also translated Plutarch's Lives, which he dedicated to the king; and afterwards undertook that of Plutarch's Morals, which he ended in the reign of Charles IX. and dedicated to that prince. Charles conferred upon him the abbey of St Cornelius de Compiegne, and made him the great almoner of France and bishop of Auxerre. He died in 1593, aged 79.

AMYRALDISM, a name given by some writers to the doctrine of universal grace, as explained and asserted by Amyraldus, or Moses Amyrault, and others his followers, among the reformed in France, towards the middle of the 17th century.

This doctrine principally consisted of the following particulars, viz. that God *desires* the happiness of all men, and none are excluded by a divine decree; that none can obtain salvation without faith in Christ; that God refuses to none the *power of believing*, though he does not grant to *all* his assistance, that they may improve this power to saving purposes; and that many perish through their own fault. Those who embraced this doctrine were called *Universalists;* though it is evident they rendered grace *universal* in words, but *partial* in reality, and are chargeable with greater inconsistencies than the *Supralapsarians*.

AMYRAULT, Moses, an eminent French Protestant divine, born at Bourgueil in Touraine in 1566. He studied at Saumur, where he was chosen professor of theology; and his learned works gained him the esteem of Catholics as well as Protestants, particularly of Cardinal Richelieu, who consulted him on a plan of reuniting their churches, which, however, as may well be supposed, came to nothing. He published a piece in which he attempted to explain the mystery of predestination and grace, which occasioned a controversy between him and some other divines. He also wrote, An Apology for the Protestants; a Paraphrase on the New Testament; and several other books. This eminent divine died in 1664.

AMYRIS. See Botany *Index*.

ANA, among physicians, denotes a quantity equal to that of the preceding ingredient. It is abbreviated thus, āā or ā.

Ana, in matters of literature, a Latin termination, adopted into the titles of several books in other languages.—*Anas*, or *books in ana*, are collections of the memorable sayings of persons of learning and wit; much the same with what we otherwise called *table-talk*.

Wolfius has given the history of books in ana, in the preface to the Casauboniana. He there observes, that though such titles be new, the thing itself is very old; that Xenophon's books of the deeds and sayings of Socrates, as well as the dialogues of Plato, are *Socratiana;* that the apophthegms of the philosophers collected by Diogenes Laërtius, the sentences of Pythagoras and those of Epictetus, the works of Athenæus, Stobeus, and divers others, are so many anas. Even the Gemara of the Jews, with several other oriental writings, according to Wolfius, properly belong to the same class. To this head of ana may likewise be referred the Orphica, the Pythagoræa, Æsopica, Pyrrhonea, &c.

Scaligerana was the first piece that appeared with a title in Ana. It was composed by Isan de Vassan, a young Champanois, recommended to Jos. Scaliger by Casaubon. Being much with Scaliger, who was daily visited by the men of learning at Leyden, De Vassan wrote down whatever things of any moment he heard Scaliger say. The work was not printed till many years after at Geneva in 1666. Patin. Let. 431.—Soon after came the Perroniana, Thuana, Naudæana, Patineana, Sorberiana, Menagiana, Anti-Menagiana, Furetiana, Chevræana, Leibnitziana, Arlequiniana, Poggiana, &c. See Ana, Supplement.

Ana ‖ Anabaptists.

ANABAPTISTON, the same with Abaptiston.

ANABAPTISTS, a name which has been indiscriminately applied to Christians of very different principles and practices; though many of them object to the denomination, and hold nothing in common, besides the opinion that baptism ought always to be performed by immersion, and not administered before the age of discretion.

The word Anabaptist is compounded of ανα, "new," and βαπτιστης, "a baptist;" and in this sense the Novatians, the Cataphrygians, and the Donatists, may be considered as a kind of Anabaptists in the earlier ages, though not then denoted by this name; for they contended, that those Christians of the Catholic church who joined themselves to their respective parties should be rebaptized. But we must not class under the same denomination those bishops of Asia and Africa, who, in the third century, maintained, that baptism administered by those whom they called heretics was not valid, and therefore that such of them as returned into their churches ought to be rebaptized. Nor do the English and Dutch Baptists consider the denomination as at all applicable to their sect: by whom the baptism appointed by Christ is held to be "nothing short of *immersion upon a personal profession of faith;*" of which profession infants being incapable, and sprinkling being no adequate symbol of the thing included, the baptizing of proselytes to their communion, who in their infancy had undergone the ceremony of sprinkling, cannot, it is urged, be interpreted a repetition of the baptismal ordinance.

Anabaptists, in a strict and proper sense, appear to be those who not only rebaptize, when they arrive at an adult age, persons that were baptized in their infancy, but also, as often as any person comes from one of their sects to another, or as often as any one is excluded from their communion and again received into the bosom of the church, they baptize him. And such were many of the German Baptists. But the single opinion common to all the sects to which the name of *Anabaptists* has been indiscriminately applied, is that of the invalidity of *infant baptism*, in whatever way administered: And hence the general denomination of *Antipædobaptists;* which included Anabaptists, Baptists, Mennonites, Waterlandians, &c. as distinguished by their respective peculiarities; though *Anabaptists* seems to have been adopted by most writers as the general term.

To the above peculiar notion concerning the baptismal sacrament, the Anabaptists added principles of a different nature, depending upon certain ideas which they entertained concerning a perfect church establishment, pure in its members, and free from the institutions of human policy.

Anabaptists.

The Anabaptists appear to have made little noise, or to have been little noticed, before the time of the reformation in Germany. The most prudent and rational part of them considered it possible, by human wisdom, industry, and vigilance, to purify the church from the contagion of the wicked, provided the manners and spirit of the primitive Christians could but recover their lost dignity and lustre; and seeing the attempts of Luther, seconded by several persons of eminent piety, prove so successful, they hoped that the happy period was arrived in which the restoration of the church to purity was to be accomplished, under the divine protection, by the labours and counsels of pious and eminent men. Others, far from being satisfied with the plan of reformation proposed by Luther, looked upon it as much beneath the sublimity of their views; and consequently undertook a more perfect reformation, or, to express more properly their visionary enterprise, they proposed to found a new church, entirely spiritual, and truly divine.

This sect was soon joined by great numbers, and (as usually happens in sudden revolutions of this nature) by many persons, whose characters and capacities were very different, though their views seemed to turn upon the same object. Their progress was rapid; for, in a very short space of time, their discourses, visions, and predictions, excited commotions in a great part of Europe, and drew into their communion a prodigious multitude, whose ignorance rendered them easy victims to the illusions of enthusiasm. The most pernicious faction of all those which composed this motley multitude, was that which pretended that the founders of the new and *perfect church*, already mentioned, were under the direction of a divine impulse, and were armed against all opposition by the power of working miracles. It was this faction that, in the year 1521, began their fanatical work, under the guidance of Munzer, Stubner, Storck, &c.

These persons were disciples of Luther; but well knowing that their opinions were such as would receive no sanction from him, they availed themselves of his absence to disseminate them in Wittenburg, and had the address to overreach the piety of Melancthon. Their principal purpose was to gain over the populace, and to form a considerable party. To effect this, says Bayle, they were industrious and active, each in his own way. Storck wanting knowledge, boasted of inspiration; and Stubner, who had both genius and erudition, laboured at commodious explications of Scripture. Not content with discrediting the court of Rome, and decrying the authority of consistories, they taught, That among Christians, who had the precepts of the gospel to direct, and the Spirit of God to guide them, the office of magistracy was not only unnecessary, but an unlawful encroachment on their spiritual liberty; that the distinctions occasioned by birth, or rank, or wealth, being contrary to the spirit of the gospel, which considers all men as equal, should be entirely abolished; that all Christians, throwing their possessions into one common stock, should live together in that state of equality which becomes members of the same family; that as neither the laws of nature nor the precepts of the New Testament had placed any restraint upon men with regard to the number of wives which they might marry, they should use that liberty which God himself had granted to the patriarchs. Anabaptists.

They employed at first the various arts of persuasion in order to propagate their doctrine. They preached, exhorted, admonished, and reasoned, in a manner that seemed proper to impress the multitude; and related a great number of visions and revelations with which they pretended to have been favoured from above. But when they saw that these methods of making proselytes were not attended with such rapid success as they fondly expected, and that the ministry of Luther and other eminent reformers was detrimental to their cause, they then had recourse to more expeditious measures, and madly attempted to propagate their fanatical doctrine by force of arms. Munzer and his associates, in the year 1525, put themselves at the head of a numerous army, composed for the most part of the peasants of Suabia, Thuringia, Franconia, and Saxony; and declared war against all laws, government, and magistrates of every kind, under the chimerical pretext that Christ was now to take the reins of civil and ecclesiastical government into his own hands, and to rule alone over the nations. But this seditious crowd was routed and dispersed, without much difficulty, by the elector of Saxony and other princes; and Munzer their ringleader ignominiously put to death, and his factious counsellors scattered abroad in different places.

Many of his followers, however, survived and propagated their opinions through Germany, Switzerland, and Holland. In the year 1533, a party of them settled at Munster under the direction of two Anabaptist prophets, John Matthias a baker of Haerlem, and John Bockholdt a journeyman taylor of Leyden. Having made themselves masters of the city, they deposed the magistrates, confiscated the estates of such as had escaped, and deposited the wealth they amassed together in a public treasury for common use. They made preparations of every kind for the defence of the city: and sent out emissaries to the Anabaptists in the Low Countries, inviting them to assemble at Munster, which was now dignified with the name of Mount Sion, that from hence they might be deputed to reduce all the nations of the earth under their dominion. Matthias, who was the first in command, was soon cut off in an act of frenzy by the bishop of Munster's army; and was succeeded by Bockholdt, who was proclaimed by a special designation of Heaven, as he pretended, king of Sion, and invested with legislative powers like those of Moses. The extravagancies of Bockholdt were too numerous to be recited: it will be sufficient to add, that the city of Munster was taken after a long siege and an obstinate resistance; and Bockholdt, the mock monarch, was punished with a most painful and ignominious death.

It must, however, be acknowledged, that the true rise of the numerous insurrections of this period ought not to be attributed to religious opinions. The first insurgents groaned under the most grievous oppressions; they took up arms principally in defence of their civil liberties; and of the commotions that took place, the Anabaptist leaders above mentioned seem rather to have availed themselves, than to have been the prime movers. See the article REFORMATION.—That a great part of the main body, indeed, consisted of

Anabaptists ‖ Anabolæum.

of Anabaptists, seems indisputable; and whatever fanaticism existed among them would naturally be called forth or be inflamed by the situations that occurred, and run riot in its wildest shapes. At the same time it appears from history, that a great part also consisted of Roman Catholics, and a still greater of persons who had scarcely any religious principles at all. Indeed, when we read of the vast numbers that were concerned in those insurrections, of whom it is reported that 100,000 fell by the sword, it appears reasonable to conclude that a great majority of them were not Anabaptists.

Before concluding this article, it must be remarked, that the Baptists or Mennonites in England and Holland are to be considered in a very different light from the enthusiasts we have been describing: And it appears equally uncandid and invidious, to trace up their distinguishing sentiment, as some of their adversaries have done, to those obnoxious characters, and there to stop, in order as it were to associate with it the ideas of turbulence and fanaticism, with which it certainly has no natural connection. Their coincidence with some of those oppressed and infatuated people in denying baptism to infants, is acknowledged by the Baptists; but they disavow the practice which the appellation of *Anabaptists* implies; and their doctrines seem referable to a more ancient and respectable origin. They appear supported by history in considering themselves as the descendants of the Waldenses, who were so grievously oppressed and persecuted by the despotic heads of the Roman hierarchy; and they profess an equal aversion to all principles of rebellion on one hand, and to all suggestions of fanaticism on the other. See BAPTISTS. The denomination of *Mennonites*, by which they are distinguished in Holland, they derive from Menno, the famous man who latterly gave consistence and stability to their sect. See MENNONITES.

ANABASII, in antiquity, were couriers who were sent on horseback or in chariots, with dispatches of importance.

ANABASIS. See BOTANY *Index*.

ANABATHRA, in ancient writers, denotes a kind of steps or ladder whereby to ascend to some eminence. In this sense we read of the anabathra of theatres, pulpits, &c. Anabathra appears to have been sometimes also applied to ranges of seats rising gradually over each other.

ANABATHRA is more particularly applied to a kind of stone blocks raised by the highway sides, to assist travellers in mounting or alighting, before the use of stirrups was invented. The first author of this contrivance among the Romans was C. Gracchus brother of Tiberius.

ANABLEPS, in *Ichthyology*, the trivial name of a species of cobitis. See COBITIS.

ANABOA, a small island situated near the coast of Loango in Africa, in E. Long. 9°. N. Lat. 1°. Here are several fertile valleys, which produce plenty of bananas, oranges, pine apples, lemons, citrons, tamarinds, cocoa nuts, &c. together with vast quantities of cotton. In this island are two high mountains, which, being continually covered with clouds, occasion frequent rains.

ANABOLÆUM, or ANABOLE, in antiquity, a kind of great or upper coat, worn over the tunica.

Anaboleus ‖ Anacharsis.

ANABOLEUS, in antiquity, an appellation given to grooms of the stable, or equerries, who assisted their masters in mounting their horses. As the ancients had no stirrups, or instruments that are now in use for mounting a horse, they either jumped upon his back, or were aided in mounting by anabolei.

ANACALYPTERIA, according to Suidas, were presents made to the bride by her husband's relations and friends, when she first uncovered her face and showed herself to men. These presents were also called επαυλια: for, among the Greeks, virgins before marriage were under strict confinement, being rarely permitted to appear in public, or converse with the other sex; and when allowed that liberty, wore a veil over their faces, termed Καλυπτρον, or Καλυπτρα, which was not left off in the presence of men till the third day after marriage; whence, according to Hesychius, this day was also called *anacalypterion*.

ANACAMPSEROS, in *Botany*, a synonyme of the portulaca and several other plants.

ANACAMPTERIA, in ecclesiastical antiquity, a kind of little edifices adjacent to the churches, designed for the entertainment of strangers and poor persons.

ANACAMPTIC, a name applied by the ancients to that part of optics which treats of reflection, being the same with what is now called CATOPTRICS.

ANACARDIUM, or CASHEW-NUT TREE. See BOTANY *Index*.

ANACEPHALÆOSIS, in *Rhetoric*, the same with Recapitulation. See RECAPITULATION.

ANACHARSIS, a Scythian philosopher, who lived about 600 years before Christ. His father was one of the chiefs of his nation, and married a woman of Greece. Instructed in the Greek language by his mother, he caught the flame for Grecian literature, and prevailed upon the king to intrust him with an embassy to Athens. Arrived in that renowned city, he was introduced to Solon by one of his own countrymen, named *Foxaris;* and it is reported, that when he came to the door of Solon, he requested a servant to inform his master, that Anacharsis a Scythian was at the door, and was desirous of being received as his friend and guest. Solon is said to have returned for answer, that "friendships are best formed at home." To this the Scythian philosopher replied, "then let Solon, who is at home, make me his friend and receive me into his house." Solon was so astonished at the propriety of this reply, that he gave him admittance; and, finding him upon farther acquaintance worthy of his confidence, he honoured him with his friendship. From such a well qualified master, Anacharsis rapidly acquired a knowledge of the wisdom of Greece, and the literature then in circulation. By the influence of Solon he was introduced to the principal characters of Athens, and was the first stranger who was honoured with the title of citizen by the Athenians.

After he had resided several years at Athens, he travelled through different countries in quest of knowledge, and then returned to his native country inflamed with the desire of instructing them in the laws and the religion of the Greeks. But his countrymen were not prepared to profit by his instructions; and while he was performing sacrifice to the goddess Cybele, correspondent to a vow which he had made on his

Anacharsis || Anaclastic.

his way home, he was slain by an arrow, said to have proceeded from the king's own hand. Thus fell the Scythian philosopher a victim to the folly and ignorance of his countrymen, who wantonly rejected the wisdom and learning of Greece.

The energetic manner in which he was accustomed to express himself, gave birth to the proverbial saying, "Scythian eloquence." Although the potter's wheel was invented in the days of Homer, some have inaccurately ascribed its invention to Anacharsis. The following ingenious sayings may be mentioned as a specimen of his genius. "The best way of teaching a youth sobriety, is to set before his eyes a drunken man. The vine bears three sorts of fruit; the first pleasure, the second intoxication, the third remorse. An ape is by nature ridiculous; man by art and study. An Athenian of bad morals reproached him with being a Scythian: to him he replied, "My country may be a disgrace to me, but you are a disgrace to your country." Some suppose, that the epistles which bear his name are spurious. (*Gen. Biog.*).

ANACHORET, in church history, denotes a hermit, or solitary monk, who retires from the society of mankind into some desert, with a view to avoid the temptations of the world, and to be more at leisure for meditation and prayer. Such were Paul, Anthony, and Hilarian, the first founders of monastic life in Egypt and Palestine.

Anachorets, among the Greeks, consist principally of monks, who retire to caves or cells, with the leave of the abbot, and an allowance from the monastery; or who, weary of the fatigues of the monastery, purchase a spot of ground, to which they retreat, never appearing in the monastery unless on solemn occasions.

ANACHRONISM, in matters of literature, an error with respect to chronology, whereby an event is placed earlier than it really happened. The word is compounded of ανα, "higher," and χρονος, "time." Such is that of Virgil, who placed Dido in Africa at the time of Æneas, though in reality she did not come there till 300 years after the taking of Troy.—An error on the other side, whereby a fact is placed later and lower than it should be, is called a *parachronism*.

ANACLASTIC GLASSES, a kind of sonorous phials or glasses, chiefly made in Germany, which have the property of being flexible, and emitting a vehement noise by the human breath.—They are also called *vexing glasses* by the Germans (*vexier glaser*), on account of the fright and disturbance they occasion by their resilition. The anaclastic glasses are a low kind of phials with flat bellies, resembling inverted funnels, whose bottoms are very thin, scarce surpassing the thickness of an onion peel: this bottom is not quite flat, but a little convex. But upon applying the mouth to the orifice, and gently inspiring, or as it were sucking out the air, the bottom gives way with a prodigious crack, and the convex becomes concave. On the contrary, upon expiring or breathing gently into the orifice of the same glass, the bottom with no less noise bends back to its former place, and becomes gibbous as before.—The anaclastic glasses first taken notice of were in the castle of Goldbach; where one of the academists *Naturæ Curiosorum*, having seen and made experiments on them, published a piece express on their history and phenomena. They are all made of a fine white glass. It is to be observed, 1. That if the bottom be concave at the time of inspiration, it will burst; and the like will happen if it be convex at the time of exspiration. 2. A strong breath will have the same effect even under the contrary circumstances. Anaclastic || Anacreon.

ANACLASTICS, that part of optics which considers the refraction of light, and is commonly called *Dioptrics*. See DIOPTRICS.

ANACLETERIA, in antiquity, a solemn festival celebrated by the ancients when their kings or princes came of age, and assumed the reins of government. It is so called, because proclamation being made of this event to the people, they went to salute their prince during the anacleteria, and to congratulate him upon his new dignity.

ANACLETICUM, in the ancient art of war, a particular blast of the trumpet, whereby the fearful and flying soldiers were rallied, and recalled to combat.

ANACLINOPALE, Αναλινοπαλη, in antiquity, a kind of wrestling, wherein the champions threw themselves voluntarily on the ground, and continued the combat by pinching, biting, scratching, and other methods of offence. The *Anaclinopale* was contradistinguished from the *Orthapale*, wherein the champions stood erect. In the Anaclinopale, the weaker combatants sometimes gained the victory.

ANACLINTERIA, in antiquity, a kind of pillows on the dining bed, whereon the guests used to lean. The ancient tricliniary beds had four pillows, one at the head, another at the feet, a third at the back, and a fourth at the breast. That on which the head lay, was properly called by the Greeks αναλινδηριον or αναλινδηρον; by the Romans *fulcrum*, sometimes *pluteus*.

ANACOLLEMA, a composition of astringent powders, applied by the ancients to the head, to prevent defluxions on the eyes.

ANACONDO, in *Natural History*, is a name given in the isle of Ceylon to a very large and terrible snake, which often devours the unfortunate traveller alive, and is itself accounted excellent and delicious fare. It is probably the *Boa Constrictor*.

ANACREON, a Greek poet, born at Teos, a city of Ionia, flourished about 532 years before the Christian era. Polycrates, tyrant of Samos, invited him to his court, and made him share with him in his business and his pleasure. He had a delicate wit, as may be judged from the inexpressible beauties and graces that shine in his works: but he was fond of pleasure, was of an amorous disposition, and addicted to drunkenness: yet, notwithstanding his debaucheries, he lived to the age of 85; when, we are told, he was choked by a grapestone which stuck in his throat as he was regaling on some new wine.

There is but a small part of Anacreon's works that remain: for, besides his odes and epigrams, he composed elegies, hymns, and iambics. His poems which are extant were rescued from oblivion by Henry Stephens, and are universally admired. The verses of Anacreon are sweeter, says Scaliger, than Indian sugar. His beauty and chief excellence, says Madame Dacier, lay in imitating nature, and in following reason; so that he presented to the mind no images but what were noble and natural. The odes of Anacreon, says Rapin,

Anacreon || Anaduomene.

pin, are flowers, beauties, and perpetual graces; it is familiar to him to write what is natural, and to the life, he having an air so delicate, so easy and graceful, that among all the ancients there is nothing comparable to the method he took, nor to that kind of writing he followed. He flows soft and easy, every where diffusing the joy and indolence of his mind through his verse, and tuning his harp to the smooth and pleasant temper of his soul. But none has given a juster character of his writings than the God of Love, as taught to speak by Mr Cowley:

All thy verse is softer far
Than the downy feathers are
Of my wings, or of my arrows,
Of my mother's doves and sparrows:
Graceful, cleanly, smooth, or round,
All with Venus' girdle bound.

ANACREONTIC VERSE, in ancient poetry, a kind of verse, so called from its being much used by the poet Anacreon. It consists of three feet and a half, usually spondees and iambuses, and sometimes anapests: Such is that of Horace,

Lydia, dic per omnes.

ANACRISIS, among the ancient Greeks, was used for a kind of trial or examination, which the archons, or chief magistrates of Athens, were to undergo before their admission into that office. The *anacrisis* stands distinguished from the *docimasia*, which was a second examination in the forum. The anacrisis was performed in the senate-house. The questions here proposed to them were concerning their family, kindred, behaviour, estate, &c. Some will have it that all magistrates underwent the anacrisis.

ANACRISIS, among civilians, an investigation of truth, interrogation of witnesses, and inquiry made into any fact, especially by torture.

ANACROSIS, in antiquity, denotes a part of the Pythian song, wherein the combat of Apollo and Python is described.—The anacrosis was the first part, and contained the preparation to the fight.

ANACYCLUS. See BOTANY *Index*.

ANADAVADÆA, in *Ornithology*, a barbarous name of a species of alauda. See ALAUDA, ORNITHOLOGY *Index*.

ANADEMA, among the ancients, denotes an ornament of the head, wherewith victors at the sacred games had their temples bound.

ANADIPLOSIS, in *Rhetoric* and *Poetry*, a repetition of the last word of a line, or clause of a sentence, in the beginning of the next: thus,

Pierides, vos hæc facietis maxima Gallo:
Galla, cujus amor, &c.
Et matutinis accredula vocibus instat,
Vocibus instat, et assiduas jacit ore querelas.

ANADROMUS, among ichthyologists, a name given to such fishes as go from the sea to the fresh water at stated seasons, and return back again; such as the salmon, &c. See SALMO.

ANADUOMENE VENUS, in the *Grecian Mythology*, answered to the Sea Venus in the Roman, and was the appellation given to one of the chief deities of the sea. The most celebrated picture in all antiquity was that of this goddess by Apelles; and the famous Venus of Medicis is a Sea Venus.

Anaduomene || Anagram.

ANÆDEIA, in antiquity, a denomination given to a silver stool placed in the Areopagus, on which the defendant, or person accused, was seated for examination. The word is Greek, Ανάδεια, which imports imprudence; but according to Junius's correction, it should rather be Ανεΐλια, q. d. *innocence*. The plaintiff or accuser was placed on an opposite stool called *hybris*, or injury; here he proposed three questions to the party accused, to which positive answers were to be given. The first, Are you guilty of this fact? The second, How did you commit the fact? The third, Who were your accomplices?

ANÆSTHESIA, signifies a privation of the senses.

ANAGALLIS, PIMPERNEL. See BOTANY *Index*.

ANAGNIA, in *Ancient Geography*, a town of Latium, capital of the Hernici; which, after a faint resistance, submitting to the Romans, was admitted to the freedom of the city, yet without the right of suffrage, (Livy). It was afterwards a colony of Drusus Cæsar, and walled round, and its territory assigned to the veterans, (Frontinus). Here Antony married Cleopatra, and divorced Octavia. Now *Anagni*, 36 miles to the east of Rome. Long. 13. 45. N. Lat. 42. 48.

ANAGNOSTA, or ANAGNOSTES, in antiquity, a kind of literary servant, retained in the families of persons of distinction, whose chief business was to read to them during meals, or at any other time when they were at leisure. Cornelius Nepos relates of Atticus, that he had always an anagnostes at his meals. He never supped without reading; so that the minds of his guests were no less agreeably entertained than their appetites. The same custom, Eginhard observes, was kept up by Charlemagne, who at table had the histories and acts of ancient kings read to him. This custom seems to have been a relick of that of the ancient Greeks, who had the praises of great men and heroes sung to them while at table. The ancient monks and clergy kept up the like usage, as we are informed by St Augustin.

ANAGOGICAL, signifies mysterious, transporting; and is used to express whatever elevates the mind, not only to the knowledge of divine things, but of divine things in the next life. This word is seldom used, but with regard to the different senses of the Scripture. The anagogical sense is, when the sacred text is explained with regard to eternal life, the point which Christians should have in view: for example, the rest of the Sabbath, in the anagogical sense, signifies the repose of everlasting happiness.

ANAGOGY, or ANAGOGE, among ecclesiastical writers, the elevation of the mind to things celestial and eternal. It is particularly used, where words, in their natural or primary meanings, denote something sensible, but have a further view to something spiritual or invisible.

ANAGOGY, in a more particular sense, denotes the application of the types and allegories of the Old Testament to subjects of the New; thus called, because the veil being here drawn, what before was hidden is exposed to open sight.

ANAGRAM (from the Greek ανα, backwards, and γραμμα,

Anagram || Anak.

γραμμα, *letter*), in matters of literature, a transposition of the letters of some name, whereby a new word is formed, either to the advantage or disadvantage of the person or thing to which the name belongs. Thus the anagram of Galenus in *angelus;* that of Logica, *caligo;* that of Alstedius, *sedulitas;* that of Loraine is *alerion*, on which account it was that the family of Loraine took *alerions* for their armoury.—Calvin, in the title of his *Institutions*, printed at Strasburgh in 1539, calls himself *Alcuinus*, which is the anagram of Calvinus, and the name of an eminently learned person in the time of Charlemagne, who contributed greatly to the restoration of learning in that age.

Those who adhere strictly to the definition of an anagram, take no other liberty than that of omitting or retaining the letter H at pleasure; whereas others make no scruple to use E for Æ, V for W, S for Z, and C for K: and *vice versa*.

Besides anagrams formed as above, we meet with another kind in ancient writers, made by dividing a single word into several; thus, *sus tinea mus*, are formed out of the word *sustineamus*.

Anagrams are sometimes also made out of several words: such as that on the question put by Pilate to our Saviour, *Quid est veritas?* whereof we have this admirable anagram, viz. *Est vir qui adest*.

The Cabbalists among the Jews are professed anagrammatists; the third part of their art, which they call *themuru*, i. e. "changing," being nothing but the art of making anagrams, or finding hidden and mystical meanings in names; which they do by changing, transposing, and differently combining the letters of those names. Thus, of נח the letters of Noah's name, they make חן *grace;* of משיח *the Messiah*, they make ישמח *he shall rejoice*.

ANAGRAMMATIST, a maker or composer of anagrams. Thomas Billon, a Provençal, was a celebrated anagrammatist, and retained by Louis XIII. with a pension of 1200 livres, in quality of anagrammatist to the king.

ANAGROS, in *Commerce*, a measure for grain used in some cities in Spain, particularly at Seville; 46 anagros make about $10\frac{1}{4}$ quarters of London.

ANAGYRIS, STINKING BEAN-TREFOIL. See BOTANY *Index*.

ANAGYRIS, or ANAGYRUS, in *Ancient Geography*, the name of a place in Attica, of the tribe Erechtheis, where a fetid plant, called *Anagyris*, probably the same with the foregoing, grew in great plenty, (Dioscorides, Pliny, Stephanus); and the more it was handled, the stronger it smelled; hence *commovere anagyrin* or (*anagyrum*), is to bring a misfortune on one's self, (Aristophanes).

ANAK, the father of the Anakims, was the son of Arba, who gave his name to Kirjath-arba, or Hebron, (Josh. xiv. 15.). Anak had three sons, Sheshai, Ahiman, and Talmai, (chap. xv. 14. and Numb. xiii. 22.), who, as well as their father, were giants, and who, with their posterity, all terrible for their fierceness and extraordinary stature, were called the *Anakims;* in comparison of whom the Hebrews, who were sent to view the land of Canaan, reported that they were but as grasshoppers, Numb. xiii. *ult.* Caleb, assisted by the tribe of Judah, took Kirjath-arba, and destroyed the Anakims (Judges i. 20. and Josh. xv. 14.) in the year of the world 2559.

Anak || Analogy

ANALECTA, or ANALECTES, in antiquity, a servant whose employment it was to gather up the offals at tables.

ANALECTA, *Analects*, in a literary sense, is used to denote a collection of small pieces; as, essays, remarks, &c.

ANALEMMA, in *Geometry*, a projection of the sphere, on the plane of the meridian, orthographically made by a straight line and ellipses, the eye being supposed at an infinite distance, and in the east or west point of the horizon.

ANALEMMA, denotes likewise an instrument of brass or wood, upon which this kind of projection is drawn, with a horizon or cursor fitted to it, wherein the solstitial colure, and all circles parallel to it, will be concentric circles; all circles oblique to the eye will be ellipses; and all circles whose planes pass through the eye, will be right lines. The use of this instrument is to show the common astronomical problems: which it will do, though not very exactly, unless it be very large.

ANALEPSIS, the augmentation or nutrition of an emaciated body.

ANALEPTICS, restorative or nourishing medicines.

ANALOGY, in *Philosophy*, a certain relation and agreement between two or more things, which in other respects are entirely different.

There is likewise an analogy between things that have some conformity or resemblance to one another; for example, between animals and plants; but the analogy is still stronger between two different species of certain animals.

Analogy enters much into all our reasoning, and serves to explain and illustrate. A great part of our philosophy, indeed, has no other foundation than analogy.

It is natural to mankind to judge of things less known, by some similitude, real or imaginary, between them and things more familiar or better known. And where the things compared have really a great similitude in their nature, when there is reason to think that they are subject to the same laws, there may be a considerable degree of probability in conclusions drawn from analogy. Thus we may observe a very great similitude between this earth which we inhabit, and the other planets, Saturn, Jupiter, Mars, Venus, and Mercury. They all revolve round the sun, as the earth does, although at different distances, and in different periods. They borrow all their light from the sun, as the earth does. Several of them are known to revolve round their axis like the earth, and, by that means, must have a like succession of day and night. Some of them have moons, that serve to give them light in the absence of the sun, as our moon does to us. They are all, in their motions, subject to the same law of gravitation as the earth is. From all this similitude, it is not unreasonable to think, that those planets may, like our earth, be the habitation of various orders of living creatures. There is some probability in this conclusion from analogy.

But it ought to be observed, that, as this kind of reasoning

Analogy.

reasoning can afford only probable evidence at best; so, unless great caution be used, we are apt to be led into error by it. To give an instance of this: Anatomists, in ancient ages, seldom dissected human bodies; but very often the bodies of those quadrupeds whose internal structure was thought to approach nearest to that of the human body. Modern anatomists have discovered many mistakes the ancients were led into, by their conceiving a greater similitude between the structure of men and of some beasts than there is in reality.

Reid on the Intellectual Powers, Essay I. ch. iv. p. 52.

Perhaps no author has made a more just and a more happy use of this mode of reasoning, than Bishop Butler in his Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature. In that excellent work, the author does not ground any of the truths of religion upon analogy, as their proper evidence. He only makes use of analogy to answer objections against them. When objections are made against the truths of religion, which may be made with equal strength against what we know to be true in the course of nature, such objections can have no weight.

Analogical reasoning, therefore, may be of excellent use in answering objections against truths which have other evidence. It may likewise give a greater or a less degree of probability in cases where we can find no other evidence. But all arguments drawn from analogy are still the weaker, the greater disparity there is between the things compared; and therefore must be weakest of all when we compare body with mind, because there are no two things in nature more unlike.

There is no subject in which men have always been so prone to form their notions by analogies of this kind, as in what relates to the mind. We form an early acquaintance with material things by means of our senses, and are bred up in a constant familiarity with them. Hence we are apt to measure all things by them; and to ascribe to things most remote from matter the qualities that belong to material things. It is for this reason that mankind have, in all ages, been so prone to conceive the mind itself to be some subtle kind of matter; that they have been disposed to ascribe human figure and human organs not only to angels, but even to the Deity.

To illustrate more fully that analogical reasoning from a supposed similitude of mind to body, which appears to be the most fruitful source of error with regard to the operations of our minds, the following instance may be given. When a man is urged by contrary motives, those on one hand inciting him to do some action, those on the other to forbear it; he deliberates about it, and at last resolves to do it, or not to do it. The contrary motives are here compared to the weights in the opposite scales of a balance; and there is not perhaps any instance that can be named of a more striking analogy between body and mind. Hence the phrases of weighing motives, of deliberating upon actions, are common to all languages.

From this analogy, some philosophers draw very important conclusions. They say, that as the balance cannot incline to one side more than the other when the opposite weights are equal, so a man cannot possibly determine himself if the motives on both hands are equal; and as the balance must necessarily turn to that side which has most weight, so the man must necessarily be determined to that hand where the motive is strongest. And on this foundation some of the schoolmen maintained, that if a hungry ass were placed between two bundles of hay equally inviting, the beast must stand still and starve to death, being unable to turn to either, because there are equal motives to both. This is an instance of that analogical reasoning, which, it is conceived, ought never to be trusted; for the analogy between a balance and a man deliberating, though one of the strongest that can be found between matter and mind, is too weak to support any argument. A piece of dead inactive matter, and an active intelligent being, are things very unlike; and because the one would remain at rest in a certain case, it does not follow that the other would be inactive in a case somewhat similar. The argument is no better than this, that because a dead animal moves only as it is pushed, and if pushed with equal force in contrary directions, must remain at rest; therefore the same thing must happen to a living animal: for surely the similitude between a dead animal and a living is as great as that between a balance and a man.

Analogy.

The derivation of the word Analogy indicates, as Professor Castillon of Berlin * observes, a resemblance discernible by reason. This is confirmed by the sense in which the term is used in geometry, where it signifies an equality of ratios. In explaining this subject, it is observed, there may be a resemblance between sensations and a resemblance between perceptions: the former is called *physical resemblance*, because it acts upon the physical or sensitive faculty; the latter *moral resemblance*, because it affects the moral or rational faculty of man.

* *Haerlem Memoirs* for 1786, or vol. xxii.

Every resemblance may be reduced to an equality in sensations or perceptions; but this supposes some equality in their causes: we say *some equality*, because the disposition of the organs, or of the soul, must necessarily affect the sensations or perceptions; but this can influence only their degree, and not their nature.

The character of one person resembles that of another only when they both speak and act so as to excite equal perceptions, or, to speak more strictly, the same perception; when they both display vivacity or indifference, anger or meekness, on the same occasions, and both excite in the soul of the observer identical perceptions, or rather the same perception of vivacity or indifference, of anger or meekness. These identical perceptions, the degree of which will depend much on the disposition of the observer's mind, must have identical causes, or, in other words, the same cause; which is the vivacity or indifference, the anger or meekness, displayed by each of these characters.

Every physical resemblance may therefore be reduced to one or more equalities, and every moral resemblance to one or more identities. Wherever there is moral resemblance there is analogy. Analogy may therefore be reduced to identity, and always supposes comparison.

Two objects are said to have an analogy to each other, or are called *analogous*, when some identity is discovered upon comparing them. An *analogical conclusion* is a conclusion deduced from some identity.

The principles of analogy are a comparison of two objects; and one or more identities resulting from their being thus compared. The characters of analogy are —that two objects be compared—that there be one or more identities between these objects—and that this is discernible only by reason or intellect.

Analogy. Analysis.

Physical resemblance is to the senses what *analogy* is to the understanding. The former, when perfect, becomes equality; the latter, identity.

Resemblance and analogy are the foundations both of probability and of certainty. When we are not satisfied that the resemblance or the analogy is complete, we stop at probability; which becomes certainty when we are, or think we are, assured that the resemblance or the analogy is perfect.

In reasoning by analogy, we should be careful not to confound it with resemblance; and also not to deduce from the identity or identities, on which the analogy is founded, a conclusion which has either no relation, or only a partial relation, to these identities.

The principal uses of analogy in the investigation of physical and moral truth, according to our author, may be reduced to the four following: 1. By means of our senses to improve, first our own judgment, and afterwards that of others, with respect to intellectual subjects. 2. To deduce a general from a particular truth. Having discovered and proved the truth of a proposition with respect to any particular object, examine whether this truth flows from a quality peculiar to this single object, or common to several objects. In the latter case all these objects may be comprehended under one general idea, founded on their common quality. Substitute this general idea instead of the particular object, and the proposition will become general, without ceasing to be true; because whatever evidently and solely results from the identity on which an analogy is founded, must necessarily be true with respect to all those objects in which the analogy is the same. 3. To prove the truth or falsehood of propositions which cannot be otherwise demonstrated. 4. To discover new truths in both natural and moral philosophy.

ANALOGY, among grammarians, is the correspondence which a word or phrase bears to the genius and received forms of any language.

ANALYSIS, in a general sense, implies the resolution of something compounded into its original and constituent parts. The word is Greek, and derived from αναλυω, "to resolve."

ANALYSIS, in *Mathematics*, is properly the method of resolving problems by means of algebraical equations; whence we often find that these two words, *analysis* and *algebra*, are used as synonymous.

Analysis, under its present improvements, must be allowed the apex or height of all human learning: it is this method which furnishes us with the most perfect examples of the art of reasoning; gives the mind an uncommon readiness at deducing and discovering, from a few data, things unknown; and, by using signs for ideas, present things to the imagination, which otherwise seemed out of its sphere: by this, geometrical demonstrations may be greatly abridged, and a long series of argumentations, wherein the mind cannot without the utmost effort and attention discover the connection of ideas, are hereby converted into sensible signs, and the several operations required therein effected by the combination of these signs. But, what is more extraordinary, by means of this art, a number of truths are frequently expressed by a single line, which in the common way of explaining and demonstrating things would fill whole volumes. Thus, by mere contemplation of one single line, whole sciences may be sometimes learned in a few minutes time, which otherwise could scarcely be attained in many years. Analysis.

ANALYSIS is divided, with regard to its object, into that of *finites* and *infinites*.

ANALYSIS of Finite Quantities, is what we otherwise call specious arithmetic or algebra. See ALGEBRA.

ANALYSIS of Infinites, called also the *New Analysis*, is particularly used for the method of fluxions, or the differential calculus. See FLUXIONS.

ANALYSIS, in *Logic*, signifies the method of tracing things backward to their source, and of resolving knowledge into its original principles. This is also called the method of *resolution*; and stands opposed to the synthetic method, or that of *composition*. The art of logical analysis consists principally in combining our perceptions, classing them together with address, and contriving proper expressions for conveying our thoughts, and representing their several divisions, classes, and relations.

ANALYSIS, in *Rhetoric*, is that which examines the connexions, tropes, figures, and the like, inquiring into the proposition, division, passions, arguments, and other apparatus of rhetoric.

Several authors, as Freigius and others, have given analyses of Cicero's Orations, wherein they reduce them to their grammatical and logical principles; strip them of all the ornaments and additions of rhetoric which otherwise disguise their true form, and conceal the connexion between one part and another. The design of these authors is to have those admired harangues just such as the judgment disposed them, without the help of imagination: so that here we may coolly view the force of each proof, and admire the use Cicero made of rhetorical figures to conceal the weak part of a cause.

A collection has been made of the analyses formed by the most celebrated authors of the 16th century, in 3 vols. folio.

ANALYSIS is also used, in *Chemistry*, for the decomposition of a mixed body, or the separation of the principles and constituent parts of a compounded substance.

To analyze bodies, or resolve them into their component parts, is indeed the chief object of the art of chemistry. Chemistry furnishes several means for the decomposition of bodies, which are founded on the difference of the properties belonging to the different principles of which the body to be analyzed is composed. If, for example, a body be composed of several principles, some of which have a great and others a moderate degree of volatility, and, lastly, others are fixed, its most volatile parts may be first separated by a gradual heat in distilling vessels; and then the parts which are next in volatility will pass over in distillation; and, lastly, those parts which are fixed, and capable of resisting the action of fire, will remain at the bottom of the vessel.

ANALYSIS is also used for a kind of syllabus, or table of the principal heads or articles of a continued discourse, disposed in their natural order and dependency. Analyses are more scientifical than alphabetical indexes; but they are less used, as being more intricate.

ANALYSIS is likewise used for a brief, but methodical, illustration of the principles of a science; in which

sense

Analysis || Anamaboa.

sense it is nearly synonymous with what we otherwise call a *synopsis*.

ANALYTIC, or ANALYTICAL, something that belongs to, or partakes of, the nature of analysis.—Thus we say, an analytical demonstration, analytical process, analytical table or scheme, analytical method of investigation, &c.

The analytic method stands opposed to the synthetic. In natural philosophy, as in mathematics, the investigation of difficult things by the analytic method ought to precede the method of composition. This analysis consists in making experiments and observations, and in drawing general conclusions therefrom by induction; and admitting of no objections against the conclusions, but such as are drawn from experiments, and other certain truths: and though the reasoning from experiments and observations by induction be no demonstration of general conclusions, yet it is the best method of reasoning which the nature of things admits of; and may be esteemed so much the stronger, as the induction is more general; and, if no exception occur from phenomena, the conclusion may be pronounced general. By this way of analysis, we may proceed from compounds to their ingredients; from motions to the forces producing them; and in general from effects to their causes, and from particular causes to more general ones, until we arrive at those which are the most general. This is the analytic method, according to the illustrious Newton.

The synthetic method consists in assuming the causes discovered and received as principles: and by them explaining the phenomena proceeding from them, and proving the explanation. See SYNTHESIS.

ANALYTICS, (*Analytica*), the science and use of analysis. The great advantage of the modern mathematics above the ancient is in point of analytics.

Pappus, in the preface to his seventh book of Mathematical Collections, enumerates the authors on the ancient analytics; being Euclid, in his *Data* and *Porismata*; Apollonius, *de Sectione Rationis*, and in his *Conics*; Aristæus, *de Locis Solidis*; and Eratosthenes, *de Mediis Proportionalibus*. But the ancient analytics were very different from the modern.

To the modern analytics principally belongs algebra; an historical account of which, with the several authors thereon, see under the article ALGEBRA.

ANAMABOA, a populous town in the kingdom of Fantin, in Guinea. The natives are generally great cheats, and must be carefully looked after in dealing with them, and their gold well examined, for it is commonly adulterated. It lies under the cannon of the English castle. The landing is pretty difficult on account of the rocks: and therefore those that come here to trade are forced to go ashore in canoes. The earth here is very proper to make bricks: the oysters, when burnt, afford good lime; and there is timber in great abundance; so that here are all the materials for building. The country at Anamaboa is full of hills, beginning at a good distance from the town, and affording a very pleasant prospect. Indian corn and palm-wine are in great plenty. They have a green fruit called *papas*, as big as a small melon, and which has a taste like cauliflower. Anamaboa is much frequented by the English ships and others for corn and slaves, which last are sometimes to be had in great numbers. The English fort is built on the foundation of a large old house, which subsisted entire in 1679. It is a large edifice, flanked by two towers, and fortified towards the sea with two bastions: the whole of brick and stone cemented with lime. It stands upon a rock at the distance of 30 paces from the sea. It is mounted with 12 pieces of cannon and 12 patereroes; and defended by a garrison of 12 whites and 18 blacks, under the command of the chief factor. Anamaboa || Anapæstic.

The natives treat the garrison of this fort with great insolence, insomuch as often to block them up, and frequently, if they dislike the governor, send him off in a canoe to Cape Coast with marks of the utmost contempt. Far from being able to oppose them, the English are glad to obtain their favour with presents. In 1701, they declared war against the English; and having assembled in a tumultuous manner before the fort, they set fire to the exterior buildings, and went on with their outrages, till they were dispersed by a discharge of the cannon from the batteries. The night following the English took their revenge, by setting fire to the town of Anamaboa: and thus hostilities continued for 20 days, till at last the natives were obliged to sue for peace. This fort was abandoned in 1733; but has been resumed by the English, who have continued in it ever since.

ANAMELECH, an idol of the Sepharvaites, who are said in Scripture to have burned their children in honour of Adrammelech and Anamelech.—These idols probably signified the sun and moon. Some of the rabbins represent Anamelech under the figure of a mule, others under that of a quail or pheasant.

ANAMIM, the second son of Mizraim (Gen. x. 14.) Anamim, if we may credit the paraphrast Jonathan the son of Uzziel, peopled the Mareotis; or the Pentapolis of Cyrene, according to the paraphrast of Jerusalem. Bocchart is of opinion, that these Anamims were the people that dwelt in the parts adjacent to the temple of Jupiter Ammon, and in the Nasamonitis. Calmet thinks the Amanians and Garamantes to be descended from Anamim.

ANAMORPHOSIS, in perspective drawings, is a deformed or distorted portrait or figure, generally confused and unintelligible to the common unassisted view; but when seen at a certain distance and height, or as reflected from a plain or curved mirror, will appear regular and in right proportion. See OPTICS (the *Index*), and PERSPECTIVE.

ANANAS, in *Botany*, the trivial name of a species of bromelia. See BROMELIA, BOTANY *Index*.

ANANCITIS, in antiquity, a kind of figured stone, otherwise called *synochitis*, celebrated for its magical virtue of raising the shadows of the infernal gods.

ANANIAS, a Saducee, high-priest of the Jews, who put to death St James the brother of our Lord, and was deposed by Agrippa.

ANANISABTA, or ANANISAPTA, a magical word frequently found inscribed on coins and other amulets, supposed to have a virtue of preserving the wearer from the plague.

ANAPÆST, in ancient poetry, a foot consisting of two short syllables and one long: Such is the word scŏpŭlōs. It is just the reverse of the dactyl.

ANAPÆSTIC VERSES, those consisting wholly or chiefly of anapæsts.

Anaphe || Anas.

ANAPHE, in *Ancient Geography*, an island spontaneously emerging out of the Cretan sea, near Thera (Pliny, Strabo); now called *Nansio*. Its name is from the sudden appearance of the new moon to the Argonauts in a storm (Apollonius). *Anaphæus*, an epithet of Apollo, who was worshipped there. *Anaphæi*, the people.

ANAPHORA, in *Rhetoric*, the repetition of the same word or words in the beginning of a sentence or verse: Thus Virgil,

Pan etiam Arcadia mecum se judice certet,
Pan etiam Arcadia dicat se judice victum.

ANAPHORA, among physicians, the throwing off purulent matter by the mouth.

ANAPHRODISIA, signifies impotence, or want of power to procreate. See IMPOTENCE.

ANAPLASIS, signifies the replacing or setting a fractured bone.

ANAPLORETICS, medicines that promote the growth or granulation of the flesh in wounds, ulcers, &c.

ANARCHI, (Ανάρχοι), in antiquity, a name given by the Athenians to four supernumerary days in their year, during which they had no magistrates. The Attic year was divided into 10 parts, according to the number of tribes, to whom the presidency of the senate fell by turns. Each division consisted of 35 days; what remained after the expiration of these, to make the lunar year complete, which according to their computation consisted of 354 days, were employed in the creation of magistrates, and called ανάρχοι ἡμέραι, and ἀρχαιρέσιοι.

ANARCHY, the want of government in a nation, where no supreme authority is lodged either in the prince or other rulers; but the people live at large, and all things are in confusion. The word is derived from the Greek privative α and ἀρχη, *command, principality*. Anarchy is supposed to have reigned after the deluge, before the foundation of monarchies. We still find it to obtain in several parts, particularly of Africa and America.

ANARCHY is also applied to certain troublesome and disorderly periods, even in governments otherwise regular. In England, the period between the death of Cromwell and King Charles's restoration is commonly represented as an *anarchy*. Every month produced a new scheme or form of government. Enthusiasts talked of nothing but annulling all the laws, abolishing all writings, records, and registers, and bringing all men to the primitive level. No modern nation was more subject to anarchies than Poland; where every interval between the death of one king and the election of another was a scene of great disorder, so that it was a proverb among that people, *Poland is governed by confusion*. The Jewish history presents numerous instances of anarchies in that state, usually denoted by this phrase, that *in those days there was no king in Israel, but every man did that which was right in his own eyes;* which is a just picture of an *anarchy*.

ANARRHICAS. See ICHTHYOLOGY *Index*.

ANARROPIA, among physicians, a tendency of the humours to the head or superior parts.

ANAS, in *Ancient Geography*, a river of Spain rising in the territory of Laminium in the Hither Spain, and now spreading into lakes, again restraining its waters, or, burrowing itself entirely in the earth, is pleased often to reappear. It pours into the Atlantic (Pliny). Now *Guadiana*, rising in the south-east of New Castile, in a district commonly called Campo de Montiel, not far from the mountain Consuegra, from the lakes called *las Lagunas de Guadiana*, and then it is called *Rio Roydera;* and, after a course of six leagues, burying itself in the earth for a league, it then rises up again from three lakes, called *los Ojos de Guadiana*, near the village Villa Harta, five leagues to the north of Calatrava, and directs its course westward through New Castile, by Medelin, Merida, and Badajoz, where it begins to bend its course southwards, between Portugal and Andalusia, falling into the bay of Cadiz near Ayamonte.

Ana || Anastasiu

ANAS. See ORNITHOLOGY *Index*.

ANASARCA, a species of dropsy. See MEDICINE *Index*.

ANASSER. See BOTANY *Index*.

ANASSUS, or ANAXUS, in *Ancient Geography*, a river in the territory of Venice, (Pliny); now the *Piave*, which rising from the mountains of Tyrol, not far from the borders of Carinthia, runs from north to south, through the territories of Cadorina, Belluno, Feltre, and, after running from west to east, through Trevigi, falls into the Adriatic, 13 miles to the south-east of Venice.

ANASTATICA. See BOTANY *Index*.

ANASTASIS, a term among ancient physicians, for a rising up to go to stool. It also signifies the passage of any humour, when expelled from one part, and obliged to remove to another.

ANASTASIUS I. emperor of the east, succeeded Zeno in the year 491, and was inaugurated that same year on April the 11th. The Manicheans and Arians were greatly in hopes of being supported by the new emperor; the former because his mother was their friend, and favoured their sect; the latter because the emperor's uncle was of their opinion: but if Anastasius did not persecute them (as we do not find he ever did), yet it does not appear that he supported either of these sects. But in order to maintain the peace of the church, upon which the tranquillity of the state very much depends, he declared, that such bishops or other clergymen who should disturb the public tranquillity, by maintaining with too much heat either side of the question for or against the council of Chalcedon, should be deprived of their benefices. Accordingly the disputes concerning Eutychianism running to a very great height, and Euphemius being deeply concerned in them, the emperor expelled him from his see, and chose Macedonius in his stead. The hatred which the different parties entertained against one another occasioned often such tumults and seditions at Constantinople as threatened the life of the emperor himself; who, to keep the people in awe, ordered that the governor of the city should be present at all church assemblies and public processions. This was so much the more necessary, because these tumults were chiefly occasioned by a kind of doxology or short hymn which used to be sung at divine service. This doxology consisted only of the following words, αγιος ὁ Θεος, αγιος ἰσχυρος, αγιος αθανατος, that is, "Holy God, holy the powerful, holy the immortal;" for which reason it was called

Anastasius. called τρισαγιος, *Trisagius*, "three times holy;" because the word *holy* was therein three times repeated. The orthodox used to sing that hymn without any addition, or by adding only to it, αγια τριας, ελεησον ἡμας, i. e. "Holy Trinity, have mercy upon us:" But Peter the Fuller, bishop of Antioch, pretended to add these words to it, viz. ὁ σαυρωθεις δι ἡμας, i. e. "who hast been crucified for us;" and as it was supposed that the first holy related to the Father, the second to the Son, the third to the Holy Ghost, the adding these words, *who hast been crucified for us*, seemed to insinuate that the whole consubstantial Trinity had suffered; for which reason the orthodox were resolved not to admit this addition. Anastasius desiring to have these fatal words added to that hymn whenever it should be sung at Constantinople, this occasioned a terrible sedition in the city, as though the very fundamentals of Christianity had been overthrown. Macedonius and his clergy are said to have raised that sedition, which came to such a height, that the emperor himself was obliged to come, without his crown on his head, and in a very humble manner, to the circus, where he declared to the people that he was very willing to quit the imperial throne; but he told them at the same time, that they could not all enjoy the sovereign power, which does not admit of a partnership: and that one person still must govern them if he resigned the crown. This discourse had such a power over the raging multitude, that, as if they had been divinely inspired, they immediately requested the emperor to take up his crown, promising that they would be quiet and obedient for the future. Anastasius is by the Popish writers represented as a great persecutor of the orthodox, because he banished and deprived Euphemius and Macedonius; but they should prove that these two prelates had been unjustly banished, which is a very hard task. As to his civil government, it is confessed that at the beginning of his reign he showed himself a very good prince: he eased the people of a very heavy tax called *Chrysargyrum*, under which they had groaned for a long time; he prohibited the fighting with wild beasts; he raised several buildings; and avoided being involved in dangerous wars as much as lay in his power. Anastasius reigned 27 years three months and three days, or, according to F. Pagi, wanting three days; and died July the 10th, A. C. 518, in the 88th year of his age.

Anastasius II. whose proper name was *Artemius*, was in the year 713 elevated to the throne of Constantinople, from the low station of a secretary, by the free voice of the senate and Roman people. His natural talents, improved by education and daily exertion, enabled him to manage with great prudence the affairs of the empire during the time that he was secretary to his predecessor Philippicus. The Saracens had made inroads upon Asia Minor, in the beginning of his reign; but he sent a strong army to the frontiers of Syria for its protection, under the command of Leo the Isaurian, a man of great military experience. These enemies of the empire also meditated the design of taking Constantinople; but the vigilance of Anastasius defeated their purpose, by providing a formidable naval force, repairing and strengthening the walls of the city, and by forcing all the inhabitants either to provide themselves with provisions for three years, or instantly to depart from the city. Disappointed in their design, the enemy's fleet sailed to Phœnicia, and the imperial fleet assembled at Rhodes to watch the motions of the enemy. But the measures of the emperor received a severe check from the conduct of the sailors, who raised a mutiny, and slew their admiral for no other cause but his honourable endeavours to maintain proper discipline in the fleet. Justly dreading severe punishment, the seamen raised the standard of rebellion, declared Anastasius unworthy to reign, and conferred the purple upon one Theodosius, a person of mean birth. Anastasius ‖ Anathema.

Informed of this sedition, Anastasius fled from his tottering throne to Nice. The new emperor hastened to besiege Constantinople, which, after a feeble defence of six months, he reduced to his subjection. The late emperor being assured of his life, abandoned his claim to the crown, assumed the character of a monk, and was banished to Thessalonica, having worn the purple only during the space of two years. Having, however, prevailed upon the Bulgarians to espouse his cause, he laid aside the habit of the monk for that of the warrior, and, in the year 719, in the time of the emperor Leo, he resumed his claim to the throne. A numerous army of these barbarians hastened to the capital; but, being unable to reduce it, they delivered up the unhappy Anastasius to the emperor, who put him to death along with his principal associates. (*Anc. Un. Hist.*).

Anastasius, surnamed *Bibliothecarius*, a Roman abbot, library-keeper of the Vatican, and one of the most learned men of the ninth century, assisted in 869 at the fourth general council, the acts and canons of which he translated from the Greek into Latin. He also composed the lives of several popes, and other works; the best edition of which is that of the Vatican.

ANASTATICA, the ROSE of JERICHO. See BOTANY *Index*.

ANASTOMOSIS, in *Anatomy*, the opening of the mouths of vessels, in order to discharge their contained fluids. It is likewise used for the communication of two vessels at their extremities; as the inosculation of a vein with a vein, of an artery with an artery, or of an artery with a vein.

ANASTOMATICS, medicines supposed to have the power of opening the mouths of the vessels, and promoting the circulation; such as deobstruent, cathartic, and sudorific medicines.

ANASTROPHE, in *Rhetoric* and *Grammar*, denote the inversion of the natural order of the words: such is, *saxa per et scopulos*, for *per saxa et scopulos*.

ANASUS, or Anisus, in *Ancient Geography*, now the *Ens*, a river of Germany, which rises on the borders of the territory of Saltzburg; then separating Upper Stiria from Upper Austria, and washing the town of Ens, falls, at the distance of a mile below it, into the Danube, in a course from south to north.

ANATHEMA, among ecclesiastical writers, imports whatever is set apart, separated, or divided; but is most usually meant to express the cutting off a person from the privileges of society and communion with the faithful.

The anathema differs from excommunication in the circumstances of being attended with curses and execrations. It was practised in the primitive church against notorious offenders; and the form of that pronounced

Anathema. nounced by Synecius against one Andronicus is as follows: "Let no church of God be open to Andronicus, but let every sanctuary be shut against him. I admonish both private men and magistrates to receive him neither under their roof nor to their table; and priests more especially, that they neither converse with him living, nor attend his funeral when dead."

Several councils also have pronounced anathemas against such as they thought corrupted the purity of the faith; and their decisions have been conceived in the following form: *Si quis dixerit, &c. anathema sit.*

There are two kinds of anathemas, the one judiciary and the other abjuratory. The former can only be denounced by a council, a pope, or a bishop; the latter makes a part of the ceremony of abjuration, the convert being obliged to anathematize the heresy he abjures.

ANATHEMA, in heathen antiquity, was an offering or present made to some deity, and hung up in the temple. Whenever a person left off his employment, it was usual to dedicate the tools to the patron deity of the trade. Persons too who had escaped from imminent danger, as shipwreck and the like, or had met with any other remarkable instance of good fortune, seldom failed to testify their gratitude by some present of this kind. Anathem

ANATHOTH, a hamlet of Palestine, very near Jerusalem (Josephus), about three miles and a half to the north; the ruins of which are still to be seen. It was the birthplace of the prophet Jeremiah, and one of the Levitical towns in the tribe of Benjamin. Anatolia

ANATIFERA CONCHA, the trivial name of a species of lepas. See LEPAS, CONCHOLOGY *Index.*

ANATOCISM, ANATOCISMUS, an usurious contract, wherein the interests arising from the principal sum are added to the principal itself, and interest exacted upon the whole. The word is originally Greek, but used by Cicero in Latin; whence it has descended into most other languages. It comes from the preposition *ανα*, which in composition signifies *repetition* or *duplication*, and *τοκος*, *usury*. Anatocism is what we properly call *interest upon interest*, or *compound interest*. This is the worst kind of usury, and has been severely condemned by the Roman law, as well as by the common laws of most other countries. See INTEREST.

ANATOLIA. See NATOLIA.

ANATOMY,

History. IN its most general sense, is the art of dissecting, or artificially separating and taking to pieces the different parts of organized bodies, in order to an exact discovery of their situation, structure, and economy; but here we limit its signification to animal bodies. The word is Greek, *ανατομη*; derived from *ανατεμνω*, to dissect, or separate by cutting.

INTRODUCTION.

§ 1. *History of Anatomy.*

THIS art seems to have been very ancient; though, for a long time, known only in an imperfect manner. —The first men who lived must have soon acquired some notion of the structure of their own bodies, particularly of the external parts, and of some even of the internal, such as bones, joints, and sinews, which are exposed to the examination of the senses in living bodies.

This rude knowledge must have been gradually improved, by the accidents to which the body is exposed, by the necessities of life, and by the various customs, ceremonies, and superstitions, of different nations. Thus, the observance of bodies killed by violence, attention to wounded men, and to many diseases, the various ways of putting criminals to death, the funeral ceremonies, and a variety of such things, must have shown men every day more and more of themselves; especially as curiosity and self-love would here urge them powerfully to observation and reflection.

The brute creation having such an affinity to man in outward form, motion, senses, and ways of life; the generation of the species, and the effect of death upon the body, being observed to be so nearly the same in both; the conclusion was not only obvious, but unavoidable, that their bodies were formed nearly upon the same model. And the opportunities of examining the bodies of brutes were so easily procured, indeed so necessarily occurred in the common business of life, that the huntsman in making use of his prey, the priest in sacrificing, the augur in divination, and above all, the butcher, or those who might out of curiosity attend upon his operations, must have been daily adding to the little stock of anatomical knowledge. Accordingly we find, in fact, that the South sea islanders, who have been left to their own observation and reasoning, without the assistance of letters, have yet a considerable share of rude or wild anatomical and physiological knowledge. Dr Hunter informs us, that when Omai was in his museum with Mr Banks, though he could not explain himself intelligibly, they plainly saw that he knew the principal parts of the body, and something likewise of their uses; and manifested a great curiosity or desire of having the functions of the internal parts of the body explained to him; particularly the relative functions of the two sexes, which with him seemed to be the most interesting object of the human mind. Histor

We may further imagine, that the philosophers of the most early ages, that is, the men of curiosity, observation, experience, and reflection, could not overlook an instance of natural organization, which was so interesting, and at the same time so wonderful, more especially such of them as applied to the study and cure of diseases. We know that physic was a branch of philosophy till the age of Hippocrates.

Thus the art must have been circumstanced in its beginning. We shall next see from the testimony of historians

History. historians and other writers, how it actually appeared as an art, from the time that writing was introduced among men; how it was improved, and conveyed down to us through a long series of ages.

Civilization, and improvements of every kind, would naturally begin in fertile countries and healthful climates, where there would be leisure for reflection, and an appetite for amusement. Accordingly, writing, and many other useful and ornamental inventions and arts, appear to have been cultivated in the eastern parts of Asia long before the earliest times that are treated of by the Greek or other European writers; and that the arts and learning of those eastern people were in subsequent times gradually communicated to adjacent countries, especially by the medium of traffic. The customs, superstitions, and climate of eastern countries, however, appear to have been as unfavourable to practical anatomy as they were inviting to the study of astronomy, geometry, poetry, and all the softer arts of peace.

Animal bodies there run so quickly into nauseous putrefaction, that the earliest inhabitants must have avoided such offensive employments as anatomical inquiries, like their posterity at this day. And in fact it does not appear, by the writings of the Grecians, or Jews, or Phœnicians, or of other eastern countries, that anatomy was particularly cultivated by any of those eastern nations. In tracing it backwards to its infancy, we cannot go farther into antiquity than the times of the Grecian philosophers. As an art in the state of some cultivation, it may be said to have been brought forth and bred up among them as a branch of natural knowledge.

The era of philosophy, as it was called, began with Thales the Milesian being declared, by a very general consent of the people, the most wise of all the Grecians, 480 years before Christ. The philosophers of his school, which was called the Ionian, cultivated principally natural knowledge. Socrates, the seventh in succession of their great teachers, introduced the study of morals, and was thence said to bring down philosophy from heaven, to make men truly wise and happy.

In the writings of his scholar and successor Plato, we see that the philosophers had carefully considered the human body, both in its organization and functions; and though they had not arrived at the knowledge of the more minute and intricate parts, which required the successive labour and attention of many ages, they had made up very noble and comprehensive ideas of the subject in general. The anatomical descriptions of Xenophon and Plato have had the honour of being quoted by Longinus (§ xxxii.) as specimens of sublime writing; and the extract from Plato is still more remarkable for its containing the rudiments of the circulation of the blood. "The heart (says Plato) is the centre or knot of the blood-vessels, the spring or fountain of the blood, which is carried impetuously round; the blood is the *pabulum* or food of the flesh; and for the purpose of nourishment, the body is laid out into canals, like those which are drawn through gardens, that the blood may be conveyed, as from a fountain, to every part of the pervious body."

Hippocrates was nearly contemporary with the great philosophers of whom we have been speaking, about 400 years before the Christian era. He is said to have separated the profession of philosophy and physic, and to have been the first who applied to physic alone as the business of his life. He is likewise generally supposed to be the first who wrote upon anatomy. We know of nothing that was written expressly upon the subject before; and the first anatomical dissection which has been recorded was made by his friend Democritus of Abdera. History.

If, however, we read the works of Hippocrates with impartiality, and apply his accounts of the parts to what we know of the human body, we must allow his descriptions to be imperfect, incorrect, sometimes extravagant, and often unintelligible, that of the bones only excepted. He seems to have studied these with more success than the other parts, and tells us that he had an opportunity of seeing a human skeleton.

From Hippocrates to Galen, who flourished towards the end of the second century, in the decline of the Roman empire, that is, in the space of 600 years, anatomy was greatly improved; the philosophers still considering it as a most curious and interesting branch of natural knowledge, and the physicians as a principal foundation of their art. Both of them, in that interval of time, contributed daily to the common stock, by more accurate and extended observations, and by the lights of improving philosophy.

As these two great men had applied very particularly to the study of animal bodies, they not only made great improvements, especially in physiology, but raised the credit of natural knowledge, and spread it as wide as Alexander's empire.

Few of Aristotle's writings were made public in his lifetime. He affected to say that they would be unintelligible to those who had not heard them explained at his lectures; and, except the use which Theophrastus made of them, they were lost to the public for above 130 years after the death of Theophrastus; and at last came out defective from bad preservation, and corrupted by men, who, without proper qualifications, presumed to correct and to supply what was lost.

From the time of Theophrastus, the study of natural knowledge at Athens was for ever on the decline; and the reputation of the Lycæum and Academy was almost confined to the studies which are subservient to oratory and public speaking.

The other great institution for Grecian education was at Alexandria in Egypt. The first Ptolemies, both from their love of literature, and to give true and permanent dignity to their empire, and to Alexander's favourite city, set up a grand school in the palace itself, with a museum and a library, which, we may say, has been the most famed in the world. Anatomy among other sciences, was publicly taught; and the two distinguished anatomists were Erasistratus the pupil and friend of Theophrastus, and Herophilus. Their voluminous works are all lost; but they are quoted by Galen almost in every page. These professors were probably the first who were authorized to dissect human bodies; a peculiarity which marks strongly the philosophical magnanimity of the first Ptolemy, and fixes a great era in the history of anatomy. And it was, no doubt, from this particular advantage which the Alexandrians had above all others, that their school not only gained, but for many centuries preserved, the first reputation.

History. ation for medical education. Ammianus Marcellinus, who lived about 650 years after the schools were set up, says, they were so famous in his time, that it was enough to secure credit to any physician if he could say he had studied at Alexandria.

Herophilus has been said to have anatomized 700 bodies. We must allow for exaggeration. Nay, it was said, that both he and Erasistratus made it a common practice to open living bodies, that they might discover the more secret springs of life. But this, no doubt, was only a vulgar opinion, arising from the prejudices of mankind; and accordingly, without any good reason, such tales have been told of modern anatomists, and have been believed by the vulgar.

Among the Romans, though it is probable they had physicians and surgeons from the foundation of the city, yet we have no account of any of these applying themselves to anatomy for a very long time. Archagathus was the first Greek physician established in Rome, and he was banished the city on account of the severity of his operations.—Asclepiades, who flourished in Rome 101 years after Archagathus, in the time of Pompey, attained such a high reputation as to be ranked in the same class with Hippocrates. He seemed to have some notion of the air in respiration acting by its weight; and in accounting for digestion, he supposed the food to be no farther changed than by a comminution into extremely small parts, which being distributed to the several parts of the body, is assimilated to the nature of each. One Cassius, commonly thought to be a disciple of Asclepiades, accounted for the right side of the body becoming paralytic on hurting the left side of the brain in the same manner as has been done by the moderns, viz. from the crossing of the nerves from the right to the left side of the brain.

From the time of Asclepiades to the second century, physicians seem to have been greatly encouraged at Rome; and in the writings of Celsus, Rufus, Pliny, Cœlius Aurelianus, and Aræteus, we find several anatomical observations, but mostly very superficial and inaccurate. Towards the end of the second century lived Claudius Galenus Pergamus, whose name is so well known in the medical world. He applied himself particularly to the study of anatomy, and did more in that way than all that went before him. He seems, however, to have been at a great loss for human subjects to operate upon; and therefore his descriptions of the parts are mostly taken from brute animals. His works contain the fullest history of anatomists, and the most complete system of the science, to be met with any where before him, or for several centuries after; so that a number of passages in them were reckoned absolutely unintelligible for many ages, until explained by the discoveries of succeeding anatomists.

About the end of the fourth century, Nimesius bishop of Emissa wrote a treatise on the nature of man, in which it is said were contained two celebrated modern discoveries; the one, the uses of the bile, boasted of by Sylvius de la Boe; and the other, the circulation of the blood. This last, however, is proved by Dr Freind, in his History of Physic, p. 229. to be falsely ascribed to this author.

The Roman empire beginning now to be oppressed by the barbarians, and sunk in gross superstition, learning of all kinds decreased; and when the empire was totally overwhelmed by those barbarous nations, every appearance of science was almost extinguished in Europe. History

The only remains of it were among the Arabians in Spain and in Asia.—The Saracens, who came into Spain, destroyed at first all the Greek books which the Vandals had spared; but though the government was in a constant struggle and fluctuation during 800 years before they were driven out, they received a taste for learning from their countrymen of the east; several of their princes encouraged liberal studies; public schools were set up at Cordova, Toledo, and other towns, and translations of the Greeks into the Arabic were universally in the hands of their teachers.

Thus was the learning of the Grecians transferred to the Arabians. But though they had so good a foundation to build upon, this art was never improved while they were masters of the world: for they were satisfied with commenting upon Galen, and seem to have made no dissection of human bodies.

Abdollatiph, who was himself a teacher of anatomy, a man eminent in his time (at and about 1202) for his learning and curiosity; a great traveller, who had been bred at Bagdad, and had seen many of the great cities and principal places for study in the Saracen empire; who had a favourable opinion of original observation, in opposition to book learning; who boldly corrected some of Galen's errors, and was persuaded that many more might be detected: this man, we say, never made or saw, or seemed to think of a human dissection. He discovered Galen's errors in the osteology, by going to burying grounds, with his students and others, where he examined and demonstrated the bones; he earnestly recommended that method of study, in preference even to the reading of Galen, and thought that many farther improvements might be made; yet he seemed not to have an idea that a fresh subject might be dissected with that view.

Perhaps the Jewish tenets which the Mahometans adopted about uncleanness and pollution, might prevent their handling dead bodies; or their opinion of what was supposed to pass between an angel and the dead person, might make them think disturbing the dead highly sacrilegious. Such, however, as Arabian learning was, for many ages together there was hardly any other in all the western countries of Europe. It was introduced by the establishment of the Saracens in Spain in 711, and kept its ground till the restoration of learning in the end of the 15th century. The state of anatomy in Europe, in the times of Arabian influence, may be seen by reading a very short system of anatomy drawn up by Mundinus, in the year 1315. It was principally extracted from what the Arabians had preserved of Galen's doctrine; and, rude as it is, in that age it was judged to be so masterly a performance, that it was ordered by a public decree, that it should be read in all the schools of Italy; and it actually continued to be almost the only book which was read upon the subject for above 200 years. Cortesius gives him the credit of being the great restorer of anatomy, and the first who dissected human bodies among the moderns.

A general prejudice against dissection, however, prevailed till the 16th century. The emperor Charles V. ordered a consultation to be held by the divines of Salamanca, in order to determine whether or not it was lawful

History. lawful in point of conscience to dissect a dead body. In Muscovy, till very lately, both anatomy and the use of skeletons were forbidden; the first as inhuman, and the latter as subservient to witchcraft.

In the beginning of the 15th century, learning revived considerably in Europe, and particularly physic, by means of copies of the Greek authors brought from the sack of Constantinople; after which the number of anatomists and anatomical books increased to a prodigious degree. The Europeans becoming thus possessed of the ancient Greek fathers of medicine, were for a long time so much occupied in correcting the copies they could obtain, studying the meaning, and commenting upon them, that they attempted nothing of their own, especially in anatomy.

And here the late Dr Hunter introduces into the annals of this art, a genius of the first rate, Leonardo da Vinci, who had been formerly overlooked, because he was of another profession, and because he published nothing upon the subject. He is considered by the doctor as by far the best anatomist and physiologist of his time: and was certainly the first man we know of who introduced the practice of making anatomical drawings.

Vassare, in his Lives of the Painters, speaks of Leonardo thus, after telling us that he had composed a book of the anatomy of a horse, for his own study: "He afterwards applied himself with more diligence to the human anatomy; in which study he reciprocally received and communicated assistance to Marc. Antonio della Torre, an excellent philosopher, who then read lectures in Pavia, and wrote upon this subject; and who was the first, as I have heard, who began to illustrate medicine from the doctrine of Galen, and to give true light to anatomy, which till that time had been involved in clouds of darkness and ignorance. In this he availed himself exceedingly of the genius and labour of Leonardo, who made a book of studies, drawn with red chalk, and touched with a pen, with great diligence, of such objects as he had himself dissected; where he made all the bones, and to those he joined, in their order, all the nerves, and covered them with the muscles. And concerning those, from part to part, he wrote remarks in letters of an ugly form, which are written by the left hand, backwards, and not to be understood but by those who know the method of reading them; for they are not to be read without a looking-glass. Of these papers of the human anatomy, there is a great part in the possession of M. Francesco da Melzo, a Milanese gentleman, who, in the time of Leonardo, was a most beautiful boy, and much beloved by him, as he is now a beautiful and genteel old man, who reads those writings, and carefully preserves them, as precious relics, together with the portrait of Leonardo of happy memory. It appears impossible that that divine spirit should reason so well upon the arteries, and muscles, and nerves, and veins; and with such diligence of every thing," &c. &c.

Those very drawings and the writings are happily found to be preserved in his majesty's great collection of original drawings, where the doctor was permitted to examine them; and his sentiments upon the occasion he thus expresses: "I expected to see little more than such designs in anatomy as might be useful to a painter in his own profession; but I saw, and indeed with astonishment, that Leonardo had been a general and a deep student. When I consider what pains he has taken upon every part of the body, the superiority of his universal genius, his particular excellence in mechanics and hydraulics, and the attention with which such a man would examine and see objects which he was to draw, I am fully persuaded that Leonardo was the best anatomist at that time in the world. We must give the 15th century the credit of Leonardo's anatomical studies, as he was 55 years of age at the close of that century."

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In the beginning of the 16th century, Achillinus and Benedictus, but particularly Berengarius and Massa, followed out the improvement of anatomy in Italy, where they taught it, and published upon the subject. These first improvers made some discoveries from their own dissections: but it is not surprising that they should have been diffident of themselves, and have followed Galen almost blindly, when his authority had been so long established, and when the enthusiasm for Greek authors was rising to such a pitch.

Soon after this, we may say about the year 1540, the great Vesalius appeared. He was studious, laborious, and ambitious. From Brussels, the place of his birth, he went to Louvain, and thence to Paris, where anatomy was not yet making a considerable figure; and then to Louvain to teach; from which place, very fortunately for his reputation, he was called to Italy, where he met with every opportunity that such a genius for anatomy could desire, that is, books, subjects, and excellent draughtsmen. He was equally laborious in reading the ancients, and in dissecting bodies. And in making the comparison, he could not but see, that there was great room for improvement, and that many of Galen's descriptions were erroneous. When he was but a young man, he published a noble system of anatomy, illustrated with a great number of elegant figures.—In this work he found so many occasions of correcting Galen, that his contemporaries, partial to antiquity, and jealous of his reputation, complained that he carried his turn for improvement and criticisms to licentiousness. The spirit of opposition and emulation was presently roused; and Sylvius in France, Columbus, Fallopius, and Eustachius in Italy, who were all in high anatomical reputation about the middle of this 16th century, endeavoured to defend Galen at the expence of Vesalius. In their disputes they made their appeals to the human body: and thus in a few years the art was greatly improved. And Vesalius being detected in the very fault which he condemns in Galen, to wit, describing from the dissections of brutes, and not of the human body, it exposed so fully that blunder of the older anatomists, that in succeeding times there has been little reason for such complaint.—Besides the above, he published several other anatomical treatises. He has been particularly serviceable by imposing names on the muscles, most of which are retained to this day. Formerly they were distinguished by numbers, which were differently applied by almost every author.

In 1561, Gabriel Fallopius, professor of anatomy at Padua, published a treatise of anatomy under the title of *Observationes Anatomicæ*. This was designed as a supplement to Vesalius; many of whose descriptions he corrects, though he always makes mention of him

History. in an honourable manner. Fallopius made many great discoveries, and his book is well worth the perusal of every anatomist.

In 1563, Bartholomæus Eustachius published his *Opuscula Anatomica* at Venice, which have ever since been justly admired for the exactness of the descriptions, and the discoveries contained in them. He published afterwards some other pieces, in which there is little of anatomy; but never published the great work he had promised, which was to be adorned with copperplates representing all the parts of the human body. These plates, after lying buried in an old cabinet for upwards of 150 years, were at last discovered and published in the year 1714, by Lancisi the pope's physician; who added a short explicatory text, because Eustachius's own writing could not be found.

From this time the study of anatomy gradually diffused itself over Europe: insomuch that for the last hundred years it has been daily improving by the labour of a number of professed anatomists almost in every country of Europe.

We may form a judgment about the state of anatomy even in Italy, in the beginning of the 17th century, from the information of Cortesius. He had been professor of anatomy at Bologna, and was then professor of medicine at Massana; where, though he had a great desire to improve himself in the art, and to finish a treatise which he had begun on practical anatomy, in 24 years he could twice only procure an opportunity of dissecting a human body, and then it was with difficulties and in hurry; whereas he had expected to have done so, he says, *once every year, according to the custom in the famous academies of Italy.*

In the very end of the 16th century, our great Harvey, as was the custom of the times, went to Italy to study medicine; for Italy was still the favourite seat of the arts: And in the very beginning of the 17th century, soon after Harvey's return to England, his master in anatomy, Fabricius ab Aquapendente, published an account of the valves in the veins, which he had discovered many years before, and no doubt taught in his lectures when Harvey attended them.

This discovery evidently affected the established doctrine of all ages, that the veins carried the blood from the liver to all parts of the body for nourishment. It set Harvey to work upon the use of the heart and vascular systems in animals; and in the course of some years he was so happy as to discover, and to prove beyond all possibility of doubt, the *circulation of the blood.* He taught his new doctrine in his lectures about the year 1616, and printed it in 1628.

It was by far the most important step that has been made in the knowledge of animal bodies in any age. It not only reflected useful lights upon what had been already found out in anatomy, but also pointed out the means of further investigation. And accordingly we see, that from Harvey to the present time, anatomy has been so much improved, that we may reasonably question if the ancients have been further outdone by the moderns in any other branch of knowledge. From one day to another there has been a constant succession of discoveries, relating either to the structure or functions of our bodies; and new anatomical processes, both of investigation and demonstration, have been daily invented. Many parts of the body which were not known in Harvey's time have since then been brought History. to light: and of those which were known, the internal composition and functions remained unexplained; and indeed must have remained inexplicable without the knowledge of the circulation.

Harvey's doctrine at first met with considerable opposition; but in the space of about 20 years it was so generally and so warmly embraced, that it was imagined every thing in physic would be explained. But time and experience have taught us, that we still are, and probably must long continue to be, very ignorant; and that in the study of the human body, and of its diseases, there will always be an extensive field for the exercise of sagacity.

After the discovery and knowledge of the circulation of the blood, the next question would naturally have been about the passage and route of the nutritious part of the food or chyle from the bowels to the blood vessels: And, by good fortune, in a few years after Harvey had made his discovery, Asellius, an Italian physician, found out the lacteals, or vessels which carry the chyle from the intestines; and printed his account of them, with coloured prints, in the year 1627, the very year before Harvey's book came out.

For a number of years after these two publications, the anatomists in all parts of Europe were daily opening living dogs, either to see the lacteals or to observe the phenomena of the circulation. In making an experiment of this kind, Pecquet in France was fortunate enough to discover the thoracic duct, or common trunk of all the lacteals, which conveys the chyle into the subclavian vein. He printed his discovery in the year 1651. And now the lacteals having been traced from the intestines to the thoracic duct, and that duct having been traced to its termination in a blood vessel, the passage of the chyle was completely made out.

The same practice of opening living animals furnished occasions of discovering the lymphatic vessels. This good fortune fell to the lot of Rudbec first, a young Swedish anatomist; and then to Thomas Bartholine, a Danish anatomist, who was the first who appeared in print upon the lymphatics. His book came out in the year 1653, that is, two years after that of Pecquet. And then it was very evident that they had been seen before by Dr Highmore and others, who had mistaken them for lacteals. But none of the anatomists of those times could make out the origin of the lymphatics, and none of the physiologists could give a satisfactory account of their use.

The circulation of the blood and the passage of the chyle having been satisfactorily traced out in full grown animals, the anatomists were naturally led next to consider how these animal processes were carried on in the child while in the womb of the mother. Accordingly the male and female organs, the appearances and contents of the pregnant uterus, the incubated egg, and every phenomenon which could illustrate generation, became the favourite subject for about 30 years with the principal anatomists of Europe.

Thus it would appear to have been in theory; but Dr Hunter believes, that in fact, as Harvey's master Fabricius laid the foundation for the discovery of the circulation of the blood by teaching him the valves of the veins, and thereby inviting him to consider that subject; so Fabricius, by his lectures, and by his elegant

History. gant work *De Formato Fœtu, et de Formatione Ovi et Pulli*, probably made that likewise a favourite subject with Dr Harvey. But whether he took up the subject of generation in consequence of his discovery of the circulation, or was led to it by his honoured master Fabricius, he spent a great deal of his time in the inquiry; and published his observations in a book *De Generatione Animalium*, in the year 1651, that is, six years before his death.

In a few years after this, Swammerdam, Van Horn, Steno, and D. Graaf, excited great attention to the subject of generation, by their supposed discovery that the females of viviparous animals have ovaria, that is, clusters of eggs in their loins, like oviparous animals; which, when impregnated by the male, are conveyed into the uterus: so that a child is produced from an egg as well as a chick; with this difference that one is hatched within, and the other without, the body of the mother.

Malpighi, a great Italian genius, some time after, made considerable advances upon the subject of generation. He had the good fortune to be the first who used magnifying glasses with address in tracing the first appearances in the formation of animals. He likewise made many other observations and improvements in the *minutiæ* of anatomy by his microscopical labours, and by cultivating comparative anatomy.

This distinguished anatomist gave the first public specimen of his abilities by printing a dissertation on the lungs, anno 1661, a period so remarkable for the study of nature, that it would be injustice to pass it without particular notice.

At the same time flourished Laurentius Bellinus at Florence, and was the first who introduced mathematical reasoning in physic. In 1662, Simon Pauli published a treatise *De Albandis Ossibus*. He had long been admired for the white skeletons he prepared; and at last discovered his method, which was by exposing the bones all winter to the weather.

Johannes Swammerdam of Amsterdam also published some anatomical treatises; but was most remarkable for his knowledge of preserving the parts of bodies entire for many years, by injecting their vessels. He also published a treatise on respiration; wherein he mentioned his having figures of all the parts of the body, as big as the life, cut in copper, which he designed to publish, with a complete system of anatomy. These, however, were never made public by Swammerdam; but, in 1683, Gothofridus Bidloo, professor of anatomy at Leyden, published a work entitled *Anatomia Corporis Humani*, where all the parts were delineated in very large plates almost as big as the life. Mr Cowper, an English surgeon, bought 300 copies of these figures; and in 1698, published them with an English text, quite different from Bidloo's Latin one; to which were added letters in Bidloo's figures, and some few figures of Mr Cowper's own. To this work Cowper's name was prefixed, without the least mention of Bidloo, except on purpose to confute him. Bidloo immediately published a very ill-natured pamphlet, called *Gulielmus Cowperus citatus coram tribunali;* appealing to the Royal Society, how far Cowper ought to be punished as a plagiary of the worst kind, and endeavouring to prove him an ignorant deceitful fellow. Cowper answered him in his own style, in a pamphlet called his *Vindiciæ;* endeavouring to prove, either that Bidloo did not understand his own tables, or that they were none of his. It was even alleged that those were the tables promised by Swammerdam, and which Bidloo had got from his widow. This, however, appears to have been only an invidious surmise, there being unquestionable evidence that they were really the performance of Bidloo. History.

Soon after, Isbrandus Diembroeck, professor of anatomy at Utrecht, began to appear as an author. His work contained very little original; but he was at great pains to collect from others whatever was valuable in their writings, and his system was the common standard among anatomical students for many years.

About the same time, Antonius Leeuwenboek of Delft improved considerably on Malpighi's use of microscopes. These two authors took up anatomy where others had dropt it; and, by this new art, they brought a number of amazing things to light. They discovered the red globules of the blood; they were enabled to see the actual circulation of the blood in the transparent parts of living animals, and could measure the velocity of its motion; they discovered that the arteries and veins had no intermediate cells or spongy substance, as Harvey and all the preceding anatomists had supposed, but communicated one with the other by a continuation of the same tube.

Leeuwenhoek was in great fame likewise for his discovery of the animalcula in the semen. Indeed there was scarcely a part of the body, solid or fluid, which escaped his examination; and he almost everywhere found, that what appeared to the naked eye to be rude indigested matter, was in reality a beautiful and regular compound.

After this period, Nuck added to our knowledge of the absorbent system already mentioned, by his injections of the lymphatic glands; Ruysch, by his description of the valves of the lymphatic vessels; and Dr Meckel, by his accurate account of the whole system; and by tracing those vessels in many parts where they had not before been described.

Besides these authors, Drs Hunter and Monro have called the attention of the public to this part of anatomy, in their controversy concerning the discovery of the office of the lymphatics.

When the lymphatic vessels were first seen and traced into the thoracic duct, it was natural for anatomists to suspect, that as the lacteals absorbed from the cavity of the intestines, the lymphatics, which are similar in figure and structure, might possibly do the same office with respect to other parts of the body: and accordingly, Dr Glisson, who wrote in 1654, supposes these vessels arose from cavities, and that their use was to absorb; and Frederic Hoffman has very explicitly laid down the doctrine of the lymphatic vessels being a system of absorbents. But anatomists in general have been of a contrary opinion: for from experiments, particularly such as were made by injections, they have been persuaded that the lymphatic vessels did not arise from cavities, and did not absorb, but were merely continuations from small arteries. The doctrine, therefore, that the lymphatics, like the lacteals, were absorbents, as had been suggested by Glisson and by Hoffman, has been revived by Dr Hunter and Dr Monro, who have controverted the experiments of

History. their predecessors in anatomy, and have endeavoured to prove that the lymphatic vessels are not continued from arteries, but are absorbents.

To this doctrine, however, several objections have been started, particularly by Haller, (*Elem. Phys.* l. 24. § 2, 3.); and it has been found, that before the doctrine of the lymphatics being a system of absorbents can be established, it must first be determined whether this system is to be found in other animals besides man and quadrupeds. Mr Hewson claims the merit of having proved the affirmative of this question by discovering the lymphatic system in birds, fish, and amphibious animals. See *Phil. Trans.* vol. lviii. and lxix.—And latterly, Mr Cruikshank has traced the ramifications of that system in almost every part of the body; and from his dissections, figures have been made and lately published to the world. To Mr Sheldon also we are much indebted for his illustration of this system, which promises to give great satisfaction, but of which only a part has been yet published.

The gravid uterus is a subject likewise which has received considerable improvements, particularly relating to one very important discovery; viz. that the internal membrane of the uterus, which Dr Hunter has named *decidua*, constitutes the exterior part of the secundines or after-birth, and separates from the rest of the uterus every time that a woman either bears a child or suffers a miscarriage. This discovery includes another, to wit, that the placenta is partly made up of an excrescence or efflorescence from the uterus itself.

These discoveries are of the utmost consequence, both in the physiological question about the connexion between the mother and child, and likewise in explaining the phenomena of births and abortions, as well as in regulating obstetrical practice.

The anatomists of this century have improved anatomy, and have made the study of it much more easy, by giving us more correct as well as more numerous figures. It is amazing to think of what has been done in that time. We have had four large folio books of figures of the bones, viz. Cheselden's, Albinus's, Sue's and Trew's. Of the muscles, we have had two large folios; one from Cowper, which is elegant; and one from Albinus, which, from the accuracy and labour of the work, we may suppose will never be outdone. Of the blood vessels we have a large folio from Dr Haller. We have had one upon the nerves from Dr Meckel, and another by Dr Monro junior. We have had Albinus's, Roederer's, Jenty's, and Hunter's works upon the pregnant uterus; Weitbrecht and Leber on the joints and fresh bones; Soemerring on the brain; Zinn on the eye; Cotunnius, Meckel junior, &c. on the ear; Walter on the nerves of the thorax and abdomen; Dr Monro on the bursæ mucosæ, &c.

It would be endless to mention the anatomical figures that have been published in this century of particular and smaller parts of the body, by Morgagni, Ruysch, Valsalva, Sanctorini, Heister, Vater, Cant, Zimmerman, Walterus, and others.

Those elegant plates of the brain, however, just published by M. Vicq. d'Azyr, must not pass without notice, especially as they form part of an universal system of anatomy and physiology, both human and comparative, proposed to be executed in the same splendid style. Upon the brain alone 19 folio plates are employed; of which several are coloured. The figures are delineated with accuracy and clearness; but the colouring is rather beautiful than correct. Such parts of this work as may be published, cannot fail to be equally acceptable to the anatomist and the philosopher; but the entire design is apparently too extensive to be accomplished within the period of a single life. In our own country, also, a very great anatomical work is carrying on by Andrew Bell, F.S.A.S. engraver to his Royal Highness the Prince of Wales, with the approbation of Dr Monro, and under the inspection of his very ingenious assistant Mr Fyfe. It is to compose a complete illustration, both general and particular, of the human body, by a selection from the best plates of all the greatest anatomists, as well foreign as of this country, exhibiting the latest discoveries in the science, and accompanied with copious explanations. The whole number of plates mentioned in the Prospectus is 240, of which 152 are already done; all in royal folio. History.

To the foreign treatises already mentioned may be added those recently published by Sabbatier and Plenck on anatomy in general. Among ourselves, the writings of Keil, Douglas, Cheselden, the first Monro, Winslow, &c. are too well known to need description. The last of these used to be recommended as a standard for the students of anatomy; but it has of late given place to a more accurate and comprehensive system, in three volumes, published by Mr Elliot of Edinburgh, upon a plan approved of by Dr Monro, and executed by Mr Fyfe. Dr Simmons of London has also obliged the world with an excellent system of anatomy; and another work under the title of "Elements of Anatomy and the Animal Economy:" in which the subjects are treated with uncommon elegance and perspicuity.

In the latter part of the last century, anatomy made two great steps, by the invention of injections, and the method of making what we commonly call *preparations*. These two modern arts have really been of infinite use to anatomy; and besides have introduced an elegance into our administrations, which in former times could not have been supposed to be possible. They arose in Holland under Swammerdam and Ruysch, and afterwards in England under Cowper, St André, and others, where they have been greatly improved.

The anatomists of former ages had no other knowledge of the blood vessels than what they were able to collect from laborious dissections, and from examining the smaller branches of them, upon some lucky occasion, when they were found more than commonly loaded with red blood. But filling the vascular system with a bright coloured wax, enables us to trace the large vessels with great ease, renders the smaller much more conspicuous, and makes thousands of the very minute ones visible, which from their delicacy, and the transparency of their natural contents, are otherwise imperceptible.

The modern art of corroding the fleshy parts with a menstruum, and of leaving the moulded wax entire, is so exceedingly useful, and at the same time so ornamental, that it does great honour to the ingenious inventor Dr Nicholls.

The wax-work arts of the moderns might deserve notice in any history of anatomy, if the masters in that way had not been so careless in their imitation. Many of the wax figures are so tawdry, with a show of unnatural colours, and so very incorrect in the circumstances

General view of subject.

of figure, situation, and the like, that though they strike a vulgar eye with admiration, they must appear ridiculous to an anatomist. But those figures, which are cast in wax, plaster, or lead, from the real subject, and which of late years have been frequently made here, are, of course, very correct in all the principal parts, and may be considered as no insignificant acquisition to modern anatomy. The proper, or principal, use of this art is, to preserve a very perfect likeness of such subjects as we but seldom can meet with, or cannot well preserve in a natural state; a subject in pregnancy, for example.

The modern improved methods of preserving animal bodies, or parts of them, has been of the greatest service to anatomy; especially in saving the time and labour of the anatomist in the nicer dissections of the small parts of the body. For now, whatever he has prepared with care, he can preserve; and the object is ready to be seen at any time. And in the same manner he can preserve anatomical curiosities, or rarities of every kind; such as, parts that are uncommonly formed; parts that are diseased; the parts of the pregnant uterus and its contents. Large collections of such curiosities, which modern anatomists are striving almost everywhere to procure, are of infinite service to the art, especially in the hands of teachers. They give students clear ideas about many things which it is very essential to know, and yet which it is impossible that a teacher should be able to show otherwise, were he ever so well supplied with fresh subjects.

§ 2. *View of the Subject in general, and Plan of the following Treatise.*

The etymology of the word *anatomy*, as above given, implies simply *dissection;* but by this term something more is usually understood.

It is every day made use of to express a knowledge of the human body; and a person who is said to understand anatomy, is supposed to be conversant with the structure and arrangement of the different solid parts of the body.

It is commonly divided into *Anatomy*, properly so called; and *Comparative* Anatomy: the first of these is confined solely to the human body; the latter includes all animals, so far as a knowledge of their structure may tend to perfect our ideas of the human body.

The term *anatomy* may also have another and more extensive signification: it may be employed to express not only a knowledge of the structure and disposition of the parts, but likewise of their economy and use. Considered in this light, it will seldom fail to excite the curiosity of people of taste, as a branch of philosophy; since, if it is pleasing to be acquainted with the structure of body, it is certainly more so to discover all the springs which give life and motion to the machine, and to observe the admirable mechanism by which so many different functions are executed.

Astronomy and anatomy, as Dr Hunter, after Fontenelle, observes, are the studies which present us with the most striking view of the two greatest attributes of the Supreme Being. The first of these fills the mind with the idea of his immensity, in the largeness, distances, and number of the heavenly bodies; the last astonishes with his intelligence and art in the variety and delicacy of animal mechanism.

General view of the subject.

The human body has been commonly enough known by the name *Microcosmus*, or the little world; as if it did not differ so much from the universal system of nature in the symmetry and number of its parts as in their size.

Galen's excellent treatise *De Usu Partium*, was composed as a prose hymn to the Creator; and abounds with as irresistible proofs of a supreme Cause and governing Providence, as we find in modern physico-theology. And Cicero dwells more on the structure and economy of animals than on all the productions of nature besides, when he wants to prove the existence of the gods from the order and beauty of the universe. He there takes a survey of the body of man in a most elegant synopsis of anatomy; and concludes thus: "Quibus rebus expositis, satis docuisse videor, hominis natura, quanto omnes anteiret animantes. Ex quo debet intelligi, nec figuram situmque membrorum, nec ingenii mentisque vim talem effici potuisse fortuna."

The satisfaction of mind which arises from the study of anatomy, and the influence which it must naturally have upon our minds as philosophers, cannot be better conveyed than by the following passage from the same author: "Quæ contuens animus, accepit ab his cognitionem deorum, ex qua oritur pictas: cui conjuncta justitia est, reliquæque virtutes: ex quibus vita beata exsistit, par et similis deorum, nulla alia re nisi immortalitate, quæ nihil ad bene vivendum pertinet, cedens cælestibus."

It would be endless to quote the animated passages of this sort which are to be found in the physicians, philosophers, and theologists, who have considered the structure and functions of animals with a view towards the Creator. It is a view which must strike one with a most awful conviction. Who can know and consider the thousand evident proofs of the astonishing art of the Creator, in forming and sustaining an animal body such as ours, without feeling the most pleasant enthusiasm? Can we seriously reflect upon this awful subject, without being almost lost in adoration? without longing for another life after this, in which we may be gratified with the highest enjoyment which our faculties and nature seem capable of, the seeing and comprehending the whole plan of the Creator, in forming the universe and in directing all its operations?

But the more immediate purposes of anatomy concern those who are to be the guardians of health, as this study is necessary to lay a foundation for all the branches of medicine. The more we know of our fabric, the more reason we have to believe, that if our senses were more acute, and our judgment more enlarged, we should be able to trace many springs of life which are now hidden from us: by the same sagacity we should discover the true causes and nature of diseases; and thereby be enabled to restore the health of many, who are now, from our more confined knowledge, said to labour under incurable disorders. By such an intimate acquaintance with the economy of our bodies, we should discover even the seeds of diseases, and destroy them before they had taken root in the constitution.

That anatomy is the very basis of surgery every body allows. It is dissection alone that can teach us, where we may cut the living body with freedom and dispatch; and where we may venture with great circumspection

and

General view of the subject.

and delicacy; and where we must not upon any account attempt it. This informs the *head*, gives dexterity to the *hand*, and familiarizes the *heart* with a sort of necessary inhumanity, the use of cutting instruments upon our fellow-creatures.

Besides the knowledge of our body, through all the variety of its *structure* and *operations* in a *sound* state, it is by anatomy only that we can arrive at the knowledge of the true nature of most of the diseases which afflict humanity. The symptoms of many disorders are often equivocal; and diseases themselves are thence frequently mistaken, even by sensible, experienced, and attentive physicians. But by anatomical examination after death, we can with certainty find out the mistake, and learn to avoid it in any similar case.

This use of anatomy has been so generally adopted by the moderns, that the cases already published are almost innumerable: Mangetus, Morgagni, indeed many of the best modern writings in physic, are full of them. And if we look among the physicians of the best character, and observe those who have the *art* itself, rather than the *craft* of the profession at heart; we shall find them constantly taking pains to procure leave to examine the bodies of their patients after death.

After having considered the rise and progress of anatomy; the various discoveries that have been made in it, from time to time; the great number of diligent observers who have applied themselves to this art; and the importance of the study, not only for the prevention and cure of diseases, but in furnishing the liveliest proofs of divine wisdom; the following questions seem naturally to arise: For what purposes is there such a variety of parts in the human body? Why such a complication of nice and tender machinery? Why was there not rather a more simple, less delicate, and less expensive frame (A)?

In order to acquire a satisfactory general idea of this subject, and find a solution of all such questions, let us, in our imagination, *make* a man: in other words, let us suppose that the *mind*, or immaterial part, is to be placed in a corporeal fabric, in order to hold a correspondence with other material beings by the intervention of the body; and then consider, *à priori*, what will be wanted for her accommodation. In this inquiry, we shall plainly see the necessity or advantage, and therefore the final cause, of most of the parts which we actually find in the human body. And if we consider that, in order to answer some of the requisites, human wit and invention would be very insufficient; we need not be surprised if we meet with some parts of the body whose use we cannot yet perceive, and with some operations or functions which we cannot explain. We can see that the whole bears the most striking characters of excelling wisdom and ingenuity: but the imperfect senses and capacity of *man* cannot pretend to reach every part of a machine, which nothing less than the intelligence and power of the *Supreme Being* could contrive and execute.

First, then, The *mind*, the thinking immaterial agent, must be provided with a place of immediate residence, which shall have all the requisites for the union of spirit and body; accordingly she is provided with the *brain*, where she dwells as governor and superintendant of the whole fabric.

General view of the subject

In the next place, As she is to hold a correspondence with all the material beings around her, she must be supplied with organs fitted to receive the different kinds of impressions which they will make. In fact, therefore, we see that she is provided with the organs of sense, as we call them; the eye is adapted to light; the ear to sound; the nose to smell; the mouth to taste; and the skin to touch.

Further: She must be furnished with organs of communication between herself in the brain and those organs of sense, to give her information of all the impressions that are made upon them: and she must have organs between herself in the brain and every other part of the body, fitted to convey her commands and influence over the whole. For these purposes the nerves are actually given. They are chords, which rise from the brain, the immediate residence of the mind, and disperse themselves in branches through all parts of the body. They convey all the different kinds of sensations to the mind, in the brain; and likewise carry out from thence all her commands or influence to the other parts of the body. They are intended to be occasional monitors against all such impressions as might endanger the wellbeing of the whole, or of any particular part; which vindicates the Creator of all things, in having actually subjected us to those many disagreeable and painful sensations which we are exposed to from a thousand accidents in life.

Moreover, the mind, in this corporeal system, must be endued with the power of moving from place to place, that she may have intercourse with a variety of objects; that she may fly from such as are disagreeable, dangerous, or hurtful, and pursue such as are pleasant or useful to her. And accordingly she is furnished with limbs, and with muscles and tendons, the instruments of motion, which are found in every part of the fabric where motion is necessary.

But to support, to give firmness and shape to the fabric; to keep the softer parts in their proper places; to give fixed points for, and the proper direction to its motions as well as to protect some of the more important and tender organs from external injuries; there must be some firm prop-work interwoven through the whole. And in fact, for such purposes the bones are given.

The prop-work must not be made into one rigid fabric, for that would prevent motion. Therefore there are a number of bones.

These pieces must all be firmly bound together, to prevent their dislocation. And this end is perfectly well answered by the ligaments.

The extremities of these bony pieces, where they move and rub upon one another, must have smooth and slippery surfaces for easy motion. This is most happily provided for by the cartilages and mucus of the joints.

The

(A) The following beautiful representation is taken from the late Dr Hunter's *Introductory Lecture on Anatomy.*

General view of the subject.

The interstices of all these parts must be filled up with some soft and ductile matter, which shall keep them in their places, unite them, and at the same time allow them to move a little upon one another. And these purposes are answered by the cellular membrane or adipose substance.

There must be an outward covering over the whole apparatus, both to give it compactness and to defend it from a thousand injuries; which, in fact, are the very purposes of the skin and other integuments.

Lastly, The mind being formed for society and intercourse with beings of her own kind, she must be endued with powers of expressing and communicating her thoughts by some sensible marks or signs; which shall be both easy to herself, and admit of great variety: and accordingly she is provided with the organs and faculty of speech, by which she can throw out signs with amazing facility, and vary them without end.

Thus we have built up an animal body which would seem to be pretty complete: but as it is the nature of matter to be altered and worked upon by matter; so in a very little time such a living creature must be destroyed, if there is no provision for repairing the injuries which she must commit upon herself, and those which she must be exposed to from without. Therefore a treasure of blood is actually provided in the heart and vascular system, full of nutritious and healing particles, fluid enough to penetrate into the minutest parts of the animal; impelled by the heart, and conveyed by the arteries, it washes every part, builds up what was broken down, and sweeps away the old and useless materials. Hence we see the nccessity or advantage of the heart and arterial system.

What more there was of this blood than enough to repair the present damages of the machine, must not be lost, but should be returned again to the heart; and for this purpose the venous system is actually provided.

These requisites in the animal explain, *à priori*, the circulation of the blood.

The old materials which were become useless, and are swept off by the current of blood, must be separated and thrown out of the system. Therefore glands, the organs of secretion, are given for straining whatever is redundant, vapid, or noxious, from the mass of blood; and when strained, they are thrown out by emunctories, called organs of excretion.

But now, as the machine must be constantly wearing, the reparation must be carried on without intermission, and the strainers must always he employed. Therefore there is actually a perpetual circulation of the blood, and the secretions are always going on.

Even all this provision, however, would not be sufficient; for that store of blood would soon be consumed, and the fabric would break down, if there were not a provision made for fresh supplies. These we observe, in fact, are profusely scattered round her in the animal and vegetable kingdoms; and she is furnished with hands, the fittest instruments that could have been contrived, for gathering them, and for preparing them in a variety of ways for the mouth.

But these supplies, which we call food, must he considerably changed; they must be converted into blood. Therefore she is provided with teeth for cutting and bruising the food, and with a stomach for melting it down: In short, with all the organs subservient to digestion. The finer parts of the aliments only can be useful in the constitution: these must be taken up and conveyed into the blood, and the dregs must be thrown off. With this view the intestinal canal is actually given. It separates the nutritious part, which we call *chyle*, to be conveyed into the blood by the system of absorbent vessels; and the fæces pass downwards, to be conducted out of the body.

General view of the subject.

Now we have got our animal not only furnished with what is wanted for its immediate existence, but also with the powers of protracting that existence to an indefinite length of time. But its duration, we may presume, must necessarily be limited: for as it is nourished, grows, and is raised up to its full strength and utmost perfection; so it must in time, in common with all material beings, begin to decay, and then hurry on to final ruin. Hence we see the necessity of a scheme for renovation. Accordingly wise Providence, to perpetuate as well as to preserve his work, besides giving a strong appetite for life and self-preservation, has made animals male and female, and given them such organs and passions as will secure the propagation of the species to the end of time.

Thus we see, that, by the very imperfect survey which human reason is able to take of this subject, the animal man must necessarily be complex in his corporeal system, and in its operations.

He must have one great and general system, the vascular, branching through the whole for circulation: Another, the nervous, with its appendages the organs of sense, for every kind of feeling: And a third, for the union and connexion of all those parts.

Besides these primary and general systems, he requires others which may be more local or confined: One for strength, support, and protection; the bony compages: Another for the requisite motions of the parts among themselves, as well as for moving from place to place; the muscular part of the body: Another to prepare nourishment for the daily recruit of the body; the digestive organs: and one for propagating the species; the organs of generation.

And in taking this general survey of what would appear, *à priori*, to be necessary for adapting an animal to the situations of life, we observe, with great satisfaction, that man is accordingly made of such systems, and for such purposes. He has them all; and he has nothing more except the organs of respiration. Breathing it seemed difficult to account for *à priori*: we only knew it to be in fact essential and necessary to life. Notwithstanding this, when we saw all the other parts of the body, and their functions, so well accounted for, and so wisely adapted to their several purposes, there could be no doubt that respiration was so likewise: And accordingly, the discoveries of Dr Priestley have lately thrown light upon this function also, as will be shown in its proper place.

Of all the different systems in the human body, the use and necessity are not more apparent, than the wisdom and contrivance which has been exerted in putting them all into the most compact and convenient form: in disposing them so, that they shall mutually receive and give helps to one another; and that all, or many of the parts, shall not only answer their principal end or purpose, but operate successfully and usefully in a variety of secondary ways.

If

General view of the subject.

If we consider the whole animal machine in this light, and compare it with any machine in which human art has exerted its utmost, suppose the best constructed ship that ever was built, we shall be convinced beyond the possibility of doubt, that there are intelligence and power far surpassing what humanity can boast of.

One superiority in the natural machine is peculiarly striking. In machines of human contrivance or art, there is no internal power, no principle in the machine itself, by which it can alter and accommodate itself to any injury which it may suffer, or make up any injury which admits of repair. But in the natural machine, the animal body, this is most wonderfully provided for, by internal powers in the machine itself; many of which are not more certain and obvious in their effects, than they are above all human comprehension as to the manner and means of their operation. Thus, a wound heals up of itself; a broken bone is made firm again by a callus; a dead part is separated and thrown off: noxious juices are driven out by some of the emunctories; a redundancy is removed by some spontaneous bleeding; a bleeding naturally stops of itself; and a great loss of blood, from any cause, is in some measure compensated by a contracting power in the vascular system, which accommodates the capacity of the vessels to the quantity contained. The stomach gives information when the supplies have been expended; represents, with great exactness, the quantity and the quality of what is wanted in the present state of the machine; and in proportion as she meets with neglect, rises in her demand, urges her petition in a louder tone, and with more forcible arguments. For its protection, an animal body resists heat and cold in a very wonderful manner, and preserves an equal temperature in a burning and in a freezing atmosphere.

General view of the subject.

A further excellence and superiority in the natural machine, if possible, still more astonishing, more beyond all human comprehension, than what we have been speaking of, is the following: Besides those internal powers of self-preservation in each individual, when two of them co-operate, or act in concert, they are endued with powers of making other animals, or machines, like themselves, which again are possessed of the same powers of producing others, and so of multiplying the species without end.

These are powers which mock all human invention or imitation. They are characteristics of the divine Architect.

Having premised this general account of the subject, we shall next consider the method to be observed in treating it.

Anatomy, it has been already observed, is divided into two parts; Anatomy, properly so called, or the anatomy of the human body, and Comparative Anatomy. In the following treatise we shall adopt the same arrangement. In the first part we shall treat of the Anatomy of the Human Body, and in the second of Comparative Anatomy.

PART I.

ANATOMY OF THE HUMAN BODY.

THE study of the *human* body, as already noticed, is commonly divided into two parts. The first, which is called *Anatomy*, relates to the matter and structure of its parts; the second, called *Physiology* and *animal economy*, relates to the principles and laws of its internal operations and functions.

As the body is a compound of solids and fluids, *Anatomy* is divided into,

1. The Anatomy of the solids, and
2. The Anatomy of the fluids.

I. The SOLIDS, by which we mean all parts of our body which are not fluid, are generally divided into two classes, viz.

1. The hard solids or bones. This part of anatomy is called *Osteology*; which signifies the doctrine of the bones.

2. The softer solids; which part is called *Sarcology*, viz. the doctrine of the flesh.

This division of the solids, we may observe, has probably taken its origin from the vulgar observation, that the body is made of bone and flesh. And as there are many different kinds of what are called soft or fleshy parts, Sarcology is subdivided into,

(1.) *Angeiology*, or the doctrine of vessels; by which is commonly understood *blood vessels*:

(2.) *Adenology*, of glands;

(3.) *Neurology*, of nerves;

(4.) *Myology*, of muscles: and,

(5.) *Splanchnology*, of the viscera or bowels. There is, besides, that part which treats of the organs of sense and of the integuments.

This division of the solids has been here mentioned, rather for the sake of explaining so many words, which are constantly used by anatomists, than for its importance or accuracy. For besides many other objections that might be urged, there are in the body three species of solids, viz. gristle or cartilage, hair, and nails; which are of an intermediate nature between bone and flesh; and therefore cannot so properly be brought into the osteology or the sarcology. The cartilages were classed with the bones: because the greatest number of them are appendages to bones: and for the like reason the hair and the nails were classed with the integuments.

II. The FLUIDS of the human body may be divided into *three* kinds, which Dr Hunter calls the *crude*, the *general* or *perfect*, and the *local* or *secreted fluid*.

1. By the *crude* fluid is meant the chyle, and whatever is absorbed at the surfaces of the body; in other words, what is recently taken into the body, and is not yet mixed with or converted into blood.

2. The *general* or *perfect* fluid is the blood itself; viz. what is contained in the heart, arteries, and veins, and is going on in the round of the circulation.

3. The

Osteology. 3. The *local* or *secreted*, are those fluids peculiar to particular parts of the body, which are strained off from the blood, and yet are very different in their properties from the blood. They are commonly called *secretions;* and some are useful, others excrementitious.

In treating of the *Physiology*, it is very difficult to say what plan should be followed; for every method which has been yet proposed is attended with manifest inconvenience. The powers and operations of the machine have such a dependence upon one another, such connexions and reciprocal influence, that they cannot well be understood or explained separately. In this sense our body may be compared to a circular chain of powers, in which nothing is first or last, nothing solitary or independent; so that whenever we begin, we find that there is something preceding which we ought to have known. If we begin with the brain and the nerves, for example, we shall find that these cannot exist, even in idea, without the heart: if we set out with the heart and vascular system, we shall presently be sensible that the brain and the nerves must be supposed: or, should we take up the mouth, and follow the course of the aliment, we should see that the very first organ which presented itself, supposed the existence both of the heart and brain: Wherefore we shall incorporate the Physiology with the Anatomy, by attempting to explain the functions after we have demonstrated the organs. Osteology.

CHAP. I. OSTEOLOGY.

WE begin with the bones, which may be considered as the great support of the body, tending to give it shape and firmness.—But before we enter into the detail of each particular bone, it will be necessary to describe their composition and connexions, and to explain the nature of the different parts which have an immediate relation to them: as the cartilages, ligaments, periosteum, marrow, and synovial glands.

SECT. I. *Of the Bones in general, with their Appendages*, &c.

1 Of the composition of the bones.

THE bones are of a firm and hard (B) substance, of a white colour, and perfectly insensible. They are the most compact and solid parts of the body, and serve for the attachment or support of all the other parts.

Three different substances are usually distinguished in them; their exterior or bony part, properly so called; their spongy cells; and their reticular substance. The first of these is formed of many laminæ or plates, composing a firm hard substance.—The spongy or cellular part is so called on account of its resemblance to a sponge, from the little cells which compose it. This substance forms almost the whole of the extremities of cylindrical bones. The reticular part is composed of fibres, which cross each other in different directions. This net-work forms the internal surface of those bones which have cavities.

The flat bones, as those of the head, are composed only of the laminæ and the cellular substance. This last is usually found in the middle of the bone, dividing it into two plates, and is there called *diplöe*.

Gagliardi, who pretended to have discovered an infinite number of claviculi (C) or bony processes, which he describes as traversing the laminæ to unite them together, has endeavoured to support this pretended discovery by the analogy of bones to the bark of trees, in which certain woody nails have been remarked; but this opinion seems to be altogether fanciful.

Some writers have supposed, that the bones are formed by layers of the periosteum, which gradually ossify in the same manner as the timber is formed in trees by the hardening of the white substance that is found between the inner bark and the wood. M. Duhamel, who has adopted this opinion, fed different animals with madder and their ordinary food alternately during a certain time; and he asserts, that in dissecting their bones, he constantly observed distinct layers of red and white, which corresponded with the length of time they had lived on madder or their usual aliment. But it has since been proved by Detleff, that M. Duhamel's experiments were inaccurate, and that neither the periosteum nor the cartilages are tinged by the use of madder, which is known to affect the bones only.

We usually consider in a bone, its body and its extremities. The ancients gave the name of diaphysis to the body or middle part, and divided the extremities into apophysis and epiphysis. An apophysis, or process, as it is more commonly called, is an eminence continued from the body of the bone, whereas an epiphysis is at first a sort of an appendage to the bone by means of an intermediate cartilage. Many epiphyses, which appear as distinct bones in the fœtus, afterwards become apophyses; for they are at length so completely united to the body of the bone as not to be distinguishable from it in the adult state. It is not unusual, however, at the age of 18 and even 20 years, to find the extremities of bones still in the state of epiphyses.

The names given to the processes of bones are expressive of their shape, size, or use; thus if a process is large and of a spherical form, it is called *caput* or *head;* if the head is flatted, it is termed *condyle*. Some processes, from their resemblance to a stiletto, a breast, or the beak of a crow, are called *styloid*, *mastoid* or *coracoid;* others are styled *ridges* or *spines*. The two processes of the os femoris derive their name of *trochanters* from their use.

A bone has its cavities as well as processes. These cavities

(B) Mr Scheele discovered that bones contain the phosphoric acid united with calcareous earth; and that to this combination they owe their firmness.

(C) In his *Anat. ossium nov. invent. illustrat.* he describes four kinds of these claviculi or nails, *viz.* the perpendicular, oblique, headed, and crooked.

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cavities either extend quite through its substance, or appear only as depressions. The former are called *foramina* or holes, and these foramina are sometimes termed *canals* or *conduits*, according to their form and extent. Of the depressions, some are useful in articulation. These are called *cotyloid* when they are deep, as is the case with the os innominatum, where it receives the head of the os femoris; or *glenoid* when they are superficial, as in the scapula, where it receives the os humeri. Of the depressions that are not designed for articulation, those which have small apertures are called *sinuses;* others that are large, and not equally surrounded by high brims, are styled *fossæ;* such as are long and narrow, *furrows;* or if broad and superficial without brims, *sinuosities*. Some are called *digital impressions*, from their resemblance to the traces of a finger on soft bodies.

2 Connexion of the bones.

We shall abridge this article, which is exceedingly diffuse in the generality of anatomical books, and will endeavour to describe it with all the clearness it will allow.

The bones composing the skeleton are so constructed, that the end of every bone is perfectly adapted to the extremity of that with which it is connected, and this connexion forms what is called their *articulation*.

Articulation is divided into *diarthrosis*, *synarthrosis*, and *amphiarthrosis*, or moveable, immoveable, and mixed articulation. Each of the two first has its subdivisions. Thus the *diarthrosis*, or moveable articulation, includes, 1. The enarthrosis, as it is called, when a large head is admitted into a deep cavity, as in the articulation of the os femoris with the os innominatum. 2. Arthrodia, when a round head is articulated with a superficial cavity, as is the case of the os humeri and scapula. 3. Ginglimus, or hinge-like articulation, as in the connexion of the thigh-bone with the tibia. The enarthrosis and arthrodia allow of motion to all sides; the ginglimus only of flexion and extension.

The *synarthrosis*, or immoveable articulation, includes, 1. The suture, when the two bones are indented into each other, as is the case with the parietal bones. 2. Gomphosis, when one bone is fixed into another, in the manner the teeth are placed in their sockets.

The term *amphiarthrosis* is applied to those articulations which partake both of the synarthrosis and diarthrosis, as is the case with the bones of the vertebræ, which are capable of motion in a certain degree, although they are firmly connected together by intermediate cartilages.

What is called *symphysis* is the union of two bones into one; as in the lower jaw, for instance, which in the fœtus consists of two distinct bones, but becomes one in a more advanced age, by the ossification of the uniting cartilage.

When bones are thus joined by the means of cartilages, the union is styled *synchondrosis;* when by ligaments, *syneurosis*.

3 Of the cartilages.

Cartilages are white, solid, smooth, and elastic substances, between the hardness of bones and ligaments, and seemingly of a fibrous texture. We are not able to trace any vessels into their substance by injection, nor are they ever found tinged in animals that have been fed with madder.

They may be distinguished into, 1st, Those which are connected with the bones; and 2dly, Those which belong to other parts of the body. The first serve either to cover the ends and cavities of bones intended for motion, as in the articulations, where by their smoothness they facilitate motions, which the bones alone could not execute with so much freedom; or, they serve to unite bones together, as in the symphysis pubis, or to lengthen them as in the ribs.

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Many of them ossifying as we advance in life, their number is less in the adult than in the fœtus, and of course there are fewer bones in the old than in the young subject.

Of the second class of cartilages, or those belonging to the soft parts, we have instances in the larynx, where we find them useful in the formation of the voice, and for the attachment of muscles.

4 Of the periosteum.

The periosteum is a fine membrane of a compact cellular texture, reflected from one joint to another, and serving as a common covering to the bones. It has sanguiferous and lymphatic vessels, and is supplied with nerves from the neighbouring parts. It adheres very firmly to their surface, and by its smoothness facilitates the motion of muscles. It likewise supports the vessels that go to be distributed through the substance of the bones, and may serve to strengthen the articulations. At the extremities of bones, where it is found covering a cartilage, it has by some been improperly considered as a distinct membrane, and named *perichondrium*. This, in its use and structure, resembles the periosteum. Where it covers the bones of the skull, it has gotten the name of *pericranium*.

The periosteum is not a production of the dura mater, as the ancients, and after them Havers, imagined; nor are the bones formed by the ossification of this membrane, at least when it is in a sound state, as some late writers have supposed.

The periosteum is deficient in the teeth above the sockets, and in those parts of bones to which ligaments or tendons are attached.

5 Of the marrow.

The marrow is a fat oily substance, filling the cavities of bones. In the great cavities of long bones it is of a much firmer consistence than in the cells of their spongy part. In the former it inclines somewhat to a yellowish tinge, and is of the consistence of fat; in the latter it is more fluid, and of a red colour. This difference in colour and consistence is owing to accidental causes; both kinds are of the same nature, and may both be described under the common name of marrow, though some writers give this name only to the fat-like substance, and call the other the medullary juice.

The marrow is contained in a very fine and transparent membrane, which is supplied with a great number of blood vessels, chiefly from the periosteum. This membrana medullaris adheres to the inner surface of the bones, and furnishes an infinite number of minute bags or vesicles for enclosing the marrow, which is likewise supported in the cavities of the bones by the long filaments of their reticular substance.

Besides the vessels from the periosteum, the membrana medullaris is furnished with others, which in the long bones may be seen passing in near the extremities of the bone, and sending off numerous branches that ramify through all the vesicles of this membrane.

The bones, and the cells containing the marrow, are

Osteology. are likewise furnished with lymphatics. By their means, the marrow, like the fat, may be taken up in a greater quantity than it is secreted: and hence it is that so little is found in the bones of those who die of lingering diseases.

It is still a matter of controversy, Whether the marrow is sensible or not? We are certainly not able to trace any nerves to it; and from this circumstance, and its analogy to fat, Haller has ventured to consider it as insensible. On the other hand, Duverney asserts, that an injury done to this substance in a living animal was attended with great pain. In this dispute physiologists do not seem to have sufficiently discriminated between the marrow itself and the membranous cells in which it is contained. The former, like the fat, being nothing more than a secreted, and of course an inorganized matter, may, with propriety, be ranked among the insensible parts, as much as inspissated mucus or any other secreted matter in the body; whereas the membrana medullaris being vascular, though it possesses but an obscure degree of feeling in a sound state, is not perfectly insensible.

The marrow was formerly supposed to be intended for the nourishment and renewal of the bones; but this doctrine is now pretty generally and deservedly exploded. It seems probable that the marrow is to the bones what fat is to the soft parts. They both serve for some important purposes in the animal economy; but their particular use has never yet been clearly ascertained. The marrow, from the transudation of the oil through the bones of a skeleton, is supposed to diminish their brittleness; and Havers, who has written professedly on the bones, describes the canals by which the marrow is conveyed through every part of their substance, and divides them into longitudinal and transverse ones. He speaks of the first as extending through the whole length of the bone; and of the latter, as the passages by which the longitudinal ones communicate with each other. The similarity of these to the large cancelli in burnt bones, and the transudation of the oil through the bones of the skeleton, seems to prove that some such passages do actually exist.

6 Synovial glands. The synovial glands are small bodies (D), supposed to be of a glandular structure, and exceedingly vascular, secreting a fluid of a clear mucilaginous nature, which serves to lubricate the joints. They are placed in small cavities in the articulations, so as to be capable of being gently compressed by the motion of the joint, which expresses their juice in proportion to the degree of friction. When the synovia is wanting, or is of too thick a consistence, the joint becomes stiff and incapable of flexion or extension. This is what is termed *anchylosis*.

7 Of the ligaments. Ligaments are white, glistening, inelastic bands, of a compact substance, more or less broad or thick, and serving to connect the bones together. They are distinguished by different names adapted to their different forms and uses. Those of the joints are called either round or bursal. The round ligaments are white, tendinous and inclastic. They are strong and flexible, and are found only in the joint of the knee, and in the articulation of the os femoris with the os innominatum. The bursal or capsular ligaments surround the whole joint like a purse, and are to be found in the articulations which allow motion every way, as in the articulation of the arm with the scapula. Osteology.

8 Of the bursæ mucosæ. Of those sacs called *Bursæ Mucosæ*, a few were known to former anatomists, but by much the greater number have been since discovered by Dr Monro (E), who observes, that they are to be met with in the extremities of the body only; that many of them are placed entirely on the inner sides of the tendons, between these and the bones. Many others cover not only the inner, but the outer sides of the tendons, or are interposed between the tendons and external parts, as well as between those and the bones.

Some are situated between the tendons and external parts only or chiefly, some between contiguous tendons, or between the tendons or the ligaments and the joints. A few such sacs are observed where the processes of bones play upon the ligaments, or where one bone plays upon another. Where two or more tendons are contiguous, and afterwards separate from each other, we generally find a common bursa divided into branches with which it communicates; and a few bursæ of contiguous tendons communicate with each other.—Some, in healthy children, communicate with the cavities of the joints; and in many old people he has seen such communication formed by use or worn by friction, independent of disease.

Their proper membrane is thin and transparent, but very dense, and capable of confining air or any other fluid. It is joined to the neighbouring parts by the common cellular substance. Between the bursa and the hard substance of bone a thin layer of cartilage or of tough membrane is very generally interposed. To the cellular substance on the outside of the bursa, the adipose substance is connected: except where the bursa covers a tendon, cartilage, or bone, much exposed to pressure or friction.

In several places a mass of fat, covered with the continuation of the membrane of the bursa, projects into its cavity. The edges of this are divided into fringes.

The inner side of the membrane is smooth, and is extremely slippery from the liquor secreted in it.

9 Their structure compared with that of the capsular ligaments of the joints. The structure of the bursæ bears a strong resemblance to the capsular ligaments of the joints. 1. The inner layer of the ligament, like that of the bursæ, is thin and dense. 2. It is connected to the external ligaments by the common cellular substance. 3. Between it and the bones, layers of cartilage, or the articular cartilages, are interposed. 4. At the sides of the joints, where it is not subject to violent pressure and friction, the adipose substance is connected with the cellular membrane. 5. Within the cavities of the joints we observe masses of fat projecting, covered with similar blood-vessels, and with similar fimbriæ hanging from their

(D) It is now much doubted, however, whether the appearances in the joints, which are usually called *glands*, are any thing more than assemblages of fat.

(E) See *Description of the Bursæ Mucosæ*, &c.

Osteology. their edges. 6. In the knee the upper part of such a mass of fat forms what has been called the *mucilaginous gland of the joint*, and the under part projects into the bursa behind the ligament which ties the patella to the tibia. 7. The liquor which lubricates the bursæ has the same colour, consistence, and properties, as that of the joints, and both are affected in the same manner by heat, mineral acids, and ardent spirits. 8. In some places the bursæ constantly communicate with the cavities of the joints, in others they generally do so; from which we may infer a sameness of structure.

When we examine the fimbriæ common to the fatty bodies of the joints and bursæ, and which have been supposed to be the ducts of glands lodged within the masses of fat, we are not able to discover any glandular appearance within them. And although we observe many vessels dispersed upon the membranes of the fatty bodies and fimbriæ; and that we cannot doubt that these fimbriæ consist of ducts which contain a lubricating liquor, and can even press such a liquor from them; yet their cavities and orifices are so minute, that they are not discoverable even by the assistance of magnifying glasses. These fimbriæ, appear, therefore, to be ducts like those of the urethra, which prepare a mucilaginous liquor without the assistance of any knotty or glandular organ.

Upon the whole, the synovia seems to be furnished by invisible exhalent arteries, by the ducts of the fimbriæ, and by oil exuding from the adipose follicles by passages not yet discovered.

10 Of the skeleton. The word *skeleton*, which by its etymology implies simply a dry preparation, is usually applied to an assemblage of all the bones of an animal united together in their natural order. It is said to be a natural skeleton, when the bones are connected together by their own proper ligaments; and an artificial one, when they are joined by any other substance, as wire, &c.

The skeleton is generally divided into the head, trunk, and extremities. The first division includes the bones of the cranium and face. The bones of the trunk are the spine, ribs, sternum, and bones of the pelvis.

The upper extremity on each side consists of the two bones of the shoulder, viz. the scapula and clavicle; the bone of the arm or os humeri; the bones of the forearm, and those of the hand.

The lower extremity on each side of the trunk consists of the thigh-bone and the bones of the leg and foot.

Sect. II. *Of the Bones of the Head.*

The head is of a roundish figure, and somewhat oval (F). Its greatest diameter is from the forehead to the occiput; its upper part is called *vertex*, or crown of the head; its anterior or fore-part the face; and the upper part of this, *sinciput*, or forehead; its sides the temples; its posterior, or hind part, the *occiput*; and its inferior part the *basis*. Osteology.

The bones of the head may be divided into those of the cranium and face.

§ 1. *Bones of the Cranium and Face.*

There are eight bones of the cranium, viz. the coronal bone or os frontis; the two parietal bones or ossa bregmatis; the os occipitis; the two temporal bones; the sphenoid bone; and the os ethmoides or cribriforme.

Of these, only the os occipitis and ossa bregmatis 11 are considered as proper to the cranium; the rest being common both to the cranium and face.

These bones are all harder at their surface than in their middle: and on this account they are divided into two tables, and a middle spongy substance called *diploë*.

In this, as in all the other bones, we shall consider its 12 Of the os figure, structure, processes, depressions, and cavities; frontis. and the manner in which it is articulated with the other bones.

The os frontis has some resemblance in shape to the shell of the cockle. Externally it is convex, its concave side being turned towards the brain. This bone, in the places where it is united to the temporal bones, is very thin, and has there no diplöe. It is likewise exceedingly thin in that part of the orbit of the eye which is nearest to the nose. Hence it is, that a wound in the eye, by a sword, or any other pointed instrument, is sometimes productive of immediate death. In these cases, the sword passing through the weak part of the bone, penetrates the brain, and divides the nerves at their origin; or perhaps opens some blood-vessel, the consequences of which are soon fatal.

We observe on the exterior surface of this bone five apophyses or processes, which are easily to be distinguished. One of these is placed at the bottom and narrowest part of the bone, and is called the nasal process, from its supporting the upper end of the bones of the nose. The four others are called angular or orbitar processes. They assist to form the orbits, which are the cavities on which the eyes are placed. In each of these orbits there are two processes, one at the interior or great angle, and the other at the exterior or little angle of the orbit. They are called the angular processes. Between these a ridge is extended in form of an arch, and on this the eyebrows are placed. It is called the orbitar or superciliary ridge, and in some measure covers and defends the globe of the eye. There is a hole in this for the passage of the frontal vessels and nerves. This arch is interrupted near the nose by a small pit, in which the tendon of the musculus obliquus major of the eye is fixed. From the under part of each superciliary ridge a thin plate runs a considerable way backwards, and has the name of *orbitar*; the external and fore part of this plate forms

(F) The bones of the fœtus being perfectly distinct, and the muscles in young persons not acting much, the shape of the head has been supposed to depend much on the management of children when very young. Vesalius, who has remarked the difference in people of different nations, observes, for instance, that the head of a Turk is conical, from the early use of the turban; whilst that of an Englishman is flattened by the chin-stay. Some of the latest physiologists suppose, with good reason, that this difference is chiefly owing to certain natural causes with which we are as yet unacquainted.

teology. forms a sinuosity for lodging the lachrymal gland. Between the orbitar plates there is a large discontinuation of the bone, which is filled up by the cribriform part of the os ethmoides.

On examining the inner surface of this bone at its under and middle part, we observe an elevation in form of a ridge, which has been called the *spinous process;* it ascends for some way, dividing the bone into two considerable fossæ, in which the anterior lobes of the brain are placed. To a narrow furrow in this ridge is attached the extremity of the falx, as the membrane is called, which divides the brain into two hemispheres. The furrow becoming gradually wider, is continued to the upper and back part of the bone. It has the falx fixed to it, and part of the longitudinal sinus lodged in it. Besides the two fossæ, there are many depressions, which appear like digital impressions, and owe their formation to the prominent circumvolutions of the brain.

In the fœtus, the forehead is composed of two distinct bones; so that in them the sagittal suture reaches from the os occipitis to the nose. This bone is almost everywhere composed of two tables and a diplöe. These two tables separating from each other under the eyes, form two cavities, one on each side of the face, called the frontal sinuses. These sinuses are lined with a soft membrane, called *membrana pituitaria.* In these sinuses a mucus is secreted, which is constantly passing through two small holes into the nostrils, which it serves to moisten.

The os frontis is joined by sutures to many of the bones of the head, viz. to the parietal, maxillary, and temporal bones; to the os ethmoides; os sphenoides; os unguis; and ossa nasi. The suture which connects it with the parietal bones is called the *coronal suture.*

13 f the pa- etal bones. The parietal bones are two in number; they are very thin, and even transparent in some places. The particular figure of each of these bones is that of an irregular square, bordered with indentations through its whole circumference, except at its lower part. It will be easily conceived, that these bones which compose the superior and lateral parts of the cranium, and cover the greatest part of the brain, form a kind of vault. On their inner surface we observe the marks of the vessels of the dura mater; and at their upper edge the groove for the superior longitudinal sinus.

The ossa parietalia are joined to each other by the sagittal suture; to the os sphenoides and ossa temporum by the squamous suture; to the os occipitis by the lambdoidal suture (G), so called from its resemblance to the Greek letter lambda; and to the os frontis by the coronal suture.

In the fœtus, the parietal bones are separated from the middle of the divided os frontis by a portion of the cranium then unossified.

14 f the occi- tal bone. The occipital bone forms the posterior and inferior parts of the skull; it approaches nearly to the shape of a lozenge, and is indented throughout three parts of its circumference.

There is a considerable hole in the inferior portion of this bone, called the *foramen magnum,* through which the medulla oblongata passes into the spine.—The nervi accessorii, and vertebral arteries, likewise pass through it. Behind the condyles are two holes for the passage of cervical veins into the lateral sinuses; and above them are two others for the passage of the eighth pair and accessory nerves out of the head. At the sides, and a little on the anterior part of the foramen magnum, are two processes, called the condyles, one on each side; they are of an oval figure, and are covered with cartilage. Osteology.

The external surface of this bone has a large transverse arched ridge, under which the bone is very irregular, where it affords attachment to several muscles. On examining its inner surface, we may observe two ridges in form of a cross; one ascending from near the foramen magnum to the top of the bone; the upper end of this, in which the falx is fixed, is hollow, for lodging the superior longitudinal sinus; and the under end has the third process of the dura mater fixed to it. The other ridge, which runs horizontally, is likewise hollow for containing the lateral sinuses. Four fossæ are formed by the cross, two above and two below. In the former are placed the posterior lobes of the brain, and in the latter the lobes of the cerebellum.

At the basis of the cranium, we observe the cuneiform process, (which is the name given to the great apophysis at the fore part of this bone); it serves for the reception of the medulla oblongata.

The os occipitis is of greater strength and thickness than either of the other bones of the head, though irregularly so; at its inferior part, where it is thinnest, it is covered by a great number of muscles.

This bone, from its situation, being more liable to be injured by falls than any other bone of the head, nature has wisely given it the greatest strength at its upper part, where it is most exposed to danger.

It is joined to the parietal bones by the lambdoidal suture, and to the ossa temporum by the additamentum of the temporal suture. It is likewise connected to the os sphenoides by the cuneiform process. It is by means of the os occipitis that the head is united to the trunk, the two condyles of this bone being connected to the superior oblique processes of the first vertebra of the neck.

15 Of the tem- poral bones. There are two temporal bones, one on each side.—We may distinguish in them two parts; one of which is called the *squamous* or *scaly part,* and other *pars petrosa* from its hardness. This last is shaped like a pyramid.

Each of these divisions affords processes and cavities: externally there are three processes; one anterior, called the *zygomatic process;* one posterior, called the *mastoid mamillary process,* from its resemblance to a nipple; and one inferior, called the *styloid process,* because it is shaped like a stiletto, or dagger.

The cavities are, 1. The meatus auditorius externus. 2. A large fossa which serves for the articulation of the lower jaw; it is before the meatus auditorius, and immediately under the zygomatic process. 3. The stylo-mastoid

(G) The lambdoidal suture is sometimes very irregular, being composed of many small sutures, which surround so many little bones called *ossa triquetra,* though perhaps improperly, as they are not always triangular.

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stylo-mastoid hole, so called from its situation between the styloid and mastoid processes; it is likewise styled the aqueduct of Fallopius, and affords a passage to the portio dura of the auditory or seventh pair of nerves. 4. Below, and on the fore part of the last foramen, we observe part of the jugular fossa, in which the beginning of the internal jugular vein is lodged. Anterior and superior to this fossa is the orifice of a foramen, through which passes the carotid artery. This foramen runs first upwards and then forwards, forming a kind of elbow, and terminates at the end of the os petrosum.—At this part of each temporal bone, we may observe the opening of the Eustachian tube, a canal which passes from the ear to the back part of the nose.

In examining the internal surface of these bones, we may remark the triangular figure of their petrous part which separates two fossæ; one superior and anterior; the other inferior and posterior: the latter of these composes part of the fossa, in which the cerebellum is placed; and the former, a portion of the least fossa for the basis of the brain. On the posterior side of the pars petrosa, we observe the meatus auditorius internus, into which enters the double nerve of the seventh pair. On the under side of this process, part of a hole appears, which is common to the temporal and occipital bones; through it the lateral sinus, the eighth pair, and accessory nerves, pass out of the head.

The pars petrosa contains several little bones called the bones of the ear; which, as they do not enter into the formation of the cranium, shall be described when we are treating of the organs of hearing.

The ossa temporum are joined to the ossa malarum, by the zygomatic sutures; to the parietal bones by the squamous sutures; to the os occipitis, by the lambdoidal suture; and to the sphenoid bone, by the suture of that name.

16
Of the os sphenoides.

This bone, from its situation amidst the other bones of the head, has been sometimes called *cuneiforme*. It is of a very irregular figure, and has been compared to a bat with its wings extended.

It is commonly divided into its middle part or body, and its sides or wings.

The fore part of the body has a spine or ridge, which makes part of the septum narium. The upper part of each wing forms a share of the temple. The fore part of this belongs to the orbit; while the under and back part, termed *spinous process*, is lodged in the base of the skull at the point of the pars petrosa. But two of the most remarkable processes are the pterygoid or aliform, one on each side of the body of the bone, and at no great distance from it. Each of these processes is divided into two wings, and of these the exterior one is the widest. The other terminates in a hook-like process.

The internal surface of this bone affords three fossæ. Two of these are formed by the wings of the bone, and make part of the lesser fossæ of the basis of the cranium. The third, which is smaller, is on the top of the body of the bone; and is called *sella turcica*, from its resemblance to a Turkish saddle. This fossa, in which the pituitary gland is placed, has posteriorly and anteriorly processes called the *clinoid processes*.

There are twelve holes in this bone, viz. six on each side. The first is the passage of the optic nerve and ocular artery; the second, or large slit, transmits the third, fourth, sixth, and first part of the fifth pair of nerves with the ocular vein; the third hole gives passage to the second branch of the fifth pair; and the fourth hole to the third branch of the fifth pair of nerves. The fifth hole is the passage of the artery of the dura mater. The sixth hole is situated above the pterygoid process of the sphenoid bone: through it a reflected branch of the second part of the fifth pair passes.

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Within the substance of the os sphenoides there are two sinuses separated by a bony plate. They are lined with the pituitary membrane; and, like the frontal sinuses, separate a mucus which passes into the nostrils.

The os sphenoides is joined to all the bones of the cranium; and likewise to the ossa maxillaria, ossa malarum, ossa palati, and vomer.

This bone makes part of the basis of the skull, assists in forming the orbits, and affords attachment to several muscles.

The os ethmoides is situated at the fore part of the basis of the cranium, and is of a very irregular figure. From the great number of holes with which it is pierced, it is sometimes called *os cribriforme*, or sieve-like bone.

17
Of the os ethmoides or cribriforme.

It consists of a middle part and two sides. The middle part is formed of a thin bony plate, in which are an infinite number of holes that afford a passage to filaments of the olfactory nerve. From the middle of this plate, both on the outside, and from within, there rises up a process, which may be easily distinguished. The inner one is called *crista galli*, from its supposed resemblance to a cock's comb. To this process the falx of the dura mater is attached. The exterior process, which has the same common basis as the crista galli, is a fine lamella which is united to the vomer; and divides the cavity of the nostrils, though unequally, it being generally a little inclined to one side.

The lateral parts of this bone are composed of a cellular substance; and these cells are so very intricate, that their figure or number cannot be described. Many writers have on this account called this part of the bone the *labyrinth*. These cells are externally covered with a very thin bony lamella. This part of the bone is called the *os planum*, and forms part of the orbit.

The different cells of this bone, which are numerous, and which are everywhere lined with the pituitary membrane, evidently serve to enlarge the cavity of the nose, in which the organ of smelling resides.

This bone is joined to the os sphenoides, os frontis, ossa maxillaria, ossa palati, ossa nasi, ossa unguis, and vomer.

The ancients, who considered the brain as the seat of all the humours, imagined that this viscus discharged its redundant moisture through the holes of the ethmoid bone. And the vulgar still think, that abscesses of the brain discharge themselves through the mouth and ears, and that snuff is liable to get into the head; but neither snuff nor the matter of an abscess are more capable of passing through the cribriform bone, than the serosity which they supposed was discharged through it in a common cold. All the holes of the ethmoid bone are filled up with the branches of the olfactory nerve. Its inner part is likewise covered with the dura mater, and its cells are everywhere lined with

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with the pituitary membrane; so that neither matter nor any other fluid can possibly pass through this bone either externally or internally. Matter is indeed sometimes discharged through the nostrils; but the seat of the disease is in the sinuses of the nose, and not in the brain; and imposthumations are observed to take place in the ear, which suppurate and discharge themselves externally.

Before we leave the bones of the head, we wish to make some general observations on its structure and figure. As the cranium might have been composed of a single bone, the articulation of its several bones being absolutely without motion, it may he asked perhaps, Why such a multiplicity of bones, and so great a number of sutures? Many advantages may possibly arise from this plurality of bones and sutures, which may not yet have been observed. We are able, however, to point out many useful ends, which could only be accomplished by this peculiarity of structure. In this, as in all the other works of nature, the great wisdom of the Creator is evinced, and cannot fail to excite our admiration and gratitude.

The cranium, by being divided into several bones, grows much faster and with greater facility, than if it was composed of one piece only. In the fœtus, the bones, as we have before observed, are perfectly distinct from each other. The ossification begins in the middle of each bone, and proceeds gradually to the circumference. Hence the ossification, and of course the increase of the head, is carried on from an infinite number of points at the same time, and the bones consequently approach each other in the same proportion. To illustrate this doctrine more clearly, if it can want further illustration, suppose it necessary for the parietal bones which compose the upper part of the head, to extend their ossification, and form the fore part of the head likewise.—Is it not evident, that this process would be much more tedious than it is now, when the os frontis and the parietal bones are both growing at the same time? Hence it happens, that the heads of young people, in which the bones begin to touch each other, increase slowly; and that the proportionate increase of the volume of the head is greater in three months in the fœtus, than it is perhaps in twenty-four months at the age of fourteen or fifteen years.

The sutures, exclusive of their advantages in suspending the processes of the dura mater, are evidently of great utility in preventing the too great extent of fractures of the skull.—Suppose, for instance, that by a fall or blow, one of the bones of the cranium becomes fractured. The fissure, which in a head composed of only one bone, would be liable to extend itself through the whole of it, is checked and sometimes perhaps stopped by the first suture it meets, and the effects of the injury are confined to the bone on which the blow was received. Ruysch indeed, and some others, will not allow the sutures to be of any such use; but cases have been met with where they seemed to have had this effect, and in young subjects their utility in this respect must be still more obvious.

The spherical shape of the head seems likewise to render it more capable of resisting external violence than any other shape would do. In a vault, the parts mutually support and strengthen each other, and this happens in the cranium.

§ 2. *Proper Bones of the Face.*

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18 Of the bones of the face.

The face, which consists of a great number of bones, is commonly divided into the upper and lower jaws. The upper jaw consists of thirteen bones, exclusive of the teeth. Of these, six are placed on each side of the maxilla superior, and one in the middle.

The bones, which are in pairs, are the ossa malarum, ossa maxillaria, ossa nasi, ossa unguis, ossa palati, and ossa spongiosa inferiora. The single bone is the vomer.

19 Of the ossa malarum.

These are the prominent square bones which are placed under the eyes, forming parts of the orbits and the upper part of the cheeks. Each of them affords three surfaces: one exterior and a little convex; a second superior and concave, forming the inferior part and sides of the orbit; and a third posterior, irregular, and hollowed for the lodgment of the lower part of the temporal muscle.

The angles of each bone form four processes, two of which may be called *orbitar processes:* of these the upper one is joined by suture to the os frontis, and that below to the maxillary bone. The third is connected with the os sphenoides by means of the transverse suture; and the fourth is joined to the zygomatic process of the temporal bone, with which it forms the zygoma.

20 Of the ossa maxillaria superiora.

These bones, which are of a very irregular figure, are so called because they form the most considerable portion of the upper jaw. They are two in number, and generally remain distinct through life.

Of the many processes which are to be seen on these bones, and which are connected with the bones of the face and skull, we shall describe only the most remarkable.

One of these processes is at the upper and fore part of the bone, making part of the side of the nose, and called the *nasal process.* Another forms a kind of circular sweep at the inferior part of the bone, in which are the alveoli or sockets for the teeth: this is called the *alveolar process.* A third process is united to the os malæ on each side. Between this and the nasal process there is a thin plate, which forms a share of the orbit, and lies over a passage for the superior maxillary vessels and nerves.—The alveolar process has posteriorly a considerable tuberosity on its internal surface, called the *maxillary tuberosity.*

Behind the alveolar process we observe two horizontal lamellæ, which uniting together, form part of the roof of the mouth, and divide it from the nose. The hollowness of the roof of the mouth is owing to this partition's being seated somewhat higher than the alveolar process.—At the fore part of the horizontal lamellæ there is a hole called *foramen incisivum,* through which small blood vessels and nerves go between the mouth and nose.

In viewing these bones internally, we observe a fossa in the inferior portion of the nasal process, which, with the os unguis and os spongiosum inferius, forms a passage for the lachrymal duct.

Where these two bones are united to each other, they project somewhat upwards and forwards, leaving between them a furrow, into which the lower portion of the septum nasi is admitted.

Each of these bones being hollow, a considerable si-

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nus is formed under its orbitar part. This cavity, which is usually named after Highmore, though it was described by Fallopius and others before his time, is lined with the pituitary membrane. It is intended for the same purposes as the other sinuses of the nose, and opens into the nostrils.

The ossa maxillaria are connected with the greater part of the bones of the face and cranium, and assist in forming not only the cheeks, but likewise the palate, nose, and orbits.

21 Of the ossa nasi. The ossa nasi form two irregular squares. They are thicker and narrower above than below. Externally they are somewhat convex, and internally slightly concave. These bones constitute the upper part of the nose. At their fore part they are united to each other, above to the os frontis, by their sides to the ossa maxillaria superiora, posteriorly and interiorly to the septum narium, and below to the cartilages that compose the rest of the nostrils.

22 Of the ossa unguis. These little transparent bones owe their name to their supposed resemblance to a finger nail. Sometimes they are called *ossa lachrymalia*, from their concurring with the nasal process of each maxillary bone in forming a lodgment for the lachrymal sac and duct.

The ossa unguis are of an irregular figure. Their external surface consists of two smooth parts, divided by a middle ridge. One of these parts, which is concave and nearest to the nose, serves to support the lachrymal sac and part of the lachrymal duct. The other, which is flat, forms a small part of the orbit.

23 Of the ossa palati. Each of these bones is connected with the os frontis, os ethmoides, and os maxillare superius.

These bones, which are situated at the back part of the roof of the mouth, between the os sphenoides and the ossa maxillaria superiora, are of a very irregular shape, and serve to form the nasal and maxillary fossa, and a small portion of the orbit. Where they are united to each other, they rise up into a spine on their internal surface. This spine appears to be a continuation of that of the superior maxillary bones, and helps to form the septum narium.

These bones are joined to the ossa maxillaria superiora, os ethmoides, os sphenoides, and vomer.

24 Of the vomer. This bone derives its name from its resemblance to a ploughshare. It is a long and flat bone, somewhat thicker at its back than at its fore part. At its upper part we observe a furrow extending through its whole length. The posterior and largest part of this furrow receives a process of the sphenoid bone. From this the furrow advances forwards, and becoming narrower and shallower, receives some part of the nasal lamella ethmoidea: the rest serves to support the middle cartilage of the nose.

The inferior portion of this bone is placed on the nasal spine of the maxillary and palate bones, which we mentioned in our description of the ossa palati.

The vomer is united to the os sphenoides, os ethmoides, ossa maxillaria superiora, and ossa palati. It forms part of the septum narium, by dividing the back part of the nose into two nostrils.

25 Of the ossa spongiosa inferiora. The parts which are usually described by this name, do not seem to deserve to be distinguished as distinct bones, except in young subjects. They consist of a spongy lamella in each nostril, which is united to the spongy lamina of the ethmoid bone, of which they are by some considered as a part. Osteology.

Each of these lamellæ is longest from behind forwards; with its convex surface turned towards the septum narium, and its concave part towards the maxillary bone, covering the opening of the lachrymal duct into the nose.

These bones are covered with the pituitary membrane; and besides their connexion with the ethmoid bone, are joined to the ossa maxillaria superiora, ossa palati, and ossa unguis.

26 Of the maxilla inferior. The maxilla inferior, or lower jaw, which in its shape resembles a horse shoe, consists of two distinct bones in the fœtus; but these unite together soon after birth, so as to form only one bone. The upper edge of this bone, like the os maxillare superius, has an alveolar process, furnished with sockets for the teeth.

On each side the posterior part of the bone rises almost perpendicularly into two processes. The highest of these, called the coronoid process, is pointed and thin, and serves for the insertion of the temporal muscle. The other, or condyloid process, as it is called, is shorter and thicker, and ends in an oblong rounded head, which is received into a fossa of the temporal bone, and is formed for a moveable articulation with the cranium. This joint is furnished with a moveable cartilage. At the bottom of each coronoid process, on its inner part, we observe a foramen extending under the roots of all the teeth, and terminating at the outer surface of the bone near the chin. Each of these canals transmits an artery, vein, and nerve, from which branches are sent off to the teeth.

The lower jaw is capable of a great variety of motion. By sliding the condyles from the cavity towards the eminences on each side, we bring it horizontally forwards, as in biting; or we may bring the condyles only forward, and tilt the rest of the jaw backward, as in opening the mouth. We are likewise able to slide the condyles alternately backwards and forwards from the cavity to the eminence, and *vice versa*, as in grinding the teeth. The cartilages, by adapting themselves to the different inequalities in these several motions of the jaw, serve to secure the articulation, and to prevent any injuries from friction.

The alveolar processes are composed of an outer and inner bony plate, united together by thin partitions, which at the fore part of the jaw divide the processes into as many sockets as there are teeth. But at the back part of the jaw, where the teeth have more than one root, we find a distinct cell for each root. In both jaws these processes begin to be formed with the teeth; they likewise accompany them in their growth, and gradually disappear when the teeth are removed.

§ 3. *Of the Teeth.*

27 Of the teeth. The teeth are bones of a particular structure, formed for the purposes of mastication and the articulation of the voice. It will be necessary to consider their composition and figure, their number and arrangement, and the time and order in which they appear.

In each tooth we may distinguish a body, a neck, and a root or fangs.

The body of the tooth is that part which appears above

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above the gums. The root is fixed into the socket, and the neck is the middle part between the two.

The teeth are composed of two substances, viz. enamel and bone. The enamel, or the vitreous or cortical part of the tooth, is a white and very hard and compact substance peculiar to the teeth, and appears fibrous or striated when broken. This substance is thickest on the grinding surface, and becoming gradually thinner, terminates insensibly at the neck of the tooth. Ruysch * affirmed, that he could trace the arteries into the hardest part of the teeth; Leeuwenhoek † suspected the fibres of the enamel to be so many vessels; and Monro ‡ says, he has frequently injected the vessels of the teeth in children, so as to make the inside of the cortex appear perfectly red. But it is certain, that it is not tinged by a madder diet, and that no injection will ever reach it, so that it has no appearance of being vascular ||.

* *Thesaur.* 10. N° 27.
† *Arcan. Natur. continuat. Epistol.*
‡ *Anat. of the Human Bones.*
|| *Hunter on the Teeth.*

The bony part, which composes the inner substance of the body, neck, and root of the tooth, resembles other bones in its structure, but it is much harder than the most compact part of bones in general. As a tooth when once formed receives no tinge from a madder diet, and as the minutest injections do not penetrate into its substance, this part of a tooth has, like the enamel, been supposed not to be vascular. But when we consider that the fangs of a tooth are invested by a periosteum, and that the swellings of these fangs are analogous to the swellings of other bones, we may reasonably conclude, that there is a similarity of structure; and that this bony part has a circulation through its substance; although from its hardness we are unable to demonstrate its vessels.

In each tooth we find an inner cavity, into which enter an artery, vein, and nerve. This cavity begins by a small opening, and becoming larger, terminates in the body of the tooth. In advanced life this hole sometimes closes, and the tooth is of course rendered insensible.

The periosteum surrounds the teeth from their fangs to a little beyond their bony sockets, where we find it adhering to the gums. This membrane, while it encloses the teeth, serves at the same time to line the sockets; so that it may be considered as common to both.

The teeth are likewise secured in their sockets by means of the gums; a red, vascular, firm, and elastic substance, that possesses but little sensibility. In the gums of infants we find a hard ridge extending through their whole length, but no such ridge is to be seen in old people who have lost their teeth.

The number of the teeth in both jaws at full maturity, usually varies from twenty-eight to thirty-two. They are commonly divided into three classes, viz. incisores, canini, and grinders or molares (H). The incisores are the four teeth in the fore part of each jaw. They have each of them two surfaces; one anterior and convex, the other posterior and slightly concave, both of which terminate in a sharp edge. They are called *incisores* from their use in dividing the food. They are usually broader and thicker in the upper than in the under jaw; and, by being placed somewhat obliquely, generally fall over the latter.

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The canini derive their name from the resemblance to a dog's tusks, being the longest of all the teeth. We find one on each side of the incisores, so that there are two canini in each jaw. Their fang resembles that of the incisores, but is much larger; and in their shape they appear like an incisor with its edge worn off, so as to terminate in a narrow point.

These teeth not being calculated for cutting and dividing the food like the incisores, or for grinding it like the molares, seem to be intended for laying hold of substances (I).

The molares or grinders, of which there are ten in each jaw, are so called, because from their shape and size they are fitted for grinding the food. Each of the incisores and canini is furnished only with one fang; but in the molares of the under jaw we constantly find two fangs, and in those of the upper jaw three fangs. These fangs are sometimes separated into two points, and each of these points has sometimes been described as a distinct fang.

The two first of the molares, or those nearest to the canine teeth on each side, differ from the other three, and are with great propriety named *bicuspides* by Mr Hunter. They have sometimes only one root, and seem to be of a middle nature between the incisores and the larger molares. The two next are much larger. The fifth or last grinder on each side is smaller and shorter than the rest; and from its not cutting the gum till after the age of twenty, and sometimes not till much later in life, it is called *dens sapientiæ*.

There is in the structure and arrangement of all these teeth an art which cannot be sufficiently admired. To understand it properly, it will be necessary to consider the under jaw as a kind of lever, with its fixed points at its articulations with the temporal bones: it will be right to observe, too, that its powers arise from its different muscles, but in elevations chiefly from the temporalis and masseter; and that the aliment constitutes the object of resistance. It will appear, then, that the molares, by being placed nearest the centre of motion, are calculated to press with a much greater force than the other teeth, independent of the grinding powers which they possess by means of the pterygoid muscles; and that it is for this reason we put between them any hard body we wish to break.

The canini and incisores are placed farther from this point, and of course cannot exert so much force; but they

(H) Mr Hunter has thought proper to vary this division. He retains the old name of *incisores* to the four fore teeth, but he distinguishes the canine teeth by the name of the *cuspidati*. The two teeth which are next to these, and which have been usually ranked with the molares, he calls the *bicuspides*; and he gives the name of *grinders* only to the three last teeth on each side.

(I) Mr Hunter remarks of these teeth, that we may trace in them a similarity in shape, situation, and use, from the most imperfectly carnivorous animal, which we believe to be the human species, to the lion, which is the most perfectly carnivorous.

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they are made for cutting and tearing the food, and this form seems to make amends for their deficiency in strength.

There are examples of children who have come into the world with two, three, and even four teeth: but these examples are very rare; and it is seldom before the seventh, eighth, or ninth month after birth, that the incisores, which are the first formed, begin to pass through the gum. The symptoms of dentition, however, in consequence of irritation from the teeth, frequently take place in the fourth or fifth month. About the twentieth or twenty-fourth month, the canini and two molares make their appearance.

The dangerous symptoms that sometimes accompany dentition, are owing to the pressure of the teeth on the gum, which they irritate so as to excite pain and inflammation. This irritation seems to occasion a gradual wasting of the gum at the part, till at length the tooth makes its appearance.

The symptoms are more or less alarming, in proportion to the resistance which the gum affords to the teeth, and according to the number of teeth which may chance to seek a passage at the same time. Were they all to appear at once, children would fall victims to the pain and excessive irritation; but nature has so very wisely disposed them, that they usually appear one after the other, with some distance of time between each. The first incisor that appears is generally in the lower jaw, and is followed by one in the upper jaw. Sometimes the canini, but more commonly one of the molares, begins to pass through the gum first.

These 20 teeth, viz. eight incisores, four canini, and eight molares, are called *temporary* or *milk teeth*, because they are all shed between the age of seven and 14, and are succeeded by what are called the *permanent* or *adult teeth*. The latter are of a firmer texture, and have larger fangs.

These adult teeth being placed in a distinct set of alveoli, the upper sockets gradually disappear, as the under ones increase in size, till at length the temporary or upper teeth, having no longer any support, consequently fall out.

To these 20 teeth which succeed the temporary ones, 12 others are afterwards added, viz. three molares on each side in both jaws: and in order to make room for this addition, we find that the jaws gradually lengthen in proportion to the growth of the teeth; so that with 20 teeth, they seem to be as completely filled as they are afterwards with 32. This is the reason why the face is rounder and flatter in children than in adults.

With regard to the formation of the teeth, we may observe, that in a fœtus of four months, the alveolar process appears only as a shallow longitudinal groove, divided by minute ridges into a number of intermediate depressions; in each of which we find a small pulpy substance, surrounded by a vascular membrane. This pulp gradually ossifies, and its lower part is lengthened out to form the fang. When the bony part of the tooth is formed, its surface begins to be incrusted with the enamel. How the latter is formed and deposited, we are not yet able to determine.

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The rudiments of some of the adult teeth begin to be formed at a very early period, for the pulp of one of the incisores may generally be perceived in a fœtus of eight months, and the ossification begins in it soon after birth. The first bicuspis begins to ossify about the fifth or sixth, and the second about the seventh year. The first adult grinder cuts the gum about the 12th, the second about the 18th, and the third, or *dens sapientiæ*, usually between the 20th and 30th year.

The teeth, like other bones, are liable to be affected by disease. Their removal is likewise the natural consequence of old age; for as we advance in life, the alveoli fill up, and the teeth, especially the incisores, fall out. When this happens, the chin projects forward, and the face is much shortened.

§ 4. *Of the Os Hyoides* (K).

28 The os hyoides, which is placed at the root of the tongue, was so called by the ancients on account of its supposed resemblance to the Greek letter *υ*.

It will be necessary to distinguish in it, its body, horns, and appendices.

The body, which is the middle and broadest part of the bone, is so placed that it may be easily felt at the fore part of the throat. Anteriorly it is irregularly convex, and its inner surface is unequally concave. Its cornua, or horns, which are flat and a little bent, being much longer than the body part, may be described as forming the sides of the *υ*. The appendices, or little horns, as they are called by M. Winslow and some other writers, are two processes which rise up from the articulations of the cornua with the body, and are usually connected with the styloid process on each side by means of a ligament.

The uses of this bone are to support the tongue and afford attachment to a great number of muscles; some of which perform the motions of the tongue, while others act on the larynx and fauces.

Sect. III. *Of the Bones of the Trunk.*

29 The trunk of the skeleton consists of the spine, the thorax, and the pelvis.

§ 1. *Of the Spine.*

30 The spine is composed of a great number of bones called *vertebræ*, forming a long bony column, in figure not much unlike the letter *ſ*. This column, which extends from the head to the lower part of the body, may be said to consist of two irregular and unequal pyramids, united to each other in that part of the loins where the last lumbar vertebra joins the os sacrum.

The vertebræ of the upper and longest pyramid are called

(K) This bone is very seldom preserved with the skeleton, and cannot be included amongst the bones of the head or in any other division of the skeleton. Thomas Bartholin has perhaps very properly described it among the parts contained in the mouth; but the generality of anatomical writers have placed it, as it is here, after the bones of the face.

Osteology. called *true vertebræ*, in contradistinction to those of the lowermost pyramid, which, from their being immoveable in the adult, are styled *false vertebræ*. It is upon the bones of the spine that the body turns; and it is to this circumstance they owe their name, which is derived from the Latin verb *vertere*, "to turn."

The true vertebræ are divided into three classes, of cervical, dorsal, and lumbar vertebræ.—The false vertebræ consist of the os sacrum and os coccygis.

In each vertebra, as in other bones, it will be necessary to remark the body of the bone, its processes, and cavities.

The body, which is convex before, and concave behind, where it assists in forming the cavity of the spine, may be compared to part of a cylinder cut off transversely.

Each vertebra affords seven processes. The first is at the back part of the vertebra, and from its shape and direction is named the *spinous process*. On each side of this are two others, which, from their situation with respect to the spine, are called *transverse processes*. The four others are styled *oblique* or *articular processes*. They are much smaller than the spinous or transverse ones. Two of them are placed on the upper, and two on the lower part of each vertebra, rising from near the basis of each transverse process. They have gotten the name of *oblique processes*, from their situation with respect to the processes with which they are articulated; and they are sometimes styled *articular processes*, from the manner in which they are articulated with each other; the two superior processes of one vertebra being articulated with the two inferior processes of the vertebra above it. Each of these processes is covered with cartilage at its articulation, and their articulations with each other are by a species of ginglimus.

In each vertebra, between its body and its processes, we find a hole large enough to admit a finger. These holes are foramina, correspond with each other through all the vertebræ, and form the long bony channel in which the spinal marrow is placed. We may likewise observe four notches in each vertebra. Two of these notches are at the upper, and two at the lower part of the bone, between the oblique processes and the body of the vertebra. Each of these notches meeting with a similar opening in the vertebra above or below it, forms a foramen for the passage of blood vessels, and of the nerves out of the spine.

The bones of the spine are united together by means of a substance, which in young subjects appears to be of a ligamentous, but in adults more of a cartilaginous nature. This intervertebral substance, which forms a kind of partition between the several vertebræ, is thicker and more flexible between the lumbar vertebræ than in the other parts of the spine, the most considerable motions of the trunk being performed on those vertebræ. This substance being very elastic, the extension and flexion of the body, and its motion backwards and forwards, or to either side, are performed with great facility. This elasticity seems to be the reason why people who have been long standing, or have carried a considerable weight, are found to be shorter than when they have been long in bed. In the two first instances the intervertebral cartilages (as they are usually called) are evidently more exposed to compression than when we are in bed in a horizontal posture.

In advanced life these cartilages become shrivelled, Osteology. and of course lose much of their elasticity. This may serve to account for the decrease in stature and the stooping forward which are usually to be observed in old people.

Besides the connexion of the several vertebræ by means of this intervertebral substance, there are likewise many strong ligaments, both external and internal, which unite the bones of the spine to each other. Their union is also strengthened by a variety of strong muscles that cover and surround the spine.

The bones of the spine are found to diminish in density, and to be less firm in the texture, in proportion as they increase in bulk; so that the lowermost vertebræ, though the largest, are not so heavy in proportion as the upper ones. By this means the size of these bones is increased without adding to their weight; a circumstance of no little importance in a part like the spine, which, besides flexibility and suppleness, seems to require lightness as one of its essential properties.

In very young children, each vertebra consists of three bony pieces united by cartilages which afterwards ossify.

31 Vertebræ of the neck.

There are seven vertebræ of the neck—they are of a firmer texture than the other bones of the spine. Their transverse processess are forked for the lodgment of muscles, and at the bottom of each we observe a foramen, through which pass the cervical artery and vein. The first and second of these vertebræ must be described more particularly. The first approaches almost to an oval shape.—On its superior surface it has two cavities which admit the condyles of the occipital bone with which it is articulated. This vertebra, which is called *atlas* from its supporting the head, cannot well be described as having either body or spinous process, being a kind of bony ring. Anteriorly, where it is articulated to the odontoid process of the second vertebra, it is very thin. On its upper surface it has two cavities which admit the condyles of the occipital bone. By this connexion the head is allowed to move forwards and backwards, but has very little motion in any other direction,

The second vertebra has gotten the name of *dentata*, from its having, at its upper and anterior part, a process called the *odontoid* or *tooth-like process*, which is articulated with the atlas, to which this second vertebra may be said to serve as an axis. This odontoid process is of a cylindrical shape, somewhat flattened, however, anteriorly and posteriorly. At its fore part where it is received by the atlas, we may observe a smooth, convex, articulating surface. It is by means of this articulation that the head performs its rotatory motion, the atlas in that case moving upon this odontoid process as upon a pivot. But when this motion is in any considerable degree, or, in other words, when the head moves much either to the right or left, all the cervical vertebræ seem to assist, otherwise the spinal marrow would be in danger of being divided transversely by the first vertebra.

32 Vertebræ of the back.

The spinous process of each of the cervical vertebræ is shorter, and their articular processes more oblique, than in the other bones of the spine.

These 12 vertebræ are of a middle size between those of the neck and loins. At their sides we may observe two depressions, one at the upper and the other at the

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lower part of the body of each vertebra; which uniting with similar depressions in the vertebræ above and below, form articulating surfaces, covered with cartilages, for receiving the heads of the ribs; and at the fore part of their transverse process (excepting the two last) we find an articulating surface for receiving the tuberosity of the ribs.

33 Lumbar vertebræ.

These five vertebræ differ only from those of the back in their being larger, and in having their spinous processes at a greater distance from each other. The most considerable motions of the trunk are made on these vertebræ; and these motions could not be performed with so much ease, were the processes placed nearer to each other.

34 Os sacrum.

The os sacrum, which is composed of five or six pieces in young subjects, becomes one bone in more advanced age.

It is nearly of a triangular figure, its inferior portion being bent a little forwards. Its superior part has two oblique processes, which are articulated with the last of the lumbar vertebræ; and it has likewise commonly three small spinous processes, which gradually become shorter, so that the lowermost is not so long as the second, nor the second as the uppermost. Its transverse processes are formed into one oblong process, which becomes gradually smaller as it descends. Its concave or anterior side is usually smooth, but its posterior convex side has many prominences (the most remarkable of which are the spinous processes just now mentioned), which are filled up and covered with the muscular and tendinous parts behind.

This bone has five pair of holes, which afford a passage to blood vessels, and likewise to the nerves that are derived from the spinal marrow, which is continued even here, being lodged in a triangular cavity, that becomes smaller as it descends, and at length terminates obliquely at the lower part of this bone. Below the third division of the os sacrum, this canal is not completely bony as the rest of the spine, being secured at its back part only by a very strong membrane, so that a wound at this part must be extremely dangerous.

The os sacrum is united laterally to the ossa innominata or hip-bones, and below to the coccyx.

35 Os coccyx.

The coccyx, which, like the os sacrum, is in young people made up of three or four distinct parts, usually becomes one bone in the adult state.

It serves to support the intestinum rectum; and, by its being capable of some degree of motion at its articulation with the sacrum, and being like that bone bent forwards, we are enabled to sit with ease.

This bone is nearly of a triangular shape, being broadest at its upper part, and from thence growing narrower to its apex, where it is not bigger than the little finger.

It has got its name from its supposed resemblance to a cuckow's beak. It differs greatly from the vertebræ, being commonly without any processes, and having no cavity for the spinal marrow, or foramina for the transmission of nerves.

The spine, of which we have now finished the anatomical description, is destined for many great and important uses. The medulla spinalis is lodged in its bony canal secure from external injury. It serves as a defence to the abdominal and thoracic viscera, and at the same time supports the head, and gives a general firmness to the whole trunk.

Osteology.

We have before compared it to the letter *f*, and its different turns will be found to render it not very unlike the figure of that letter.—In the neck we see it projecting somewhat forward to support the head, which, without this assistance, would require a greater number of muscles. Lower down, in the thorax, we find it taking a curved direction backwards, and of course increasing the cavity of the chest. After this, in the loins, it again projects forwards in a direction with the centre of gravity, by which means we are easily enabled to keep the body in an erect posture, for otherwise we should be liable to fall forwards. Towards its inferior extremity, however, it again recedes backward, and thus assists in forming the pelvis, the name given to the cavity in which the urinary bladder, intestinum rectum, and other viscera are placed.

If this bony column had been formed only of one piece, it would have been much more easily fractured than it is now: and by confining the trunk to a stiff situation, a variety of motions would have been altogether prevented, which are now performed with ease by the great number of bones of which it is composed.

It is firm, and yet to this firmness there is added a perfect flexibility. If it be required to carry a load upon the head, the neck becomes stiff with the assistance of its muscles, and accommodates itself to the load, as if it was composed only of one bone.—In stooping likewise, or in turning to either side, the spine turns itself in every direction, as if all its bones were separated from each other.

In a part of the body like the spine, that is made up of so great a number of bones, and intended for such a variety of motion, there must be a greater danger of dislocation than fracture; but we shall find, that this is very wisely guarded against in every direction by the processes belonging to each vertebra, and by the ligaments, cartilages, &c. by which these bones are connected with each other.

§ 2. *Of the Bones of the Thorax.*

36

The thorax, or chest, is composed of many bones, viz. the sternum which is placed at its anterior part, twelve ribs on each side which make up its lateral parts, and the dorsal vertebræ which constitute its posterior part. These last have been already described.

37 Of the sternum.

The sternum is the long bone which extends itself from the upper to the lower part of the breast anteriorly, and to which the ribs and the clavicles are articulated.

In children it is composed of several bones united by cartilages; but as we advance in life, most of these cartilages ossify, and the sternum in the adult state is found to consist only of three pieces, and sometimes becomes one bone. It is however generally described as being composed of three parts—one superior, which is broad, thick, and short; and one in the middle, which is thinner, narrower, and longer than the other.

It terminates at its lower part by a third piece, which is called the *xyphoid*, or *sword-like cartilage*, from its supposed resemblance to the blade of a sword, and because in young subjects it is commonly in a cartilaginous state.

We

Osteology. We have already observed, that this bone is articulated with the clavicle on each side. It is likewise joined to the fourteen true ribs, viz. seven on its right and seven on its left side.

38 The ribs. The ribs are bones shaped like a bow, forming the sides of the chest. There are twelve on each side. They are distinguished into true and false ribs: The seven upper ribs which are articulated to the sternum are called *true ribs*, and the five lower ones that are not immediately attached to that bone are called *false ribs*.

On the inferior and interior surface of each rib, we observe a sinuosity for the lodgment of an artery, vein, and nerve.

The ribs are not bony through their whole length, their anterior part being cartilaginous. They are articulated with the vertebræ and sternum. Every rib (or at least the greater number of them) has at its posterior part two processes; one at its extremity, called the *head of the rib*, by means of which it is articulated with the body of two vertebræ; and another, called its tuberosity, by which it is articulated with the transverse process of the lowest of these two vertebræ. The first rib is not articulated by its extremity to two vertebræ, being simply attached to the upper part of the first vertebra of the back. The seven superior or true ribs are articulated anteriorly with the sternum by their cartilages; but the false ribs are supported in a different manner—the eighth, which is the first of these ribs, being attached by its cartilages to the seventh; the ninth to the eighth, &c.

The two lowermost ribs differ likewise from all the rest in the following particulars: They are articulated only with the body of a vertebra, and not with a transverse process; and anteriorly, their cartilage is loose, not being attached to the cartilages of the other ribs; and this seems to be, because the most considerable motions of the trunk are not performed on the lumbar vertebræ alone, but likewise on the two last vertebræ of the back: so that if these two ribs had been confined at the fore part like the other ribs, and had been likewise articulated with the bodies of two vertebræ, and with the transverse processes, the motion of the two last vertebræ, and consequently of the whole trunk, would have been impeded.

The ribs help to form the cavity of the thorax; they afford attachment to different muscles; they are useful in respiration; and they serve as a security to the heart and lungs.

§ 3. *Of the Bones of the Pelvis.*

39 The pelvis is composed of the os sacrum, os coccygis, and two ossa innominata. The two first of these bones were included in the account of the spine, to which they more properly belong.

In children, each os innominatum is composed of three distinct bones; but as we advance in life the intermediate cartilages gradually ossify, and the marks of the original separation disappear, so that they become one irregular bone; still, however, continuing to retain the names of ilium, ischium, and pubis, by which their divisions were originally distinguished, and to be described as three different bones by the generality of anatomists. The os ilium forms the upper and most considerable part of the bone, the os ischium its lower and posterior portion, and the os pubis its fore part. Osteology.

40 Os ilium. The os ilium, or haunch-bone, is articulated posteriorly to the os sacrum by a firm cartilaginous substance, and is united to the os pubis before and to the os ischium below. Its superior portion is thin, and terminates in a ridge called the crista or spine of the ilium, and more commonly known by the name of the haunch. This crista rises up like an arch, being turned somewhat outwards, so as to resemble the wings of a phaeton.

Externally this bone is unequally prominent and hollowed for the lodgment of muscles; internally we find it smooth and concave. At its lower part there is a considerable ridge on its inner surface. This ridge extends from the os sacrum, and corresponds with a similar prominence both on that bone and the ischium; forms with the inner part of the ossa pubis what in midwifery is termed the brim of the pelvis.

The crista, or spine, which at first is an epiphysis, has two considerable tuberosities; one anteriorly, and the other posteriorly, which is the largest of the two: These, from their projecting more than the parts of the bone below them, have gotten the name of spinal processes. From the anterior spinous process, the sartorius and tensor vaginæ femoris muscles have their origin; and below the posterior process we observe a considerable niche in the bone, which, in the recent subject, is formed into a large foramen, by means of a strong ligament that is stretched over its lower part from the os sacrum to the sharp-pointed process of the ischium. This hole affords a passage to the great sciatic nerve, and to the posterior crural vessels under the pyriform muscle, part of which likewise passes out here.

41 Os ischium. The os ischium, or hip-bone, which is of a very irregular figure, constitutes the lower lateral parts of the pelvis, and is commonly divided into its body, tuberosity, and ramus. The body forms the lower and most considerable portion of the acetabulum, and sends a sharp-pointed process backwards, called the spine of the ischium. To this process the ligament adheres, which was just now spoken of, as forming a foramen for the passage of the sciatic nerve. The tuberosity, which is the lowest part of the trunk, and supports us when we sit, is large and irregular, affording origin to several muscles. From this tuberosity we find the bone becoming thinner and narrower. This part, which has the name of ramus or branch, passes forwards and upwards, and concurs with the ramus of the os pubis, to form a large hole called the *foramen magnum ischii*, or *thyroideum*, as it is sometimes named from its resemblance to a door or shield. This hole, which in the recent subject is closed by a strong membrane called the obturator ligament, affords through its whole circumference attachment to muscles. At its upper part where we observe a niche in the bone, it gives passage to the obturator vessels and nerves, which go to the inner part of the thigh. Nature seems everywhere to avoid an unnecessary weight of bone, and this foramen, no doubt, serves to lighten the bones of the pelvis.

42 Os pubis. The os pubis or share-bone, which with its fellow forms the fore part of the pelvis, is the smallest division of the os innominatum. It is united to its fellow by

Osteology. by means of a strong cartilage, which forms what is called the symphysis pubis.

In each os pubis we may distinguish the body of the bone, its angle and ramus. The body or outer part is united to the os ilium. The angle comes forwards to form the symphysis, and the ramus is a thin process which unites with the ramus of the ischium, to form the foramen thyroideum.

The three bones we have described as composing each os innominatum, all assist in forming the acetabulum, in which the head of the os femoris is received.

This cavity is everywhere lined with a smooth cartilage, excepting at its inner part, where we may observe a little fossa, in which are lodged the mucilaginous glands of the joint. We may likewise notice the pit or depression made by the round ligament, as it is improperly called, which, by adhering to this cavity and to the head of the thigh-bone, helps to secure the latter in the socket.

These bones, which are united to each other and to the spine, by many very strong ligaments, serve to support the trunk, and to connect it with the lower extremities; and at the same time to form the pelvis or bason, in which are lodged the intestines and urinary bladder, and in women the uterus; so that the study of this part of osteology is of the utmost importance in midwifery.

It is worthy of observation, that in women the os sacrum is usually shorter, broader, and more hollowed, the ossa ilia more expanded, and the inferior opening of the pelvis larger, than in men.

Sect. IV. *Of the Extremities.*

43 The parts of the skeleton consist of the upper extremity and the lower.

§ 1. *Of the Upper Extremities.*

44 This consists of the shoulder, the arm, and the hand.

45 #### 1. Of the Shoulder.

The shoulder consists of two bones, the clavicula and the scapula.

46 Of the clavicula. The former, which is so named from its resemblance to the key in use among the ancients, is a little curved at both its extremities like an Italic *f*. It is likewise called *jugulum*, or collar bone, from its situation. It is about the size of the little finger, but longer, and being of a very spongy substance, is very liable to be fractured. In this, as in other long bones, we may distinguish a body and two extremities. The body is rather flattened than rounded. The anterior extremity is formed into a slightly convex head, which is nearly of a triangular shape. The inferior surface of the head is articulated with the sternum. The posterior extremity, which is flatter and broader than the other, is connected to a process of the scapula, called *acromion*. Both these articulations are secured by ligaments, and in that with the sternum we meet with a moveable cartilage, to prevent any injury from friction.

The clavicle serves to regulate the motions of the scapula, by preventing it from being brought too much forwards, or carried too far backwards. It affords origin to several muscles, and helps to cover and protect the subclavian vessels, which derive their name from their situation under this bone. Osteology.

47 Of the scapula. The scapula, or shoulder-blade, which is nearly of a triangular shape, is fixed to the posterior part of the true ribs, somewhat in the manner of a buckler. It is of a very unequal thickness, and like all other broad flat bones, is somewhat cellular. Exteriorly it is convex, and interiorly concave, to accommodate itself to the convexity of the ribs. We observe in this bone three unequal sides, which are thicker and stronger than the body of the bone, and are therefore termed its *costæ*. The largest of the three, called also the basis, is turned towards the vertebræ. Another, which is less than the former, is below this; and the third, which is the least of the three, is at the upper part of the bone. Externally the bone is elevated into a considerable spine, which rising small at the basis of the scapula, becomes gradually higher and broader, and divides the outer surface of the bone into two fossæ. The superior of these, which is the smallest, serves to lodge the supra spinatus muscle; and the inferior fossa, which is much larger than the other, gives origin to the infra spinatus. This spine terminates in a broad and flat process at the top of the shoulder, called the *processus acromion*, to which the clavicle is articulated. This process is hollowed at its lower part to allow a passage to the supra and infra spinati muscles. The scapula has likewise another considerable process at its upper part, which, from its resemblance to the beak of a bird, is called the *coracoid process*. From the outer side of this coracoid process, a strong ligament passes to the processus acromion, which prevents a luxation of the os humeri upwards. A third process begins by a narrow neck, and ends in a cavity called *glenoid*, for the connexion of the os humeri.

The scapula is articulated with the clavicle and os humeri, to which last it serves as a fulcrum; and by varying its position it affords a greater scope to the bones of the arm in their different motions. It likewise gives origin to several muscles, and posteriorly serves as a defence to the trunk.

2. Bones of the Arm.

48 The arm is commonly divided into two parts, which are articulated to each other at the elbow. The upper part retains the name of arm, properly so called, and the lower part is usually called the fore-arm.

49 The arm is composed of a single bone called *os humeri*. This bone, which is almost of a cylindrical shape, may be divided into its body and its extremities.

The upper extremity begins by a large, round, smooth head, which is admitted into the glenoid cavity of the scapula. On the upper and fore part of the bone there is a groove for lodging the long head of the biceps muscle of the arm; and on each side of the groove, at the upper end of the bone, there is a tubercle to which the spinati muscles are fixed.

The lower extremity has several processes and cavities. The principal processes are its two condyles, one exterior and the other interior, and of these the last is the largest. Between these two we observe two lateral protuberances, which, together with a middle cavity,

teology. vity, form as it were a kind of pulley upon which the motions of the fore-arm are chiefly performed. At each side of the condyles, as well exteriorly as interiorly, there is another eminence which gives origin to several muscles of the hand and fingers. Posteriorly and superiorly, speaking with respect to the condyles, we observe a deep fossa which receives a considerable process of the ulna; and anteriorly and opposite to this fossa, we observe another, which is much less, and receives another process of the same bone.

The body of the bone has at its upper and anterior part a furrow which begins from behind the head of the bone, and serves to lodge the tendon of a muscle. The body of the os humeri is hollow through its whole length, and like all other long bones has its marrow.

This bone is articulated at its upper part to the scapula. This articulation, which allows motion every way, is surrounded by a capsular ligament that is sometimes torn in luxation, and becomes an obstacle to the easy reduction of the bone. Its lower extremity is articulated with the bones of the fore-arm.

50 the fore-a. The fore-arm is composed of two bones, the ulna and radius.

51 the ul- The ulna or elbow bone is much less than the os humeri, and becomes gradually smaller as it descends to the wrist. At its upper part it has two processes and two cavities. Of the two processes, the largest, which is situated posteriorly, and called the *olecranon*, is admitted into the posterior fossa of the os humeri. The other process is placed anteriorly, and is called the *coronoid process*. In bending the arm it enters into the anterior fossa of the os humeri. This process being much smaller than the other, permits the fore-arm to bend inwards; whereas the olecranon, which is shaped like a hook, reaches the bottom of its fossa in the os humeri as soon as the arm becomes straight, and will not permit the fore-arm to be bent backwards. The ligaments likewise oppose this motion.

Between the two processes we have described, there is a considerable cavity called the sigmoid cavity, divided into two fossæ by a small eminence, which passes from one process to the other; it is by means of this cavity and the two processes, that the ulna is articulated with the os humeri by ginglimus.

At the bottom of the coronoid process interiorly, there is a small sigmoid cavity, which serves for the articulation of the ulna with the radius.

The body of the ulna is of a triangular shape: Its lower extremity terminates by a small head and a little styloid process. The ulna is articulated above to the os humeri—both above and below to the radius, and to the wrist at its lower extremity. All these articulations are secured by means of ligaments. The chief use of this bone seems to be to support and regulate the motions of the radius.

52 the ra- is. The radius, which is so named from its supposed resemblance to the spoke of a wheel, is placed at the inside of the fore-arm. It is somewhat larger than the ulna, but not quite so long as that bone. Its upper part is cylindrical, hollowed superiorly to receive the outer condyle of the os humeri. Laterally it is admitted into the little sigmoid cavity of the ulna, and the cylindrical part of the bone turns in this cavity in the motions of pronation and supination (L). This bone follows the ulna in flexion and extension, and may likewise be moved round its axis in any direction. The lower extremity of the radius is much larger and stronger than its upper part; the ulna, on the contrary, is smaller and weaker below than above; so that they serve to supply each other's deficiencies in both those parts. Osteology.

On the external side of this bone, we observe a small cavity which is destined to receive the lower end of the ulna; and its lower extremity is formed into a large cavity, by means of which it is articulated with the bones of the wrist, and on this account it is sometimes called *manubrium manus*. It supports the two first bones of the wrist on the side of the thumb, whereas the ulna is articulated with that bone of the wrist which corresponds with the little finger.

Through the whole length both of this bone and the ulna, a ridge is observed which affords attachment to an interosseous ligament. This ligament fills up the space between the two bones.

3. Bones of the Hand.

53 54 Of the carpus. The carpus or wrist consists of eight small bones of an irregular shape, and disposed in two unequal rows. Those of the upper row are articulated with the bones of the fore-arm, and those of the lower one with the metacarpus.

The ancient anatomists described these bones numerically; Lyserus seems to have been the first who gave to each of them a particular name. The names he adopted are found on the figure of the bones, and are now pretty generally received, except the first, which instead of κολυλοειδες (the name given to it by Lyserus, on account of its sinus, that admits a part of the os magnum), has by later writers been named *Scaphoides* or *Naviculare*. This, which is the outermost of the upper row (considering the thumb as the outer side of the hand), is articulated with the radius; on its inner side it is connected with the os lunare, and below to the trapezium and trapezoides. Next to this is a smaller bone, called the *os lunare;* because its outer side, which is connected with the scaphoides, is shaped like a crescent. This is likewise articulated with the radius. On its inner side it joins the os cuneiforme; and anteriorly, the os magnum and os unciforme.

The os cuneiforme, which is the third bone in the upper row, is compared to a wedge, from its being broader above, at the back of the hand, than it is below. Posteriorly it is articulated with the ulna, and anteriorly with the os unciforme.

These three bones form an oblong articulating surface, covered by cartilage, by which the hand is connected with the fore-arm.

The os pisiforme, or pea-like bone, which is smaller than

(L) The motions of pronation and supination may be easily described. If the palm of the hand, for instance, is placed on the surface of a table, the hand may be said to be in a state of pronation; but if the back part of the hand is turned towards the table, the hand will be then in a state of supination.

Osteology. than the three just now described, though generally classed with the bones of the upper row, does not properly belong to either series, being placed on the under surface of the os cuneiforme, so as to project into the palm of the hand. The four bones of the second row correspond with the bones of the thumb and fingers; the first, second, and fourth, are from their shapes named *trapezium*, *trapezoides*, and *unciforme;* the third, from its being the largest bone of the carpus, is styled *os magnum*.

All these bones are convex towards the back, and slightly concave towards the palm of the hand; their articulating surfaces are covered with cartilages, and secured by many strong ligaments, particularly by two ligamentous expansions, called the external and internal annular ligaments of the wrist. The former extends in an oblique direction from the os pisiforme to the styloid process of the radius, and is an inch and a half in breadth; the latter or internal annular ligament is stretched from the os pisiforme and os unciforme, to the os scaphoides and trapezium. These annular ligaments likewise serve to bend down the tendons of the wrist and fingers.

55 Of the metacarpus. The metacarpus consists of four bones, which support the fingers; externally they are a little convex, and internally somewhat concave, where they form the palm of the hand. They are hollow, and of a cylindrical shape.

At each extremity they are a little hollowed for their articulation; superiorly with the bones of the carpus, and inferiorly with the first phalanx of the fingers, in the same manner as the several phalanges of the fingers are articulated with each other.

56 Of the fingers. The five fingers of each hand are composed of fifteen bones, disposed in three ranks called phalanges: The bones of the first phalanx, which are articulated with the metacarpus, are the largest, and those of the last phalanx the smallest. All these bones are larger at their extremities than in their middle part.

We observe at the extremities of the bones of the carpus, metacarpus, and fingers, several inequalities that serve for their articulation with each other; and these articulations are strengthened by means of the ligaments which surround them.

It will be easily understood that this multiplicity of bones in the hand (for there are 27 in each hand) is essential to the different motions we wish to perform. If each finger was composed only of one bone instead of three, it would be impossible for us to grasp any thing.

57 ### § 2. *Of the Lower Extremities.*

Each lower extremity is divided into four parts, viz. the os femoris, or thigh bone; the rotula, or knee-pan; the leg; and the foot.

1. Of the Thigh.

58 Of the os femoris. The thigh is composed only of this bone, which is the largest and strongest we have. It will be necessary to distinguish its body and extremities: Its body, which is of a cylindrical shape, is convex before and concave behind, where it serves to lodge several muscles. Throughout two-thirds of its length we observe a ridge, called *linea aspera*, which originates from the trochanters, and after running for some way downwards, divides into two branches, that terminate in the tuberosities at the lower extremity of the bone. Osteology.

At its upper extremity we must describe the neck and smooth head of the bone, and likewise two considerable processes: The head, which forms the greater portion of a sphere unequally divided, is turned inwards, and received into the great cotyloid cavity of the os innominatum. At this part of the bone there is a little fossa to be observed, to which the round ligament is attached, and which we have already described as tending to secure the head of this bone in the great acetabulum. The neck is almost horizontal, considered with respect to its situation with the body of the bone. Of the two processes, the external one, which is the largest, is called trochanter major; and the other, which is placed on the inside of the bone, trochanter minor. They both afford attachment to muscles. The articulation of the os femoris with the trunk is strengthened by means of a capsular ligament, which adheres everywhere round the edge of the great cotyloid cavity of the os innominatum, and surrounds the head of the bone.

The os femoris moves upon the trunk in every direction.

At the lower extremity of the bone are two processes called the condyles, and an intermediate smooth cavity, by means of which it is articulated with the leg by ginglimus.

All round the under end of the bone there is an irregular surface where the capsular ligament of the joint has its origin, and where blood-vessels go into the substance of the bone.

Between the condyles there is a cavity posteriorly, in which the blood-vessels and nerves are placed, secure from the compression to which they would otherwise be exposed in the action of bending the leg, and which would not fail to be hurtful.

At the side of each condyle externally, there is a tuberosity, from whence the lateral ligaments originate, which are extended down to the tibia.

A ligament likewise arises from each condyle posteriorly. One of these ligaments passes from the right to the left, and the other from the left to the right, so that they intersect each other, and for that reason are called the *cross ligaments*.

The lateral ligaments prevent the motion of the leg upon the thigh to the right or left, and the cross ligaments, which are also attached to the tibia, prevent the latter from being brought forwards.

In new born children all the processes of this bone are cartilaginous.

2. The Rotula, or Knee-pan.

59 Of the rotula. The rotula, patella, or knee-pan, as it is differently called, is a flat bone about four or five inches in circumference, and is placed at the fore part of the joint of the knee. In its shape it is somewhat like the common figure of the heart, with its point downwards.

It is thinner at its edge than in its middle part; at its forepart it is smooth and somewhat convex; its posterior surface, which is more unequal, affords an elevation in the middle which is admitted between the two condyles of the os femoris.

This bone is retained in its proper situation by a strong ligament which everywhere surrounds it, and adheres

Osteology. adheres both to the tibia and os femoris; it is likewise firmly connected with the tibia by means of a strong tendinous ligament of an inch in breadth, and upwards of two inches in length, which adheres to the lower part of the patella, and to the tuberosity at the upper end of the tibia. On account of this connexion, it is very properly considered as an appendage to the tibia, which it follows in all its motions, so as to be to it what the olecranon is to the ulna. There is this difference, however, that the olecranon is a fixed process; whereas the patella is moveable, being capable of sliding from above downwards and from below upwards. This mobility is essential to the rotatory motion of the leg.

In very young children this bone is entirely cartilaginous.

The principal use of the patella seems to be to defend the articulation of the knee from external injury; it likewise tends to increase the power of the extensor muscles of the leg, by removing their direction farther from the centre of motion in the manner of a pulley.

3. Of the Leg.

60 The leg is composed of two bones: Of these the inner one, which is the largest; is called tibia; the other is much smaller, and named fibula.

61 The tibia, which is so called from its resemblance to the musical pipe of the ancients, has three surfaces, and is not very unlike a triangular prism. Its posterior surface is the broadest; anteriorly it has a considerable ridge called the shin, between which and the skin there are no muscles. At the upper extremity of this bone are two surfaces, a little concave, and separated from each other by an intermediate elevation. The two little cavities receive the condyles of the os femoris, and the eminence between them is admitted into the cavity which we spoke of as being between the two condyles; so that this articulation affords a specimen of the complete ginglimus. Under the external edge of the upper end of this bone is a circular flat surface, which receives the head of the fibula.

At the lower and inner portion of the tibia, we observe a considerable process called *malleolus internus*. The basis of the bone terminates in a large transverse cavity, by which it is articulated with the uppermost bone of the foot. It has likewise another cavity at its lower end and upper side, which is somewhat oblong, and receives the lower end of the fibula.

The tibia is hollow through its whole length.

62 The fibula is a small long bone situated on the outside of the tibia. Its superior extremity does not reach quite so high as the upper part of the tibia, but its lower end descends somewhat lower. Both above and below, it is articulated with the tibia by means of the lateral cavities we noticed in our description of that bone.

Its lower extremity is stretched out into a coronoid process, which is flattened at its inside, and is convex externally, forming what is called the *malleolus externus*, or *outer ankle*. This is rather lower than the malleolus internus of the tibia.

The body of this bone, which is irregularly triangular, is a little hollow at its internal surface, which is turned towards the tibia; and it affords like that bone, through its whole length, attachment to a ligament, which from its situation is called the interosseous ligament. Osteology.

4. Of the Foot.

63 The foot consists of the tarsus, metatarsus, and toes.

64 The tarsus is composed of seven bones, viz. the astragalus, os calcis, os naviculare, os cuboides, and three others called cuneiform bones. Of the tarsus.

65 The astragalus is a large bone with which both the tibia and fibula are articulated. It is the uppermost bone of the foot; it has several surfaces to be considered; its upper, and somewhat posterior part, which is smooth and convex, is admitted into the cavity of the tibia. Its lateral parts are connected with the malleoli of the two bones of the legs; below, it is articulated with the os calcis, and its anterior surface is received by the os naviculare. All these articulations are secured by means of ligaments. Of the astragalus.

66 The os calcis, or calcaneum, which is of a very irregular figure, is the largest bone of the foot. Behind, it is formed into a considerable tuberosity, called the heel; without this tuberosity, which supports us in an erect posture, and when we walk, we should be liable to fall backwards. Of the os calcis.

On the internal surface of this bone, we observe a considerable sinuosity, which affords a passage to the tendon of a muscle; and to the posterior part of the os calcis, a strong tendinous cord, called *tendo achillis* (M), is attached, which is formed by the tendons of several muscles united together. The articulation of this with the other bones is secured by means of ligaments.

67 The os naviculare, or scaphoides (for these two terms have the same signification), is so called on account of its resemblance to a little bark. At its posterior part, which is concave, it receives the astragalus; anteriorly it is articulated with the cuneiform bones, and laterally it is connected with the os cuboides. Of the os naviculare.

68 The os cuboides forms an irregular cube. Posteriorly it is articulated with the os calcis; anteriorly it supports the two last bones of the metatarsus, and laterally it joins the third cuneiform bone and the os naviculare. Of the os cuboides.

69 Each of the ossa cuneiformia, which are three in number, resembles a wedge, and from this similitude their name is derived. They are placed next to the metatarsus by the sides of each other, and are usually distinguished into *os cuneiforme externum*, *medium* or *minimum*, and *internum* or *maximum*. The superior surface of these bones, from their wedge-like shape, is broader than that which is below, where they help to form the sole of the foot; posteriorly they are united to the os naviculare, and anteriorly they support the three first metatarsal bones. Of the ossa cuneiformia.

When these seven bones composing the tarsus are viewed together in the skeleton, they appear convex above, where they help to form the upper part of the foot; and concave underneath, where they form the

(M) This tendon is sometimes ruptured by jumping, dancing, or other violent efforts.

Osteology. hollow of the foot, in which the vessels, tendons, and nerves of the foot, are placed secure from pressure.

They are united to each other by very strong ligaments, and their articulation with the foot is secured by a capsular and two lateral ligaments; each of the latter is covered by an annular ligament of considerable breadth and thickness, which serves to bind down the tendons of the foot, and at the same time to strengthen the articulation.

The os cuneiforme externum is joined laterally to the os cuboides.

These bones complete our account of the tarsus. Though what we have said of this part of the osteology has been very simple and concise, yet many readers may not clearly understand it: but if they will be pleased to view these bones in their proper situation in the skeleton, all that we have said of them will be easily understood.

70 Of the metatarsus. The metatarsus is made up of five bones, whereas the metacarpus consists only of four. The cause of this difference is, that in the hand the last bone of the thumb is not included among the metacarpal bones; whereas in the foot the great toe has only two bones. The first of these bones supports the great toe, and is much larger than the rest, which nearly resemble each other in size.

These bones are articulated by one extremity with the cuneiform bones and the os cuboides, and by their other end with the toes.

71 Of the toes. Each of the toes, like the fingers, consists of three bones, except the great toe, which is formed of two bones. Those of the other four are distinguished into three phalanges. Although the toes are more confined in their motion than the fingers, yet they appear to be perfectly fitted for the purposes they are designed for. In walking, the toes bring the centre of gravity perpendicular to the advanced foot; and as the soles of the feet are naturally concave, we can at pleasure increase the concavity, and form a kind of vault, which adjusts itself to the different inequalities that occur to us in walking; and which, without this mode of arrangement, would incommode us exceedingly, especially when bare-footed. Osteology.

§ 4. *Of the Ossa* SESAMOIDEA. 72

Besides the bones we have already described, there are several small ones that are met with only in the adult skeleton, and in persons who are advanced in life; which, from their supposed general resemblance to the seeds of the sesamum, are called *ossa sesamoidea.* They are commonly to be seen at the first joint of the great toe, and sometimes at the joints of the thumb; they are likewise now and then to be found at the lower extremity of the fibula, upon the condyles of the thigh-bone, under the os cuboides of the tarsus, and in other parts of the body. Their size and number seem constantly to be increased by age and hard labour; and as they are generally found in situations where tendons and ligaments are most exposed to the action of muscles, they are now generally considered as ossified portions of ligaments or tendons.

The upper surface of these bones is usually convex, and adherent to the tendon that covers it; the side which is next to the joint is smooth and flat. Though their formation is accidental, yet they seem to be of some use, by raising the tendons farther from the centre of motion, and consequently increasing the power of the muscles. In the great toe and thumb they are likewise useful, by forming a groove for the flexor tendons.

EXPLANATION OF THE PLATES OF OSTEOLOGY.

PLATE XXI.

FIG. 1. A Front View of the MALE SKELETON.

A, The os frontis. B, The os parietale. C, The coronal suture. D, The squamous part of the temporal bones. E, The squamous suture. F, The zygoma. G, The mastoid process. H, The temporal process of the sphenoid bone. I, The orbit. K, The os malæ. L, The os maxillare superius. M, Its nasal process. N, The ossa nasi. O, The os unguis. P, The maxilla inferior. Q, The teeth, which are sixteen in number in each jaw. R, The seven cervical vertebræ, with their intermediate cartilages. S, Their transverse processes. T, The twelve dorsal vertebræ, with their intermediate cartilages. U, The five lumbar vertebræ. V, Their transverse processes. W, The upper part of the os sacrum. X, Its lateral parts. The holes seen on its fore part are the passages of the undermost spinal nerves and small vessels. Opposite to the holes, the marks of the original divisions of the bone are seen. Y, The os ilium. Z, Its crest or spine. a, The anterior spinous processes. b, The brim of the pelvis. c, The ischiatic niche. d, The os ischium. e, Its tuberosity. f, Its spinous process. g, Its crus. h, The foramen thyroideum. i, The os pubis. k, The symphysis pubis. l, The crus pubis. m, The acetabulum. n, The seventh or last true rib. o, The twelfth or last false rib. p, The upper end of the sternum. q, The middle piece. r, The upper end, or cartilago ensiformis. s, The clavicle. t, The internal surface of the scapula. u, Its acromion. v, Its coracoid process. w, Its cervix. x, The glenoid cavity. y, The os humeri. z, Its head, which is connected to the glenoid cavity. 1, Its external tubercle. 2, Its internal tubercle. 3, The groove for lodging the long head of the biceps muscle of the arm. 4, The internal condyle. 5, The external condyle. Between 4 and 5, the trochlea. 6, The radius. 7, Its head. 8, Its tubercle. 9, The ulna. 10, Its coronoid process. 11, 12, 13, 14, 15, 16, 17, 18, The carpus; composed of os naviculare, os lunare, os cuneiforme, os pisiforme, os trapezium, os trapezoides, os magnum, os unciforme. 19, The five bones of the metacarpus. 20, The two bones of the thumb. 21, The three bones of each of the fingers. 22, The os femoris. 23, Its head. 24, Its cervix. 25, The trochanter major. 26, The trochanter minor. 27, The internal condyle. 28, The external condyle. 29, The rotula. 30, The tibia. 31, Its head. 32, Its tubercle. 33, Its spine. 34, The malleolus internus. 35, The fibula. 36, Its head. 37, The malleolus externus. The tarsus is composed of, 38, The astragalus;

Osteology. lus; 39, the os calcis; 40, the os naviculare; 41, three ossa cuneiformia, and the os cuboides, which is not seen in this figure. 42, The five bones of the metatarsus. 43, The two bones of the great toe. 44, The three bones of each of the small toes.

FIG. 2. A Front View of the SKULL.

A, The os frontis. B, The lateral part of the os frontis, which gives origin to part of the temporal muscle. C, The superciliary ridge. D, the superciliary hole through which the frontal vessels and nerves pass. EE, The orbitar processes. F, The middle of the transverse suture. G, The upper part of the orbit. H, The foramen opticum. I, The foramen lacerum. K, The inferior orbitar fissure. L, The os unguis. M, The ossa nasi. N, The os maxillare superius. O, Its nasal process. P, The external orbitar hole through which the superior maxillary vessels and nerves pass. Q, The os malæ. R, A passage for small vessels into, or out of, the orbit. S, The under part of the left nostril. T, The septum narium. U, The os spongiosum superius. V, The os spongiosum inferius. W, The edge of the alveoli, or spongy sockets, for the teeth. X, The maxilla inferior. Y, The passage for the inferior maxillary vessels and nerves.

FIG. 3. A Side View of the SKULL.

A, The os frontis. B, The coronal suture. C, The os parietale. D, An arched ridge which gives origin to the temporal muscle. E, The squamous suture. F, The squamous part of the temporal bone; and, farther forwards, the temporal process of the sphenoid bone. G, The zygomatic process of the temporal bone. H, The zygomatic suture. I, The mastoid process of the temporal bone. K, The meatus auditorius externus. L, The orbitar plate of the frontal bone, under which is seen the transverse suture. M, The pars plana of the ethmoid bone. N, The os unguis. O, The right os nasi. P, The superior maxillary bone. Q, Its nasal process. R, The two dentes incisores. S, The dens caninus. T, The two small molares. U, The three large molares. V, The os malæ. W, The lower jaw. X, Its angle. Y, The coronoid process. Z, The condyloid process, by which the jaw is articulated with the temporal bone.

FIG. 4. The Posterior and Right side of the SKULL.

A, The os frontis. BB, The ossa parietalia. C, The sagittal suture. D, The parietal hole, through which a small vein runs to the superior longitudinal sinus. E, The lambdoid suture. FF, Ossa triquetra. G, The os occipitis. H, The squamous part of the temporal bone. I, The mastoid process. K, The zygoma. L, The os malæ. M, The temporal part of the sphenoid bone. N, The superior maxillary bone and teeth.

FIG. 5. The External Surface of the Os FRONTIS.

A, The convex part. B, Part of the temporal fossa. C, The external angular process. D, The internal angular process. E, The nasal process. F, The superciliary arch. G, The superciliary hole. H, The orbitar plate.

FIG. 5. The Internal Surface of the Os FRONTIS.

AA, The serrated edge which assists to form the coronal suture. B, The external angular process. C, The internal angular process. D, The nasal process. E, The orbitar plate. F, The cells which correspond with those of the ethmoid bone. G, The passage from the frontal sinus. H, The opening which receives the cribriform plate of the ethmoid bone. I, The cavity which lodges the fore part of the brain. K, The spine to which the falx is fixed. L, The groove which lodges the superior longitudinal sinus. Osteology.

PLATE XXII.

FIG. 1. A Back View of the SKELETON.

AA, The ossa parietalia. B, The sagittal suture. C, The lambdoid suture. D, The occipital bone. E, The squamous suture. F, The mastoid process of the temporal bone. G, The os malæ. H, The palate plates of the superior maxillary bones. I, The maxilla inferior. K, The teeth of both jaws. L, The seven cervical vertebræ. M, Their spinous processes. N, Their transverse and oblique processes. O, The last of the twelve dorsal vertebræ. P, The fifth or last lumbar vertebra. Q, The transverse processes. R, The oblique processes. S, The spinous processes. T, The upper part of the os sacrum. U, The posterior holes which transmit small blood-vessels and nerves. V, The under part of the os sacrum which is covered by a membrane. W, The os coccygis. X, The os ilium. Y, Its spine or crest. Z, The ischiatic niche. a, The os ischium. b, Its tuberosity. c, Its spine. d, The os pubis. e, The foramen thyroideum. f, The seventh or last true rib. g, The twelfth or last false rib. h, The clavicle. i, The scapula. k, Its spine. l, Its acromion. m, Its cervix. n, Its superior costa. o, Its posterior costa. p, Its inferior costa. q, The os humeri. r, The radius. s, The ulna. t, Its olecranon. u, All the bones of the carpus, excepting the os pisiforme, which is seen in Plate XXI. fig. 1. v, The five bones of the metacarpus. w, The two bones of the thumb. x, The three bones of each of the fingers. y, The two sesamoid bones at the root of the left thumb. z, The os femoris. 1, The trochanter major. 2, The trochanter minor. 3, The linea aspera. 4. The internal condyle. 5, The external condyle. 6 6, The semilunar cartilages. 7. The tibia. 8, The malleolus internus. 9, The fibula. 10, The malleolus externus. 11, The tarsus. 12, The metatarsus. 13, The toes.

FIG. 2. The External Surface of the Left Os PARIETALE.

A, The convex smooth surface. B, The parietal hole. C, An arch made by the beginning of the temporal muscle.

FIG. 3. The Internal Surface of the same Bone.

A, Its superior edge, which, joined with the other, forms the sagittal suture. B, The anterior edge, which assists in the formation of the coronal suture. C, The inferior edge for the squamous suture. D, The posterior edge for the lambdoid suture. E, A depression made by the lateral sinus. FF, The prints of the arteries of the dura mater.

FIG. 4. The External Surface of the Left Os TEMPORUM.

A, The squamous part. B, The mastoid process. C, The zygomatic process. D, The styloid process. E, The petrosal process. F, The meatus auditorius externus.

Osteology. externus. G, The glenoid cavity for the articulation of the lower jaw. H, The foramen stylo-mastoideum for the portio dura of the seventh pair of nerves. I, Passages for blood vessels into the bone. K, The foramen mastoideum through which a vein goes to the lateral sinus.

FIG. 5. The Internal Surface of the Left Os TEMPORUM.

A, The squamous part; the upper edge of which assists in forming the squamous suture. B, The mastoid process. C, the styloid process. D, The pars petrosa. E, The entry of the seventh pair, or auditory nerve. F, The fossa, which lodges a part of the lateral sinus. G, The foramen mastoideum.

FIG. 6. The External Surface of the OSSEOUS CIRCLE, which terminates the meatus auditorius externus.

A, The anterior part. B, A small part of the groove in which the membrana tympani is fixed.

N. B. This, with the subsequent bones of the ear, are here delineated as large as the life.

FIG. 7. The Internal Surface of the OSSEOUS CIRCLE.

A, The anterior part. B, The groove in which the membrana tympani is fixed.

FIG. 8. The situation and connexion of the Small Bones of the EAR.

A, The malleus. B, The incus. C, The os orbiculare. D, The stapes.

FIG. 9. The MALLEUS, with its Head, Handle, and Small Processes.

FIG. 10. The INCUS, with its Body, Superior and Inferior Branches.

FIG. 11. The OS ORBICULARE.

FIG. 12. The STAPES, with its Head, Base, and two Crura.

FIG. 13. An Internal View of the LABYRINTH of the EAR.

A, The hollow part of the cochlea, which forms a share of the meatus auditorius internus. B, The vestibulum. CCC, The semicircular canals.

FIG. 14. An External View of the LABYRINTH.

A, The semicircular canals. B, The fenestra ovalis which leads into the vestibulum. C, The fenestra rotunda which opens into the cochlea. D, The different turns of the cochlea.

FIG. 15. The Internal Surface of the Os SPHENOIDES.

AA, The temporal processes. BB, The pterygoid processes. CC, The spinous processes. DD, The anterior clinoid processes. E, The posterior clinoid process. F, The anterior process which joins the ethmoid bone. G, The sella turcica for lodging the glandula pituitaria. H, The foramen opticum. K, The foramen lacerum. L, The foramen rotundum. M, The foramen ovale. N, The foramen spinale.

FIG. 16. The External Surface of the Os SPHENOIDES.

AA, The temporal processes. BB, The pterygoid processes. CC, The spinous processes. D, The processus azygos. E, The small triangular processes which grow from the body of the bone. FF, The orifices of the sphenoidal sinuses. G, The foramen lacerum. H, The foramen rotundum. I, The foramen ovale. K, The foramen pterygoideum. Osteology.

FIG. 17. The External View of the Os ETHMOIDES.

A, The nasal lamella. BB, The grooves between the nasal lamella and ossa spongiosa superiora. CC, The ossa spongiosa superiora. DD, The sphenoid cornua. See Fig. 16. E.

FIG. 18. The Internal View of the Os ETHMOIDES.

A, The crista galli. B, The cribriform plate, with the different passages of the olfactory nerves. CC, Some of the ethmoidal cells. D, The right os planum. EE, The sphenoidal cornua.

FIG. 19. The Right SPHENOIDAL CORNU.

FIG. 20. The Left SPHENOIDAL CORNU.

FIG. 21. The External Surface of the Os OCCIPITIS.

A, The upper part of the bone. B, The superior arched ridge. C, The inferior arched ridge. Under the arches are prints made by muscles of the neck. DD, The two condyloid processes which articulate the head with the spine. E, The cuneiform process. F, The foramen magnum through which the spinal marrow passes. GG, The posterior condyloid foramina which transmit veins into the lateral sinuses. HH, The foramina lingualia for the passage of the ninth pair of nerves.

FIG. 22. The Internal Surface of the Os OCCIPITIS.

AA, The two sides which assist to form the lambdoid suture. B, The point of the cuneiform process where it joins the sphenoid bone. CC, The prints made by the posterior lobes of the brain. DD, Prints made by the lobes of the cerebellum. E, The cruciform ridge for the attachment of the processes of the dura mater. F, The course of the superior longitudinal sinuses. GG, The course of the two lateral sinuses. H, The foramen magnum. II, The posterior condyloid foramina.

PLATE XXIII.

FIG. 1. A Side View of the SKELETON.

AA, The ossa parietalia. B, The sagittal suture. C, The os occipitis. DD, The lambdoid suture. E, The squamous part of the temporal bone. F, The mastoid process. G, The meatus auditorius externus. H, The os frontis. I, The os malæ. K, The os maxillare superius. L, The maxilla inferior. M, The teeth of both jaws. N, The seventh or last cervical vertebra. O, The spinous processes. P, Their transverse and oblique processes. Q, The twelfth or last dorsal vertebra. R, The fifth or last lumbar vertebra. S, The spinous processes. T, Openings between the vertebræ for the passage of the spinal nerves. U, The under end of the os sacrum. V, The os coccygis. W, The os ilium. X, The anterior spinous processes. Y, The posterior spinous processes. Z, The ischiatic niche. a, The right os ilium. b, The ossa pubis. c, The tuberosity of the left os ischium. d, The scapula. e, Its spine. f, The os humeri. g, The radius. h, The ulna. i, The carpus. k, The metacarpal bone of the thumb. l, The metacarpal bones of the fingers. m, The two bones of the thumb. n, The three bones of each of the fingers. o, The os femoris.

Osteology. femoris. p, Its head. q, The trochanter major. r, The external condyle. s, The rotula. t, The tibia. u, The fibula. v. The malleolus externus. w, The astragalus. x, The os calcis. y, The os naviculare. z, The three ossa cuneiformia. 1, The os cuboides. 2, The five metatarsal bones. 3, The two bones of the great toe. 4, The three bones of each of the small toes.

FIG. 2. A View of the Internal Surface of the Base of the SKULL.

AAA, The two tables of the skull with the diplöe. BB, The orbitar plates of the frontal bone. C, The crista galli, with the cribriform plate of the ethmoidal bone on each side of it, through which the first pair of nerves pass. D, The cuneiform process of the occipital bone. E, The cruciform ridge. F, The foramen magnum for the passage of the spinal marrow. G, The zygoma, made by the joining of the zygomatic processes of the os temporum and os malæ. H, The pars squamosa of the os temporum. I, The pars mammillaris. K, The pars petrosa. L, The temporal process of the sphenoid bone. MM, The anterior clinoid processes. N, The posterior clinoid process. O, The sella turcica. P, The foramen opticum, for the passage of the optic nerve and ocular artery of the left side. Q, The foramen lacerum, for the third, fourth, sixth, and first of the fifth part of nerves and ocular vein. R, The foramen rotundum for the second of the fifth pair. S, The foramen ovale, for the third of the fifth pair. T, The foramen spinale, for the principal artery of the dura mater. U, The entry of the auditory nerve. V, The passage for the lateral sinus. W, The passage of the eighth pair of nerves. X, The passage of the ninth pair.

FIG. 3. A View of the External Surface of the Base of the SKULL.

A, The two dentes incisores of the right side B, The dens caninus. C, The two small molares. D, The three large molares. E, The foramen incisivum, which gives passage to small blood-vessels and nerves. F, The palate plates of the ossa maxillaria and palati, joined by the longitudinal and transverse palate sutures. G, The foramen palatinum posterius, for the palatine vessels and nerves. H, The os maxillare superius of the right side. I, The os malæ. K, The zygomatic process of the temporal bone. L, The posterior extremity of the ossa spongiosa. M, The posterior extremity of the vomer, which forms the back part of the septum nasi. N, The pterygoid process of the right side of the sphenoid bone. OO, The foramina ovalia. PP, The foramina spinalia. QQ, The passages of the internal carotid arteries. R, A hole between the point of each pars petrosa and cuneiform process of the occipital bone, which is filled up with a ligamentous substance in the recent subject. S, The passage of the left lateral sinus. T, The posterior condyloid foramen of the left side. U, The foramen mastoideum. V, The foramen magnum. W, The inferior orbitar fissure. X, The glenoid cavity, for the articulation of the lower jaw. Y, The squamous part of the temporal bone. Z, The mastoid process, at the inner side of which is a fossa for the posterior belly of the digastric muscle. a, The styloid process. b, The meatus auditorius externus. c, The left condyle of the occipital bone. d, The perpendicular occipital spine. ee, The inferior horizontal ridge of the occipital bone. ff, The superior horizontal ridge, which is opposite to the crucial ridge where the longitudinal sinus divides to form the lateral sinuses. ggg, The lambdoid suture. h, The left squamous suture. i, The parietal bone.

FIG. 4. The Anterior Surface of the OSSA NASI.

A, The upper part which joins the os frontis. B, The under end, which joins the cartilage of the nose. C, Their inner edge where they join each other.

FIG. 5. The Posterior Surface of the OSSA NASI.

AA, Their cavity, which forms part of the arch of the nose. BB, Their ridge or spine, which projects a little to be fixed to the fore part of the septum narium.

FIG. 6. The External Surface of the OS MAXILLARE SUPERIUS of the left side.

A, The nasal process. B, The orbitar plate. C, The unequal surface which joins the os malæ. D, The external orbitar hole. E, The opening into the nostril. F, The palate plate. G, The maxillary tuberosity. H, Part of the os palati. I, The two dentes incisores. K, The dens caninus. L, The two small dentes molares. M, The three large dentes molares.

FIG. 7. The Internal Surface of the OS MAXILLARE SUPERIUS and OS PALATI.

A, The nasal process. BB, Eminences for the connexion of the spongiosum inferius. D, The under end of the lachrymal groove. E, The antrum maxillare. F, The nasal spine, between which and B is the cavity of the nostril. G, The palate plate. H, The orbitar part of the os palati. I, The nasal plate. K, The suture which unites the maxillary and palate bones. L, The pterygoid process of the palate bone.

FIG. 8. The External Surface of the right OS UNGUIS.

A, The orbitar part. B, The lachrymal part. C, The ridge between them.

FIG. 9. The Internal Surface of the right OS UNGUIS.

This side of the bones has a furrow opposite to the external ridge; all behind this is irregular, where it covers part of the cthmoidal cells.

FIG. 10. The External Surface of the left OS MALÆ.

A, The superior orbitar process. B, The inferior orbitar process. C, The malar process. D, The zygomatic process. E, The orbitar plate. F, A passage for small vessels into or out of the orbit.

FIG. 11. The Internal Surface of the left OS MALÆ.

A, The superior orbitar process. B, The inferior orbitar process. C, The malar process. D, The zygomatic process. E, The internal orbitar plate or process.

FIG. 12. The External Surface of the right OS SPONGIOSUM INFERIUS.

A, The anterior part. B, The hook-like process for covering part of the antrum maxillare. C, A small process which covers part of the under end of the lachrymal groove. D, The inferior edge turned a little outwards.

FIG.

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FIG. 13. The Internal Surface of the Os SPONGIOSUM INFERIUS.

A, The anterior extremity. B, The upper edge which joins the superior maxillary and palate bones.

FIG. 14. The Posterior and External Surface of the right Os PALATI.

A, The orbitar process. B, The nasal lamella. C, The pterygoid process. D, The palate process.

FIG. 15. The Anterior and External Surface of the right Os PALATI.

A, The orbitar process. B, An opening through which the lateral nasal vessels and nerves pass. C, The nasal lamella. D, The pterygoid process. E, The posterior edge of the palate process for the connexion of the velum palati. F, The inner edge by which the two ossa palati are connected.

FIG. 16. The right side of the VOMER.

A, The upper edge which joins the nasal lamella of the ethmoid bone and the middle cartilage of the nose. B, The inferior edge which is connected to the superior maxillary and palate bones. C, The superior and posterior part which receives the processus azygos of the sphenoid bone.

FIG. 17. The MAXILLA INFERIOR.

A, The chin. B, The base and left side. C, The angle. D, The coronoid process. E, The condyloid process. F, The beginning of the inferior maxillary canal of the right side, for the entry of the nerve and blood vessels. G, The termination of the left canal. H, The two dentes incisores. I, The dens caninus. K, The two small molares. L, The three large molares.

FIG. 18. The different classes of the TEETH.

1, 2, A fore and back view of the two anterior dentes incisores of the lower jaw. 3, 4, Similar teeth of the upper jaw. 5, 6, A fore and back view of the dentes canini. 7, 8, The anterior dentes molares. 9, 10, 11, The posterior dentes molares. 12, 13, 14, 15, 16, Unusual appearances in the shape and size of the teeth.

FIG. 19. The External Surface of the Os HYOIDES.

A, The body. BB, The cornua. CC, The appendices.

PLATE XXIV.

FIG. 1. A Posterior View of the STERNUM and CLAVICLES, with the Ligament connecting the Clavicles to each other.

a, The posterior surface of the sternum. bb, The broken ends of the clavicles. cccc, The tubercles near the extremity of each clavicle. d, The ligament connecting the clavicles.

FIG. 2. A Fore View of the LEFT SCAPULA, and of a half of the CLAVICLE, with their Ligaments.

a, The spine of the scapula. b, The acromion. c, The inferior angle. d, Inferior costa, e, Cervix. f, Glenoid cavity, covered with cartilage for the arm bone. gg, The capsular ligament of the joint. h, Coracoid process. i, The broken end of the clavicle. k, Its extremity joined to the acromion. l, A ligament coming out single from the acromion to the coracoid process. m, A ligament coming out single from the acromion, and dividing it into two, which are fixed to the coracoid process.

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FIG. 3. The Joint of the Elbow of the LEFT ARM, with the Ligaments.

a, The os humeri. b, Its internal condyle. cc, The two prominent parts of its trochlea appearing through the capsular ligament. d, The ulna. e, The radius. f, The part of the ligament including the head of the radius.

FIG. 4. The Bones of the RIGHT HAND, with the PALM in view.

a, The radius. b, The ulna. c, The scaphoid bone of the carpus. d, The os lunare. e, The os cuneiforme. f, The os pisiforme. g, Trapezium. h, Trapezoides. i, Capitatum. k, Unciforme. l, The four metacarpal bones of the fingers. m, The first phalanx. n, The second phalanx. o, The third phalanx. p, The metacarpal bone of the thumb. q, The first joint. r, The second.

FIG. 5. The Posterior View of the Bones of the LEFT HAND.

The explication of FIG. 4. serves for this figure; the same letters pointing out the same bones, though in a different view.

FIG. 6. The Upper extremity of the TIBIA, with the Semilunar Cartilages of the Joint of the Knee, and some Ligaments.

a, The strong ligament which connects the rotula to the tubercle of the tibia. bb, The parts of the extremity of the tibia, covered with cartilage, which appear within the semilunar cartilages. cc, The semilunar cartilages. d, The two parts of what is called the cross ligament.

FIG. 7. The Posterior View of the Joint of the RIGHT KNEE.

a, The os femoris cut. b, Its internal condyle. c, Its external condyle. d, The back part of the tibia. e, The superior extremity of the fibula. f, The edge of the internal semilunar cartilage. g, An oblique ligament. h, A larger perpendicular ligament. i, A ligament connecting the femur and fibula.

FIG. 8. The Anterior View of the Joint of the RIGHT KNEE.

b, The internal condyle. c, Its external condyle. d, The part of the os femoris, on which the patella moves. e, A perpendicular ligament. ff, The two parts of the crucial ligaments. gg, The edges of the two moveable semilunar cartilages. h, The tibia, i, The strong ligament of the patella. k, The back part of it where the fat has been dissected away. l, The external depression. m, The internal one. n, The cut tibia.

FIG. 9. A View of the Inferior Part of the Bones of the RIGHT FOOT.

a, The great knob of the os calcis. b, A prominence on its outside. c, The hollow for the tendons, nerves, and blood vessels. d, The anterior extremity of the os calcis. e, Part of the astragalus. f, Its head covered with cartilage. g, The internal prominence

Osteology. nence of the os naviculare. h, The os cuboides. i, The os cuneiforme internum; k,—Medium; l,—Externum. m, The metatarsal bones of the four lesser toes. n, The first—o, The second—p, The third phalanx of the four lesser toes. q, The metatarsal bones of the great toe. r, Its first—s, Its second joint.

FIG. 10. The Inferior Surface of the two large SESAMOID BONES at the first joint of the Great Toe.

FIG. 11. The Superior View of the Bones of the RIGHT FOOT.

a, b, as in fig. 9. c, The superior head of the astragalus. d, &c. as in fig. 9.

FIG. 12. The View of the SOLE of the FOOT, with its Ligaments.

a, The great knob of the os calcis. b, the hollow for the tendons, nerves, and blood-vessels. c, The sheaths of the flexores pollicis and digitorum longi opened. d, The strong cartilaginous ligament supporting the head of the astragalus. e, h, Two ligaments which unite into one, and are fixed to the metatarsal bone of the great toe. f, A ligament from the knob of the os calcis to the metatarsal bone of the little toe. g, A strong triangular ligament, which supports the bones of the tarsus. i, The ligaments of the joints of the five metatarsal bones. Osteology.

FIG. 13. a, The head of the thigh-bone of a child. b, The ligamentum rotundum connecting it to the acetabulum. c, The caspular ligament of the joint with its arteries injected. d, The numerous vessels of the mucilaginous gland injected.

FIG. 14. The Back View of the Cartilages of the LARYNX, with the OS HYOIDES.

a, The posterior part of the base of the os hyoides. bb, Its cornua. c, The appendix of the right side. d, A ligament sent out from the appendix of the left side, to the styloid process of the temporal bone. e, The union of the base with the left cornua. ff, The posterior sides of (g) the thyroid cartilages. hh, Its superior cornua. ii, Its inferior cornua. k, The cricoid cartilage. ll, The arytenoid cartilages. m, The entry into the lungs, named *glottis*. n, The epiglottis. oo, The superior cartilages of the trachea. p, Its ligamentous back part.

FIG. 15. The Superior Concave Surface of the SESAMOID BONES at the first joint of the Great Toe, with their Ligaments.

a, Three sesamoid bones. b, The ligamentous substance in which they are formed.

CHAP. II. OF THE SOFT PARTS IN GENERAL.

OF THE COMMON INTEGUMENTS WITH THEIR APPENDAGES; AND OF THE MUSCLES.

73 ANATOMICAL writers usually proceed to a description of the muscles after having finished the osteology; but we shall deviate a little from the common method, with a view to describe every thing clearly and distinctly, and to avoid a tautology which would otherwise be unavoidable. All the parts of the body are so intimately connected with each other, that it seems impossible to convey a just idea of any one of them, without being in some measure obliged to say something of others; and on this account we wish to mention in this place the names and situation of the principal viscera of the body, that when mention is hereafter made of any one of them in the course of the work, the reader may at least know where they are placed.

After this little digression, the common integuments, and after them the muscles, will be described; we then propose to enter into an examination of the several viscera, and their different functions. In describing the brain, occasion will be taken to speak of the nerves and animal spirits. The circulation of the blood will follow the anatomy of the heart, and the secretions and other matters will be introduced in their proper places.

The body is divided into three great cavities. Of these the uppermost is formed by the bones of the cranium, and encloses the brain and cerebellum.

The second is composed of the vertebræ of the back, the sternum, and true ribs, with the additional assistance of muscles, membranes, and common integuments, and is called the *thorax*.—It contains the heart and lungs.

The third, and inferior cavity, is the abdomen. It is separated from the thorax by means of the diaphragm, and is formed by the lumbar vertebræ, the os sacrum, the ossa innominata, and the false ribs, to which we may add the peritonæum, and a variety of muscles. This cavity encloses the stomach, intestines, omentum or cawl, liver, pancreas, spleen, kidneys, urinary bladder, and parts of generation.

Under the division of common integuments are usually included the epidermis, or scarf-skin, the reticulum mucosum of Malpighi, the cutis, or true skin, and the membrana adiposa. The hair and nails, as well as the sebaceous glands, may be considered as appendages to the skin.

SECT. I. *Of the Skin.*

§ 1. *Of the Scarf-Skin.*

74 THE epidermis, cuticula, or scarf-skin, is a fine, transparent, and insensible pellicle, destitute of nerves and blood vessels, which invests the body, and everywhere covers the true skin. This scarf-skin, which seems to be very simple, appears, when examined with a microscope, to be composed of several laminæ or scales which are increased by pressure, as we may observe in the hands and feet, where it is frequently much thickened, and becomes perfectly callous. It seems to adhere to the cutis by a number of very minute filaments, but may easily be separated from it by heat, or by maceration in water. Some anatomical writers have supposed that it Cuticle.

is

Of the Integuments, &c.

is formed by a moisture exhaled from the whole surface of the body, which gradually hardens when it comes into contact with the air. They were perhaps induced to adopt this opinion, by observing the speedy regeneration of this part of the body when it has been by any means destroyed, it appearing to be renewed on all parts of the surface at the same time; whereas other parts which have been injured, are found to direct their growth from their circumference only towards their centre. But a demonstrative proof that the epidermis is not a fluid hardened by means of the external air, is, that the fœtus in utero is found to have this covering. Leeuwenhoek supposed its formation to be owing to the expansion of the extremities of the excretory vessels, which are found every where upon the surface of the true skin. Ruysch attributed its origin to the nervous papillæ of the skin; and Heister thinks it probable, that it may be owing both to the papillæ and the excretory vessels. The celebrated Morgagni, on the other hand, contends *, that it is nothing more than the surface of the cutis, hardened and rendered insensible by the liquor amnii in utero and by the pressure of the air. This is a subject, however, on which we can advance nothing with certainty.

* *Adversar. Anat.* II. *Animad.* ver. 2.

The cuticle is pierced with an infinite number of pores, or little holes, which afford a passage to the hairs, sweat, and insensible perspiration, and likewise to warm water, mercury, and whatever else is capable of being taken in by the absorbents of the skin. The lines which we observe on the epidermis belong to the true skin. The cuticle adjusts itself to them, but does not form them.

§ 2. *Of the Rete Mucosum.*

75 Rete mucosum.

Between the epidermis and cutis we meet with an appearance to which Malpighi, who first described it, gave the name of *rete mucosum*, supposing it to be of a membranous structure, and pierced with an infinite number of pores; but the fact is, that it seems to be nothing more than a mucous substance which may be dissolved by macerating it in water, while the cuticle and cutis preserve their texture.

The colour of the body is found to depend on the colour of this rete mucosum; for in negroes it is observed to be perfectly black, whilst the true skin is of the ordinary colour.

The blisters which raise the skin when burnt or scalded, have been supposed by some to be owing to a rarefaction of this mucus; but they are more probably occasioned by an increased action of the vessels of the part, together with an afflux and effusion of the thinner parts of the blood.

§ 3. *Of the* Cutis, *or True Skin.*

76 Cutis.

The cutis is composed of fibres closely compacted together, as we may observe in leather which is the prepared skin of animals. These fibres form a thick network, which everywhere admits the filaments of nerves, and an infinite number of blood-vessels and lymphatics.

The cutis, when the epidermis is taken off, is found to have, throughout its whole surface, innumerable papillæ, which appear like very minute granulations, and seem to be calculated to receive the impressions of the touch, being the most easily observed where the sense of feeling is the most delicate, as in the palms of the hands and on the fingers.

Of the Integuments, &c.

These papillæ are supposed by many anatomical writers to be continuations of the pulpy substance of nerves, whose coats have terminated in the cellular texture of the skin. The great sensibility of these papillæ evidently proves them to be exceedingly nervous; but surely the nervous fibrillæ of the skin are of themselves scarcely equal to the formation of the papillæ, and it seems to be more probable that they are formed like the rest of the cutis.

These papillæ being described, the uses of the epidermis and the reticulum mucosum will be more easily understood; the latter serving to keep them constantly moist; while the former protects them from the external air, and modifies their too great sensibility.

§ 4. *Of the* Glands *of the Skin.*

77 The sebaceous glands.

In different parts of the body we meet, within the substance of the skin, with certain glands or follicles, which discharge a fat and oily humour that serves to lubricate and soften the skin. When the fluid they secrete has acquired a certain degree of thickness, it approaches to the colour and consistence of suet; and from this appearance they have derived their name of *sebaceous glands*. They are found in the greatest number in the nose, ear, nipple, axilla, groin, scrotum, vagina, and prepuce.

Besides these sebaceous glands, we read, in anatomical books, of others that are described as small spherical bodies placed in all parts of the skin, in much greater abundance than those just now mentioned, and named *miliary*, from their supposed resemblance to millet seed. Steno, who first described these glands, and Malpighi, Ruysch, Verheyen, Winslow, and others, who have adopted his opinions on this subject, speak of them as having excretory ducts, that open on the surface of the cuticle, and distil the sweat and matter of insensible perspiration: and yet, notwithstanding the positive manner in which these pretended glands have been spoken of, we are now sufficiently convinced that their existence is altogether imaginary.

§ 5. *Of the* Insensible *Perspiration and* Sweat.

78 Insensible perspiration.

The matter of insensible perspiration, or in other words, the subtile vapour that is continually exhaling from the surface of the body, is not secreted by any particular glands, but seems to be derived wholly from the extremities of the minute arteries that are everywhere dispersed through the skin. These exhaling vessels are easily demonstrated in the dead subject, by throwing water into the arteries; for then small drops exude from all parts of the skin, and raise up the cuticle, the pores of which are closed by death: and in the living subject, a looking-glass placed against the skin, is soon obscured by the vapour. Bidloo fancied he had discovered ducts leading from the cutis to the cuticle, and transmitting this fluid; but in this he was mistaken.

When the perspiration is by any means increased, and several drops that were insensible when separate, are united together and condensed by the external air, they form upon the skin small but visible drops called

sweat

Of the Integuments, &c.

sweat (N). This particularly happens after much exercise, or whatever occasions an increased determination of fluids to the surface of the body; a greater quantity of perspirable matter being in such cases carried through the passages that are destined to convey it off.

70 Whether ese are e and the me or different exetions.

It has been disputed, indeed, whether the insensible perspiration and sweat are to be considered as one and the same excretion, differing only in degree; or whether they are two distinct excretions derived from different sources. In support of the latter opinion, it has been alleged, that the insensible perspiration is agreeable to nature, and essential to health, whereas sweat may be considered as a species of disease. But this argument proves nothing; and it seems probable, that both the insensible vapour and the sweat are exhaled in a similar manner, though they differ in quantity, and probably in their qualities; the former being more limpid, and seemingly less impregnated with salts than the latter; at any rate we may consider the skin as an emunctory through which the redundant water, and sometimes the other more saline parts of the blood, are carried off. But the insensible perspiration is not confined to the skin only—a great part of what we are constantly throwing off in this way is from the lungs. The quantity of fluid exhaled from the human body by this insensible perspiration is very considerable. Sanctorius (O), an Italian physician, who indefatigably passed a great many years in a series of statical experiments, demonstrated long ago, what has been confirmed by later observations, that the quantity of vapour exhaled from the skin and from the surface of the lungs, amounts nearly to 5-8ths of the aliment we take in. So that if in the warm climate of Italy a person eats and drinks the quantity of eight pounds in the course of a day, five pounds of it will pass off by insensible perspiration, while three pounds only will be evacuated by stool, urine, saliva, &c. But in countries where the degree of cold is greater than in Italy, the quantity of perspired matter is less: in some of the more northern climates, it being found not to equal the discharge by urine. It is likewise observed to vary according to the season of the year, and according to the constitution, age, sex, diseases, diet, exercise, passions, &c. of different people.

80 Their uses.

From what has been said on this subject, it will be easily conceived, that this evacuation cannot be either much increased or diminished in quantity without affecting the health. Of the Integuments, &c.

The perspirable matter and the sweat are in some measure analogous to the urine, as appears from their taste and saline nature (P). And it is worthy of observation, that when either of these secretions is increased in quantity, the other is diminished; so that they who perspire the least, usually pass the greatest quantity of urine, and *vice versa*.

§ 6. *Of the* NAILS.

81 The nails.

The nails are of a compact texture, hard and transparent like horn. Their origin is still a subject of dispute. Malpighi supposed them to be formed by a continuation of the papillæ of the skin: Ludwig, on the other hand, maintained, that they were composed of the extremities of blood-vessels and nerves. Both these opinions are now deservedly rejected.

They seem to possess many properties in common with the cuticle; like it they are neither vascular nor sensible, and when the cuticle is separated from the true skin by maceration or other means, the nails come away with it.

They appear to be composed of different layers, of unequal size, applied one over the other. Each layer seems to be formed of longitudinal fibres.

In each nail we may distinguish three parts, viz. the root, the body or middle, and the extremity. The root is a soft, thin, and white substance, terminating in the form of a crescent; the epidermis adheres very strongly to this part; the body of the nail is broader, redder, and thicker, and the extremity is of still greater firmness.

The nails increase from their roots, and not from their upper extremity.

Their principal use is to cover and defend the ends of the fingers and toes from external injury.

§ 7. *Of the* HAIR.

82 The hair.

The hairs, which from their being generally known, do not seem to require any definition, arise from distinct capsules or bulbs seated in the cellular membrane under the skin (Q). Some of these bulbs enclose several

(N) Leeuwenhoek asserts, that one drop of sweat is formed by the conflux of 15 drops of perspirable vapour.

(O) The insensible perspiration is sometimes distinguished by the name of this physician, who was born in the territories of Venice, and was afterwards a professor in the university of Padua. After estimating the aliment he took in, and the sensible secretions and discharges, he was enabled to ascertain with great accuracy the weight or quantity of insensible perspiration by means of a statical chair which he contrived for this purpose; and from his experiments, which were conducted with great industry and patience, he was led to determine what kind of solid or liquid aliment increased or diminished it. From these experiments he formed a system, which he published at Venice in 1614, in the form of aphorisms, under the title of *Ars de Medicina Statica*.

(P) Minute crystals have been observed to shoot upon the clothes of men who work in glass-houses. *Haller. Elem. Phys.*

(Q) Malpighi, and after him the celebrated Ruysch, supposed the hairs to be continuations of nerves, being of opinion that they originated from the papillæ of the skin, which they considered as nervous; and as a corroborating proof of what they advanced, they argued the pain we feel in plucking them out: but later anatomists seem to have rejected this doctrine, and consider the hairs as particular bodies, not arising from the papillæ (for in the parts where the papillæ abound most there are no hairs), but from bulbs or capsules, which are peculiar to them.

veral hairs. They may be observed at the roots of the hairs which form the beard or whiskers of a cat.

The hairs, like the nails, grow only from below by a regular propulsion from their root, where they receive their nourishment. Their bulbs, when viewed with a microscope are found to be of various shapes. In the head and scrotum they are roundish; in the eyebrows they are oval; in the other parts of the body they are nearly of a cylindrical shape. Each bulb seems to consist of two membranes, between which there is a certain quantity of moisture. Within the bulb the hair separates into three or four fibrillæ; the bodies of the hairs, which are the parts without the skin, vary in softness and colour according to the difference of climate, age, or temperament of body (R).

Their general use in the body does not seem to be absolutely determined; but hairs in particular parts, as on the eyebrows and eyelids, are destined for particular uses, which will be mentioned when those parts are described.

§ 8. *Of the* Cellular Membrane *and* Fat.

83 Cellular membrane.

The cellular membrane is found to invest the most minute fibres we are able to trace; so that, by modern physiologists, it is very properly considered as the universal connecting medium of every part of the body.

It is composed of an infinite number of minute cells united together, and communicating with each other. The two diseases peculiar to this membrane are proofs of such a communication; for in the *emphysema* all its cells are filled with air, and in the anasarca they are universally distended with water. Besides these proofs of communication from disease, a familiar instance of it may be observed amongst butchers, who usually puncture this membrane, and by inflating it with air add to the good appearance of their meat.

84 Fat.

The cells of this membrane serve as reservoirs to the oily part of the blood, or *Fat*, which seems to be deposited in them, either by transudation through the coats of the arteries that ramify through these cells, or by particular vesssls, continued from the ends of arteries. These cells are not of a glandular structure, as Malpighi and others after him have supposed. The fat is absorbed and carried back into the system by the lymphatics. The great waste of it in many diseases, particularly in the consumption, is a sufficient proof that such an absorption takes place.

The fulness and size of the body are in a great measure proportioned to the quantity of fat contained in the cells of this membrane.

In the living body it seems to be a fluid oil, which concretes after death. In graminivorous animals, it is found to be of a firmer consistence than in man.

The fat is not confined to the skin alone, being met with everywhere in the interstices of muscles, in the omentum, about the kidneys, at the basis of the heart, in the orbits, &c.

The chief uses of the fat seem to be to afford moisture to all the parts with which it is connected; to facilitate the action of the muscles; and to add to the beauty of the body, by making it everywhere smooth and equal.

Sect. II. *Of the Muscles.*

85 The muscles are the organs of motion. The parts that are usually included under this name consist of distinct portions of flesh, susceptible of contraction and relaxation; the motions of which, in a natural and healthy state, are subject to the will, and for this reason they are called *voluntary* muscles. But besides these, there are other parts of the body that owe their power of contraction to their muscular fibres; thus the heart is of a muscular texture, forming what is called a hollow muscle; and the urinary bladder, stomach, intestines, &c. are enabled to act upon their contents, merely because they are provided with muscular fibres. These are called *involuntary* muscles, because their motions are not dependent on the will. The muscles of respiration being in some measure influenced by the will, are said to have a *mixed* motion.

The names by which the voluntary muscles are distinguished, are founded on their size, figure, situation, use, or the arrangement of their fibres, or their origin and insertion. But besides these particular distinctions, there are certain general ones that require to be noticed. Thus, if the fibres of a muscle are placed parallel to each other in a straight direction, they form what is styled a *rectilinear* muscle; if the fibres cross and intersect each other, they constitute a compound muscle; a *radiated* one, if the fibres are disposed in the manner of rays; or a *penniform* muscle, if, like the plume of a pen, they are placed obliquely with respect to the tendon.

Muscles that act in opposition to each other, are called *antagonistæ;* thus every extensor muscle has a flexor for its antagonist, and *vice versa*. Muscles that concur in the same action are styled *congeneres*.

The muscles being attached to the bones, the latter may be considered as levers that are moved in different directions by the contraction of those organs.

That end of a muscle which adheres to the most fixed part is usually called the *origin*, and that which adheres to the more moveable part, the *insertion* of the muscle.

In every muscle we may distinguish two kinds of fibres; the one soft, of a red colour, sensible, and irritable, called fleshy fibres: the other of a firmer texture, of a white glistening colour, insensible, without irritability or the power of contracting, and named tendinous fibres. They are occasionally intermixed, but the fleshy fibres generally prevail in the belly or middle part of a muscle, and the tendinous ones in the extremities. If these tendinous fibres are formed into a round

(R) The hairs likewise differ from each other, and may not be improperly divided into two classes; one of which may include the hair of the head, chin, pubes, and axillæ; and the other, the softer hairs, which are to be observed almost everywhere on the surface of the body.

round slender cord, they form what is called the *tendon* of the muscle; on the other hand, if they are spread into a broad flat surface, the extremity of the muscle is styled *aponeurosis*.

The tendons of many muscles, especially when they are long and exposed to pressure or friction in the grooves formed for them in the bones, are surrounded by a tendinous sheath or *fascia*, in which we sometimes find a small mucous sac or *bursa mucosa*, which obviates any inconvenience from friction. Sometimes we find whole muscles, and even several muscles, covered by a fascia of the same kind, that affords origin to many of their fibres, dipping down between them, adhering to the ridges of bones, and thus preventing them from swelling too much when in action. The most remarkable instance of such a covering is the *fascia lata* of the thigh.

Each muscle is enclosed by a thin covering of cellular membrane, which has been sometimes improperly considered as peculiar to the muscles, and described under the name of *propria membrana musculosa*. This cellular covering dips down into the substance of the muscle, connecting and surrounding the most minute fibres we are able to demonstrate, and affording a support to their vessels and nerves.

Leeuwenhoek fancied he had discovered, by means of his microscope, the ultimate division of a muscle, and that he could point out the simple fibre, which appeared to him to be a hundred times less than a hair; but he was afterwards convinced how much he was mistaken on this subject, and candidly acknowledged, that what he had taken for a simple fibre was in fact a bundle of fibres.

It is easy to observe several of these fascicula or bundles in a piece of beef, in which, from the coarseness of its texture, they are very evident.

The red colour which particularly distinguishes the muscular or fleshy parts of animals, is owing to an infinite number of blood-vessels, that are dispersed through their substance. When we macerate the fibres of a muscle in water, it becomes of a white colour like all other parts of the body divested of their blood. The blood-vessels are accompanied by nerves, and they are both distributed in such abundance to these parts, that in endeavouring to trace the course of the blood-vessels in a muscle, it would appear to be formed altogether by their ramifications; and in an attempt to follow the branches of its nerves, they would be found to be equal in proportion.

If a muscle is pricked or irritated, it immediately contracts. This is called its irritable principle; and this irritability is to be considered as the characteristic of muscular fibres; and may serve to prove their existence in parts that are too minute to be examined by the eye. This power, which disposes the muscles to contract when stimulated, independent of the will, is supposed to be inherent in them; and is therefore named *vis insita*. This property is not to be confounded with elasticity, which the membranes and other parts of the body possess in a greater or less degree in common with the muscles; nor with sensibility, for the heart, though the most irritable, seems to be the least sensible of any of the muscular parts of the body.

86 The vis insita.

After a muscular fibre has contracted, it soon returns to a state of relaxation, till it is excited afresh, and then it contracts and relaxes again. We may likewise produce such a contraction, by irritating the nerve leading to a muscle, although the muscle itself is not affected.

This principle is found to be greater in small than in large, and in young than in old, animals.

In the voluntary muscles these effects of contraction and relaxation of the fleshy fibres are produced in obedience to the will, by what may be called the *vis nervosa*, a property that is not to be confounded with the *vis insita*. As the existence of a *vis insita* different from a *vis nervea*, was the doctrine taught by Dr Haller in his *Elem. Phys.* but is at present called in question by several, particularly Dr Monro, we think it necessary to give a few objections, as stated in his Observations on the Nervous System.

87 The vis nervea.

"The chief experiment (says the Doctor) which seems to have led Dr Haller to this opinion, is the well known one, that the heart and other muscles, after being detached from the brain, continue to act spontaneously, or by stimuli may be roused into action, for a considerable length of time; and when it cannot be alleged, says Dr Haller, that the nervous fluid is by the mind, or otherwise, impelled into the muscle.

"That in this instance, we cannot comprehend by what power the nervous fluid or energy can be put in motion, must perhaps be granted: But has Dr Haller given a better explanation of the manner in which his supposed vis insita becomes active?

"If it be as difficult to point out the cause of the action of the vis insita as that of the action of the vis nervea, the admission of that new power, instead of relieving, would add to our perplexity.

"We should then have admitted, that two causes of a different nature were capable of producing exactly the same effect; which is not in general agreeable to the laws of nature.

"We should find other consequences arise from such a hypothesis, which tend to weaken the credibility of it. For instance, if in a sound animal the vis nervea alone produces the contraction of the muscles, we will ask what purpose the vis insita serves? If both operate, are we to suppose that the vis nervea, impelled by the mind or living principle, gives the order, which the vis insita executes, and that the nerves are the internuntii; and so admit two wise agents employed in every the most simple action? But instead of speculating farther, let us learn the effect of experiments, and endeavour from these to draw plain conclusions.

"1. When I poured a solution of opium in water under the skin of the leg of a frog, the muscles, to the surface of which it was applied, were very soon deprived of the power of contraction. In like manner, when I poured this solution into the cavity of the heart, by opening the vena cava, the heart was almost instantly deprived of its power of motion, whether the experiment was performed on it fixed in its place, or cut out of the body.

"2. I opened the thorax of a living frog; and then tied or cut its aorta, so as to put a stop to the circulation of its blood.

Of the Muscles.

" I then opened the vena cava, and poured the solution of opium into the heart; and found, not only that this organ was instantly deprived of its powers of action, but that in a few minutes the most distant muscles of the limbs were extremely weakened. Yet this weakness was not owing to the want of circulation, for the frog could jump about for more than an hour after the heart was cut out.

" In the first of these two experiments, we observe the supposed vis insita destroyed by the opium; in the latter the vis nervea: for it is evident that the limbs were affected by the sympathy of the brain, and of the nervous system in general, with the nerves of the heart.

" 3. When the nerve of any muscle is first divided by a transverse section, and then burnt with a hot iron, or punctured with a needle, the muscle in which it terminates contracts violently, exactly in the same manner as when the irritation is applied to the fibres of the muscle. But when the hot iron or needle is confined to the nerve, Dr Haller himself must have admitted, that the vis nervea, and not the vis insita, was excited. But here I would ask two questions.

" First, Whether we do not as well understand how the vis nervea is excited when irritation is applied to the muscle as when it is applied to the trunk of the nerve, the impelling power of the mind seeming to be equally wanting in both cases?

" Secondly, If it appears that irritation applied to the trunk of a nerve excites the vis nervea, why should we doubt that it can equally well excite it when applied to the small and very sensible branches and terminations of the nerve in the muscle?

" As therefore, it appears that the supposed vis insita is destroyed or excited by the same means as the vis nervea; nay, that when, by the application of opium to the heart of a frog, after the aorta is cut and the circulation interrupted, we have destroyed the vis insita, the vis nervea is so much extinguished, that the animal cannot act with the distant muscles of the limb; and that these afterwards grow very torpid, or lose much of their supposed vis insita; it seems clearly to follow, that there is no just ground for supposing that any other principle produces the contraction of a muscle."

The *vis nervosa*, or operation of the mind, if we may so call it, by which a muscle is brought into contraction, is not inherent in the muscle like the *vis insita*, neither is it perpetual, like this latter property. After long continued or violent exercise, for example, the voluntary muscles become painful, and at length incapable of further action; whereas the heart and other involuntary muscles, the motions of which depend solely on the *vis insita*, continue through life in a constant state of action, without any inconvenience or waste of this inherent principle.

Of the Muscles.

The action of the vis nervosa on the voluntary muscles constitutes what is called muscular motion; a subject that has given rise to a variety of hypotheses, many of them ingenious, but none of them satisfactory.

Borelli and some others have undertaken to explain the cause of contraction, by supposing that every muscular fibre forms as it were a chain of very minute bladders, while the nerves which are distributed through the muscle, bring with them a supply of animal spirits, which at our will fill these bladders, and by increasing their diameter in width, shorten them, and of course the whole fibre.

Borelli supposes the bladders to be of a rhomboidal shape; Bernouilli, on the other hand, contends that they are oval. Our countryman, Cowper, fancied he had filled them with mercury; the cause of this mistake was probably owing to the mercury's insinuating itself into some of the lymphatic vessels. The late ingenious Mr Elliot undertook to account for the phenomena of muscular motion on principles very different from those just now mentioned. He supposed that a dephlogisticated state of the blood is requisite for muscular action, and that a communication of phlogiston to the blood is a necessary effect of such action.

We know that the muscular fibre is shortened, and that the muscle itself swells when in action; but how these phenomena are produced, we are unable to determine. We likewise know that the nerves are essential to muscular motion; for upon dividing or making a ligature round the nerve leading to a muscle, the latter becomes incapable of motion. A ligature made on the artery of a muscle produces a similar effect: a proof this, that a regular supply of blood is also equally necessary to muscular motion. The cause of palsy is usually not to be sought for in the muscle affected, but in the nerve leading to that muscle, or that part of the brain or spinal marrow from which the nerve derives its origin.

Of the particular Muscles.

As the enumeration and description of the particular muscles must be dry and unentertaining to the generality of readers, yet cannot be altogether omitted in a work of this nature, it appeared eligible to throw this part of the subject into the form of a table; in which the name, origin, insertion, and principal use of each muscle will be found described in few words, and occasionally its etymology, when it is of Greek derivation or difficult to be understood.

A TABLE

A TABLE of the MUSCLES, arranged according to their SITUATION.

[*N. B.* This table does not include all the muscles of the body; those belonging to the eyes, internal ear, intestinum rectum, and the male and female organs of generation, being described in other parts of the work. The reader will be pleased to observe likewise, that although the muscles (a few only excepted) are in pairs, mention is here made only of the muscles of one side].

MUSCLES situated	*Name.*	*Origin.*	*Insertion.*	*Use.*
under the integuments of the cranium, - -	1. Occipito-frontalis.	From the transverse ridge of the os occipitis.	Into the skin of the eyebrows.	To pull the skin of the head backwards, and to raise the eyebrows and skin of the forehead.
	2. Corrugator supercilii.	From above the joining of the os frontis, os nasi, and os maxillare.	Into the inner part of the occipito-frontalis.	To draw the eyebrows towards each other, and to wrinkle the forehead.
——— of the eyelids,	1. Orbicularis palpebrarum.	From around the edge of the orbit.	Into the nasal process of the os maxillare.	To shut the eye.
	2. Levator palpebræ superioris.	From the bottom of the orbit, near the optic foramen.	Into the cartilage of the upper eyelid.	To open the eye.
——— of the external ear,	1. Attollens auriculam.	From the tendon of the occipito frontalis near the os temporis.	Into the upper part of the ear.	To raise the ear.
	2. Anterior auriculæ.	From near the back part of the zygoma.	Into an eminence behind the helix.	To raise this eminence, and to pull it forwards.
	3. Retrahentes (s) auriculæ.	From the outer and back part of the root of the mastoid process.	Into the convex part of the concha.	To stretch the concha, and pull the ear backwards.
——— of the cartilages of the ear,	1. Tragicus.	From the outer and middle part of the concha, near the tragus.	Into the upper part of the tragus.	To depress the concha, and pull the point of the tragus a little outwards.
	2. Anti-tragicus.	From the root of the inner part of the helix.	Into the upper part of the anti-tragus.	To dilate the mouth of the concha.
	3. Transversus auriculæ.	From the upper part of the concha.	Into the inner part of the helix.	To stretch the concha and scapha, and likewise to pull the parts it is connected with towards each other.
	4. Helicis major.	From the upper, anterior, and acute part of the helix.	Into the cartilage of the helix, a little above the tragus.	To depress the upper part of the helix.
	5. Helicis minor.	From the lower and fore part of the helix.	Into the helix, near the fissure in its cartilage.	To contract the fissure.

MUSCLES

(s) These are three small slender muscles. The inferior one is sometimes wanting.

Of the Muscles.

	Name.	Origin.	Insertion.	Use.
Muscles of the nose,	1. Compressor naris. (t)	From the outer part of the root of the alæ nasi.	Into the nasal process of the os maxillare, and anterior extremity of the os nasi.	To straiten the nostrils, and likewise to corrugate the skin of the nose.
—— of the mouth and lips,	1. Levator labii superioris, alæque nasi.	From the outer part of the orbitar process of the os maxillare, and from the nasal process of that bone, where it joins the os frontis.	Into the upper lip and alæ of the nose.	To draw the upper lip and skin of the nose upwards and outwards.
	2. Levator anguli oris.	From the os maxillare superius, between the orbitar foramen and the first dens molaris.	Into the orbicularis oris at the angle of the mouth.	To raise the corner of the mouth.
	3. Zygomaticus major.	From the os malæ, near the zygomatic suture.	Into the angle of the mouth.	To raise the angle of the mouth, and make the cheek prominent as in laughing.
	4. Zygomaticus minor.	Immediately above the origin of the zyg. major.	Into the angle of the mouth.	To raise the angle of the mouth obliquely outwards.
	5. Buccinator.	From the alveoli of the dentes molares in the upper and lower jaws.	Into the angle of the mouth.	To contract the mouth and draw the angle of it outwards and backwards.
	6. Depressor labii superioris, alæque nasi.	From the os maxill. super. immediately above the gums of the dentes incisores.	Into the root of the alæ nasi and upper lip.	To draw the alæ nasi and upper lip downwards.
	7. Depressor anguli oris.	At the side of the chin from the lower edge of the maxilla inferior.	Into the angle of the mouth.	To draw the corner of the mouth downwards.
	8. Depressor labii inferioris.	From the lower and anterior part of the maxilla inferior.	Into the under lip.	To draw the under lip downwards and somewhat outwards.
	9. Levator labii inferioris.	From near the gums of the incisores and caninus of the maxilla inferior.	Into the under lip and skin of the chin.	To raise the under lip and skin of the chin.
	10. Orbicularis oris (u).			To shut the mouth by constringing the lips.
—— of the lower jaw,	1. Temporalis.	From part of the os bregmatis and os frontis; squamous part of the os temporis; back part of the os malæ, and the temporal process of the os sphenoides (v.)	Into the coronoid process of the lower jaw.	To move the lower jaw upwards.

2. Masseter

(t) The nose is affected by fibres of the occipito-frontalis, and by several muscles of the face; but this pair, the compressores, is the only one that is proper to it.

(u) This muscle is in a great measure, if not wholly, formed by the buccinator, zygomatici, depressores, and other muscles that move the lips. Its fibres surround the mouth like a ring.

(v) Some of its fibres likewise have their origin from a strong fascia that covers the muscle and adheres to the bone

	Name.	*Origin.*	*Insertion.*	*Use.*
	2. Masseter (W).	From the malar process of the os maxillare, and the lower edges of the os malæ, and of the zygomatic process of the os temporis.	Into the basis of the coronoid process, and that part of the jaw which supports that and the condyloid process.	To raise and likewise to move the jaw a little forwards and backwards.
	3. Pterygoideus internus.	From the inner surface of the outer wing of the pterygoid process of the os sphenoides, and from the process of the os palati that helps to form the pterygoid fossa.	Into the lower jaw on its inner side and near its angle.	To raise the lower jaw, and draw it a little to one side.
	4. Pterygoideus externus.	From the external ala of the pterygoid process, a small part of the adjacent os maxillare, and a ridge in the temporal process of the os sphenoides.	Into the fore part of the condyloid process of the lower jaw, and likewise of the capsular ligament.	To move the jaw forwards and to the opposite side (X); and at the same time to prevent the ligament of the joint from being pinched.
Muscles situated at the fore part of the neck, - - -	1. Latissimus colli (Y).	From the cellular membrane covering the pectoral, deltoid, and trapezius muscles.	Into the side of the chin and integuments of the cheek.	To draw the cheeks and skin of the face downwards; and when the mouth is shut, to draw all that part of the skin to which it is connected below the lower jaw upwards.
	2. Mastoideus (Z).	From the upper part of the sternum, and from the upper and fore part of the clavicle.	Into the mastoid process, and as far back as the lambdoidal suture.	To move the head to one side, or when both muscles act, to bend it forwards.
——— situated between the trunk and the os hyoides,	1. Omo-hyoideus (A).	From the upper costa of the scapula near its niche; from part of a ligament that extends across this niche, and sometimes by a few fibres, from the coracoid process.	Into the basis of the os hyoides.	To draw the os hyoides in an oblique direction downwards.

2. Sterno-

bone round the whole circumference of its origin. When we remove this covering, we find the muscle of a semicircular shape with its radiated fibres, converging and forming a strong middle tendon.

(W) So called from its use in chewing, its derivation being from μασσαομαι, *manduco*, "to eat."

(X) This happens when the muscle acts singly. When both act, the jaw is brought horizontally forwards.

(Y) This broad and thin muscular expansion, which is situated immediately under the common integuments, is by Winslow named *musculus cutaneus*. Galen gave it the name of πλατυσμα μυοιδες, (*Platysma myoides*); the etymology of which is from πλατυσμος, *dilatatio*, and μυς, *musculus*, and ειδος, *forma*.

(Z) This, on account of its two origins, is by Albinus described as two distinct muscles, which he names *sterno-mastoideus* and *cleido mastoideus*.

(A) As this muscle does not always arise from the coracoid process, it seems to have been improperly named *coraco-*

	Name.	Origin.	Insertion.	Use.
	2. Sterno-hyoideus.	From the cartilage of the first rib, the inner and upper part of the sternum, and a small part of the clavicle.	Into the basis of the os hyoides.	To draw the os hyoides downwards.
	3. Hyo-thyroideus.	From part of the basis and horn of the os hyoides.	Into a rough oblique line at the side of the thyroid cartilage.	To raise the thyroid cartilage, or depress the os hyoides.
	4. Sterno-thyroideus.	From between the cartilages of the 1st and 2d ribs, at the upper and inner part of the sternum.	Immediately under the hyo-thyroideus.	To pull the thyroid cartilage downwards.
	5. Crico-thyroideus.	From the anterior part and side of the cricoid cartilage.	Into the lower part and inferior horn of the thyroid cartilage.	To pull the cricoid cartilage upwards and backwards, or the thyroid forwards and downwards.
Muscles situated between the os hyoides and lower jaw,	1. Digastricus (B).	From a fossa at the root of the mastoid process, and likewise from the os hyoides.	Into the lower and anterior part of the chin.	To draw the lower jaw downwards.
	2. Stylo-hyoideus (C).	From the basis of the styloid process.	Into the side and fore part of the os hyoides near its base.	To draw the os hyoides obliquely upwards.
	3. Mylo-hyoideus (D).	From the inside of the lower jaw, between the last dens molaris and the chin.	Into the basis of the os hyoides.	To move the os hyoides forwards or upwards.
	4. (E) Genio-hyoideus.	From the inside of the chin.	Into the base of the os hyoides.	To move the os hyoides forwards or upwards.
	5. Genio-glossus.	From the inside of the chin.	Into the tongue and basis of the os hyoides.	To move the tongue in various directions.
	6. Hyo-glossus (F).	From the horn, basis, and appendix of the os hyoides.	Into the tongue laterally.	To draw the tongue downwards and inwards.
	7. Lingualis.	Laterally from the root of the tongue.	Into the extremity of the tongue.	To shorten the tongue and draw it backwards.
	8. Stylo-glossus.			

coraco-hyoides by Douglas and Albinus. Winslow calls it *omo-hyoides*, on account of its general origin from the scapula.

(B) from δις and γαστηρ (*biventer*), because it has two fleshy bellies with a middle tendon. This tendon passes through the stylo-hyoideus.

(C) In some subjects we meet with another muscle, which, from its having nearly the same origin, insertion, and use as this, has been named *stylo-hyoideus alter*.

(D) So named from its arising near the dentes molares (μυλοι) and its being inserted into the os hyoides.

(E) From γενειον, *mentum*, "the chin."

(F) From κερας, *cornu*, and γλωσσα, *lingua*, "the tongue."

	Name.	Origin.	Insertion.	Use.
	8. Stylo-glossus.	From the styloid process, and sometimes also from a ligament that extends from thence to the angle of the lower jaw.	Into the side of the tongue from the root to near its tip.	To move the tongue backwards and to one side.
	9. Stylo-pharyngæus.	From the basis of the styloid process.	Into the side of the pharynx and posterior part of the thyroid cartilage.	To raise the thyroid cartilage and pharynx, and likewise to dilate the latter.
	10. Circumflexus palati.	From near the bony part of the Eustachian tube, and from the spinous process of the os sphenoides.	Into the semilunar edge of the os palati and the velum pendulum palati (G).	To dilate and draw the velum obliquely downwards.
	11. Levator palati.	From the membranous part of the Eustachian tube, and the extremity of the os petrosum.	Into the velum pendulum palati.	To pull the velum backwards.
Muscles situated about the fauces,	1. Palato-pharyngæus.	From the lower and anterior part of the cartilaginous extremity of the Eustachian tube (H); the tendinous expansion of the circumflexus palati; and the velum pendulum palati near the basis and back part of the uvula.	Into the upper and posterior part of the thyroid cartilage.	To raise the pharynx and thyroid cartilage, or to pull the velum and uvula backwards and downwards.
	2. Constrictor isthmi faucium.	From near the basis of the tongue laterally.	Into the velum pendulum palati, near the basis and fore part of the uvula.	To raise the tongue and draw the velum towards it (I).
	3. Azygos uvulæ.	From the end of the suture that unites the ossa palati.	Into the extremity of the uvula.	To shorten the uvula, and bring it forwards and upwards
——— at the back part of the pharynx, -	1. Constrictor pharyngis superior.	From the cuneiform process of the occipital bone; the pterygoid process of the os sphenoides; and from each jaw near the last dens molaris (K).	Into the middle of the pharynx.	To move the pharynx upwards and forwards, and to compress its upper part.

2. Constrictor

(G) This muscle in its course forms a round tendon, which, after passing over a kind of hook formed by the inner plate of the pterygoid process of the sphenoid bone, expands into a tendinous membrane.

(H) The few fibres that arise from the Eustachian tube are described as a distinct muscle by Albinus, under the name of *salpingo-pharyngæus*. They serve to dilate the mouth of the tube.

(I) This muscle, and the palato-pharyngæus, likewise serve to close the passage into the fauces, and to carry the food into the pharynx.

(K) The three orders of fibres here mentioned, with a few others derived from the tongue, have given occasion to Douglas to describe them as four distinct muscles, under the names of *cephalo-pharyngæus*, *mylo-pharyngæus*, *ptery pharyngæus*, and *glosso-pharyngæus*.

	Name.	*Origin.*	*Insertion.*	*Use.*
	2. Constrictor pharyngis medius (L).	From the horn and appendix of the os hyoides, and from the ligament that unites it with the thyroid cartilage.	Into the middle of the processus cuneiformis of the occipital bone, about its middle, and before the great foramen.	To draw the os hyoides and pharynx upwards, and to compress the latter.
	3. Constrictor pharyngis inferior (M).	From the cricoid and thyroid cartilages.	Into the middle of the pharynx.	To compress part of the pharynx.
Muscles about the glottis, - -	1. Crico-arytænoideus lateralis.	From the side of the cricoid cartilage.	Into the basis of the arytænoid cartilage laterally.	To open the glottis.
	2. Crico-arytænoideus posticus.	From the cricoid cartilage posteriorly.	Into the basis of the arytænoid cartilage posteriorly.	To open the glottis.
	3. Arytænoideus obliquus.	From the basis of one of the arytænoid cartilages.	Near the extremity of the other arytænoid cartilage.	To draw the parts it is connected with towards each other.
	4. Arytænoideus transversus.	From one of the arytænoid cartilages laterally.	In the other arytænoid cartilage laterally.	To shut the glottis.
	5. Thyreo-arytænoideus.	From the posterior and under part of the thyroid cartilage.	Into the arytænoid cartilage.	To draw the arytænoid cartilage forwards.
	6. Arytæno-epiglottideus.	From the upper part of the arytænoid cartilage laterally.	Into the side of the epiglottis.	To move the epiglottis outwards.
	7. Thyreo-epiglottideus.	From the thyroid cartilage.	Into the side of the epiglottis.	To pull the epiglottis obliquely downwards (N).
——— at the fore part of the neck close to the vertebræ, - -	1. Rectus capitis internus major.	From the anterior extremities of the transverse processes of the five lowermost cervical vertebræ.	Into the fore part of the cuneiform process of the os occipitis.	To bend the head forwards.
	2. Rectus capitis internus minor.	From the anterior and upper part of the first cervical vertebra.	Near the basis of the condyloid process of the os occipitis.	To assist the last described muscle.
	3. Rectus capitis lateralis.	From the anterior and upper part of the transverse process of the first cervical vertebra.	Into the os occipitis, opposite to the stylo-mastoid foramen.	To move the head to one side.
	4. Longus colli.	Within the thorax, laterally from the bodies of the three uppermost dorsal vertebræ; from the basis and fore part	Into the second cervical vertebra anteriorly.	To pull the neck to one side (O).

(L) Douglas makes two muscles of this, the *hyo-pharyngæus* and *syndesmo-pharyngæus*.
(M) The crico-pharyngæus and thyro-pharyngæus of Douglas.
(N) When either this or the preceding muscle acts with its fellow, the epiglottis is drawn directly downwards upon the glottis.
(O) When both muscles act, the neck is drawn directly forwards.

Name.		Origin.	Insertion.	Use.
		of the transverse processes of the first and second dorsal vertebræ, and of the last cervical vertebra; and lastly, from the anterior extremities of the transverse processes of the 6th, 5th, 4th, and 3d cervical vertebræ.		
Muscles at the fore part of the abdomen, - -	1. Obliquus externus.	From the lower edges of the eight inferior ribs near their cartilages.	Into the linea alba (P), ossa pubis (Q), and spine of the ilium (R).	To compress and support the viscera, assist in evacuating the fæces and urine, draw down the ribs, and bend the trunk forwards or obliquely to one side.
	2. Obliquus internus.	From the spinous process of the three lowermost lumbar vertebræ, the back part of the os sacrum, the spine of the ilium, and back part of Fallopius's ligament (T).	Into the cartilages of all the false ribs, linea alba (S), and fore part of the pubis.	To assist the obliquus externus.
	3. Transversalis.	From the cartilages of the seven inferior ribs; the transverse processes of the last dorsal, and four upper lumbar vertebræ; the inner part of Fallopius's ligament and the spine of the ilium.	Into the linea alba and cartilago ensiformis.	To compress the abdominal viscera.

4. Rectus

(P) The linea alba is that tendinous expansion which reaches from the cartilago ensiformis to the os pubis. It is formed by the interlacement of the tendinous fibres of the oblique and transverse muscles, and on this account some anatomists have considered these as three digastric muscles.

(Q) A little above the pubis the tendinous fibres of this muscle separate from each other, so as to form an opening called the *ring* of the obliquus externus, and commonly, though improperly, the ring of the abdominal muscles, there being no such aperture either in the transversalis or obliquus internus. This ring in the male subject affords a passage to the spermatic vessels, and in the female to the round ligament of the uterus.

(R) From the anterior and upper spinous process of the ilium, this muscle is stretched tendinous to the os pubis, and thus forms what is called by some *Fallopius's*, and by others *Poupart's ligament*. The blood-vessels pass under it to the thigh.

(S) The tendon formed by the upper part of the muscle in its way to the linea alba is divided into two layers. The posterior layer runs under, and the anterior one over, the rectus muscle.

(T) From this part it detaches some fibres which extend downwards upon the spermatic chord, and form what is described as the cremaster muscle.

	Name.	*Origin.*	*Insertion.*	*Use.*
	4. Rectus abdominis.	From the upper edge of the pubis and the symphysis pubis.	Into the cartilages of the 5th, 6th, and 7th ribs, and the edge of the cartilago ensiformis (U).	To compress the fore part of the abdomen, and to bend the trunk forwards.
	5. Pyramidalis (V).	From the anterior and upper part of the pubis.	Into the linea alba and inner edge of the rectus, commonly about two inches above the pubis.	To assist the lower portion of the rectus.
Muscles at the fore part of the thorax,	1. Pectoralis major.	From the cartilaginous ends of the 5th and 6th ribs; the sternum, and anterior part of the clavicle.	Into the upper and inner part of the os humeri (W).	To draw the arm forwards, or obliquely forwards.
	2. Subclavius.	From the cartilage of the first rib.	Into the under surface of the clavicle.	To move the clavicle forwards and downwards, and to assist in raising the first rib.
	3. Pectoralis minor (X).	From the upper edges of the 3d, 4th, and 5th ribs.	Into the coracoid process of the scapula.	To move the scapula forwards and downwards, or to elevate the ribs.
	4. Serratus magnus.	From the eight superior ribs.	Into the basis of the scapula.	To bring the scapula forwards.
——— that concur in forming the thorax, - - -	1. Diaphragma (Y).			
	2. Levatores costarum.	From the transverse processes of the last cervical, and the eleven upper dorsal vertebræ.	Into the upper side of each rib, near its tuberosity.	To move the ribs upwards and outwards.
	3. Intercostales externi.	From the lower edge of each upper rib.	Into the superior edge of each lower rib.	To elevate the ribs.
	4. Intercostales interni (A).			
	5. Sterno-costales			

(U) The fibres of the rectus are generally divided by three tendinous intersections. The two upper thirds of this muscle passing between the tendinous layers of the obliquus internus, are enclosed as it were in a sheath; but at its lower part we find it immediately contiguous to the peritonæum, the inferior portion of the tendon of the transversalis passing over the rectus, and adhering to the interior layer of the obliquus internus.

(V) This muscle is sometimes wanting.

(W) The fibres of this muscle pass towards the axilla in a folding manner, and with those of the latissimus dorsi form the arm-pit.

(X) This and some other muscles derive their name of *serratus*, from their arising by a number of tendinous or fleshy digitations, resembling the teeth of a saw (*serra*).

(Y) For a description of the diaphragm, see Chap. IV. Sect. IV.

(A) The origin, insertion, and use of the internal intercostals, are similar to those of the external. The reader, however, will be pleased to observe, that the intercostales externi occupy the spaces between the ribs only from the spine to their cartilages; from thence to the sternum, there being only a thin membrane, which is spread over the intercostales interni; and that the latter, on the contrary, extend only from the sternum to the angles of each rib.

The fibres of the external muscles run obliquely forwards; those of the internal obliquely backwards. This difference in the direction of their fibres induced Galen to suppose that they were intended for different uses; that the external intercostals, for instance, serve to elevate, and the internal ones to depress the ribs. Fallopius seems to have been the first who ventured to dispute the truth of this doctrine, which has since been revived by

	Name.	*Origin.*	*Insertion.*	*Use.*
	5. Sterno-costales (B).	From the cartilago ensiformis, and lower and middle part of the sternum.	Into the cartilages of the 2d, 3d, 4th, 5th, and 6th ribs.	To depress the cartilages of the ribs.
Muscles at the back part of the neck and trunk, - - -	1. Trapezius (C), or cucullaris.	From the middle of the os occipitis, and the spinous processes of the two inferior cervical, and of all the dorsal vertebræ (D).	Into the posterior half of the clavicle, part of the acromion, and the spine of the scapula.	To move the scapula.
	2. Rhomboideus (E).	From the spinous processes of the three lowermost cervical, and of all the dorsal vertebræ.	Into the basis of the scapula.	To move the scapula upwards and backwards.
	3. Latissimus dorsi.	From part of the spine of the os ilium, the spinous processes of the os sacrum and lumbar vertebræ, and of six or eight of the dorsal vertebræ; also from the four inferior false ribs near their cartilages.	Into the os humeri, at the inner edge of the groove for lodging the long head of the biceps muscle.	To draw the os humeri downwards and backwards, and to roll it upon its axis.
	4. Serratus inferior posticus.	From the spinous processes of the two lowermost dorsal, and of three of the lumbar vertebræ.	Into the lower edges of the three or four lowermost ribs near their cartilages.	To draw the ribs outwards, downwards, and backwards.
	5. Levator scapulæ.	From the transverse processes of the four uppermost vertebræ colli.	Into the upper angle of the scapula.	To move the scapula forwards and upwards.
	6. Serratus superior posticus.	From the lower part of the ligamentum colli, the spinous process of the lowermost cervical vertebræ, and of the two superior dorsal vertebræ.	Into the 2d, 3d, and 4th ribs.	To expand the thorax.

7. Splenius

Boyle, and more lately still by Hamberger, whose theoretical arguments on this subject have been clearly refuted by the experiments of Haller.

(B) These consist of four, and sometimes five distinct muscles on each side. Vesalius, and after him Douglas and Albinus, consider them as forming a single muscle, which, on account of its shape, they named *triangularis*. Verheyen, Winslow, and Haller, more properly describe them as so many separate muscles, which, on account of their origin and insertion, they name *sterno-costales*.

(C) So named by Riolanus, from τραπεζα, on account of its quadrilateral shape. Columbus and others give it the name of *cucullaris*, from its resemblance to a monk's hood.

(D) The tendinous fibres of this muscle, united with those of its fellow in the nape of the neck, form what is called the *ligamentum colli*.

(E) This muscle consists of two distinct portions, which are described as separate muscles by Albinus, under the names of *rhomboideus minor* and *rhomboideus major*.

Of the Muscles.

Name.	Origin.	Insertion.	Use.
7. Splenius (F).	From the spinous processes of the four or five uppermost vertebræ of the back, and of the lowermost cervical vertebra.	Into the transverse processes of the two first cervical vertebræ, the upper and back part of the mastoid process, and a ridge on the os occipitis.	To move the head backwards.
8. Complexus (G).	From the transverse processes of the four or five uppermost dorsal, and of the six lowermost cervical vertebræ.	Into the os occipitis.	To draw the head backwards.
9. Trachelo-mastoideus (H).	From the transverse processes of the first dorsal vertebra and four or five of the lowermost cervical vertebræ.	Into the mastoid process.	To draw the head backwards.
10. Rectus capitis posticus major.	From the spinous process of the second cervical vertebra.	Into the os occipitis.	To extend the head and draw it backwards.
11. Rectus capitis posticus minor.	From the first vertebra of the neck.	Into the os occipitis.	To assist the rectus major.
12. Obliquus superior capitis.	From the transverse process of the first cervical vertebra.	Into the os occipitis.	To draw the head backwards.
13. Obliquus inferior capitis.	From the spinous process of the second cervical vertebra.	Into the transverse process of the first cervical vertebra.	To draw the face towards the shoulder, and to move the first vertebra upon the second.
14. Sacro-lumbalis (I).	From the back part of the os sacrum, spine of the ilium, spinous processes, and roots of the transverse processes of the vertebræ of the loins.	Into the lower edge of each rib.	To draw the ribs downwards, move the body upon its axis, assist in erecting the trunk, and turn the neck backwards, or to one side.
15. Longisssimus dorsi (K).	The same as that of the sacro-lumbalis.	Into the transverse processes of the dorsal vertebræ.	To stretch the vertebræ of the back, and keep the trunk erect.

16. Spinalis

(F) According to some writers, this muscle has gotten its name from its resemblance to the spleen; others derive it from *splenium*, *splint*.

(G) So named on account of its complicated structure.

(H) So named from its origin from the neck (τραχηλος) and its insertion into the mastoid process.

(I) Several thin fasciculi of fleshy fibres arise from the lower ribs, and terminate in the inner side of this muscle. Steno names them *musculi ad sacro-lumbalem accessorii*. The sacro-lumbalis likewise sends off a fleshy slip from its upper part, which by Douglas and Albinus is described as a distinct muscle, under the name of *cervicalis descendens*. Morgagni has very properly considered it as part of the sacro-lumbalis.

(K) At the upper part of this muscle a broad thin layer of fleshy fibres is found crossing, and intimately adhering to it. This portion, which is described by Albinus under the name of *transversalis cervicis*, may very properly be considered as an appendage to the longissimus dorsi. It arises from the transverse processes of the five or six superior dorsal vertebræ, and is inserted into the transverse processes of the six inferior cervical vertebræ. By means of this appendage the longissimus dorsi may serve to move the neck to one side, or obliquely backwards.

	Name.	*Origin.*	*Insertion.*	*Use.*
	16. Spinalis dorsi.	From the spinous processes of the uppermost lumbar and lowermost dorsal vertebræ.	Into the spinous processes of the nine superior dorsal vertebræ.	To extend the vertebræ.
	17. Semi-spinalis dorsi.	From the transverse processes of the 7th, 8th, 9th, and 10th, vertebræ of the back.	Into the spinous processes of the four uppermost dorsal, and lowermost of the cervical vertebræ.	To extend the spine obliquely backwards.
	18. Multifidus spinæ (L).	From the os sacrum, ilium, oblique and transverse processes of the lumbar vertebræ, transverse processes of the dorsal and four of the cervical vertebræ.	Into the spinous processes of the lumbar, dorsal, and six of the cervical vertebræ.	To extend the back, and draw it backwards or to one side.
	19. Semi-spinalis colli.	From the transverse processes of the five or six uppermost dorsal vertebræ.	Into the spinous processes of the 2d, 3d, 4th, 5th, and 6th cervical vertebræ.	To stretch the neck obliquely backwards.
	20. Scalenus (M).	From the transverse processes of the five inferior cervical vertebræ.	Into the upper and outer part of the first and second ribs.	To move the neck forwards, or to one side.
	21. Inter-spinales (N).	From the upper part of each of the spinous processes of the six inferior cervical vertebræ.	Into the under part of each of the spinous processes of the vertebræ above.	To draw the spinous processes towards each other.
	22. Inter-transversales (O).	From the upper part of each of the transverse processes of the vertebræ.	Into the under part of each of the transverse processes of the vertebræ above.	To draw the transverse processes towards each other.
Muscles within the cavity of the abdomen, on the anterior and lateral parts of the spine, - - -	1. Psoas parvus (P).	From the sides and transverse processes of the uppermost lumbar vertebra, and sometimes of the lowermost dorsal vertebra.	Into the brim of the pelvis, at the junction of the os pubis with the ilium.	To bend the loins forwards.

2. Psoas

(I.) Anatomists in general have unnecessarily multiplied the muscles of the spine. Albinus has the merit of having introduced greater simplicity into this part of myology. Under the name of *multifidus spinæ*, he has very properly included those portions of muscular flesh intermixed with tendinous fibres, situated close to the back part of the spine, and which are described by Douglas under the names of *transversales colli*, *dorsi*, *et lumborum*.

(M) The ancients gave it this name from its resemblance to an irregular triangle (σκαληνος). It consists of three fleshy portions. The anterior one affords a passage to the axillary artery, and between this and the middle portion we find the nerves going to the upper extremities. The middle is in part covered by the posterior portion, which is the longest and thinnest of the three.

(N) In the generality of anatomical books we find these muscles divided into *inter-spinales cervicis*, *dorsi*, and *lumborum;* but we do not find any such muscles either in the loins or back.

(O) These muscles are to be found only in the neck and loins; what have been described as the *inter-transversales dorsi* being rather small tendons than muscles.

(P) This and the following pair of muscles derive their name of *psoas* from ψοα, *lumbus*, on account of their situation at the anterior part of the loins.

	Name.	*Orgin.*	*Insertion.*	*Use.*
	2. Psoas magnus.	From the bodies and transverse processes of the last dorsal, and all the lumbar vertebræ.	Into the os femoris, a little below the trochanter minor.	To bend the thigh forwards.
	3. Iliacus internus.	From the inner lip, hollow part, and edge of the os ilium.	In common with the psoas magnus.	To assist the psoas magnus.
	4. Quadratus lumborum (Q).	From the posterior part of the spine of the ilium.	Into the transverse processes of the four uppermost lumbar vertebræ, the inferior edge of the last rib, and the side of the lowermost dorsal vertebra.	To support the spine, or to draw it to one side.
	5. Coccygæus.	From the posterior and inner edge of the spine of the ischium.	Into the lower part of the os sacrum, and almost the whole length of the os coccygis laterally.	To draw the os coccygis forwards and inwards (R).
Muscles on the scapula and upper part of the os humeri, - -	1. Deltoides (S).	From the clavicle, processus acromion, and spine of the scapula.	Into the anterior and middle part of the os humeri.	To raise the arm.
	2. Supra-spinatus.	From the basis, spine, and upper costa of the scapula.	Into a large tuberosity at the head of the os humeri.	To raise the arm.
	3. Infra-spinatus.	From the basis and spine of the scapula.	Into the upper and middle part of the tuberosity.	To roll the os humeri outwards.
	4. Teres minor (T).	From the inferior costa of the scapula.	Into the lower part of the tuberosity.	To assist the infra-spinatus.
	5. Teres major.	From the inferior angle, and inferior costa of the scapula.	Into the ridge at the inner side of the groove formed for the long head of the biceps.	To assist in the rotatory motion of the arm.
	6. Subscapularis.	From the basis, superior and inferior costæ of the scapula.	Into the upper part of a small tuberosity at the head of the os humeri.	To roll the arm inwards.
	7. Coraco-brachialis (U).	From the coracoid process of the scapula.	Into the middle and inner side of the os humeri.	To roll the arm forwards and upwards.

Muscles

(Q) So called from its shape, which is that of an irregular square.

(R) Some of the fibres of this muscle are united with those of the levator ani, so that it assists in closing the lower part of the pelvis.

(S) So named from its supposed resemblance to the Greek Δ reversed.

(T) This and the following pair are called *teres*, from their being of a long and round shape.

(U) This muscle affords a passage to the musculo-cutaneous nerve.

	Name.	Origin.	Insertion.	Use.
Muscles on the os humeri, - -	1. Biceps flexor cubiti.	By two heads, one from the coracoid process, and the other, or long head, from the upper and outer edge of the glenoid cavity of the scapula.	Into the tuberosity at the upper end of the radius.	To bend the fore-arm.
	2. Brachialis internus.	From the os humeri, below, and at each side of the tendon of the deltoides.	Into a small tuberosity at the fore part of the coronoid process of the ulna.	To assist in bending the fore-arm.
	3. Triceps extensor cubiti.	By three heads: the first, from the inferior costa of the scapula; the second, from the upper and outer part of the os humeri; and the third, from the back part of that bone.	Into the upper and outer part of the olecranon.	To extend the fore-arm.
——— on the fore-arm, - - -	1. Supinator longus.	From the outer ridge and anterior surface of the os humeri, a little above its outer condyle.	Into the radius near its styloid process.	To assist in turning the palm of the hand upwards.
	2. Extensor carpi radialis longus.	Immediately below the origin of the supinator longus.	Into the upper part of the metacarpal bone of the fore-finger.	To extend the wrist.
	3. Extensor carpi radialis brevis.	From the outer and lower part of the outer condyle of the os humeri, and the upper part of the radius.	Into the upper part of the metacarpal bone of the middle finger.	To assist the extensor longus.
	4. Extensor digitorum communis.	From the outer condyle of the os humeri.	Into the back part of all the bones of the four fingers.	To extend the fingers.
	5. Extensor minimi digiti.	From the outer condyle of the os humeri.	Into the bones of the little finger.	To extend the little finger.
	6. Extensor carpi ulnaris.	From the outer condyle of the os humeri.	Into the metacarpal bone of the little finger.	To assist in extending the wrist.
	7. Anconæus (v).	From the outer condyle of the os humeri.	Into the outer edge of the ulna.	To extend the fore-arm.
	8. Flexor carpi ulnaris.	From the inner condyle of the os humeri, and anterior edge of the olecranon (w).	Into the os pisiforme.	To assist in bending the hand.
	9. Palmaris longus.	From the inner condyle of the os humeri.	Into the internal annular ligament, and aponeurosis palmaris (x).	To bend the arm.

10. Flexor

(v) So called from ἀγκων, *cubitus*.

(w) Between the two origins of this muscle we find the ulnar nerve going to the fore-arm.

(x) The aponeurosis palmaris is a tendinous membrane that extends over the palm of the hand. Some anatomists

Of the Muscles.

	Name.	*Orgin.*	*Insertion.*	*Use.*
	10. Flexor carpi radialis.	From the inner condyle of the os humeri.	Into the metacarpal bone of the forefinger.	To bend the hand.
	11. Pronator radii teres.	From the outer condyle of the os humeri, and coronoid process of the ulna.	Into the anterior and convex edge of the radius, near its middle.	To roll the hand inwards.
	12. Flexor sublimis perforatus (Y).	From the inner condyle of the os humeri, inner edge of the coronoid process of the ulna, and upper and anterior part of the radius.	Into the second bone of each finger.	To bend the second joint of the fingers.
	13. Supinator radii brevis.	From the outer condyle of the os humeri, and posterior surface and outer edge of the ulna.	Into the anterior, inner, and upper part of the radius.	To roll the radius outwards.
	14. Abductor pollicis longus.	From the middle and back part of the ulna, interosseous ligament, and radius.	By two tendons into the os trapezium, and first bone of the thumb.	To stretch the first bone of the thumb outwards.
	15. Extensor minor pollicis.	From the back part of the ulna, and interosseous ligament and radius.	Into the convex part of the second bone of the thumb.	To extend the second bone of the thumb obliquely outwards.
	16. Extensor major pollicis.	From the back of the ulna and interosseous ligament.	Into the third and last bone of the thumb.	To stretch the thumb obliquely backwards.
	17. Indicator.	From the middle of the ulna.	Into the metacarpal bone of the forefinger.	To extend the forefinger.
	18. Flexor profundus perforans.	From the upper and fore part of the ulna, and interosseous ligament.	Into the fore part of the last bone of each of the fingers.	To bend the last joint of the fingers.
	19. Flexor longus pollicis.	From the upper and fore part of the radius.	Into the last joint of the thumb.	To bend the last joint of the thumb.
	20. Pronator radii quadratus.	From the inner and lower part of the ulna.	Into the radius, opposite to its origin.	To roll the radius inwards, and of course to assist in the pronation of the hand.
Muscles on the hand,	1. Lumbricales (Z).	From the tendons of the perforans.	Into the tendons of the extensor digitorum communis.	To bend the first, and to extend the two last joints of the fingers (A).

2. Abductor

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tomists have supposed it to be a production of the tendon of this muscle, but without sufficient grounds; for in some subjects we find the palmaris longus inserted wholly into the annular ligament, so as to be perfectly distinct from this aponeurosis; and it now and then happens, that no palmaris longus is to be found, whereas this expansion is never deficient.

(Y) This muscle is named *perforatus*, on account of the four tendons, in which it terminates, being perforated by those of another muscle, the perforans.

(Z) So named from their being shaped somewhat like the lumbricus or earth-worm.

(A) Fallopius was the first who remarked the two opposite uses of this muscle. Their extending power is owing to their connexion with the extensor communis.

Name.	*Origin.*	*Insertion.*	*Use.*
2. Abductor brevis pollicis.	From the fore part of the internal annular ligament, os scaphoides, and one of the tendons of the abductor longus pollicis.	Into the outer side of the second bone of the thumb, near its root.	To move the thumb from the fingers.
3. Opponens pollicis.	From the inner and anterior part of the internal annular ligament, and from the os scaphoides.	Into the first bone of the thumb.	To move the thumb inwards, and to turn it upon its axis.
4. Flexor brevis pollicis.	From the os trapezoides, internal annular ligament, os magnum, and os unciforme.	Into the ossa sesamoidea and second bone of the thumb.	To bend the second joint of the thumb.
5. Adductor pollicis.	From the metacarpal bone of the middle finger.	Into the basis of the second bone of the thumb.	To move the thumb towards the fingers.
6. Abductor indicis.	From the inner side of the first bone of the thumb, and from the os trapezium.	Into the first bone of the fore finger posteriorly.	To move the fore finger towards the thumb.
7. Palmaris brevis.	From the internal annular ligament, and aponeurosis palmaris.	Into the os pisiforme, and the skin covering the abductor minimi digiti.	To contract the palm of the hand.
8. Abductor minimi digiti.	From the internal annular ligament, and os pisiforme.	Into the side of the first bone of the little finger.	To draw the little finger from the rest.
9. Flexor parvus minimi digiti.	From the os unciforme and internal annular ligament.	Into the first bone of the little finger.	To bend the little finger.
10. Adductor metacarpi minimi digiti.	From the os unciforme and internal annular ligament.	Into the metacarpal bone of the little finger.	To move that bone towards the rest.
11. Interossei interni.	Situated between the metacarpal bones.	Into the roots of the fingers.	To extend the fingers, and move them towards the thumb (B).
12. Interossei externi.	Situated between the metacarpal bones on the back of the hand.	Into the roots of the fingers.	To extend the fingers; but the first draws the middle finger inwards, the second draws it outwards, and the third draws the ring finger inwards.
MUSCLES at the back part of the pelvis, and upper part of the thigh, - -			
1. Glutæus (C) maximus.	From the spine of the ilium, posterior sacro-ischiatic ligament, os sacrum, and os coccygis.	Into the upper part of the *linea aspera* of the os femoris.	To extend the thigh and draw it outwards.

2. Glutæus

(B) The third interosseus internus (for there are four of the externi and three of the interni) differs from the rest in drawing the middle finger from the thumb.

(C) From γλουτος, *nates*.

	Name.	*Origin.*	*Insertion.*	*Use.*
	2. Glutæus medius.	From the spine and superior surface of the ilium.	Into the outer and back part of the great trochanter of the os femoris.	To draw the thigh outwards and a little backwards, and when it is bended, to roll it.
	3. Glutæus minimus.	From the outer surface of the ilium and the border of its great niche.	Into the upper and anterior part of the great trochanter.	To assist the former.
	4. Pyriformis (D).	From the anterior part of the os sacrum.	Into a cavity at the root of the trochanter major.	To roll the thigh outwards.
	5. Gemini (E).	By two portions, one from the outer surface of the spine of the ischium; the other from the tuberosity of the ischium and posterior sacro-ischiatic ligament.	Into the same cavity as the pyriformis.	To roll the thigh outwards, and likewise to confine the tendon of the obturator internus, when the latter is in action.
	6. Obturator internus.	From the superior half of the inner border of the foramen thyroideum.	Into the same cavity with the former.	To roll the thigh outwards.
	7. Quadratus (F) femoris.	From the tuberosity of the ischium.	Into a ridge between the trochanter major and trochanter minor.	To move the thigh outwards.
Muscles on the thigh (G).	1. Biceps flexor cruris.	By two heads; one from the tuberosity of the ischium, the other from the linea aspera near the insertion of the glutæus maximus.	Into the upper and back part of the fibula (H).	To bend the leg.
	2. Semi-tendinosus.	From the tuberosity of the ischium.	Into the upper and inner part of the tibia.	To bend and draw the leg inwards.
	3. Semi-membranosus (I).	From the tuberosity of the ischium.	Into the upper and back part of the head of the tibia.	To bend the leg.
	4. Tensor vaginæ femoris.	From the superior and anterior spinous process of the ilium.	Into the inner side of the fascia lata, which covers the outside of the thigh.	To stretch the fascia.

5. Sartorius.

(D) So named from its pear-like shape.

(E) The two portions of this muscle having been described as two distinct muscles by some anatomists, have occasioned it to be named *gemini*. The tendon of the obturator internus runs between these two portions.

(F) The muscle is not of the square shape its name would seem to indicate.

(G) The muscles of the leg and thigh are covered by a broad tendinous membrane called *fascia lata*, that surrounds them in the manner of a sheath. It is sent off from the tendons of the glutæi and other muscles, and dipping down between the muscles it covers, adheres to the linea aspera, and spreading over the joint of the knee, gradually disappears on the leg. It is thickest on the inside of the thigh.

(H) The tendon of this muscle forms the *outer ham-string*.

(I) So named on account of its origin, which is by a broad flat tendon three inches long.

Name.	*Origin.*	*Insertion.*	*Use.*
5. Sartorius.	From the superior and anterior spinous process of the ilium.	Into the upper and inner part of the tibia.	To bend the leg inwards (K).
6. Rectus.	By two tendons; one from the anterior and inferior spinous process of the ilium; the other from the posterior edge of the cotyloid cavity.	Into the upper and fore part of the patella.	To extend the leg.
7. Gracilis.	From the fore part of the ischium and pubis.	Into the upper and inner part of the tibia.	To bend the leg.
8. Vastus externus (L).	From the anterior and lower part of the great trochanter, and the outer edge of the linea aspera.	To the upper and outer part of the patella.	To extend the leg.
9. Vastus internus.	From the inner edge of the linea aspera, beginning between the fore part of the os femoris and the root of the lesser trochanter.	Into the upper and inner part of the patella.	To extend the leg.
10. Cruræus (M).	From the outer and arterior part of the lesser trochanter.	Into the upper part of the patella.	To extend the leg.
11. Pectinalis.	From the anterior edge of the os pubis, or pectinis, as it is sometimes called.	Into the upper and fore part of the linea aspera.	To draw the thigh inwards, upwards, and to roll it a little outwards.
12. Adductor longus femoris (N).	From the upper and fore part of the os pubis.	Near the middle and back part of the linea aspera.	To draw the thigh inwards, upwards, and to roll it a little outwards.
13. Adductor brevis femoris.	From the fore part of the ramus of the os pubis.	Into the inner and upper part of the linea aspera.	
14. Adductor magnus femoris.	From the lower and fore part of the ramus of the os pubis.	Into the whole length of the linea aspera.	
15. Obturator externus.	From part of the obturator ligament, and the inner half of the circumference of the foramen thyroideum.	Into the os femoris, near the root of the great trochanter.	To move the thigh outwards in an oblique direction, and likewise to bend and draw it inwards.

(K) Spigelius was the first who gave this the name of *sartorius*, or the taylor's muscle, from its use in crossing the legs.

(L) The vastus externus, vastus internus, and cruræus, are so intimately connected with each other, that some anatomists have been induced to consider them as a *triceps*, or single muscle with three heads.

(M) Under the cruræus we sometimes meet with two small muscles, to which Albinus has given the name of *sub-cruræi*. They terminate on each side of the patella, and prevent the capsular ligament from being pinched. When they are wanting, which is very often the case, some of the fibres of the cruræus are found adhering to the capsula.

(N) This and the two following muscles have been usually, but improperly, considered as forming a single muscle with three heads, and on that account named *triceps femoris*.

Of the Muscles.

	Name.	*Origin.*	*Insertion.*	*Use.*
MUSCLES on the leg,	1. Gastrocnemius (O) externus.	By two heads; one from the inner condyle, the other from the outer condyle, of the os femoris.	By a great round tendon, common to this and the following muscle.	To extend the foot.
	2. Gastrocnemius (P) internus.	By two heads; one from the back part of the head of the fibula, the other from the upper and back part of the tibia.	By a large tendon (the *tendo achillis*) common to this and the former muscle, into the lower and back part of the os calcis.	To extend the foot.
	3. Plantaris (Q).	From the upper and posterior part of the outer condyle of the os femoris.	Into the inside of the back part of the os calcis.	To assist in extending the foot.
	4. Popliteus (R).	From the outer condyle of the thigh.	Into the upper and inner part of the tibia.	To assist in bending the leg and rolling it inwards.
	5. Flexor longus digitorum pedis (S).	From the upper and inner part of the tibia.	By four tendons, which, after passing through the perforations in those of the flexor digitorum brevis, are inserted into the last bone of all the toes, except the great toe.	To bend the last joint of the toe.
	6. Flexor longus pollicis pedis.	From the back part, and a little below the head of the fibula.	Into the last bone of the great toe.	To bend the great toe.
	7. Tibialis posticus.	From the back part, and outer edge of the tibia, and likewise from the interosseous ligament and adjacent part of the fibula.	Into the inner and upper part of the os naviculare and side of the os cuneiforme medium.	To move the foot inwards.
	8. Peroneus longus.	From the outer side of the head of the tibia, and also from the upper, anterior, and outer part of the *perone* or fibula, to which it adheres for a considerable way down.	Into the metatarsal bone of the great toe.	To move the foot outwards.
	9. Peroneus brevis.	From the outer and fore part of the fibula.	Into the metatarsal bone of the little toe.	To assist the last described muscle.

10. Extensor

(O) Γαστροκνημια, *sura*, "the calf of the leg."

(P) This muscle is by some anatomists named *soleus*, on account of its being shaped like the sole-fish.

(Q) This muscle has gotten the name of *plantaris*, from its being supposed to furnish the aponeurosis that covers the sole of the foot; but it does not in the least contribute to the formation of that tendinous expansion.

(R) So called on account of its situation at the ham (*poples*).

(S) This muscle, about the middle of the foot, unites with a fleshy mass, which, from its having first been described by Sylvius, is usually called *massa carnea* JACOBI SYLVII.

	Name.	*Origin.*	*Insertion.*	*Use.*
	10. Extensor longus digitorum pedis.	From the upper, outer, and fore part of the tibia, interosseous ligament, and inner edge of the fibula.	By four tendons into the first joint of the smaller toes.	To extend the toes.
	11. Peroneus tertius.	From the fore part of the lower half of the fibula, and from the interosseous ligament.	Into the metatarsal bone of the little toe.	To bend the foot.
	12. Tibialis anticus.	From the upper and fore part of the tibia.	Into the os cuneiforme internum.	To bend the foot.
	13. Extensor proprius pollicis pedis.	From the upper and fore part of the tibia.	Into the convex surface of the bones of the great toe.	To extend the great toe.
MUSCLES on the foot,	1. Extensor brevis digitorum pedis.	From the upper and anterior part of the os calcis.	By four tendons; one of which joins the tendon of the externus longus pollicis, and the other three the tendons of the extensor digitorum longus.	To extend the toes.
	2. Flexor brevis digitorum pedis.	From the lower part of the os calcis.	By four tendons, which, after affording a passage to those of the flexor longus, are inserted into the second phalanx of each of the small toes.	To bend the second joint of the toes.
	3. Abductor pollicis pedis.	From the inner and lower part of the os calcis.	Into the first joint of the great toe.	To move the great toe from the other toes.
	4. Abductor minimi digiti.	From the outer tubercle of the os calcis, the root of the metatarsal bone of the little toe, and also from the aponeurosis plantaris.	Into the outer side of the first joint of the little toe.	To draw the little toe outwards.
	5. Lumbricales pedis.	From the tendons of the flexor longus digitorum pedis.	Into the tendinous expansion at the upper part of the toes.	To draw the toes inwards.
	6. Flexor brevis pollicis pedis.	From the inferior and anterior part of the os calcis, and also from the inferior part of the os cuneiformeexternum.	By two tendons into the first joint of the great toe.	To bend the first joint of the great toe.
	7. Adductor pollicis pedis.	From the near roots of the metatarsal bones of the 2d, 3d, and 4th toes.	Into the outer os sesamoideum, or first joint of the great toe.	To draw the great toe nearer to the rest, and also to bend it.
	8. Transversales pedis.	From the outer and under part of the anterior end of the metatarsal bone of the little toe.	Into the inner os sesamoideum, and anterior end of the metatarsal bone of the great toe.	To contract the foot.

Name.	*Origin.*	*Insertion.*	*Use.*
9. Flexor brevis minimi digiti pedis.	From the basis of the metatarsal bone of the little toe.	Into the first joint of the little toe.	To bend the little toe.
10. Interossei pedis interni (T).	Situated between the metatarsal bones.		
11. Interossei externi (U).			

EXPLANATION OF PLATES XXV. and XXVI.

PLATE XXV.

FIG. 1. The MUSCLES immediately under the common teguments on the anterior part of the body are represented on the right side; and on the left side the MUSCLES are seen which come in view when the exterior ones are taken away.

A, the frontal muscle. B, The tendinous aponeurosis which joins it to the occipital; hence both named *occipito-frontalis*. C, Attollens aurem. D, The ear. E, Anterior auris. FF, Orbicularis palpebrarum. G, Levator labii superioris alæque nasi. H, Levator anguli oris. I, Zygomaticus minor. K, Zygomaticus major. L, Masseter. M, Orbicularis oris. N, Depressor labii inferioris. O, Depressor anguli oris. P, Buccinator. QQ, Platysma myoides. RR, Sterno-cleido-mastoidæus. S, Part of the trapezius. T, Part of the scaleni.

SUPERIOR EXTREMITY.—U, Deltoides. V, Pectoralis major. W, Part of the latissimus dorsi. XX, Biceps flexor cubiti. YY, Part of the brachialis externus. ZZ, The beginning of the tendinous aponeurosis (from the biceps), which is spread over the muscles of the fore-arm. aa, Its strong tendon inserted into the tubercle of the radius. bb, Part of the brachialis internus. c, Pronator radii teres. d, Flexor carpi radialis. e, Part of the flexor carpi ulnaris. f, Palmaris longus. g, Aponeurosis palmaris. 3, Palmaris brevis. 1, Ligamentum carpi annulare. 22, Abductor minimi digiti. h, Supinator radii longus. i, The tendons of the thumb. k, Abductor pollicis. l, Flexor pollicis longus. mm, The tendons of the flexor sublimis perforatus, profundus perforans, and lumbricales.—The sheaths are entire in the right hand,—in the left cut open, to show the tendons of the flexor profundus perforating the sublimis.

MUSCLES not referred to—in the left superior extremity.—n, Pectoralis minor, seu serratus anticus minor. o, The two heads of (xx) the biceps. p, Coracobrachialis. qq, The long head of the triceps extensor cubiti. rr, Teres major. ss, Subscapularis. tt, Extensores radiales. u, Supinator brevis. v, The cut extremity of the pronator teres. w, Flexor sublimis perforatus. x, Part of the flexor profundus. y, Flexor pollicis longus. z, Part of the flexor pollicis brevis. 4, Abductor minimi digiti. 5, The four lumbricales.

TRUNK.—6, Serrated extremities of the serratus anticus major. 77, Obliquus externus abdominis. 88, The linea alba. 9, The umbilicus. 10, Pyramidalis. 11 11, The spermatic cord. On the left side it is covered by the cremaster. 12 12, Rectus abdominis. 13, Obliquus internus. 14 14, &c. Intercostal muscles.

INFERIOR EXTREMITIES.—*a a*, The gracilis. *b b*, Part of the triceps. *c c*, Pectinalis. *d d*, Psoas magnus. *e e*, Iliacus internus. *f*, Part of the glutæus medius. *g*, Part of the glutæus minimus. *h*, Cut extremity of the rectus cruris. *i i*, Vastus externus. *k*, Tendon of the rectus cruris. *l l*, Vastus externus. * Sartorius muscle. ** Fleshy origin of the tensor vaginæ femoris or membranosus. Its tendinous aponeurosis covers (*i*) the vastus externus in the right side. *m m*, Patella. *n n*, Ligament or tendon from it to the tibia. *o*, Rectus cruris. *p*, Cruræus. *q q*, The tibia. *r r*, Part of the gemellus or gastrocnemius externus. *s s s*, Part of the soleus or gastrocnemius internus. *t*, Tibialis anticus. *u*, Tibialis posticus. *v v*, Pæronæi muscles. *w w*, Extensor longus digitorum pedis. *x x*, Extensor longus pollicis pedis. *y*, Abductor pollicis pedis.

FIG. 2. The MUSCLES, GLANDS, &c. of the left Side of the Face and Neck, after the common Teguments and Platysma myoides have been taken off.

a, The frontal muscle. b, Temporalis and temporal artery. c, Orbicularis palpebrarum. d, Levator labii superioris alæque nasi. e, Levator anguli oris. f, Zygomaticus. g, Depressor labii inferioris. h, Depressor anguli oris. i, Buccinator. k, Masseter. ll, Parotid gland. m, Its duct. n, Sterno-cleido-mastoidæus. o, Part of the trapezius. p, Sterno-hyoidæus. q, Sterno-thyroidæus. r, Omo-hyoidæus. s, Levator scapulæ. tt, Scaleni. u, Part of the splenius.

FIG. 3. The MUSCLES of the Face and Neck in view after the exterior ones are taken away.

a a, Corrugator supercilii. b, Temporalis. c, Tendon of the levator palpebræ superioris. d, Tendon of the orbicularis palpebrarum. e, Masseter. f, Buccinator. g, Levator anguli oris. h, Depressor labii superioris alæque nasi. i, Orbicularis oris. k, Depressor anguli oris. l, Muscles of the os hyoides. m, Sterno-cleido mastoidæus.

FIG.

(T) The interossei interni are three in number; their use is to draw the smaller toes towards the great toe.

(U) The interossei externi are four in number; the first serves to move the fore toe towards the great toe; the rest move the toes outwards. All the interossei assist in extending the toes.

FIG. 4. Some of the MUSCLES of the Os Hyoides and Submaxillary Gland.

a, Part of the masseter muscle. b, Posterior head of the digastric. c, Its anterior head. dd, Sterno-hyoidæus. e, Omo-hyoidæus. f, Stylo-hyoidæus. g, Submaxillary gland in situ.

FIG. 5. The Submaxillary Gland and Duct.

a, Musculus mylo-hyoidæus. b, Hyo-glossus. c, Submaxillary gland extra situm. d, Its duct.

PLATE XXVI.

FIG. 1. The MUSCLES immediately under the common teguments on the posterior part of the body are represented in the right side; and on the left side the MUSCLES are seen which come in view when the exterior ones are taken away.

HEAD.—AA, Occipito-frontalis. B, Attollens aurem. C, Part of the orbicularis palpebrarum. D, Masseter. E, Pterygoidæus internus.

TRUNK.—Right side. FFF, Trapezius seu cucullaris. GGGG, Latissimus dorsi. H, Part of the obliquus externus abdominis.

TRUNK.—Left side. I, Splenius. K, Part of the complexus. L, Levator scapulæ. M, Rhomboides. NN, Serratus posticus inferior. O, Part of the longissimus dorsi. P, Part of the sacro-lumbalis. Q, Part of the semi-spinalis dorsi. R, Part of the serratus anticus major. S, Part of the obliquus internus abdominis.

SUPERIOR EXTREMITY.—Right side. T, Deltoides. U, Triceps extensor cubiti. V, Supinator longus. WW, Extensores carpi radialis longior and brevior. XX, Extensor carpi ulnaris. YY, Extensor digitorum communis. Z, Abductor indicis. 1 2 3, Extensores pollicis.

SUPERIOR EXTREMITY.—Left side. a, Supra-spinatus. b, Infra-spinatus. c, Teres minor. d, Teres major. e, Triceps extensor cubiti. ff, Extensores carpi radiales. g, Supinator brevis. h, Indicator. 1 2 3, Extensores pollicis. i, Abductor minimi digiti. k, Interossei.

INFERIOR EXTREMITY.—Right side. l, Glutæus maximus. m, Part of the glutæus medius. n, Tensor vaginæ femoris. o, Gracilis. pp, Adductor femoris magnus. q, Part of the vastus internus. r, Semimembranosus. s, Semitendinosus. t, Long head of the biceps flexor cruris. uu, Gastrocnemius externus seu gemellus. v, Tendo Achillis. w, Solæus seu gastrocnemius internus. xx, Peronæus longus and brevis. y, Tendons of the flexor longus digitorum pedis;—and under them * flexor brevis digitorum pedis. z, Abductor minimi digiti pedis.

INFERIOR EXTREMITY.—Left side. *m*, *n*, *o*, *p p*, *q*, *r*, *s*, *t*, *v*, *w w*, *x x*, *y*, *z*, Point the same parts as in the right side. *a*, Pyriformis. *bb*, Gemini. *cc*, Obturator internus. *d*, Quadratus femoris. *e*, Coccygæus. *f*, The short head of the biceps flexor cruris. *gg*, Plantaris. *h*, Poplitæus. *i*, Flexor longus pollicis pedis.

FIG. 2. The Palm of the Left Hand after the common Teguments are removed, to show the MUSCLES of the Fingers.

a, Tendon of the flexor carpi radialis. b, Tendon of the flexor carpi ulnaris. c, Tendons of the flexor sublimis perforatus, profundus perforans, and lumbricales. d, Abductor pollicis. ee, Flexor pollicis longus. f, Flexor pollicis brevis. g, Palmaris brevis. h, Abductor minimi digiti. i, Ligamentum carpi annulare. k, A probe put under the tendons of the flexor digitorum sublimis; which are perforated by l, the flexor digitorum profundus. mmmm, Lumbricales. n, Adductor pollicis.

FIG. 3. A Fore view of the Foot and tendons of the Flexores Digitorum.

a, Cut extremity of the tendo Achillis. b, Upper part of the astragalus. c, Os calcis. d, Tendon of the tibialis anticus. e, Tendon of the extensor pollicis longus. f, Tendon of the peronæus brevis. g, Tendons of the flexor digitorum longus, with the nonus Vesalii. hh, The whole of the flexor digitorum brevis.

FIG. 4. MUSCLES of the Anus.

aa, An outline of the buttocks, and upper part of the thighs. b, The testes contained in the scrotum. cc, Sphincter ani. d, Anus. e, Levator ani. ff, Erector penis. gg, Accelerator urinæ. h, Corpus cavernosum urethræ.

FIG. 5. MUSCLES of the Penis.

aa, b, d, ee, ff, h, Point the same as in fig. 4. c, Sphincter ani. gg, Transversalis penis.

CHAP. III. OF THE ABDOMEN, OR LOWER BELLY.

THE abdomen, or lower belly, extends from the lower extremity of the sternum, or the hollow usually called the pit of the stomach, and more properly *scrobiculus cordis*, to the lower part of the trunk.

It is distinguished into three divisions called *regions*; of these, the upper one, which is called the *epigastric region*, begins immediately under the sternum, and extends to within two fingers breadth of the navel, where the middle or *umbilical region* begins, and reaches to the same distance below the navel. The third, which is called the *hypogastric*, includes the rest of the abdomen, as far as the os pubis.

Each of these regions is subdivided into three others; two of which compose the sides, and the other the middle part of each region.

The middle part of the upper region is called *epigastrium*, and its two sides *hypochondria*. The middle part of the next region is the umbilical region, properly so called, and its two sides are the flanks, or iliac regions. Lastly, The middle part of the lower region retains the name of hypogastrium, and its sides are called inguina or groins. The back part of the abdomen bears the name of lumbar region.

These are the divisions of the lower belly, which are necessary to be held in remembrance, as they frequently occur in surgical and anatomical writing. We will now proceed to examine the contents of the abdomen; and after having pointed out the names and arrangement of the several viscera contained in it, describe each of them separately.

Of the Abdomen.

After having removed the skin, adipose membrane, and abdominal muscles, we discover the peritonæum or membrane that envelopes all the viscera of the lower belly. This being opened, the first part that presents itself is the omentum or cawl, floating on the surface of the intestines, which are likewise seen everywhere loose and moist, and making a great number of circumvolutions through the whole cavity of the abdomen. The stomach is placed in the epigastrium, and under the stomach is the pancreas. The liver fills the right hypochondrium, and the splcen is situated in the left. The kidneys are seen about the middle of the lumbar region, and the urinary bladder and parts of generation are seated in the lower division of the belly.

Sect. I. *Of the Peritonæum.*

89 The peritonæum is a strong simple membrane, by which all the viscera of the abdomen are surrounded, and in some measure supported. Many anatomical writers, particularly Winslow, have described it as being composed of two distinct membranous laminæ; but their description seems to be erroneous: what perhaps appeared to be a second lamina, being found to be simply a cellular coat, which sends off productions to the blood vessels passing out of the abdominal cavity. The aorta and vena cava likewise derive a covering from the same membrane, which seems to be a part of the cellular membrane we have already described.

The peritonæum, by its productions and reduplications, envelopes the greatest part of the abdominal viscera. It is soft, and capable of considerable extension; and is kept smooth and moist by a vapour, which is constantly exhaling from its inner surface, and is returned again into the circulation by the absorbents.

This moisture not only contributes to the softness of the peritonæum, but prevents the attrition, and other ill effects, which would otherwise probably be occasioned by the motion of the viscera upon each other.

When this fluid is snpplied in too great a quantity, or the absorbents become incapable of carrying it off, it accumulates, and constitutes an ascites or dropsy of the belly; and when by any means the exhalation is discontinued, the peritonæum thickens, becomes diseased, and the viscera are sometimes found adhering to each other.

The peritonæum is not a very vascular membrane. In a sound state it seems to be endued with little or no feeling, and the nerves that pass through it appear to belong to the abdominal muscles.

Sect. II. *Of the Omentum.*

90 The omentum, epiploon, or cawl, is a double membrane, produced from the peritonæum. It is interlarded with fat, and adheres to the stomach, spleen, duodenum, and colon; from thence hanging down loose and floating on the surface of the intestines. Its size is different in different subjects. In some it descends as low as the pelvis, and it is commonly longer at the left side than the right.

Of the Abdomen.

This part, the situation of which we have just now described, was the only one known to the ancients under the name of *epiploon;* but at present we distinguish three omenta, viz. *omentum magnum colico-gastricum*, *omentum parvum hepatico-gastricum*, and *omentum colicum*. They all agree in being formed of two very delicate laminæ, separated by a thin layer of cellular membrane.

The omentum magnum colico-gastricum, of which we have already spoken, derives its arteries from the splenic and hepatic. Its veins terminate in the vena portæ. Its nerves, which are very few, come from the splenic and hepatic plexus.

The omentum parvum hepatico-gastricum abounds less with fat than the great epiploon. It begins at the upper part of the duodenum, extends along the lesser curvature of the stomach as far as the œsophagus, and terminates about the neck of the gall-bladder, and behind the left ligament of the liver, so that it covers the lesser lobe; near the beginning of which we may observe a small opening, first described by Winslow, through which the whole pouch may easily be distended with air (x). The vessels of the omentum parvum are derived chiefly from the coronary stomachic arteries and veins.

The omentum colicum begins at the fore part of the cæcum and right side of the colon. It appears as a hollow conical appendage to these intestines, and usually terminates at the back of the omentum magnum. It seems to be nothing more than a membranous coat of the cæcum and colon, assuming a conical shape when distended with air.

The uses of the omentum are not yet satisfactorily determined. Perhaps by its softness and looseness it may serve to prevent those adhesions of the abdominal viscera, which have been found to take place when the fat of the omentum has been much wasted. Some authors have supposed, that it assists in the preparation of bile; but this is founded merely on conjecture.

Sect. III. *Of the Stomach.*

91 The stomach is a membranous and muscular bag, in shape not unlike a bagpipe, lying across the upper part of the abdomen, and inclining rather more to the left than the right side.

It has two orifices, one of which receives the end of the œsophagus, and is called the *cardia*, and sometimes the left and upper orifice of the stomach; though its situation is not much higher than the other, which is styled the right and inferior orifice, and more commonly the *pylorus;* both these openings are more elevated than the body of the stomach.

The aliment passes down the œsophagus into the stomach through the cardia, and after having undergone

(x) This membranous bag, though exceedingly thin and transparent, is found capable of supporting mercury, thrown into it by the same channel.

Of the Abdomen.

gone the necessary digestion, passes out at the pylorus where the intestinal canal commences.

The stomach is composed of four tunics or coats, which are so intimately connected together that it requires no little dexterity in the anatomist to demonstrate them. The exterior one is membranous, being derived from the peritonæum. The second is a muscular tunic, composed of fleshy fibres, which are in the greatest number about the two orifices. The third is called the nervous coat, and within this is the villous or velvet-like coat which composes the inside of the stomach.

The two last coats being more extensive than the two first, form the folds, which are observed everywhere in the cavity of this viscus, and more particularly about the pylorus; where they seem to impede the too hasty exclusion of the aliment, making a considerable plait, called *valvula pylori*.

The inner coat is constantly moistened by a mucus, which approaches to the nature of the saliva, and is called the gastric juice: this liquor has been supposed to be secreted by certain minute glands (y) seated in the nervous tunic, whose excretory ducts open on the surface of the villous coat.

The arteries of the stomach called the gastric arteries are principally derived from the cœliac; some of its veins pass to the splenic, and others to the vena portæ; and its nerves are chiefly from the eighth pair or par vagum.

The account given of the tunics of the stomach may be applied to the whole alimentary canal: for both the œsophagus and intestines are, like this viscus, composed of four coats.

Before we describe the course of the aliment, and the uses of the stomach, it will be necessary to speak of other parts which assist in the process of digestion.

Sect. IV. *Of the Oesophagus.*

92 The œsophagus or gullet is a membranous and muscular canal, extending from the bottom of the mouth to the upper orifice of the stomach. Its upper part, where the aliment is received, is shaped somewhat like a funnel, and is called the *pharynx*.

From hence it runs down close to the bodies of the vertebræ as far as the diaphragm, in which there is an opening through which it passes, and then terminates in the stomach about the eleventh or twelfth vertebra of the back.

The œsophagus is plentifully supplied with arteries from the external carotid, bronchial, and superior intercostal arteries; its veins empty themselves into the vena azygos, internal jugular, and mammary veins, &c.

Its nerves are derived chiefly from the eighth pair.

We likewise meet with a mucus in the œsophagus, which everywhere lubricates its inner surface, and tends to assist in deglutition. This mucus seems to be secreted by very minute glands, like the mucus in other parts of the alimentary canal.

Sect. V. *Of the Intestines.*

The intestines form a canal, which is usually six 93
times longer than the body to which it belongs. This canal extends from the pylorus, or inferior orifice of the stomach, to the anus.

It will be easily understood, that a part of such great length must necessarily make many circumvolutions, to be confined with so many other viscera within the cavity of the lower belly.

Although the intestines are in fact, as we have observed, only one long and extensive canal, yet different parts have been distinguished by different names.

The intestines are first distinguished into two parts, one of which begins at the stomach, and is called the *thin* or *small intestines*, from the small size of the canal, when compared with the other part, which is called the *large intestines*, and includes the lower portion of the canal down to the anus.

Each of these parts has its subdivisions. The small intestines being distinguished into duodenum, jejunum, and ileum, and the larger portion into cæcum, colon, and rectum.

The small intestines fill the middle and fore parts of the belly, while the large intestines fill the sides and both the upper and lower parts of the cavity.

The duodenum, which is the first of the small intestines, is so called, because it is about 12 inches long. It begins at the pylorus, and terminates in the jejunum, which is a part of the canal observed to be usually more empty than the other intestines. This appearance give it its name, and likewise serves to point out where it begins.

The next division is the ileum, which of itself exceeds the united length of the duodenum and jejunum, and has received its name from its numerous circumvolutions. The large circumvolution of the ileum covers the first of the large intestines called the *cæcum* (z), which seems properly to belong to the colon, being a kind of pouch of about four fingers in width, and nearly of the same length, having exteriorly a little appendix, called *appendix cæci*.

The cæcum is placed in the cavity of the os ilium on the right side, and terminates in the colon, which is the largest of all the intestines.

This intestine ascends by the right kidney to which it is attached, passes under the hollow part of the liver, and the bottom of the stomach, to the spleen, to which it is likewise secured, as it is also to the left kidney; and from thence passes down towards the os sacrum,

(y) Heister, speaking of these glands, very properly says, "in *porcis* facile, in *homine* raro observantur;" for although many anatomical writers have described their appearance and figure, yet they do not seem to have been hitherto satisfactorily demonstrated in the human stomach; and the gastric juice is now more generally believed to be derived from the exhalant arteries of the stomach.

(z) Anatomists have differed with respect to this division of the intestines.—The method here followed is now generally adopted; but there are authors who allow the name of *cæcum* only to the little appendix, which has likewise been called the *vermiform appendix*, from its resemblance to a worm in size and length.

Of the Abdomen.

where, from its straight course, the canal begins to take the name of *rectum*.

There are three ligamentous bands extending through the whole length of the colon, which by being shorter than its two inner coats, serve to increase the plaits on the inner surface of this gut.

The *anus*, which terminates the intestinum rectum, is furnished with three muscles; one of these is composed of circular fibres, and from its use in shutting the passage of the anus is called *sphincter ani*.

The other two are the *levatores ani*, so called, because they elevate the anus after dejection. When these by palsy, or any other disease, lose the power of contracting, the anus prolapses; and when the sphincter is affected by similar causes, the fæces are voided involuntarily.

It has been already observed that the intestinal canal is composed of four tunics; but it remains to be remarked, that here, as in the stomach, the two inner tunics being more extensive than the other two, form the plaits which are to be seen in the inner surface of the intestines, and are called *valvulæ conniventes*.

Some authors have considered these plaits as tending to retard the motion of the fæces, in order to afford more time for the separation of the chyle; but there are others who attribute to them a different use; they contend, that these valves, by being naturally inclined downwards, cannot impede the descent of the fæces, but that they are intended to prevent their return upwards.

They are probably destined for both these uses; for although these folds incline to their lower side, yet the inequalities they occasion in the canal are sufficient to retard in some measure the progressive motion of the fæces, and to afford a greater surface for the absorption of chyle; and their natural position seems to oppose itself to the return of the aliment.

Besides these *valvulæ conniventes*, there is one more considerable than the rest, called the *valve of the colon*; which is found at that part of the canal where the intestinum ileum is joined to the colon. This valve permits the alimentary pulp to pass downwards, but serves to prevent its return upwards; and it is by this valve that clysters are prevented from passing into the small intestines (Y).

Of the little vermiform appendix of the cæcum, it will be sufficient to say, that its uses have never yet been ascertained. In birds we meet with two of these appendices.

The intestines are lubricated by a constant supply of mucus, which is probably secreted by very minute follicles (Z). This mucus promotes the descent of the alimentary pulp, and in some measure defends the inner surface of the intestines from the irritation to which it would, perhaps, otherwise be continually exposed from the aliment; and which, when in a certain degree, excites a painful disorder called *colic*, a name given to the disease, because its most usual seat is in the intestinum colon.

The intestines are likewise frequently distended with air, and this distension sometimes occasions pain, and constitutes the flatulent colic.

The arteries of the intestines are continuations of the mesenteric arteries, which are derived in two considerable branches from the aorta.—The redundant blood is carried back into the vena portarum.

In the rectum the veins are called *hæmorrhoidal*, and are there distinguished into internal and external: the first are branches of the inferior mesenteric vein, but the latter pass into other veins. Sometimes these veins are distended with blood from obstructions, from weakness of their coats, or from other causes, and what we call the *hæmorrhoids* takes place. In this disease they are sometimes ruptured; and the discharge of blood which consequently follows has probably occasioned them to be called *hæmorrhoidal veins*.

The nerves of the intestines are derived from the eighth pair.

Sect. VI. *Of the Mesentery.*

The name of the *mesentery* implies its situation amidst the intestines. It is in fact a part of the peritonæum, being a reduplication (A) of that membrane from each side of the lumbar vertebræ, to which it is firmly attached, so that it is formed of two laminæ connected to each other by cellular membrane. 94

The intestines, in their different circumvolutions, form a great number of arches, and the mesentery accompanies them through all these turns; but by being attached

(Y) This is not invariably the case; for the contents of a clyster have been found not only to reach the small intestines, but to be voided at the mouth. Such instances, however, are not common.

(Z) Some writers have distinguished these glands into miliary, lenticular, &c. Brunner and Peyer were the first anatomists who described the glands of the intestines, and their descriptions were chiefly taken from animals, these glandular appearances not seeming to have been hitherto satisfactorily pointed out in the human subject. It is now pretty generally believed, that the mucus which everywhere lubricates the alimentary canal, is exhaled from the minute ends of arteries; and that these extremities first open into a hollow vesicle, from whence the deposited juice of several branches flows out through one common orifice.

(A) He who only reads of the reduplication of membranes, will perhaps not easily understand how the peritonæum and pleura are reflected over the viscera in their several cavities; for one of these serves the same purpose in the thorax that the other does in the abdomen. This disposition, for the discovery of which we are indebted to modern anatomists, constitutes a curious part of anatomical knowledge: but the student, unaided by experience, and assisted only by what the limits of this work would permit us to say on the occasion, would probably imbibe only confused ideas of the matter; and it will perfectly answer the present purpose, if he considers the mesentery as a membrane attached by one of its sides to the lumbar vertebræ, and by the other to the intestines.

Of the omen.

attached only to the hollow part of each arch, it is found to have only a third of the extent of the intestines.

That part of the membrane which accompanies the small intestines is the *mesentery*, properly so called; but those parts of it which are attached to the colon and rectum are distinguished by the names of *meso-colon* and *meso-rectum*.

There are many conglobate glands dispersed through this double membrane, through which the lacteals and lymphatics pass in their way to the thoracic duct. The blood-vessels of the mesentery were described in speaking of the intestines.

This membrane, by its attachment to the vertebræ, serves to keep the intestines in their natural situation. The idea usually formed of the colic called *miserere*, is perfectly erroneous; it being impossible that the intestines can be twisted; as many suppose they are, in that disease, their attachment to the mesentery effectually preventing such an accident—but a disarrangement sometimes takes place in the intestinal canal itself, which is productive of disagreeable and sometimes fatal consequences. This is by an introsusception of the intestine, an idea of which may be easily formed, by taking the finger of a glove, and involving one part of it within the other.

If inflammation takes place, the stricture in this case is increased, and the peristaltic motion of the intestines (by which is meant the progressive motion of the fæces downwards) is inverted, and what is called the *iliac passion* takes place. The same effects may be occasioned by a descent of the intestine, or of the omentum either with it or by itself, and thus constituting what is called a *hernia* or *rupture*; a term by which in general is meant the falling down or protrusion of any part of the intestine or omentum, which ought naturally to be contained within the cavity of the belly.

To convey an idea of the manner in which such a descent takes place, it will be necessary to observe, that the lower edge of the tendon of the musculus obliquus externus, is stretched from the fore part of the os ilium or haunch bone to the os pubis, and constitutes what is called *Poupart's* or *Fallopius's ligament*, forming an opening, through which pass the great crural artery and vein. Near the os pubis the same tendinous fibres are separated from each other, and form an opening on each side, called the *abdominal ring*, through which the spermatic vessels pass in men, and the ligamenta uteri in women. In consequence of violent efforts, or perhaps of natural causes, the intestines are found sometimes to pass through these openings; but the peritonæum which encloses them, when in their natural cavity, still continues to surround them even in their descent. This membrane does not become torn or lacerated by the violence, as might be easily imagined; but its dilatability enables it to pass out with the viscus, which it encloses as it were in a bag, and thus forms what is called the *hernial sac*.

If the hernia be under Poupart's ligament, it is called *femoral*; if in the groin *inguinal* (B); and *scrotal*, if in the scrotum. Different names are likewise given to the hernia as the contents of the sac differ, whether of omentum only, or intestine, or both;—but these definitions more properly belong to the province of surgery.

Sect. VII. *Of the Pancreas.*

95

The pancreas is a conglomerate gland, placed behind the bottom of the stomach, towards the first vertebra of the loins; shaped like a dog's tongue, with its point stretched out towards the spleen, and its other end extending towards the duodenum. It is about eight fingers breadth in length, two or three in width, and one in thickness.

This viscus, which is of a yellowish colour, somewhat inclining to red, is covered with a membrane which it derives from the peritonæum. Its arteries, which are rather numerous than large, are derived chiefly from the splenic and hepatic, and its veins pass into the veins of the same name.—Its nerves are derived from the intercostal.

The many little glands of which it has been observed the pancreas is composed, all serve to secrete a liquor called the *pancreatic juice*, which in its colour, consistence, and other properties, does not seem to differ from the saliva. Each of these glands sends out a little excretory duct, which, uniting with others, help to form larger ducts; and all these at last terminate in one common excretory duct (first discovered by Virtsungus in 1642), which runs through the middle of the gland, and is now usually called *ductus pancreaticus Virtsungi*. This canal opens into the intestinum duodenum, sometimes by the same orifice with the biliary duct, and sometimes by a distinct opening. The liquor it discharges being of a mild and insipid nature, serves to dilute the alimentary pulp, and to incorporate it more easily with the bile.

Sect. VIII. *Of the Liver.*

96

The liver is a viscus of considerable size, and of a reddish colour; convex superiorly and anteriorly where it is placed under the ribs and diaphragm, and of an unequal form posteriorly. It is chiefly situated in the right hypochondrium, and under the false ribs; but it likewise extends into the epigastric region, where it borders upon the stomach. It is covered by a production of the peritonæum, which serves to attach it by three of its reduplications to the false ribs. These reduplications are called *ligaments*, though very different in their texture from what are called by the same name in other parts of the body. The umbilical cord, too, which in the fœtus is pervious, gradually becomes a simple ligament after birth; and by passing to the liver, serves likewise to secure it in its situation.

At the posterior part of this organ, where the umbilical vessels enter, it is found divided into two lobes. Of these, the largest is placed in the right hypochondrium; the other, which covers part of the stomach, is called the *little lobe*. All the vessels which go to the liver pass in at the fissure we have mentioned; and the production of the peritonæum, which invests the liver, was described by Glisson, an English anatomist, as accompanying them in their passage, and surrounding

(B) The hernia congenita will be considered with the male organs of generation, with which it is intimately connected.

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surrounding them like a glove; hence this production has been commonly known by the name of *capsula of Glisson*: but it appears to be chiefly a continuation of the cellular membrane which covers the vena portæ ventralis.

The liver was considered by the ancients as an organ destined to prepare and perfect the blood; but later discoveries have proved, that this opinion was wrong, and that the liver is a glandular substance formed for the secretion of the bile.

The blood is conveyed to the liver by the hepatic artery and the vena portæ. This is contrary to the mode of circulation in other parts, where veins only serve to carry off the redundant blood: but in this viscus the hepatic artery, which is derived from the cæliac, is principally destined for its nourishment; and the vena portæ, which is formed by the union of the veins from most of the abdominal viscera, furnishes the blood from which the bile is chiefly to be separated: so that these two series of vessels serve very distinct purposes. The vena portæ, as it is ramified through the liver, performs the office both of a vein and an artery; for like the former it returns the blood from the extremities of arteries, while as the latter it prepares it for secretion.

The nerves of the liver are branches of the intercostal and par vagum. The bile, after being separated from the mass of blood, in a manner of which mention will be made in another place, is conveyed out of this organ by very minute excretory ducts, called *pori biliarii;* these uniting together like the excretory ducts in the pancreas, gradually form larger ones, which at length terminate in a considerable channel called *ductus hepaticus.*

Sect. IX. *Of the Gall-Bladder.*

97 The gall-bladder is a little membranous bag, shaped like a pear, and attached to the posterior and almost inferior part of the great lobe of the liver.

It has two tunics; of which the exterior one is a production of the peritonæum. The interior, or villous coat, is supplied with a mucus that defends it from the acrimony of the bile. These two coverings are intimately connected by means of cellular membrane, which from its firm glistening appearance has generally been spoken of as a muscular tunic.

The gall-bladder is supplied with blood-vessels from the hepatic arteries. These branches are called the *cystic arteries*, and the cystic veins carry back the blood.

Its nerves are derived from the same origin as those of the liver.

The neck of the gall-bladder is continued in the form of a canal called *ductus cysticus*, which soon unites with the ductus hepaticus we described as the excretory duct of the liver; and forming one common canal, takes the name of *ductus choledochus communis*, through which both the cystic and hepatic bile are discharged into the duodenum. This canal opens into the intestine in an oblique direction, first passing through the exterior tunic, and then piercing the other coats after running between each of them a very little way. This economy serves two useful purposes;—to promote the discharge of bile, and to prevent its return.

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98 Of the bile.

The bile may be defined to be a natural liquid soap, somewhat unctuous and bitter, and of a yellowish colour, which easily mixes with water, oil, and vinous spirits, and is capable of dissolving resinous substances. From some late experiments made by M. Cadet *, it appears to be formed of an animal oil, combined with the alkaline base of sea salt, a salt of the nature of milk, and a calcareous earth which is slightly ferruginous.

* *Mem. de l'Acad. des Sciences*, 1767.

Its definition seems sufficiently to point out the uses for which it is intended (c). It blends the alimentary mass, by dividing and attenuating it; corrects the too great disposition to acescency, which the aliment acquires in the stomach; and, finally, by its acrimony, tends to excite the peristaltic motion of the intestines.

After what has been said, it will be conceived that there are two sorts of bile: one of which is derived immediately from the liver through the hepatic duct, and the other from the gall-bladder. These two biles, however, do not essentially differ from each other. The hepatic bile indeed is milder, and more liquid than the cystic, which is constantly thicker and yellower; and by being bitterer, seems to possess greater activity than the other.

Every body knows the source of the hepatic bile, that it is secreted from the mass of blood by the liver; but the origin of the cystic bile has occasioned no little controversy amongst anatomical writers. There are some who contend, that it is separated in the substance of the liver, from whence it passes into the gall-bladder through particular vessels. In deer, and in some other quadrupeds, as well as in several birds and fishes, there is an evident communication, by means of particular vessels, between the liver and the gall-bladder. Bianchi, Winslow, and others, have asserted the existence of such vessels in the human subject, and named them *hepaticystic ducts;* but it is certain that no such ducts exist.—In obstructions of the cystic duct, the gall-bladder has been found shrivelled and empty: so that we may consider the gall-bladder as a reservoir of hepatic bile; and that it is an established fact, that the whole of the bile contained in the gall-bladder is derived from the liver; that it passes from the hepatic or the cystic duct, and from that to the gall-bladder. The difference in the colour, consistence, and taste of the bile, is merely the consequence of stagnation and absorption. When the stomach is distended with aliment, this reservoir undergoes a certain degree of compression, and the bile passes out into the intestinal canal; and in the efforts to vomit, the gall-bladder seems to be constantly affected, and at such times discharges itself of its contents.

Sometimes

(c) The ancients, who were not acquainted with the real use of the liver, considered the bile as an excrementitious and useless fluid.

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Sometimes the bile concretes in the gall-bladder, so as to form what are called *gall-stones* (D). When these concretions pass into the cystic duct, they sometimes occasion exquisite pain, by distending the canal in their way to the duodenum; and by lodging in the ductus choledochus communis, and obstructing the course of the bile, this fluid will be absorbed, and by being carried back into the circulation occasion a temporary jaundice.

Sect. X. *Of the Spleen.*

99. The spleen is a soft and spongy viscus, of a bluish colour, and about five or six fingers breadth in length, and three in width, situated in the left hypochondrium, between the stomach and the false ribs. That side of it which is placed on the side of the ribs is convex; and the other, which is turned towards the stomach, is concave.

The splenic artery, which is a branch from the cæliac, supplies this viscus with blood, and a vein of the same name carries it back into the vena portæ.

Its nerves are derived from a particular plexus called the *splenic*, which is formed by branches of the intercostal nerve, and by the eighth pair, or par vagum.

The ancients, who supposed two sorts of bile, considered the spleen as the receptacle of what they called *atra bilis*. Havers, who wrote professedly on the bones, determined its use to be that of secreting the synovia; and the late Mr Hewson imagined, that it concurred with the thymus and lymphatic glands of the body in forming the red globules of the blood. All these opinions seem to be equally fanciful. The want of an excretory duct has occasioned the real use of this viscus to be still doubtful. Perhaps the blood undergoes some change in it, which may assist in the preparation of the bile. This is the opinion of the generality of modern physiologists; and the great quantity of blood with which it is supplied, together with the course of its veins into the vena portæ, seem to render this notion probable.

Sect. XI. *Of the Glandulæ Renales, Kidneys, and Ureters.*

100 The glandulæ renales, which were by the ancients supposed to secrete the atra bilis, and by them named *capsulæ atrabiliares*, are two flat bodies of an irregular figure, one on each side between the kidney and the aorta.

In the fœtus they are as large as the kidneys: but they do not increase afterwards in proportion to those parts; and in adults and old people they are generally found shrivelled, and much wasted. They have their arteries and veins. Their arteries usually arise from the splenic or the emulgent, and sometimes from the aorta; and their veins go to the neighbouring veins, or to the vena cava. Their nerves are branches of the intercostal.

The use of these parts is not yet perfectly known. In the fœtus the secretion of urine must be in a very small quantity, and a part of the blood may perhaps then pass through these channels, which in the adult is carried to the kidneys to supply the matter of urine.

101 Kidneys. The kidneys are two in number, situated one on the right and the other on the left side in the lumbar region, between the last false rib and the os ilium, by the sides of the vertebræ. Each kidney in its figure resembles a sort of bean, which from its shape is called *kidney bean*. The concave part of each kidney is turned towards the aorta and vena cava ascendens. They are surrounded by a good deal of fat, and receive a coat from the peritonæum; and when this is removed, a very fine membrane is found investing their substance and the vessels which ramify through them.

Each kidney has a considerable artery and vein, which are called the *emulgent*. The artery is a branch from the aorta, and the vein passes into the vena cava. Their nerves, which every where accompany the blood vessels, arise from a considerable plexus, which is derived from the intercostal.

In each kidney, which in the adult is of a pretty firm texture, there are three substances to be distinguished (E). The outer part is glandular or cortical, beyond this is the vascular or tubular substance, and the inner part is papillary or membranous.

It is in the cortical part of the kidney that the secretion is carried on; the urine being there received from the minute extremities of the capillary arteries, is conveyed out of this cortical substance by an infinite number of very small cylindrical canals or excretory vessels, which constitute the tubular part. These tubes, as they approach the inner substance of the kidney, gradually unite together; and thus forming larger canals, at length terminate in ten or twelve little protuberances called *papillæ*, the orifices of which may be seen without the assistance of glasses. These papillæ open into a small cavity or reservoir called the *pelvis of the kidney*, and formed by a distinct membranous bag which embraces the papillæ. From this pelvis the urine is conveyed through a membranous canal which passes out from the hollow side of the kidney, a little below the blood-vessels, and is called *ureter*.

102 Ureters. The ureters are each about as large as a common writing pen. They are somewhat curved in their course from the kidneys, like the letter *f*, and at length terminate in the posterior and almost inferior part of the bladder, at some distance from each other. They pass into the bladder in the same manner as the ductus choledochus communis passes into the intestinum duodenum, not by a direct passage, but by an oblique course

(D) These concretions sometimes remain in the gall-bladder without causing any uneasiness. Dr Heberden relates, that a gall-stone, weighing two drachms, was found in the gall-bladder of Lord Bath, though he had never complained of the jaundice, or of any disorder which he could attribute to that cause. *Med. Trans.* vol. ii.

(E) The kidneys in the fœtus are distinctly lobulated; but in the adult they become perfectly firm, smooth, and regular.

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course between the two coats; so that the discharge of urine into the bladder is promoted, whilst its return is prevented. Nor does this mode of structure prevent the passage of fluids only from the bladder into the ureters, but likewise air:—for air thrown into the bladder inflates it, and it continues to be distended if a ligature is passed round its neck; which seems to prove sufficiently that it cannot pass into the ureters.

Sect. XII. *Of the Urinary Bladder.*

103 The urinary bladder is a membranous and muscular bag of an oblong roundish shape, situated in the pelvis, between the os pubis and intestinum rectum in men, and between the os pubis and uterus in women. Its upper and widest part is usually called the *bottom*, its narrower part the *neck* of the bladder; the former is only covered by the peritonæum.

The bladder is formed of three coats, connected together by means of cellular membrane. The external or peritonæal, is only a partial one, covering the upper and back part of the bladder. The middle, or muscular coat, is composed of irritable, and of course muscular fibres, which are most collected around the neck of the bladder, but not so as to form a distinct muscle or sphincter, as the generality of anatomists have hitherto supposed.

The inner coat, though much smoother, has been said to resemble the villous tunic of the intestines, and like that is provided with a mucus, which defends it against the acrimony of the urine.

104 Of the urine. It will easily be conceived, from what has been said, that the kidneys are two glandular bodies, through which a saline and excrementitious fluid called *urine* is constantly filtering from the mass of blood.

While only a small quantity of urine is collected in the bladder, it excites no kind of uneasiness: but when a greater quantity is accumulated, so that the bladder is distended in a certain degree, it excites in us a certain sensation, which brings on as it were a voluntary contraction of the bladder to promote its discharge.—But this contraction is not effected by the muscular fibres of the bladder alone: for all the abdominal muscles contract in obedience to our will, and press downwards all the viscera of the lower belly; and these powers being united, at length overcome the resistance of the fibres surrounding the neck of the bladder, which dilates and affords a passage to the urine through the urethra.

The frequency of this evacuation depends on the quantity of urine secreted; on the degree of acrimony it possesses; on the size of the bladder, and on its degree of sensibility.

The urine varies much in its colour and contents. These varieties depend on age, sex, climate, diet, and other circumstances. In infants it is generally a clear watery fluid, without smell or taste. As we advance in life, it acquires more colour and smell, and becomes more impregnated with salts. In old people it becomes still more acrid and fetid.

In a healthy state it is nearly of a straw colour.—After being kept for some time, it deposits a tartarous matter, which is found to be composed chiefly of earth and salt, and soon incrusts the sides of the vessel in which it is contained. While this separation is taking place, appearances like minute fibres or threads of a whitish colour, may be seen in the middle of the urine, and an oily scum observed floating on its surface. So that the most common appearances of the urine are sufficient to ascertain that it is a watery substance, impregnated with earthy, saline, and oily particles.

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The urine is not always voided of the same colour and consistence; for these are found to depend on the proportion of its watery part to that of its other constituent principles.—Its colour and degree of fluidity seem to depend on the quantity of saline and inflammable particles contained in it: so that an increased proportion of those parts will constantly give the urine a higher colour, and add to the quantity of sediment.

The variety in the appearances of the urine depends on the nature and quantity of solid and fluid aliment we take in; and it is likewise occasioned by the different state of the urinary vessels, by which we mean the channels through which it is separated from the blood, and conveyed through the pelvis into the ureters. The causes of calculous concretion in the urinary passages, are to be looked for in the natural constitution of the body, mode of life, &c.

It having been observed, that after drinking any light wine or Spa water, it very soon passed off by urine, it has been supposed by some, that the urine is not altogether conveyed to the bladder by the ordinary course of circulation, but that there must certainly exist some other shorter means of communication, perhaps by certain vessels between the stomach and the bladder, or by a retrograde motion in the lymphatics. But it is certain, that if we open the belly of a dog, press out the urine from the bladder, pass a ligature round the emulgent arteries, and then sew up the abdomen, and give him even the most diuretic liquor to drink, the stomach and other channels will be distended with it, but not a drop of urine will be found to have passed into the bladder; or the same thing happens when a ligature is thrown round the two ureters. This experiment then seems to be a sufficient proof, that all the urine we evacuate is conveyed to the kidneys through the emulgent arteries, in the manner we have described.—It is true, that wine and other liquors promote a speedy evacuation of urine: but the discharge seems to be merely the effect of the stimulus they occasion; by which the bladder and urinary parts are solicited to a more copious discharge of the urine, which was before in the body, and not immediately of that which was last drank; and this increased discharge, if the supply is kept up, will continue: nor will this appear wonderful, if we consider the great capacity of the vessels that go to the kidneys; the constant supply of fresh blood that is essential to health; and the rapidity with which it is incessantly circulated through the heart to all parts of the body.

Sect. XIII. *Of Digestion.*

105 We are now proceeding to speak of *digestion*, which seems to be introduced in this place with propriety, after a description of the abdominal viscera, the greater part of which contribute to this function. By *digestion* is to be understood, the changes the aliment undergoes

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dergoes for the formation of chyle;—these changes are effected in the mouth, stomach, and small intestines.

The mouth, of which every body has a general knowledge, is the cavity between the two jaws, formed anteriorly and laterally by the lips, teeth, and cheeks, and terminating posteriorly in the throat.

The lips and cheeks are made up of fat and muscles, covered by the cuticle, which is continued over the whole inner surface of the mouth, like a fine and delicate membrane.—Besides this membrane, the inside of the mouth is furnished with a spongy and very vascular substance called the *gums*, by means of which the teeth are secured in their sockets. A similar substance covers the roof of the mouth, and forms what is called the *velum pendulum palati*, which is fixed to the extremity of the arch formed by the ossa maxillaria and ossa palati, and terminates in a soft, small, and conical body, named *uvula;* which appears, as it were, suspended from the middle of the arch over the basis of the tongue.

The velum pendulum palati performs the office of a valve between the cavity of the mouth and the pharynx, being moved by several muscles (F).

The tongue is composed of several muscles (G) which enable it to perform a variety of motions for the articulation of the voice; for the purposes of mastication; and for conveying the aliment into the pharynx. Its upper part is covered with papillæ, which constitute the organ of taste, and are easily to be distinguished; it is covered by the same membrane that lines the inside of the mouth, and which makes at its inferior part towards its basis a reduplication called *frænum*.

Posteriorly, under the velum palati, and at the basis of the tongue, is the pharynx; which is the beginning of the œsophagus, stretched out every way, so as to resemble the top of a funnel, through which the aliment passes into the stomach.

The mouth has a communication with the nostrils at its posterior and upper part; with the ears, by the Eustachian tubes; with the lungs, by means of the larynx; and with the stomach, by means of the œsophagus.

The pharynx is constantly moistened by a fluid, secreted by two considerable glands called the *tonsils*, one on each side of the velum palati. These glands, from their supposed resemblance to almonds, have likewise been called *amygdalus*.

The mouth is moistened by a considerable quantity of saliva. This fluid is derived from the *parotid glands;* a name which by its etymology points out their situation to be near the ears. They are two in number, one on each side under the os malæ; and they are of the conglomerate kind; being formed of many smaller glands, each of which sends out a very small excretory duct, which unites with the rest, to form one common channel, that runs over the cheek, and piercing the buccinator muscle, opens into the mouth on each side, by an orifice into which a bristle may be easily introduced.—Besides these, the maxillary glands, which are placed near the inner surface of the angle of the lower jaw on each side; the sublingual glands, which are situated at the root of the tongue; the glands of the palate, which are seated in the velum palati; and those of the checks, lips, &c. together with many other less considerable ones,—pour the saliva into the mouth through their several excretory ducts.

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The saliva, like all the other humours of the body, is found to be different in different people; but in general, it is a limpid and insipid fluid, without smell in healthy subjects; and these properties would seem to prove, that it contains very few saline or inflammable particles.

The uses of the saliva seem to be to moisten and lubricate the mouth, and to assist in reducing the aliment into a soft pulp before it is conveyed into the stomach.

106
Of hunger and thirst.

The variety of functions which are constantly performed by the living body, must necessarily occasion a continual waste and dissipation of its several parts. A great quantity is every day thrown off by the insensible perspiration and other discharges; and were not these losses constantly recruited by a fresh supply of chyle, the body would soon effect its own dissolution. But nature has very wisely favoured us with organs fitted to produce such a supply; and has at the same time endued us with the sensations of hunger and thirst, that our attention may not be diverted from the necessary business of nutrition. The sensation of hunger is universally known; but it would perhaps be difficult to describe it perfectly in words. It may, however, be defined to be a certain uneasy sensation in the stomach, which induces us to wish for solid food; and which likewise serves to point out the proper quantity, and time for taking it. In describing the stomach, mention was made of the gastric juice, as everywhere lubricating its inner coat. This humour mixes itself with the aliment in the stomach, and helps to prepare it for its passage into the intestines; but when the stomach is perfectly empty, this same fluid irritates the coats of the stomach itself, and produces the sensation of hunger.

A certain proportion of liquid aliment is required to assist in the process of digestion, and to afford that moisture to the body, of which there is such a constant dissipation. Thirst induces us to take this necessary supply of drink; and the seat of this sensation is in the tongue, fauces, and œsophagus, which from their great sensibility are required to be kept moist: for though the fauces are naturally moistened by the mucus and salival juices; yet the blood, when deprived of its watery part, or rendered acrimonious by any natural causes, never fails particularly to affect these parts, and the whole alimentary canal, and to occasion thirst.—This is the common effect of fevers and of hard labour, by both which too much of the watery part of the blood is dissipated.

It has been observed, that the aliment undergoes some

(F) These are the circumflexus palati, levator palati mollis, palato-pharyngæus, constrictor isthmi faucium, and azygos uvulæ.

(G) These are, the genio-glossus, hyo-glossus, lingualis, and stylo-glossus.

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107 Of mastication and deglutition.

some preparation in the mouth before it passes into the stomach; and this preparation is the effect of mastication. In treating of the upper and lower jaws, mention was made of the number and arrangement of the teeth. The upper jaw was described as being immoveable; but the lower jaw was spoken of as being capable of elevation and depression, and of a grinding motion. The aliment, when first carried into the mouth, is pressed between the teeth of the two jaws, by a very strong and frequent motion of the lower jaw; and the tongue and the cheeks assisting in this process, continue to replace the food between the teeth till it is perfectly divided, and reduced to the consistence of pulp. The incisores and canini divide it first into smaller pieces, but it is between the surfaces of the dentes molares by the grinding motion of the jaw that the mastication is completed.

During this process, the salival glands being gently compressed by the contraction of the muscles that move the lower jaw, pour out their saliva: this helps to divide and break down the food, which at length becomes a kind of pulp, and is then carried over the basis of the tongue into the fauces. But to effect this passage into the œsophagus, it is necessary that the other openings which were mentioned, as having a communication with the mouth as well as the pharynx, should be closed; that none of the aliment, whether solid or liquid, may pass into them, whilst the pharynx alone is dilated to receive it:—And such a disposition actually takes place in a manner we will endeavour to describe.

The trachea arteria, or windpipe, through which the air is conveyed to the lungs, is placed before the œsophagus: in the act of swallowing, therefore, if the *larynx* (for so the upper part of the trachea is called) is not closed, the aliment will pass into it in its way to the œsophagus. But this is prevented by a small and very elastic cartilage, called *epiglottis*, which is attached only to the fore part of the larynx; so that the food in its passage to the œsophagus presses down this cartilage, which then covers the glottis or opening of the larynx; and at the same time the velum palati being capable of some degree of motion, is drawn backwards by its muscles, and closes the openings into the nose and the Eustachian tubes.—This, however, is not all. The larynx, which being composed of cartilaginous rings cannot fail in its ordinary state to compress the membranous canal of the œsophagus, is in the act of deglutition carried forwards and upwards by muscles destined for that purpose; and consequently drawing the fore part of the pharynx with it, that opening is fully dilated. When the aliment has reached the pharynx, its descent is promoted by its own proper weight, and by the muscular fibres of the œsophagus, which continue to contract from above downwards, until the aliment has reached the stomach. That these fibres have no inconsiderable share in deglutition, any person may experience, by swallowing with his head downwards, when the descent of the aliment cannot possibly be effected by its weight.

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It is necessary that the nostrils and the lungs should communicate with the mouth, for the purposes of speech and respiration; but if the most minute part of our food happens to be introduced into the trachea, it never fails to produce a violent cough, and sometimes the most alarming symptoms. This is liable to happen when we laugh or speak in the act of deglutition; the food is then said to have passed the wrong way. And indeed this is not improperly expressed: for death would soon follow, if the quantity of aliment introduced into the trachea should be sufficient to obstruct the respiration only during a very short time; or if the irritating particles of food should not soon be thrown up again by means of the cough, which in these cases very seasonably increases in proportion to the degree of irritation.

If the velum palati did not close the passage to the nostrils, deglutition would be performed with difficulty, and perhaps not at all; for the aliment would return through the nose, as is sometimes the case in drinking. Children, from a deficiency in this velum palati, have been seen to die a few hours after birth; and they who from disease or any other causes have not this part perfect, swallow with difficulty.

The aliment, after having been sufficiently divided by the action of the teeth, and attenuated by the saliva, is received into the stomach, where it is destined to undergo a more considerable change.

The properties of the aliment not being much altered at its first entrance into the stomach, and before it is thoroughly blended with the gastric juice, it is capable of irritating the inner coat of the stomach to a certain degree, and occasions a contraction of its two orifices.—In this membranous bag, surrounded by the abdominal viscera, and with a certain degree of natural heat, the aliment undergoes a constant agitation by means of the abdominal muscles and of the diaphragm, and likewise by a certain contraction or expansion of the muscular fibres of the stomach itself. By this motion, every part of the food is exposed to the action of the gastric juice, which gradually divides and attenuates it, and prepares it for its passage into the intestines.

Some observations lately published by Mr Hunter, in the Philosophical Transactions, tend to throw considerable light on the principles of digestion. There are few dead bodies in which the stomach, at its great end, is not found to be in some degree digested (H). Animals, or parts of animals, possessed of the living principle,

(H) The Abbé Spallanzani, who has written upon digestion, found, from a variety of experiments made upon quadrupeds, birds, and fishes, that digestion goes on for some time after death, though far less considerable than in living animals; but heat is necessary in many animals, or at least promotes it in a much greater degree. He found also, that when the stomach was cut out of the body, it had somewhat of the power of digestion, though this was trifling when compared with that which took place when the stomach was left in the body. In not one of the animals was the great curvature of the stomach dissolved, or much eroded after death. There was often a little erosion, especially in different fishes; in which, when he had cleared the stomach of its contents, the internal coat was wanting. In other animals there was only a slight excoriation: and the in-

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principle, when taken into the stomach, are not in the least affected by the action of that viscus; but the moment they lose the living principle, they become subject to its digestive powers. This seems to be the case with the stomach, which is enabled to resist the action of its juices in the living body: but when deprived of the living principle, it is then no longer able to resist the powers of that menstruum, which it had itself formed for the digestion of its contents; the process of digestion appearing to be continued after death. This is confirmed by what happens in the stomachs of fishes: They frequently swallow, without mastication, fish which are larger than the digesting parts of their stomach can contain; and in such cases, that part which is taken into the stomach, is more or less dissolved, while that part which remains in the œsophagus is perfectly sound; and here, as well as in the human body, the digesting part of the stomach is often reduced to the same state as the digested part of the food. These appearances tend to prove, that digestion is not effected by a mechanical power, by contractions of the stomach, or by heat; but by a fluid secreted in the coats of the stomach, which is poured into its cavity, and there animalizes the food, or assimilates it to the nature of blood.

From some late experiments by M. Sage*, it appears, that inflammable air has the property of destroying and dissolving the animal texture: And as we swallow with the substances which serve us for food a great quantity of atmospherical air, M. Sage thinks it possible, that dephlogisticated, which is its principle, may be converted in the stomach into inflammable air, or may modify into inflammable air a portion of the oily substance which is the principle of aliments. In this case, would not the inflammable air (he asks), by dissolving our food, facilitate its conversion into chyle?

* *Hist. de l'Academie Royale des Sciences, &c. pour* 1784. *mem.* 15.

Be this as it may, the food, after having remained one, two, or three hours in the stomach, is converted into a grayish pulp, which is usually called *chymus*, a word of Greek etymology, signifying *juice*, and some few milky or chylous particles begin to appear.—But the term of its residence in this bag is proportioned to the nature of the aliment, and to the state of the stomach and its juices. The thinner and more perfectly digested parts of the food pass by a little at a time into the duodenum, through the pylorus, the fibres of which relax to afford it a passage; and the grosser and less digested particles remain in the stomach, till they acquire a sufficient fluidity to pass into the intestines, where the nature of the chymus is perfectly changed. The bile and pancreatic juice which flow into the duodenum, and the mucus, which is everywhere distilled from the surface of the intestines, mix themselves with the alimentary pulp, which they still farther attenuate and dissolve, and into which they seem to infuse new properties.

Two matters very different from each other in their nature and destination, are the result of this combination.—One of these, which is composed of the liquid parts of the aliment, and of some of its more solid particles, extremely divided and mixed with the juices we have described, constitutes a very mild, sweet, and whitish fluid resembling milk, and distinguished by the name of *chyle*. This fluid is absorbed by the lacteal veins, which convey it into the circulation, where, by being assimilated into the nature of blood, it affords the supply of nutrition, which the continual waste of that body is found to require.—The other is the remains of the alimentary mass deprived of all its nutritious particles, and containing only such parts as were rejected by the absorbing mouths of the lacteals. This grosser part, called the *fæces*, passes on through the course of the intestines, to be voided at the anus, as will be explained hereafter; for this process in the economy cannot be well understood till the motion of respiration has been explained. But the structure of the intestines is a subject which may be properly described in this place, and deserves to be attended to.

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It has been already observed, that the intestinal canal is five or six times as long as the body, and that it forms many circumvolutions in the cavity of the abdomen, which it traverses from the right to the left, and again from the left to the right; in one place descending, and in another extending itself upwards. It was noticed likewise, that the inner coat of the intestines, by being more capacious than their exterior tunics, formed a multitude of plaits placed at a certain distance from each other, and called *valvulæ conniventes*. Now this disposition will be found to afford a farther proof of that divine wisdom, which the anatomist and physiologist cannot fail to discover in all their pursuits. —For if the intestinal canal was much shorter than it naturally is; if instead of the present circumvolution, it passed in a direct course from the stomach; and if its inner surface was smooth and destitute of valves; the aliment would consequently pass with great rapidity to the anus, and sufficient time would be wanting to assimilate the chyle, and for the necessary absorption of it into the lacteals; so that the body would be deprived of the supply of nutrition, which is so essential to life and health; but the length and circumvolutions of the intestines, the inequality of their internal surface, and the course of the aliment through them, all concur to perfect the separation of the chyle from the fæces, and to afford the necessary nourishment to the body.

Sect. XIV. *Of the Course of the Chyle, and of the Lymphatic System.*

An infinite number of very minute vessels, called the *lacteal veins*, arise like net-work from the inner surface of the intestines (but principally from the *jejunum* and *ileum*), which are destined to imbibe the nutritious fluid or chyle. These vessels, which were discovered by Asellius in 1622 (1), pass obliquely through the coats 108

of

jury in all of them was at the inferior part, or great curvature. The coats of the stomach suffer less after death than flesh, or part of the stomach of similar animals put into it: The author assigns as a reason for this, that these bodies are invested on all sides by the gastric fluid, whereas it only acts on the internal surface of the stomach.

(1) We are informed by Galen, that the lacteals had been seen in kids by Erasistratus, who considered them as

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of the intestine, and running along the mesentery, unite as they advance, and form larger branches, all of which pass through the mesenteric or conglobate glands, which are very numerous in the human subject. As they run between the intestines and these glands, they are styled *venæ lacteæ primi generis:* but after leaving these glands they are found to be less numerous, and being increased in size, are then called *venæ lacteæ secundi generis*, which go to deposit their contents in the *thoracic duct*, through which the chyle is conveyed into the blood.

The *thoracic duct* begins about the lower part of the first vertebra lumborum, from whence it passes up by the side of the aorta, between that and the vena azygos, close to the vertebræ, being covered by the pleura. Sometimes it is found divided into two branches; but they usually unite again into one canal, which opens into the left subclavian vein, after having run a little way in an oblique course between its coats. The subclavian vein communicates with the vena cava, which passes to the right auricle of the heart.

The lower part of this duct being usually larger than any other part of it, has been named *receptaculum chyli*, or *Pecquet's receptacle*, in honour of the anatomist who first discovered it in 1651. In some quadrupeds, in turtle and in fish, this enlargement * is more considerable, in proportion to the size of the duct, than it usually is in the human subject, where it is not commonly found large enough to merit the name of *receptaculum.*

* *Hewson's Exp. Inq.* Part II.

Opportunities of observing the lacteals in the human subject do not often occur; but they may be easily demonstrated in a dog or any other quadruped that is killed two or three hours after feeding upon milk, for then they appear filled with white chyle.

But these *lacteals*, which we have described as passing from the intestines through the mesentery to the thoracic duct, compose only a part of a system of vessels which perform the office of *absorption*, and which constitute, with their common trunk, the thoracic duct, and the conglobate glands that are dispersed through the body, what may be styled the *lymphatic system.* So that what is said of the structure of one of these series of vessels may very properly be applied to that of the other.

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The *lymphatic veins* (K) are minute pellucid tubes, which, like the lacteals, direct their course towards the centre of the body, where they pour a colourless fluid into the thoracic duct. The lymphatics from all the lower parts of the body gradually unite as they approach this duct, into which they enter by three or four very large trunks, that seem to form the lower extremity of this canal, or *receptaculum chyli*, which may be considered as the great trunk of the lymphatic system. The lacteals open into it near the same place; and the lymphatics, from a large share of the upper parts of the body, pour their lymph into different parts of this duct as it runs upwards, to terminate in the left subclavian vein. The lymphatics from the right side of the neck, thorax, and right arm, &c. terminate in the right subclavian vein.

As the lymphatics commonly lie close to the large blood vessels, a ligature passed round the crural artery in a living animal, by enclosing the lymphatics, will occasion a distension of these vessels below the ligature, so as to demonstrate them with ease; and a ligature, passed round the thoracic duct, instantly after killing an animal, will, by stopping the course of its contents into the subclavian vein, distend not only the lacteals, but also the lymphatics in the abdomen and lower extremities, with their natural fluids (L).

The coats of these vessels are too thin to be separated from each other; but the mercury they are capable of sustaining, proves them to be very strong; and their great power of contraction, after undergoing considerable distension, together with the irritability with which Baron Haller found them to be endued *, seems to render it probable, that, like the blood-vessels, they have a muscular coat.

* *Sur le mouvement du sang*, Ex. 295, 298.

The lymphatics are nourished after the same manner as

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as arteries carrying a milky fluid: but from the remote time in which he lived, they do not seem to have been noticed till they were discovered in a living dog by Asellius, who denominated them *lacteals*, and considered them as serving to convey the chyle from the intestines to the liver; for before the discovery of the thoracic duct, the use of the liver was universally supposed to be that of converting the chyle into blood. But the discovery of the thoracic duct by Pecquet, not long after, corrected this error. Pecquet very candidly confesses, that his discovery accidentally arose from his observing a white fluid, mixed with the blood, flowing out of the vena cava, after he had cut off the heart of a living dog; which he suspected to be chyle, and afterwards traced to its source from the thoracic duct: This duct had been seen near a hundred years before in a horse by Eustachius, who speaks of it as a vein of a particular structure, but without knowing any thing of its termination or use.

(K) The arteries in their course through the body becoming gradually too minute to admit the red globules of the blood, have then been styled *capillary* or *lymphatic arteries.* The vessels which are here described as constituting the lymphatic system, were at first supposed to be continued from those arteries, and to convey back the lymph, either into the red veins or the thoracic duct; the office of absorption having been attributed to the *red veins.* But we know that the *lymphatic veins* are not continuations of the *lymphatic arteries*, but that they constitute the *absorbent system.* There are still, however, some very respectable names among the anatomists of the present age, who contend, that the red veins act likewise as absorbents: but it seems to have been clearly proved, that the red veins do absorb nowhere but in the cavernous cells of the penis, the erection of which is occasioned by a distension of those cells with arterial blood.

(L) In the dead body they may be easily demonstrated by opening the artery ramifying through any viscus, as in the spleen, for instance, and then throwing in air; by which the lymphatics will be distended. One of them may then be punctured, and mercury introduced into it through a blowpipe.

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as all the other parts of the body. For even the most minute of these vessels are probably supplied with still more minute arteries and veins. This seems to be proved by the inflammation of which they are susceptible; and the painful swellings which sometimes take place in lymphatic vessels prove that they have nerves as well as blood-vessels.

Both the lacteals, lymphatics, and thoracic duct, are furnished with valves, which are much more common in these vessels than in the red veins. These valves are usually in pairs, and serve to promote the course of the chyle and lymph towards the thoracic duct, and to prevent its return. Mention has been made of the glands, through which the lacteals pass in their course through the mesentery; and it is to be observed, that the lymphatics pass through similar glands in their way to the thoracic duct. These glands are all of the conglobate kind, but the changes which the chyle and lymph undergo in their passage through them, have not yet been ascertained.

The *lymphatic vessels* begin from surfaces and cavities in all parts of the body as *absorbents*. This is a fact now universally allowed; but how the fluids as they absorb are poured into these cavities, is a subject of controversy. The contents of the abdomen, for instance, were described as being constantly moistened by a very thin watery fluid. The same thing takes place in the pericardium, pleura, and all the other cavities of the body, and this watery fluid is the *lymph*. But whether it is exhaled into those cavities through the minute ends of arteries, or transuded through their coats, are the points in dispute. We cannot here be permitted to relate the many ingenious arguments that have been advanced in favour of each of these opinions; nor is it perhaps of consequence to our present purpose to enter into the dispute. It will be sufficient if the reader can form an idea of what the lymph is, and of the manner in which it is absorbed.

The *lymph*, from its transparency and want of colour, would seem to be nothing but water; and hence the first discoverers of these vessels styled them *ductus aquosi:* but experiments prove, that the lymph of a healthy animal coagulates by being exposed to the air or a certain degree of heat, and likewise by being suffered to rest: seeming to agree in this property with that part of the blood called the *coagulable lymph.*— This property of the lymph leads to determine its use, in moistening and lubricating the several cavities of the body in which it is found; and for which, by its gelatinous principle, it seems to be much better calculated than a pure and watery fluid would be, for such it has been supposed to be by some anatomists.

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The mouths of the *lymphatics* and *lacteals*, by acting as capillary tubes, seem to absorb the *lymph* and *chyle* somewhat in the same manner as a capillary tube of glass, when put into a bason of water, is enabled to attract the water into it to a certain height: but it is probable that they likewise possess a living power, which assists in performing this office. In the human body the *lymph*, or the *chyle*, is probably conveyed upon this principle as far as the first pair of valves, which seem to be placed not far from the orifice of the absorbing vessel, whether *lymphatic* or *lacteal;* and the fluid will then be propelled forwards, by a continuation of the absorption at the orifice. But this does not seem to be the only inducement to its progress towards the thoracic duct; these vessels have probably a muscular coat, which may serve to press the fluid forwards from one pair of valves to another; and as the large lymphatic vessels and the thoracic duct are placed close to the large arteries, which have a considerable pulsation, it is reasonable to suppose, that they derive some advantages from this situation.

Sect. XV. *Of the Generative Organs; of Conception*, &c.

§ 1. *The Male Organs.*

The male organs of generation have been usually 810
divided into the parts which serve to prepare the semen from the blood, and those which are destined to convey it into the womb. But it seems to be more proper to distinguish them into the *preparing*, the *containing*, and the *expelling* parts, which are the different offices of the *testes*, the *vesiculæ seminales*, and the *penis;* and this is the order in which we propose to describe them.

The testes are two glandular bodies, serving to secrete the semen from the blood. They are originally formed and lodged within the cavity of the abdomen; and it is not till after the child is born, or very near that time, that they begin to pass into the groin, and from thence into the scrotum (M). By this disposition they are very wisely protected from the injuries to which they would be liable to be exposed, from the different positions of the child at the time of parturition.

The testicles in this state are loosely attached to the psoæ muscles, by means of the peritonæum by which they are covered; and they are at this time of life connected in a very particular manner to the parietes of the abdomen, and likewise to the scrotum, by means of a substance which Mr Hunter calls the *ligament* or *gubernaculum testis*, because it connects the testis with the scrotum,

(M) It sometimes happens in dissecting ruptures, that the intestine is found in the same sac, and in contact with the testis. This appearance was at first attributed to a supposed laceration of the peritonæum; but later observations, by pointing out the situation of the testicles in the fœtus, have led to prove, that the testis, as it descends into the scrotum, carries with it a portion or elongation of the peritonæum, which becomes its tunica vaginalis, or a kind of sac, in which the testicle is lodged, as will be explained in the course of this section. The communication between this sac and the cavity of the abdomen is usually soon cut off; but in some subjects it continues open during life; and when a hernia or descent of the intestine takes place in such a subject, it does not push down a portion of the peritonæum before it, as it must otherwise necessarily do, but passes at once through this opening, and comes in contact with the naked testicle, constituting that particular species of rupture called *hernia congenita.*

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scrotum, and directs its course in its descent. This gubernaculum is of a pyramidal form, with its bulbous head fixed to the lower end of the testes and epididymis, and loses its lower and slender extremity in the cellular membrane of the scrotum. It is difficult to ascertain what the structure and composition of this gubernaculum is, but it is certainly vascular and fibrous; and from certain circumstances, it would seem to be in part composed of the cremaster muscle, running upwards to join the lower end of the testis.

We are not to suppose that the testicle, when descended into the scrotum, is to be seen loose as a piece of gut or omentum would be in a common hernial sac. We have already observed, that during its residence in the cavity of the abdomen it is attached to the peritonæum, which descends with it; so that when the sac is completed in the scrotum, the testicle is at first attached only to the posterior part of it, while the fore part of it lies loose, and for some time affords a communication with the abdomen. The spermatic chord, which is made up of the spermatic artery and vein, and of the vas deferens or excretory duct of the testis, is closely attached behind to the posterior part of this elongation of the peritonæum. But the fore part of the peritoneal sac, which is at first loose and not attached to the testicle, closes after a certain time, and becomes united to the posterior part, and thus perfectly surrounds the testicle as it were in a purse.

The testicles of the fœtus differ only in their size and situation from those of the adult. In their passage from the abdomen they descend through the abdominal rings into the scrotum, where they are supported and defended by various integuments.

What the immediate cause of this descent is, has not yet been satisfactorily determined. It has been ascribed to the effects of respiration, but the testicles have sometimes been found in the scrotum before the child has breathed; and it does not seem to be occasioned by the action of the cremaster muscle, because the same effect would be liable to happen in the hedgehog and some other quadrupeds, whose testicles remain in the abdomen during life.

The scrotum, which is the external or common covering of both testicles, is a kind of sac formed by the common integuments, and externally divided into two equal parts by a prominent line called *raphe*.

In the inner part of the scrotum we meet with a cellular coat called *dartos* (N), which by its duplicature divides the scrotum into two equal parts, and forms what is called *septum scroti*, which corresponds with the raphe. The collapsion which is so often observed to take place in the scrotum of the healthy subject, when excited by cold or by the stimulus of venery, seems to be very properly attributed to the contractile motion of the skin, and not to any muscular fibres, as is the case in dogs and some other quadrupeds.

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The scrotum, then, by means of its septum, is found to make two distinct bags, in which the testicles, invested by their proper tunics, are securely lodged and separated from each other. These coats are the cremaster, the tunica vaginalis, and the tunica albuginea. The first of these is composed of muscular fibres, and is to be considered only as a partial covering of the testis; for it surrounds only the spermatic chord, and terminates upon the upper and external parts of the tunica vaginalis testis, serving to draw up and suspend the testicle (O). The tunica vaginalis testis has already been described as being a thin production of the peritonæum loosely adhering everywhere to the testicle, which it includes as it were in a bag. The tunica albuginea is a firm, white, and very compact membrane of a glistening appearance, which immediately invests the body of the testis and the epididymis; serving in some measure to connect them to each other, but without extending itself at all to the spermatic chord. This tunica albuginea serves to confine the growth of the testis and epididymis within certain limits, and by giving them a due degree of firmness, enables them to perform their proper functions.

Having removed this last tunic, we discover the substance of the testicle itself, which appears to be made up of an infinite number of very elastic filaments, which may be best distinguished after macerating the testicle in water. Each testicle is made up of the spermatic artery and vein, and the excretory vessels or tubuli seminiferi. There are likewise a great number of absorbent vessels, and some branches of nerves to be met with in the testicles.

The spermatic arteries arise one on each side from the aorta, generally about an inch below the emulgents. The right spermatic vein commonly passes into the vena cava: but the left spermatic vein usually empties itself into the emulgent on that side; and it is supposed to take this course into the emulgent, that it may avoid passing over the aorta, which it would be obliged to do in its way to the vena cava.

The blood is circulated very slowly through the spermatic artery, which makes an infinite number of circumvolutions in the substance of the testicle, where it deposites the semen, which passes through the tubuli seminiferi. These tubuli seminiferi are seen running in short waves from the tunica albuginea to the axis of the testicle; and are divided into distinct portions by certain thin membranous productions, which originate from the tunica albuginea. They at length unite, and by an infinite number of convolutions form a sort of appendix to the testis called *epididymis* (P), which is

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(N) The dartos has usually been considered as a muscle, and is described as such both by Douglas and Winslow. But there being no part of the scrotum of the human subject which can be said to consist of muscular fibres, Albinus and Haller have very properly omitted to describe the dartos as a muscle, and consider it merely as a cellular coat.

(O) The cremaster muscle is composed of a few fibres from the obliquus internus abdominis, which uniting with a few from the transversalis, descend upon the spermatic chord, and are insensibly lost upon the tunica vaginalis of the testicle. It serves to suspend and draw up the testicle.

(P) The testicles were named *didymi* by the ancients; and the name of this part was given to it on account of its situation upon the testicle.

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a vascular body of an oblong shape, situated upon the superior part of each testicle. These tubuli of the epididymis at length form an excretory duct called *vas deferens*, which ascends towards the abdominal rings, with the other parts that make up the spermatic chord, and then a separation takes place; the nerves and blood-vessels passing on to their several terminations, and the vas deferens going to deposite its semen in the vesiculæ seminales, which are two soft bodies of a white and convoluted appearance externally, situated obliquely between the rectum and the lower part of the bladder, and uniting together at the lower extremity. From these reservoirs (a), which are plentifully supplied with blood-vessels and nerves, the semen is occasionally discharged through two short passages, which open into the urethra close to a little eminence called *verumontanum*.

Near this eminence we meet with the prostate, which is situated at the neck of the bladder, and is described as being of a glandular structure. It is shaped somewhat like a heart with its small end foremost, and invests the origin of the urethra. Internally it appears to be of a firm substance, and composed of several follicles, secreting a whitish viscid fluid, that is discharged by ten or twelve excretory ducts into the urethra, on each side of the openings of the vesiculæ seminales, at the same time, and from the same causes, that the semen is expelled. As this latter fluid is found to be exceedingly limpid in the vesiculæ seminales of the dead subject, it probably owes its whiteness and viscidity to this liquor of the prostate.

The penis, which is to be considered as the vehicle or active organ of procreation, is composed of two columns, the corpora cavernosa, and corpus spongiosum. The corpora cavernosa, which constitute the greatest part of the penis, may be described as two cylindrical ligamentous tubes, each of which is composed of an infinite number of minute cells of a spongy texture, which communicate with each other. These two bodies are of a very pliant texture, and capable of considerable distension; and being united laterally to each other, occasion by this union a space above and another below. The uppermost of these spaces is filled by the blood-vessels, and the lower one, which is larger than the other, by the urethra and its corpus spongiosum. These two cavernous bodies are at first only separated

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(a) That the bags called *vesiculæ seminales*, are reservoirs of semen, is a circumstance which has been by anatomists universally believed. Mr J. Hunter, however, from several circumstances, has been induced to think this opinion erroneous.

He has examined these vesiculæ in people who have died suddenly, and he found their contents to be different in their properties from the semen. In those who had lost one of the testicles, or the use of one of them, by disease, both the vesiculæ were full, and their contents similar. And in a *lusus naturæ*, where there was no communication between the vasa deferentia and vesiculæ, nor between the vesiculæ and penis, the same thing took place.

From these observations, he thinks we have a presumptive proof, That the semen can be absorbed in the body of the testicle and the epididymis, and that the vesiculæ secrete a mucus which they are capable of absorbing when it cannot be made use of: that the semen is not retained in reservoirs after it is secreted, and kept there till it is used; but that it is secreted at the time in consequence of certain affections of the mind stimulating the testicles to this action.

He corroborates his observations by the appearance on dissection in other animals; and here he finds, That the shape and contents of the vesiculæ vary much in different animals, while the semen in most of them he has examined is nearly the same: That the vasa deferentia in many animals do not communicate with the vesiculæ: That the contents of the vesiculæ of castrated and perfect animals are similar, and nearly equal in quantity, in no way resembling the semen as emitted from the animal *in coitu*, or what is found in the vas deferens after death. He observes likewise, that the bulb of the urethra of perfect males is considerably larger than in castrated animals.

From the whole, he thinks the following inferences may be fairly drawn: That the bags called *vesiculæ seminales* are not seminal reservoirs, but glands secreting a peculiar mucus: and that the bulb of the urethra is properly speaking the receptacle of the semen, in which it is accumulated previous to ejection.

But although he has endeavoured to prove that the vesiculæ do not contain the semen, he has not been able to ascertain their particular use. He thinks, however, we may be allowed upon the whole to conclude, that they are, together with other parts, subservient to the purposes of generation.

Although the author has treated this subject very ably, and made many ingenious observations, some things may be objected to what he has advanced; of which the following are a few: That those animals who have bags called *vesiculæ seminales* perform copulation quickly; whereas others that want them, as the dog kind, are tedious in copulation: That in the human body, at least, there is a free communication between the vasa deferentia and vesiculæ; and in animals where the author has observed no communication between the vasa deferentia and vesiculæ, there may be a communication by vessels not yet discovered, and which may be compared to the hepato-cystic ducts in fowls and fishes: That the fluid in the end of the vasa deferentia and the vesiculæ seminales are similar, according to the author's own observation: That the vesiculæ in some animals increase and decrease with the testicle at particular seasons: That in birds and certain fishes, there is a dilatation of the ends of the vasa deferentia, which the author himself allows to be a reservoir for the semen.

With respect to the circumstance of the bulb of the urethra answering the purpose of a reservoir, the author has mentioned no facts which tend to establish this opinion. See *Observations on certain Parts of the Animal Economy.*

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parated by a partition of tendinous fibres, which allow them to communicate with each other; but they afterwards divaricate from each other like the branches of the letter Y, and diminishing gradually in size, are attached, one on each side, by means of the ligamentum suspensorium penis, to the ramus ischii, and to the inferior portion of the os pubis.

The corpus spongiosum penis, or corpus spongiosum urethræ, as it is styled by some authors, begins as soon as the urethra has passed the prostate, with a thick origin almost like a heart, first under the urethra, and afterwards above it, becoming gradually thinner, and surrounding the whole canal of the urethra, till it terminates in a considerable expansion, and constitutes what is called the *glans penis*, which is exceedingly vascular, and covered with papillæ like the tongue. The cuticle which lines the inner surface of the urethra, is continued over the glans in the same manner as it is spread over the lips.

The penis is invested by the common integuments, but the cutis is reflected back everywhere from the glans as it is in the eyelids; so that it covers this part, when the penis is in a relaxed state, as it were with a hood, and from this use is called *prepuce*.

The prepuce is tied down to the under part of the glans by a small ligament called *frænum*, which is in fact only a continuation of the cuticle and cutis. There are many simple sebaceous follicles called *glandulæ odoriferæ*, placed round the basis of the glans; and the fluid they secrete serves to preserve the exquisite sensibility of this part of the penis, and to prevent the ill effects of attrition from the prepuce.

The urethra may be defined to be a membranous canal, passing from the bladder through the whole extent of the penis. Several very small openings, called *lacunæ*, communicate with this canal, through which a mucus is discharged into it; and besides these, there are two glands, first described by Cowper, as secreting a fluid for lubricating the urethra, and called *Cowper's glands* (R); and Littre * speaks of a gland situated near the prostate, as being destined for the same use.

* *Memoires de l'Acad. Royale des Sciences*, 1700.

The urethra being continued from the neck of the bladder, is to be considered as making part of the urinary passage; and it likewise affords a conveyance to the semen, which we have observed is occasionally discharged into it from the vesiculæ seminales. The direction of this canal being first under and then before the pubis, occasions a winding in its course from the bladder to the penis, not unlike the turns of the letter *S*.

The penis has three pair of muscles, the erectores, acceleratores, and transversales. They push the blood from the crura to the fore part of the corpora cavernosa. The first originate from the tuberosity of the ischium, and terminate in the corpora cavernosa. The acceleratores arise from the sphincter, and by their insertion serve to compress the bulbous part of the urethra; and the transversales are destined to afford a passage to the semen, by dilating the canal of the urethra.

The arteries of the penis are chiefly derived from the internal iliacs. Some of them are supposed to terminate by pabulous orifices within the corpora cavernosa and corpus spongiosum; and others terminate in veins, which at last make up the vena magna dorsi penis, and other smaller veins, which are in general distributed in like order with the arteries.

Its nerves are large and numerous. They arise from the great sciatic nerve, and accompany the arteries in their course through the penis.

We have now described the anatomy of this organ; and there only remains to be explained, how it is enabled to attain that degree of firmness and distension which is essential to the great work of generation.

The greatest part of the penis has been spoken of as being of a spongy and cellular texture, plentifully supplied with blood vessels and nerves, and as having muscles to move it in different directions. Now, the blood is constantly passing into its cells through the small branches of the arteries which open into them, and is from thence as constantly returned by the veins, so long as the corpora cavernosa and corpus spongiosum continue to be in a relaxed and pliant state. But when, from any nervous influence, or other means which it is not necessary here to define or explain, the erectores penis, ejaculatores seminis, levatores ani, &c. are induced to contract, the veins undergo a certain degree of compression, and the passage of the blood through them is so much impeded, that it collects in them in a greater proportion than they are enabled to carry off, so that the penis gradually enlarges, and being more and more forcibly drawn up against the os pubis, the vena magna itself is at length compressed, and the penis becomes fully distended. But as the causes which first occasioned this distension subside, the penis gradually returns to its state of relaxation.

§ 2. *Female Organs of Generation.*

Anatomical writers usually divide the female organs of generation into *external* and *internal*. In the first division they include the *mons veneris*, *labia pudendi*, *perinæum*, *clitoris*, *nymphæ*, and *carunculæ myrtiformes:* and in the latter, the *vagina*, with the *uterus* and its appendages.

The *mons veneris*, which is placed on the upper part of the symphysis pubis, is internally composed of adipose membranes, which makes it soft and prominent: it divides into two parts called *labia pudendi*, which descending towards the rectum, from which they are divided by the perinæum, form what is called the *fourchette*. The perinæum is that fleshy space which extends about an inch and a half from the fourchette to the anus, and from thence about two inches to the coccyx.

The labia pudendi being separated, we observe a sulcus called *fossa magna;* in the upper part of which is placed the clitoris, a small round spongy body, in some measure resembling the male penis, but impervious, composed of two corpora cavernosa, arising from the tuberosities of the ossa ischii; furnished with two pair of

(R) Both Heister and Morgagni observe, that they have sometimes not been able to find these glands; so that they do not seem to exist in all subjects.

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of muscles, the erectores clitoridis, and the sphincter or constrictor ostii vaginæ; and terminating in the glans, which is covered with its prepuce. From the lower part, on each side of the fossa, pass the nymphæ, two membranous and spongy folds, which seem destined for useful purposes in parturition, by tending to enlarge the volume of the vagina as the child's head passes through it. Between these, about the middle of the fossa magna, we perceive the orifice of the vagina or os externum, closed by folds and wrinkles; and about half an inch above this, and about an inch below the clitoris, appears the meatus urinarius or orifice of the urethra, much shorter, though somewhat larger, than in men, with a little prominence at its lower edge, which facilitates the introduction of the catheter.

The os externum is surrounded internally by several membranous folds called *carunculæ myrtiformes*, which are partly the remains of a thin membrane called *hymen*, that covers the vagina in children. In general the hymen is sufficiently open to admit the passage of the menses, if it exists at the time of their appearance; sometimes, however, it has been found perfectly closed.

The vagina, situated between the urethra and the rectum, is a membranous cavity, surrounded, especially at its external extremity, with a spongy and vascular substance, which is covered by the sphincter ostii vaginæ. It terminates in the uterus, about half an inch above the os tincæ, and is wider and shorter in women who have had children than in virgins.

All these parts are plentifully supplied with blood vessels and nerves. Around the nymphæ there are sebaceous follicles, which pour out a fluid to lubricate the inner surface of the vagina; and the meatus urinarius, like the urethra in the male subject, is constantly moistened by a mucus, which defends it against the acrimony of the urine.

The *uterus* is a hollow viscus, situated in the hypogastric region, between the rectum and bladder. It is destined to receive the first rudiments of the fœtus, and to assist in the developement of all its parts, till it arrives at a state of perfection, and is fitted to enter into the world, at the time appointed by the wise Author of nature.

The uterus, in its unimpregnated state, resembles a pear in shape, somewhat flattened, with its fundus or bottom part turned towards the abdomen, and its cervix or neck surrounded by the vagina. The entrance into its cavity forms a little protuberance, which has been compared to the mouth of a tench, and is therefore called *os tincæ*.

The substance of the uterus, which is of a considerable thickness, appears to be composed of muscular and small ligamentous fibres, small branches of nerves, some lymphatics, and with arteries and veins innumerable. Its nerves are chiefly derived from the intercostal, and its arteries and veins from the hypogastric and spermatic. The membrane which lines its cervix is a continuation of the inner membrane of the vagina; but the outer surface of the body of the uterus is covered with the peritonæum, which is reflected over it, and descends from thence to the intestinum rectum. This duplicature of the peritonæum, by passing off from the sides of the uterus to the sides of the pelvis, is there firmly connected, and forms what are called *ligamenta uteri lata*; which not only serve to support the uterus, but to convey nerves and blood vessels to it.

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The *ligamenta uteri rotunda* arise from the sides of the fundus uteri, and passing along within the fore part of the ligamenta lata, descend through the abdominal rings, and terminate in the substance of the mons veneris. The substance of these ligaments is vascular; and although both they and the ligamenta lata admit the uterus, in the virgin state, to move only about an inch up and down, yet in the course of pregnancy they admit of considerable distension, and after parturition return nearly to their original state with surprising quickness.

On each side of the inner surface of the uterus, in the angle near the fundus, a small orifice is to be discovered, which is the beginning of one of the tubæ Fallopianæ. Each of these tubes, which are two in number, passing through the substance of the uterus, is extended along the broad ligaments, till it reaches the edge of the pelvis, from whence it reflects back; and turning over behind the ligaments, about an inch of its extremity is seen hanging loose in the pelvis, near the ovarium. These extremities, having a jagged appearance, are called *fimbriæ*, or *morsus diaboli*. Each tuba Fallopiana is usually about three or four inches long. Their cavities are at first very small, but become gradually larger, like a trumpet, as they approach the fimbriæ.

Near the fimbriæ of each tuba Fallopiana, about an inch from the uterus, is situated an oval body called *ovarium*, of about half the size of the male testicle. Each of these ovaria is covered by a production of the peritonæum, and hangs loose in the pelvis. They are of a flat and angular form, and appear to be composed of a white and cellular substance, in which we are able to discover several minute vesicles filled with a coagulable lymph, of an uncertain number, commonly exceeding 12 in each ovary. In the female of riper years, these vesicles become exceedingly turgid, and a kind of yellow coagulum is gradually formed within one of them, which increases for a certain time. In conception, one of these mature ova is supposed to be impregnated with the male semen, and to be squeezed out of its nidus into the Fallopian tube; after which the ruptured part forms a substance which in some animals is of a yellow colour, and is therefore called *corpus luteum*; and it is observable, that the number of these scars or fissures in the ovarium, constantly corresponds with the number of fœtuses excluded by the mother.

§ 3. *Of Conception.*

Man, being ever curious and inquisitive, has naturally been led to inquire after the origin of his existence; and the subject of generation has employed the philosophical world in all ages: but in following nature up to her minute recesses, the philosopher soon finds himself bewildered; and his imagination often supplies that which he so eagerly wishes to discover, but which is destined perhaps never to be revealed to him. Of the many theories which have been formed on this subject, that of the ancient philosophers seems to have been the most simple: they considered the male semen as alone capable of forming the fœtus, and 113

believed

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believed that the female only afforded it a lodging in the womb, and supplied it with nourishment after it was perfectly formed. This opinion, however, soon gave place to another, in which the female was allowed a more considerable share in conception.

This second system considered the fœtus as being formed by the mixture of the seminal liquor of both sexes, by a certain arrangement of its several particles in the uterus. But in the 16th century, vesicles or eggs were discovered in the ovaria or female testicles; the fœtus had been found sometimes in the abdomen, and sometimes in the Fallopian tubes; and the two former opinions were exploded in favour of a new doctrine. The ovaria were compared to a bunch of grapes, being supposed to consist of vesicles, each of which had a stalk; so that it might be disengaged without hurting the rest, or spilling the liquor it contained. Each vesicle was said to include a little animal, almost complete in all its parts; and the vapour of the male semen being conveyed to the ovarium, was supposed to produce a fermentation in the vesicle which approached the nearest to maturity; and thus inducing it to disengage itself from the ovarium, it passed into the tuba Fallopiana, through which it was conveyed to the uterus. Here it was supposed to take root like a vegetable seed, and to form with the vessels originating from the uterus, what is called the *placenta;* by means of which the circulation is carried on between the mother and the fœtus.

This opinion, with all its absurdities, continued to be almost universally adopted till the close of the same century, when Leeuwenhoek, by means of his glasses, discovered certain opaque particles, which he described as so many animalcula, floating in the seminal fluid of the male.

This discovery introduced a new schism among the philosophers of that time, and gave rise to a system which is not yet entirely exploded. According to this theory, the male semen passing into the tubæ Fallopianæ, one of the animalcula penetrates into the substance of the ovarium, and enters into one of its vesicles or ova. This impregnated ovum is then squeezed from its husk, through the coats of the ovarium, and being seized by the fimbria, is conducted through the tube to the uterus, where it is nourished till it arrives at a state of perfection. In this system there is much ingenuity; but there are certain circumstances supposed to take place, which have been hitherto inexplicable. A celebrated modern writer, M. Buffon, endeavours to restore, in some measure, the most ancient opinion, by allowing the female semen a share in this office; asserting, that the animalcula or organic particles are to be discovered in the seminal liquor of both sexes: he derives the female semen from the ovaria, and he contends that no ovum exists in those parts. But in this idea he is evidently mistaken; and the opinion now most generally adopted is, that an impregnation of the ovum, by the influence of the male semen, is essential to conception. That the ovum is to be impregnated, there can be no doubt; but as the manner in which such an impregnation is supposed to take place, and the means by which the ovum afterwards gets into the Fallopian tube, and from thence into the uterus, are still founded chiefly on hypothesis, we will not attempt to extend farther the investigation of a subject concerning which so little can be advanced with certainty.

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§ 4. *Of the Fœtus in Utero.*

Opportunities of dissecting the human gravid uterus occurring but seldom, the state of the embryo (s) immediately after conception cannot be perfectly known. 113

When the ovum descends into the uterus, it is supposed to be very minute; and it is not till a considerable time after conception that the rudiments of the embryo begin to be ascertained.

About the third or fourth week the eye may discover the first lineaments of the fœtus; but these lineaments are as yet very imperfect, it being only about the size of a house fly. Two little vesicles appear in an almost transparent jelly; the largest of which is destined to become the head of the fœtus, and the other smaller one is reserved for the trunk. But at this period no extremities are to be seen; the umbilical cord appears only as a very minute thread, and the placenta does not as yet absorb the red particles of the blood. At six weeks, not only the head, but the features of the face, begin to be developed. The nose appears like a small prominent line, and we are able to discover another line under it, which is destined for the separation of the lips. Two black points appear in the place of eyes, and two minute holes mark the ears. At the sides of the trunk, both above and below, we see four minute protuberances, which are the rudiments of the arms and legs. At the end of eight weeks the body of the fœtus is upwards of an inch in length, and both the hands and feet are to be distinguished. The upper extremities are found to increase faster than the lower ones, and the separation of the fingers is accomplished sooner than that of the toes.

At this period the human form may be decisively ascertained: all the parts of the face may be distinguished, the shape of the body is clearly marked out, the haunches and the abdomen are elevated, the fingers and toes are separated from each other, and the intestines appear like minute threads.

At the end of the third month, the fœtus measures about three inches; at the end of the fourth month, five inches; in the fifth month, six or seven inches; in the sixth month, eight or nine inches; in the seventh month, eleven or twelve inches; in the eighth month, fourteen or fifteen inches; and at the end of the ninth month, or full time, from eighteen to twenty-two inches. But as we have not an opportunity of examining the same fœtus at different periods of pregnancy, and as their size and length may be influenced by the constitution and mode of life of the mother, calculations of this kind must be very uncertain.

The fœtus during all this time assumes an oval figure,

(s) The rudiments of the child are usually distinguished by this name till the human figure can be distinctly ascertained, and then it has the appellation of *fœtus*.

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gure, which corresponds with the shape of the uterus. Its chin is found reclining on its breast, with its knees, drawn up towards its chin, and its arms folded over them. But it seems likely, that the posture of some of these parts is varied in the latter months of pregnancy, so as to cause those painful twitches which its mother usually feels from time to time. In natural cases, its head is probably placed towards the os tincæ from the time of conception to that of its birth; though formerly it was considered as being placed towards the fundus uteri till about the eighth or ninth month, when the head, by becoming specifically heavier than the other parts of the body, was supposed to be turned downwards.

The capacity of the uterus increases in proportion to the growth of the fœtus, but without becoming thinner in its substance, as might naturally be expected. The nourishment of the fœtus, during all this time, seems to be derived from the placenta, which appears to be originally formed by that part of the ovum which is next the fundus uteri. The remaining part of the ovum is covered by a membrane called *spongy chorion* (T); within which is another called *true chorion*, which includes a third termed *amnios* (U): this contains a watery fluid, which is the *liquor amnii* (V), in which the fœtus floats till the time of its birth. On the side next the fœtus, the placenta is covered by the amnios and true chorion; on the side next the mother it has a production continued from the spongy chorion. The amnios and chorion are remarkably thin and transparent, having no blood vessels entering into their composition. The spongy chorion is opaque and vascular.

In the first months of pregnancy, the involucra bear a large proportion to their contents; but this proportion is afterwards reversed, as the fœtus increases in bulk.

The placenta, which is the medium through which the blood is conveyed from the mother to the fœtus, and the manner in which this conveyance takes place, deserve next to be considered.

The placenta is a broad, fat, and spongy substance, like a cake, closely adhering to the inner surface of the womb, usually near the fundus, and appearing to be chiefly made up of the ramifications of the umbilical arteries and vein, and partly of the extremities of the uterine vessels. The arteries of the uterus discharge their contents into the substance of this cake; and the veins of the placenta, receiving the blood either by a direct communication of vessels, or by absorption, at length form the umbilical vein, which passes on to the sinus of the vena portæ, and from thence to the vena cava, by means of the canalis venosus, a communication that is closed in the adult. But the circulation of the blood through the heart is not conducted in the fœtus as in the adult; in the latter, the blood is carried from the right auricle of the heart through the pulmonary artery, and is returned to the left auricle by the pulmonary vein; but a dilatation of the lungs is essential to the passage of the blood through the pulmonary vessels, and this dilatation cannot take place till after the child is born and has respired. This deficiency, however, is supplied in the fœtus by an immediate communication between the right and left auricle, through an oval opening, in the septum which divides the two auricles, called *foramen ovale*. The blood is likewise transmitted from the pulmonary artery to the aorta, by means of a duct called *canalis arteriosus*, which, like the canalis venosus, and foramen ovale, gradually closes after birth.

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The blood is returned again from the fœtus through two arteries, called the *umbilical arteries*, which arise from the iliacs. Those two vessels taking a winding course with the vein, form with that, and the membranes by which they are surrounded, what is called the *umbilical chord*. These arteries, after ramifying through the substance of the placenta, discharge their blood into the veins of the uterus; in the same manner as the uterine arteries discharged their blood into the branches of the umbilical vein. So that the blood is constantly passing in at one side of the placenta and out at the other; but in what particular manner it gets through the placenta is a point not yet determined.

EXPLANATION

(T) Dr Hunter has described this as a lamella from the inner surface of the uterus. In the latter months of pregnancy it becomes gradually thinner and more connected with the chorion: he has named it *membrana caduca*, or *decidua*, as it is cast off with the placenta. Signior Scarpa, with more probability, considers it as being composed of an inspissated coagulable lymph.

(U) In some quadrupeds, the urine appears to be conveyed from the bladder through a canal called *urachus* to the *allantois*, which is a reservoir, resembling a long and blind gut, situated between the chorion and amnios. The human fœtus seems to have no such reservoir, though some writers have supposed that it does exist. From the top of the bladder a few longitudinal fibres are extended to the umbilical chord; and these fibres have been considered as the urachus, though without having been ever found pervious.

(V) The liquor amnii coagulates like the lymph. It has been supposed to pass into the œsophagus, and to afford nourishment to the fœtus; but this does not seem probable. Children have come into the world without an œsophagus, or any communication between the stomach and the mouth; but there has been no well attested instance of a child's having been born without a placenta; and it does not seem likely, that any of the fluid can be absorbed through the pores of the skin, the skin in the fœtus being everywhere covered with a great quantity of mucus.

EXPLANATION of PLATES XXVII. XXVIII. and XXIX.

Plate XXVII.

Fig. 1. Shows the Contents of the Thorax and Abdomen in situ.

1, Top of the trachea or windpipe. 2 2, The internal jugular veins. 3 3, The subclavian veins. 4, The vena cava descendens. 5, The right auricle of the heart. 6, The right ventricle. 7, Part of the left ventricle. 8, The aorta descendens. 9, The pulmonary artery. 10, The right lung, part of which is cut off to show the great blood-vessels. 11, The left lung entire. 12 12, The anterior edge of the diaphragm. 13 13, The two great lobes of the liver. 14, The ligamentum rotundum. 15, The gall-bladder. 16, The stomach. 17 17, The jejunum and ilium. 18, The spleen.

Fig. 2. Shows the Organs subservient to the Chylopoietic Viscera,—with those of Urine and Generation.

1 1, The under side of the two great lobes of the liver. a, Lobulus Spigellii. 2, The ligamentum rotundum. 3, The gall-bladder. 4, The pancreas. 5, The spleen. 6 6, The kidneys. 7, The aorta descendens. 8, Vena cava ascendens. 9 9, The renal veins covering the arteries. 10, A probe under the spermatic vessels and a bit of the inferior mesenteric artery, and over the ureters. 11 11, The ureters. 12 12, The iliac arteries and veins. 13, The rectum intestinum. 14, The bladder of urine.

Fig. 3. Shows the Chylopoietic Viscera, and Organs subservient to them, taken out of the Body entire.

AA, The under side of the two great lobes of the liver. B, Ligamentum rotundum. C, The gall-bladder. D, Ductus cysticus. E, Ductus hepaticus. F, Ductus communis choledochus. G, Vena portarum. H, Arteria hepatica. II, The stomach. KK, Venæ et arteriæ gastro-epiploicæ, dextræ et sinistræ. LL, Venæ et arteriæ coronariæ ventriculi. M, The spleen. NN, Mesocolon, with its vessels. OOO, Intestinum colon. P, One of the ligaments of the colon, which is a bundle of longitudinal muscular fibres. QQQQ, Jejunum and ilium. RR, Sigmoid flexure of the colon with the ligament continued, and over S, the rectum intestinum. TT, Levatores ani. U, Sphincter ani. V, The place to which the prostate gland is connected. W, The anus.

Fig. 4. Shows the heart of a Fœtus at the full time, with the Right Auricle cut open to show the Foramen Ovale, or passage between both Auricles.

a, The right ventricle. b, The left ventricle. cc, The outer side of the right auricle stretched out. dd, The posterior side, which forms the anterior side of the septum. e, The foramen ovale, with the membrane or valve which covers the left side. f, Vena cava inferior passing through g, a portion of the diaphragm.

Fig. 5. Shows the Heart and Large Vessels of a Fœtus at the full time.

a, The left ventricle. b, The right ventricle. c, A part of the right auricle. d, Left auricle. ee, The right branch of the pulmonary artery. f, Arteria pulmonalis. gg, The left branch of the pulmonary artery, with a number of its largest branches dissected from the lungs. h, The canalis arteriosus. i, The arch of the aorta. kk, The aorta descendens. l, The left subclavian artery. m, The left carotid artery. n, The right carotid artery. o, The right subclavian artery. p, The origin of the right carotid and right subclavian arteries in one common trunk. q, The vena cava superior or descendens. r, The right common subclavian vein. s, The left common subclavian vein.

N. B.—All the parts described in this figure are to be found in the adult, except the canalis arteriosus.

Plate XXVIII.

Fig. 1. Exhibits the more superficial Lymphatic Vessels of the Lower Extremity.

A, The spine of the os ilium. B, The os pubis. C, The iliac artery. D, The knee. EEF, Branches of the crural artery. G, The musculus gastrocnemius. H, The tibia. I, The tendon of the musculus tibialis anticus. On the outlines, a, A lymphatic vessel belonging to the top of the foot. B, Its first division into branches. c, c, c, Other divisions of the same lymphatic vessel. d, A small lymphatic gland. e, The lymphatic vessels which lie between the skin and the muscles of the thigh. ff, Two lymphatic glands at the upper part of the thigh below the groin. gg, Other glands. h, A lymphatic vessel which passes by the side of those glands without communicating with them; and, bending towards the inside of the groin at (i), opens into the lymphatic gland (k). l l, Lymphatic glands in the groin, which are common to the lymphatic vessels of the genitals and those of the lower extremity. m, n, A plexus of lymphatic vessels passing on the inside of the iliac artery.

Fig. 2. Exhibits a Back View of the Lower Extremity, dissected so as to show the deeper-seated Lymphatic Vessels which accompany the Arteries.

A, The os pubis. B, The tuberosity of the ischium. C, That part of the os ilium which was articulated with the os sacrum. D, The extremity of the iliac artery appearing above the groin. E, The knee. F, F, The two cut surfaces of the triceps muscle, which was divided to show the lymphatic vessels that pass through its perforation along with the crural artery. G, The edge of the musculus gracilis. H, The gastrocnemius and soleus, much shrunk by being dried, and by the soleus being separated from the tibia to expose the vessels. I, The heel. K, The sole of the foot. L, The superficial lymphatic vessels passing over the knee, to get to the thigh. On the outlines;

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outlines; M, The posterior tibial artery. a, A lymphatic vessel accompanying the posterior tibial artery. b, The same vessel crossing the artery. c, A small lymphatic gland, through which this deep-seated lymphatic vessel passes. d, The lymphatic vessel passing under a small part of the soleus, which is left attached to the bone, the rest being removed. e, The lymphatic vessel crossing the popliteal artery. f, g, h, Lymphatic glands in the ham, through which the lymphatic vessel passes. i, The lymphatic vessel passing with the crural artery, through the perforation of the triceps muscle. k, The lymphatic vessel, after it has passed the perforation of the triceps, dividing into branches which embrace the artery (l). m, A lymphatic gland belonging to the deep-seated lymphatic vessel. At this place those vessels pass to the fore part of the groin, where they communicate with the superficial lymphatic vessels. n, A part of the superficial lymphatic vessel appearing on the brim of the pelvis.

FIG. 3. Exhibits the Trunk of the Human subject, prepared to show the Lymphatic Vessels and the Ductus Thoracicus.

A, The neck. BB, The two jugular veins. C, The vena cava superior. DDDD, The subclavian veins. E, The beginning of the aorta, pulled to the left side by means of a ligature, in order to show the thoracic duct behind it. F, The branches arising from the curvature of the aorta. GG, The two carotid arteries. HH, The first ribs. II, The trachea. KK, The spine. LL, The vena azygos. MM, The descending aorta. N, The cœliac artery, dividing into three branches. O, The superior mesenteric artery. P, The right crus diaphragmatis. QQ, The two kidneys. R, The right emulgent artery. SS, The external iliac arteries. gd, The musculi psoæ. T, The internal iliac artery. U, The cavity of the pelvis. XX, The spine of the os ilium. YY, The groins. *a*, A lymphatic gland in the groin, into which lymphatic vessels from the lower extremity are seen to enter. *bb*, The lymphatic vessels of the lower extremities passing under Poupart's ligament. *cc*, A plexus of the lymphatic vessels lying on each side of the pelvis. *d*, The psoas muscle with lymphatic vessels lying upon its inside. *e*, A plexus of lymphatics, which having passed over the brim of the pelvis at (*c*), having entered the cavity of the pelvis, and received the lymphatic vessels belonging to the viscera contained in that cavity, next ascends, and passes behind the iliac artery to (*g*). *f*, Some lymphatic vessels of the left side passing over the upper side of the os sacrum, to meet those of the right side. *g*, The right psoas, with a large plexus of lymphatics lying on its inside. *hh*, The plexus lying on each side of the spine. *iii*, Spaces occupied by the lymphatic glands. *k*, The trunk of the lacteals, lying on the under side of the superior mesenteric artery. *l*, The same dividing into two branches, one of which passes on each side of the aorta; that of the right side being seen to enter the thoracic duct at (*m*). *m*, The thoracic duct beginning from the large lymphatics. *n*, The duct passing under the lower part of the crus diaphragmatis, and under the right emulgent artery. *o*, The thoracic duct penetrating the thorax. *p*, Some lymphatic vessels joining that duct in the thorax. *q*, The thoracic duct passing under the curvature of the aorta to get to the left subclavian vein; the aorta being drawn aside to show the duct. *r*, A plexus of lymphatic vessels passing upon the trachea from the thyroid gland to the thoracic duct.

PLATE XXIX.

FIG. 1. Represents the Under and Posterior Side of the Bladder of Urine, &c.

a, The bladder. bb, The insertion of the ureters. cc, The vasa deferentia, which convey the semen from the testicles to dd, The vesiculæ seminales—and pass through e, The prostate gland, to discharge themselves into f, The beginning of the urethra.

FIG. 2. A transverse Section of the Penis.

gg, Corpora cavernosa penis. h, Corpus cavernosum urethræ. i, Urethra. k, Septum penis. ll, The septum between the corpus cavernosum urethræ and that of the penis.

FIG. 3. A longitudinal Section of the Penis.

mm, The corpora cavernosa penis divided by n, The septum penis. n, The corpus cavernosum glandis, which is the continuation of that of the urethra.

FIG. 4. Represents the Female Organs of Generation.

a, That side of the uterus which is next the os sacrum. 1, Its fundus. 2, Its cervix. bb, The Fallopian or uterine tubes, which open into the cavity of the uterus;—but the other end is open within the pelvis, and surrounded by cc, The fimbriæ. dd, The ovaria. e, The os internum uteri, or mouth of the womb. ff, The ligamenta rotunda, which passes without the belly, and is fixed to the labia pudendi. gg, The cut edges of the ligamenta lata, which connects the uterus to the pelvis. h, The inside of the vagina. i, The orifice of the urethra. k, The clitoris surrounded by (l), The præputium. mm, The labia pudendi. nn, The nymphæ.

FIG. 5. Shows the Spermatic ducts of the Testicle filled with Mercury.

A, The vas deferens. B, Its beginning, which forms the posterior part of the epididymis. C, The middle of the epididymis, composed of serpentine ducts. D, The head, or anterior part of the epididymis unravelled. eeee, The whole ducts which compose the head of the epididymis unravelled. ff, The vasa deferentia. gg, Rete testis. hh, Some rectilineal ducts which send off the vasa deferentia. ii, The substance of the testicle.

FIG. 6. The Right Testicle entire, and the Epididymis filled with Mercury.

A, The beginning of the vas deferens. B, The vas deferens ascending towards the abdomen. C, The posterior part of the epididymis, named *globus minor*. D, The spermatic vessels inclosed in cellular substance. E, The body of the epididymis. F, Its head, named *globus major*. G, Its beginning from the testicle. H, The body of the testicle enclosed in the tunica albuginea.

CHAP.

CHAP. IV. OF THE THORAX.

114 Of the chest.

THE thorax, or chest, is that cavity of the trunk which extends from the clavicles, or the lower part of the neck, to the diaphragm; and includes the vital organs, which are the heart and lungs, and likewise the trachea and œsophagus.—This cavity is formed by the ribs and vertebræ of the back covered by a great number of muscles, and by the common integuments, and anteriorly by two glandular bodies called the *breasts*. The spaces between the ribs are filled up by muscular fibres, which from their situation are called *intercostal muscles*.

SECT. I. *Of the Breasts.*

115 THE *breasts* may be defined to be two large conglomerate glands, mixed with a good deal of adipose membrane. The glandular part is composed of an infinite number of minute arteries, veins, and nerves.

The arteries are derived from two different trunks; one of which is called the *internal*, and the other the *external, mammary artery*. The first of these arises from the subclavian, and the latter from the axillary.

The veins everywhere accompany the arteries, and are distinguished by the same name. The nerves are chiefly from the vertebral pairs. Like all other conglomerate glands, the breasts are made of a great many small distinct glands, in which the milk is secreted from the ultimate branches of arteries. The excretory ducts of these several glands, gradually uniting as they approach the nipple, form the tubuli lactiferi, which are usually more than a dozen in number, and open at its apex, but have little or no communication, as has been supposed, at the root of the nipple. These ducts, in their course from the glands, are surrounded by a ligamentary elastic substance, which terminates with them in the nipple. Both this substance, and the ducts which it contains, are capable of considerable extension and contraction; but in their natural state are moderately corrugated, so as to prevent an involuntary flow of milk, unless the distending force be very great from the accumulation of too great a quantity.

The whole substance of the nipple is very spongy and elastic; its external surface is uneven, and full of small tubercles. The nipple is surrounded with a disk or circle of a different colour, called the *areola;* and on the inside of the skin, under the areola, are many sebaceous glands, which pour out a mucus to defend the areola and nipple; for the skin upon these parts is very thin; and the nervous papillæ lying very bare, are much exposed to irritation.

The breasts are formed for the secretion of milk, which is destined for the nourishment of the child for some time after its birth. This secretion begins to take place soon after delivery, and continues to flow for many months in very large quantities, if the woman suckles her child.

The operation of suction depends on the principles of the air-pump, and the flow of milk through the lactiferous tubes is facilitated by their being stretched out.

The milk, examined chemically, appears to be composed of oil, mucilage, and water, and of a considerable quantity of sugar. The generality of physiologists have supposed that, like the chyle, it frequently retains the properties of the aliment and medicines taken into the stomach; but it has been proved by experiment *, that this supposition is ill founded. * *Jour. Med.* 17

SECT. II. *Of the Pleura.*

THE cavity of the thorax is everywhere lined by a membrane of a firm texture called *pleura*. It is composed of two distinct portions or bags, which, by being applied to each other laterally, form a septum called *mediastinum;* which divides the cavity into two parts, and is attached posteriorly to the vertebræ of the back, and anteriorly to the sternum. But the two laminæ of which this septum is formed, do not everywhere adhere to each other; for at the lower part of the thorax they are separated to afford a lodgment to the heart; and at the upper part of the cavity, they receive between them the thymus. 116

The pleura is plentifully supplied with arteries and veins from the internal mammary and the intercostals. Its nerves, which are very inconsiderable, are derived chiefly from the dorsal and intercostal nerves.

The surface of the pleura, like that of the peritonæum and other membranes lining cavities, is constantly bedewed with a serous moisture (w), which prevents adhesions of the viscera.

The mediastinum, by dividing the breast into two cavities, obviates many inconveniences, to which we should otherwise be liable. It prevents the two lobes of the lungs from compressing each other when we lie on one side; and consequently contributes to the freedom of respiration, which is disturbed by the least pressure on the lungs. If the point of a sword penetrates between the ribs into the cavity of the thorax, the lungs on that side cease to perform their office; because the air being admitted through the wound, prevents the dilatation of that lobe; while the other lobe, which is separated from it by the mediastinum, remains unhurt, and continues to perform its function as usual.

SECT. III. *Of the Thymus.*

THE *thymus* is a glandular substance, the use of which is not perfectly ascertained, its excretory duct not 117

(w) When this fluid is exhaled in too great a quantity, or is not properly carried off, it accumulates and constitutes the hydrops pectoris.

not having yet been discovered. It is of an oblong figure, and is larger in the fœtus and in young children than in adults, being sometimes nearly effaced in very old subjects. It is placed in the upper part of the thorax, between the two laminæ of the mediastinum; but at first is not altogether contained within the cavity of the chest, being found to border upon the upper extremity of the sternum.

Sect. IV. *Of the Diaphragm.*

118

The cavity of the thorax is separated from that of the abdomen by a fleshy and membranous septum called the *diaphragm* or *midriff*. The greatest part of it is composed of muscular fibres; and on this account systematic writers usually place it very properly among the muscles. Its middle part is tendinous, and it is covered by the pleura above, and by the peritonæum below. It seems to have been improperly named *septum transversum*, as it does not make a plane transverse division of the two cavities, but forms a kind of vault, the fore part of which is attached to the sternum. Laterally it is fixed to the last of the true ribs, and to all the false ribs: and its lower and posterior part is attached to the vertebræ lumborum, where it may be said to be divided into two portions or crura (x).

The principal arteries of the diaphragm are derived from the aorta, and its veins pass into the vena cava. Its nerves are chiefly derived from the cervical pairs. It affords a passage to the vena cava through its tendinous part, and to the œsophagus through its fleshy portion. The aorta passes down behind it between its crura.

The diaphragm not only serves to divide the thorax from the abdomen, but by its muscular structure is rendered one of the chief agents in respiration. When its fibres contract, its convex side, which is turned towards the thorax, becomes gradually flat, and by increasing the cavity of the breast, affords room for a complete dilatation of the lungs, by means of the air which is then drawn into them by the act of inspiration. The fibres of the diaphragm then relax; and as it resumes its former state, the cavity of the thorax becomes gradually diminished, and the air is driven out again from the lungs by a motion contrary to the former one, called *expiration*.

It is, in some measure, by means of the diaphragm, that we void the fæces at the anus, and empty the urinary bladder. Besides these offices, the acts of coughing, sneezing, speaking, laughing, gaping, and sighing, could not take place without its assistance; and the gentle pressure which all the abdominal viscera receive from its constant and regular motion, cannot fail to assist in the performance of the several functions which were ascribed to those viscera.

Sect. V. *Of the Trachea.*

119

The trachea, or wind-pipe, is a cartilaginous and membranous canal, through which the air passes into the lungs. Its upper part, which is called the *larynx*, is composed of five cartilages. The uppermost of these cartilages is placed over the glottis or mouth of the larynx, and is called *epiglottis*, which has been before spoken of, as closing the passage to the lungs in the act of swallowing. At the side of the glottis are placed the two arytenoid cartilages, which are of a very complex figure, not easily to be described. The anterior and larger part of the larynx is made up of two cartilages; one of which is called *thyroides* or *scutiformis*, from its being shaped like a buckler; and the other *cricoides* or *annularis*, from its resembling a ring. Both these cartilages may be felt immediately under the skin; at the fore part of the throat, and the thyroides, by its convexity, forms an eminence called *pomum adami*, which is usually more considerable in the male than in the female subject.

All these cartilages are united to each other by means of very elastic ligamentous fibres; and are enabled, by the assistance of their several muscles, to dilate or contract the passage of the larynx, and to perform that variety of motion which seems to point out the larynx as the principal organ of the voice; for when the air passes out through a wound in the trachea, it produces no sound.

These cartilages are moistened by a mucus, which seems to be separated by minute glands situated near them. The upper part of the trachea is covered anteriorly and laterally by a considerable body, which is supposed to be of a glandular structure, and from its situation near the thyroid cartilage is called the *thyroid gland*; though its excretory duct has not yet been discovered, or its real use ascertained.

The glottis is interiorly covered by a very fine membrane, which is moistened by a constant supply of a watery fluid. From the larynx, the canal begins to take the name of *trachea* or *asperia arteria*, and extends from thence as far down as the third or fourth vertebra of the back, where it divides into two branches, which are the right and left bronchial tube. Each of these bronchi (y) ramifies through the substance of that lobe of the lungs, to which it is distributed by an infinite number of branches, which are formed of cartilages, separated from each other like those of the trachea, by an intervening membranous and ligamentary substance. Each of these cartilages is of an angular figure; and as they become gradually less and less in

(x) Anatomical writers have usually described the diaphragm as being made up of two muscles united by a middle tendon; and these two portions or crura form what they speak of as the *inferior muscle*, arising from the sides and fore part of the vertebræ.

(y) The right bronchial tube is usually found to be somewhat shorter and thicker than the left; and M. Portal, who has published a memoir on the action of the lungs on the aorta in respiration, observes, that the left bronchial tube is closely contracted by the aorta; and from some experiments he is induced to conclude, that in the first respirations, the air only enters into the right lobe of the lungs. *Memoires de l'Academie Royale des Sciences*, 1769.

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in their diameter, the lower ones are in some measure received into those above them, when the lungs, after being inflated, gradually collapse by the air being pushed out from them in expiration. As the branches of the bronchi become more minute, their cartilages become more and more angular and membranous, till at length they are found to be perfectly membranous, and at last become invisible.

The trachea is furnished with fleshy or muscular fibres; some of which pass through its whole extent longitudinally, while the others are carried round it in a circular direction; so that by the contraction or relaxation of these fibres, it is enabled to shorten or lengthen itself, and likewise to dilate or contract the diameter of its passage.

The trachea and its branches, in all their ramifications, are furnished with a great number of small glands which are lodged in their cellular substance, and discharge a mucous fluid on the inner surface of these tubes.

The cartilages of the trachea, by keeping it constantly open, afford a free passage to the air, which we are obliged to be incessantly respiring; and its membranous part, by being capable of contraction and dilatation, enables us to receive and expel the air in a greater or less quantity, and with more or less velocity, as may be required in singing or in declamation. This membranous structure of the trachea posteriorly seems likewise to assist in the descent of the food, by preventing that impediment to its passage down the œsophagus, which might be expected if the cartilages were complete rings.

The trachea receives its arteries from the carotid and subclavian arteries, and its veins pass into the jugulars. Its nerves arise from the recurrent branch of the eighth pair, and from the cervical plexus.

Sect. VI. *Of the Lungs.*

220 The lungs fill the greater part of the cavity of the breast. They are of a soft and spongy texture, and are divided into two lobes, which are separated from each other by the mediastinum, and are externally covered by a production of the pleura. Each of these is divided into two or three lesser lobes; and we commonly find three in the right side of the cavity, and two in the left.

To discover the structure of the lungs, it is required to follow the ramifications of the bronchi, which were described in the last section. These becoming gradually more and more minute, at length terminate in the cellular spaces or vesicles, which make up the greatest part of the substance of the lungs, and readily communicate with each other.

The lungs seem to possess but little sensibility. Their nerves, which are small, and few in number, are derived from the intercostal and eighth pair. This last pair having reached the thorax, sends off a branch on each side of the trachea, called the *recurrent*, which reascends at the back of the trachea, to which it furnishes branches in its ascent, as well as to the œsophagus, but it is chiefly distributed to the larynx and its muscles. By dividing the recurrent and superior laryngeal nerves at their origin, an animal is deprived of its voice.

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There are two series of arteries which carry blood to the lungs: these are the arteriæ bronchiales, and the pulmonary artery.

The arteriæ bronchiales begin usually by two branches; one of which commonly arises from the right intercostal, and the other from the trunk of the aorta: but sometimes there are three of these arteries, and in some subjects only one. The use of these arteries is to serve for the nourishment of the lungs; and their ramifications are seen creeping everywhere on the branches of the bronchi. The blood is brought back from them by the bronchial veins into the vena azygos.

The pulmonary artery and vein are not intended for the nourishment of the lungs; but the blood in its passage through them is destined to undergo some changes, or to acquire certain essential properties (from the action of the air), which it has lost in its circulation through the other parts of the body. The pulmonary artery receives the blood from the right ventricle of the heart; and dividing into two branches, accompanies the bronchi everywhere, by its ramifications through the lungs; and the blood is afterwards conveyed back by the pulmonary vein, which gradually forming a considerable trunk, goes to empty itself into the left ventricle of the heart; so that the quantity of blood which enters into the lungs, is perhaps greater than that which is sent in the same proportion of time through all the other parts of the body.

Sect. VII. *Of Respiration.*

Respiration constitutes one of those functions which 121
are properly termed *vital*, as being essential to life; for to live and to breathe are in fact synonymous terms. It consists in an alternate contraction and dilatation of the thorax, by first inspiring air into the lungs, and then expelling it from them in expiration.

It will perhaps be easy to distinguish and point out the several phenomena of respiration; but to explain their physical cause will be attended with difficulty: for it will naturally be inquired, how the lungs, when emptied of the air, and contracted by expiration, become again inflated, they themselves being perfectly passive? How the ribs are elevated in opposition to their own natural situation? and why the diaphragm is contracted downwards towards the abdomen? Were we to assert that the air, by forcing its way into the cavity of the lungs, dilated them, and consequently elevated the ribs and pressed down the diaphragm, we should speak erroneously. What induces the first inspiration, it is not easy to ascertain; but after an animal has once respired, it would seem likely that the blood, after expiration, finding its passage through the lungs obstructed, becomes a stimulus, which induces the intercostal muscles and the diaphragm to contract, and enlarge the cavity of the thorax, in consequence perhaps of a certain nervous influence, which we will not here attempt to explain. The air then rushes into the lungs; every branch of the bronchial tubes, and all the cellular spaces into which they open, become fully dilated; and the pulmonary vessels being equally distended, the blood flows through them with ease. But as the stimulus which first occasioned this dilatation ceases to operate, the muscles gradually contract; the diaphragm rises upwards again, and diminishes the cavity of the chest; the

ribs

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ribs return to their former state; and as the air passes out in expiration, the lungs gradually collapse, and a resistance of the passage to the blood again takes place. But the heart continuing to receive and expel the blood, the pulmonary artery begins again to be distended, the stimulus is renewed, and the same process is repeated, and continues to be repeated, in a regular succession, during life: for though the muscles of respiration, having a mixed motion, are (unlike the heart) in some measure dependent on the will, yet no human being, after having once respired, can live many moments without it. In an attempt to hold one's breath, the blood soon begins to distend the veins, which are unable to empty their contents into the heart; and we are able only, during a very little time, to resist the stimulus to inspiration. In drowning, the circulation seems to be stopped upon this principle; and in hanging, the pressure made on the jugular veins, may cooperate with the stoppage of respiration in bringing on death.

Till within these few years physiologists were entirely ignorant of the use of respiration. It was at length discovered in part by the illustrious Dr Priestley. He found that the air expired by animals was phlogisticated: and that the air was fitter for respiration, or for supporting animal life, in proportion as it was freer from the phlogistic principle. It had long been observed that the blood in passing through the lungs acquired a more florid colour. He therefore suspected, that it was owing to its having imparted phlogiston to the air: and he satisfied himself of the truth of this idea by experiments, which showed, that the crassamentum of extravasated blood phlogisticated air in proportion as it lost its dark colour. He farther found, that blood thus reddened had a strong attraction for phlogiston; insomuch that it was capable of taking it from phlogisticated air, thereby becoming of a darker colour. From hence it appeared that the blood, in its circulation through the arterial system, imbibes a considerable quantity of phlogiston, which is discharged from it to the air in the lungs.

This discovery has since been prosecuted by two very ingenious physiologists, Dr Crawford and Mr Elliot. It has been shown by Professors Black and Irvine, that different bodies have different capacities for containing fire. For example, that oil and water, when equally hot to the sense and the thermometer, contain different proportions of that principle; and that unequal quantities of it are required, in order to raise those substances to like temperatures. The inquiries of Dr Crawford and Mr Elliot tend to prove, that the capacities of bodies for containing fire are diminished by the addition of phlogison, and increased by its separation: the capacity of calx of antimony, for example, being greater than that of the antimony itself. Common air contains a great quantity of fire; combustible bodies very little. In combustion, a double elective attraction takes place; the phlogiston of the body being transferred to the air, the fire contained in the air to the combustible body. But as the capacity of the latter is not increased so much as that of the former is diminished, only part of the extricated fire will be absorbed by the body. The remainder therefore will raise the temperature of the compound; and hence we may account for the heat attending combustion. As the use of respiration is to dephlogisticate the blood, it seems probable, that a like double elective attraction takes place in this process: the phlogiston of the blood being transferred to the air, and the fire contained in the air to the blood; but with this difference, that the capacities being equal, the whole of the extricated fire is absorbed by the latter. The blood in this state circulating through the body, imbibes phlogiston, and of course gives out its fire; part only of which is absorbed by the parts furnishing the phlogiston, the remainder, as in combustion, becoming sensible; and is therefore the cause of the heat of the body, or what is called animal heat.

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In confirmation of this doctrine it may be observed, that the venous blood contains less fire than the arterial; combustible bodies less than incombustible ones; and that air contains less of this principle, according as it is rendered, by combination with phlogiston, less fit for respiration (z)

In ascending very high mountains, respiration is found to become short and frequent, and sometimes to be attended with a spitting of blood. These symptoms seem to be occasioned by the air being too rare and thin to dilate the lungs sufficiently; and the blood gradually accumulating in the pulmonary vessels, sometimes bursts through their coats and is brought up by coughing. This has likewise been accounted for in a different way, by supposing that the air contained in the blood, not receiving an equal pressure from that of the atmosphere, expands, and at length ruptures the very minute branches of the pulmonary vessels; upon the same principle that fruits and animals put under the receiver of an air-pump, are seen to swell as the outer air becomes exhausted. But the late Dr Darwin published some experiments, in which he attempted to prove, that no air or elastic vapour does exist in the blood-vessels, as has been generally supposed; and he is induced to impute the spitting of blood which has sometimes taken place in ascending high mountains, to accident, or to violent exertions; as it never happens to animals that are put into the exhausted receiver of an air-pump, where the diminution of pressure is many times greater than on the summit of the highest mountains.

Sect. VIII. *Of the Voice.*

Respiration has already been described as affording us many advantages; and next to that of life, its most important use seems to be that of forming the voice and speech. The ancients, and almost all the moderns, have considered the organ of speech as a kind of musical instrument, which may be compared to a flute, to an hautboy, to an organ, &c. and they argue after the following manner: 121

The trachea, which begins at the root of the tongue, and goes to terminate in the lungs, may be compared to

(z) See Crawford's Experiments and Observations on Animal Heat, and Elliot's Philosophical Observations.

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to the pipe of an organ; the lungs dilating like bellows during the time of inspiration; and as the air is driven out from them in inspiration, it finds its passage straitened by the cartilages of the larynx, against which it strikes. As these cartilages are more or less elastic, they occasion in their turn more or less vibration in the air, and thus produce the sound of the voice; the variation in the sound and tone of which depends on the state of the glottis, which, when straitened, produces an acute tone, and a grave one when dilated.

M. Ferein communicated to the French Academy of Sciences a very ingenious theory on the formation of the voice. He considered the organ of the voice as a *string* as well as a *wind* instrument; so that what art has hitherto been unable to construct, and what both the fathers Mersenne and Kircher so much wished to see, M. Ferein imagined he had at length discovered in the human body. He observes, that there are at the edges of the glottis certain tendinous chords, placed horizontally across it, which are capable of considerable vibration, so as to produce sound, in the same manner as it is produced by the strings of a violin or a harpsichord: and he supposes that the air, as it passes out from the lungs, acts as a bow on these strings, while the efforts of the breast and lungs regulate its motion, and produce the variety of tones. So that, according to this system, the variation in the voice is not occasioned by the dilatation or contraction of the glottis, but by the distension or relaxation of these strings, the sound being more or less acute in proportion as they are more or less stretched out. Another writer on this subject supposes, that the organ of voice is a double instrument, which produces in unison two sounds of a different nature; one by means of the air, and the other by means of the chords of the glottis. Neither of these systems, however, is universally adopted. They are both liable to insuperable difficulties; so that the manner in which the voice is formed has never yet been satisfactorily ascertained: we may observe, however, that the sound produced by the glottis is not articulated. To effect this, it is required to pass through the mouth, where it is differently modified by the action of the tongue, which is either pushed against the teeth, or upwards towards the palate; detaining it in its passage, or permitting it to flow freely, by contracting or dilating the mouth.

Sect. IX. *Of Dejection.*

123 By dejection we mean the act of voiding the fæces at the anus; and an account of the manner in which this is conducted was reserved for this part of the work, because it seemed to require a knowledge of respiration to be perfectly understood.

The intestines were described as having a peristaltic motion, by which the fæces were gradually advancing towards the anus. Now, whenever the fæces are accumulated in the intestinum rectum in a sufficient quantity to become troublesome, either by their weight or acrimony, they excite a certain uneasiness which induces us to go to stool.—To effect this, we begin by making a considerable inspiration; in consequence of which the diaphragm is carried downwards towards the lower belly; the abdominal muscles are at the same time contracted in obedience to the will: and the intestines being compressed on all sides, the resistance of the *sphincter* is overcome, and the fæces pass out at the anus; which is afterwards drawn up by its longitudinal fibres, which are called *levatores ani*, and then by means of its *sphincter* is again contracted: but it sometimes happens, as in dysenteries for instance, that the fæces are very liquid, and have considerable acrimony; and then the irritation they occasion is more frequent, so as to promote their discharge without any pressure from the diaphragm or abdominal muscles; and sometimes involuntarily, as is the case when the sphincter becomes paralytic.

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Sect. X. *Of the Pericardium, and of the Heart and its Auricles.*

124 Pericardium.

The two membranous bags of the pleura, which were described as forming the mediastinum, recede one from the other, so as to afford a lodgment to a firm membranous sac, in which the heart is securely lodged; this sac, which is the *pericardium*, appears to be composed of two tunics, united to each other by cellular membrane.—The outer coat, which is thick, and in some places of a tendinous complexion, is a production of the mediastinum; the inner coat, which is extremely thin, is reflected over the auricles and ventricles of the heart, in the same manner as the tunica conjunctiva, after lining the eyelids, is reflected over the eye.

This bag adheres to the tendinous part of the diaphragm, and contains a coagulable lymph, the *liquor pericardii*, which serves to lubricate the heart and facilitate its motion; and seems to be secreted and absorbed in the same manner as it is in the other cavities of the body.

The arteries of the pericardium are derived from the phrenic, and its veins pass into veins of the same name; its nerves are likewise branches of the phrenic.

The size of the pericardium is adapted to that of the heart, being usually large enough to contain it loosely. As its cavity does not extend to the sternum, the lungs cover it in inspiration; and as it everywhere invests the heart, it effectually secures it from being injured by lymph, pus, or any other fluid, extravasated into the cavities of the thorax.

125 Heart, ar its auricl

The heart is a hollow muscle of a conical shape, situated transversely between the two laminæ of the mediastinum, at the lower part of the thorax; having its basis turned towards the right side, and its point or apex towards the left.—Its lower surface is somewhat flattened towards the diaphragm. Its basis, from which the great vessels originate, is covered with fat; and it has two hollow and fleshy appendages, called *auricles*.—Round these several openings, the heart seems to be of a firm ligamentous texture, from which all its fibres seem to originate; and as they advance from thence towards the apex, the substance of the heart seems to become thinner.

The heart includes two cavities or *ventricles*, which are separated from each other by a fleshy septum; one of these is called the *right*, and the other the *left*, *ventricle*; though perhaps, with respect to their situation, it would be more proper to distinguish them into the *anterior* and *posterior ventricles*.

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The heart is exteriorly covered by a very fine membrane; and its structure is perfectly muscular or fleshy, being composed of fibres which are described as passing in different directions; some as being extended longitudinally from the basis to the apex; others, as taking an oblique or spiral course; and a third sort as being placed in a transverse direction (A).—Within the two ventricles we observe several furrows; and there are likewise tendinous strings, which arise from fleshy *columnæ* in the two cavities, and are attached to the valves of the auricles: That the use of these and the other valves of the heart may be understood, it must be observed, that four large vessels pass out from the basis of the heart, viz. two arteries and two veins; and that each of these vessels is furnished with a thin membranous production, which is attached all round to the borders of their several orifices, from whence hanging loosely down they appear to be divided into two or three distinct portions. But as their uses in the arteries and veins are different, so are they differently disposed. Those of the arteries are intended to give way to the passage of the blood into them from the ventricles, but to oppose its return: and, on the contrary, the valves of the veins are constructed so as to allow the blood only to pass into the heart. In consequence of these different uses, we find the valves of the pulmonary artery and of the aorta attached to the orifices of those vessels, so as to have their concave surfaces turned towards the artery; and their convex surfaces, which mutually meet together, being placed towards the ventricle, only permit the blood to pass one way, which is into the arteries. There are usually three of these valves belonging to the pulmonary artery, and as many to the aorta; and from their figure they are called *valvulæ semilunares*. The communication between the two great veins and the ventricles is by means of the two appendages or auricles into which the blood is discharged; so that the other valves which may be said to belong to the veins, are placed in each ventricle, where the auricle opens into it. The valves in the right ventricle are usually three in number, and are named *valvulæ tricuspides;* but in the left ventricle we commonly observe only two, and these are the *valvulæ mitrales*. The membranes which form these valves in each cavity are attached so as to project somewhat forward; and both the *tricuspides* and the *mitrales* are connected with the tendinous strings, which were described as arising from the fleshy *columnæ*. By the contraction of either ventricle the blood is driven into the artery which communicates with that ventricle; and these tendinous strings being gradually relaxed as the sides of the cavity are brought nearer to each other, the valves naturally close the opening into the auricle, and the blood necessarily directs its course into the then only open passage, which is into the artery; but after this contraction the heart becomes relaxed, the tendinous strings are again stretched out, and, drawing the valves of the auricle downwards, the blood is poured by the veins into the ventricle, from whence, by another contraction, it is again thrown into the artery, as will be described hereafter. The right ventricle is not quite so long, though somewhat larger than the left; but the latter has more substance than the other; and this seems to be, because it is intended to transmit the blood to the most distant parts of the body, whereas the right ventricle distributes it only to the lungs.

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The heart receives its nerves from the par vagum and the intercostals. The arteries which serve for its nourishment are two in number, and arise from the aorta. They surround in some measure the basis of the heart, and from this course are called the *coronary arteries*. From these arteries the blood is returned by veins of the same name into the auricles, and even into the ventricles.

The muscular bags called the *auricles* are situated at the basis of the heart, at the sides of each other; and, corresponding with the two ventricles, are like those two cavities distinguished into *right* and *left*. These sacs, which are anteriorly unequal, have externally a jagged appendix; which, from its having been compared to the extremity of an ear, has given them their name of *auricles*.

Sect. XI. *Angiology, or a Description of the Blood Vessels.*

The heart has been described as contracting itself, and throwing the blood from its two ventricles into the pulmonary artery and the aorta, and then as relaxing itself and receiving a fresh supply from two large veins, which are the pulmonary vein and the vena cava. We will now point out the principal distributions of these vessels. 126

The *pulmonary artery* arises from the right ventricle by a large trunk, which soon divides into two considerable branches, which pass to the right and left lobes of the lungs: each of these branches is afterwards divided and subdivided into an infinite number of branches and ramifications, which extend through the whole substance of the lungs; and from these branches the blood is returned by the veins, which, contrary to the course of the arteries, begin by very minute canals, and gradually become larger, forming at length four large trunks called *pulmonary veins*, which terminate in the *left auricle* by one common opening, from whence the blood passes into the *left ventricle*. From this same ventricle arises the *aorta* or *great artery*, which at its beginning is nearly an inch in diameter: it soon sends off two branches, the *coronaries*, which go to be distributed to the heart and its auricles. After this, at or about the third or fourth vertebra of the back, it makes a considerable curvature; from this curvature (B) arise three arteries; one of

(A) Authors differ about the course and distinctions of these fibres; and it seems right to observe, that the structure of the heart being more compact than that of other muscles, its fibres are not easily separated.

(B) Anatomists usually call the upper part of this curvature *aorta ascendens;* and the other part of the artery to its division at the iliacs, *aorta descendens;* but they differ about the place where this distinction is to be introduced; and it seems sufficiently to answer every purpose, to speak only of the aorta and its curvature.

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of which soon divides into two branches. The first two are the left subclavian and the left carotid, and the third is a common trunk to the right subclavian and right carotid; though sometimes both the carotids arise distinctly from the aorta.

The two *carotids* ascend with the subclavians, along the sides of the trachea; and when they have reached the larynx, divide into two principal branches, the *internal* and *external carotid*. The first of these runs a little way backwards in a bending direction; and having reached the under part of the ear, passes through the canal in the os petrosum, and entering into the cavity of the cranium, is distributed to the brain and the membranes which envelope it, and likewise to the eye. The *external carotid* divides into several branches, which are distributed to the larynx, pharynx, and other parts of the neck; and to the jaws, lips, tongue, eyes, temples, and all the external parts of the head.

Each *subclavian* is likewise divided into a great number of branches. It sends off the *vertebral artery*, which passes through the openings we see at the bottom of the transverse processes of the vertebræ of the neck, and in its course sends off many ramifications to the neighbouring parts. Some of its branches are distributed to the spinal marrow, and after a considerable inflection it enters into the cranium, and is distributed to the brain. The subclavian likewise sends off branches to the muscles of the neck and scapula; and the mediastinum, thymus, pericardium, diaphragm, the breast and the muscles of the thorax, and even of the abdomen, derive branches from the subclavian, which are distinguished by different names, alluding to the parts to which they are distributed; as the *mammary*, the *phrenic*, the *intercostal*, &c. But notwithstanding the great number of branches which have been described as arising from the subclavian, it is still a considerable artery when it reaches the *axilla*, where it drops its former name, which alludes to its passage under the clavicle, and is called the *axillary* artery; from which a variety of branches are distributed to the muscles of the breast, scapula, and arm.—But its main trunk taking the name of *brachialis*, runs along on the inside of the arm near the os humeri, till it reaches the joint of the fore arm, and then it divides into two branches. This division, however, is different in different subjects; for in some it takes place higher up, and in others lower down. When it happens to divide above the joint, it may be considered as a happy disposition in case of an accident by bleeding; for supposing the artery to be unfortunately punctured by the lancet, and that the hæmorrhage could only be stopped by making a ligature on the vessel, one branch would remain unhurt, through which the blood would pass uninterrupted to the fore arm and hand. One of the two branches of the brachialis plunges down under the flexor muscles, and runs along the edge of the ulna; while the other is carried along the outer surface of the radius, and is easily felt at the wrist, where it is only covered by the common integuments. Both these branches commonly unite in the palm of the hand, and form an arterial arch, from whence branches are detached to the fingers.

The *aorta*, after having given off at its curvature the carotids and subclavians which convey blood to all the upper parts of the body, descends upon the bodies of the vertebræ a little to the left, as far as the os sacrum, where it drops the name of *aorta*, and divides into two considerable branches. In this course, from its curvature to its bifurcation, it sends off several arteries in the following order: 1. One or two little arteries, first demonstrated by Ruysch as going to the bronchi, and called *arteriæ bronchiales Ruyschii*. 2. The arteriæ œsophageæ. These are commonly three or four in number. They arise from the fore part of the aorta, and are distributed chiefly to the œsophagus. 3. The inferior intercostal arteries, which are distributed between the ribs in the same manner as the arteries of the three or four superior ribs are, which are derived from the subclavian. These arteries send off branches to the medulla spinalis. 4. The diaphragmatic or inferior phrenic arteries, which go to the diaphragm, stomach, omentum, duodenum, pancreas, spleen, liver, and gall-bladder. 5. The cœliac, which sends off the coronary stomachic, the splenic, and the hepatic artery. 6. The superior mesenteric artery, which is distributed to the mesentery and small intestines. 7. The emulgents, which go to the kidneys. 8. The arteries which are distributed to the glandulæ renales. 9. The spermatic. 10. The inferior mesenteric artery, which ramifies through the lower portion of the mesentery and the large intestines. A branch of this artery which goes to the rectum is called the *internal hæmorrhoidal*. 11. The lumbar arteries, and a very small branch called the *sacra*, which are distributed to the muscles of the loins and abdomen, and to the os sacrum and medulla spinalis.

The trunk of the aorta, when it has reached the last vertebra lumborum, or the os sacrum, drops the name of *aorta*, and separates into two forked branches called the *iliacs*. Each of these soon divides into two branches; one of which is called the *internal iliac*, or *hypogastric artery*, and is distributed upon the contents of the pelvis and upon the muscles on its outer side. One branch, called *pudenda communis*, sends small ramifications to the end of the rectum under the name of *hæmorrhoidales externæ*, and is afterwards distributed upon the penis. The other branch, the external iliac, after having given off the circumflex artery of the os ilium and the epigastric, which is distributed to the recti muscles, passes out of the abdomen under Poupart's ligament, and takes the name of *crural artery*. It descends on the inner part of the thigh close to the os femoris, sending off branches to the muscles, and then sinking deeper in the hind part of the thigh, reaches the ham, where it takes the name of *popliteal*: after this it separates into two considerable branches; one of which is called the *anterior tibial artery*; the other divides into two branches, and these arteries all go to be distributed to the leg and foot.

The blood, which is thus distributed by the aorta to all parts of the body, is brought back by the veins, which are supposed to be continued from the ultimate branches of arteries; and uniting together as they approach the heart, at length form the large trunks, the vena cava ascendens, and vena cava descendens.

All the veins which bring back the blood from the upper extremities, and from the head and breast, pass into the vena cava descendens; and those which return it from the lower parts of the body terminate in the

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vena cava ascendens; and these two cavas uniting together, as they approach the heart, open by one common orifice into the left auricle.

It does not here seem to be necessary to follow the different divisions of the veins as we did those of the arteries; and it will be sufficient to remark, that in general every artery is accompanied by its vein, and that both are distinguished by the same name. But, like many other general rules, this too has its exceptions (c). The veins, for instance, which accompany the external and internal carotid, are not called the *carotid veins*, but the *external* and *internal jugular*.—In the thorax there is a vein distinguished by a proper name, and this is the *azygos*, or *vena sine pari*. This vein, which is a pretty considerable one, runs along by the right side of the vertebræ of the back, and is chiefly destined to receive the blood from the intercostals on that side, and from the lower half of those on the left side, and to convey it into the vena cava descendens. In the abdomen we meet with a vein, which is a still more remarkable one, and this is the *vena portæ*, which performs the office both of an artery and a vein. It is formed by a reunion of all the veins which come from the stomach, intestines, omentum, pancreas, and spleen, so as to compose one great trunk, which goes to ramify through the liver; and after having deposited the bile, its ramifications unite, and bring back into the vena cava, not only the blood which the vena portæ had carried into the liver, but likewise the blood from the hepatic artery. Every artery has a vein which corresponds with it; but the trunks and branches of the veins are more numerous than those of the arteries. The reasons for this disposition are perhaps not difficult to be explained; the blood in its course through the veins is much farther removed from the source and cause of its motion, which are in the heart, than it was when in the arteries; so that its course is consequently less rapid, and enough of it could not possibly be brought back to the heart in the moment of its dilatation, to equal the quantity which is driven into the arteries from the two ventricles at the time they contract; and the equilibrium, which is so essential to the continuance of life and health, would consequently be destroyed, if the capacity of the veins did not exceed that of the arteries, in the same proportion that the rapidity of the blood's motion through the arteries exceeds that of its return through the veins.

A large artery ramifying through the body, and continued to the minute branches of veins, which gradually unite together to form a large trunk, may be compared to two trees united to each other at their tops; or rather as having their ramifications so disposed that the two trunks terminate in one common point; and if we farther suppose, that both these trunks and their branches are hollow, and that a fluid is incessantly circulated through them, by entering into one of the trunks and returning through the other, we shall be enabled to conceive how the blood is circulated through the vessels of the human body.

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Every trunk of an artery, before it divides, is nearly cylindrical, or of equal diameter through its whole length, and so are all its branches when examined separately. But every trunk seems to contain less blood than the many branches do into which that trunk separates; and each of these branches probably contains less blood than the ramifications do into which it is subdivided: and it is the same with the veins; the volume of their several ramifications, when considered together, being found to exceed that of the great trunk which they form by their union.

The return of the blood through the veins to the heart, is promoted by the action of the muscles, and the pulsation of the arteries. And this return is likewise greatly assisted by the *valves* which are to be met with in the veins, and which constitute one of the great distinctions between them and the arteries. These valves, which are supposed to be formed by the inner coat of the veins, permit the blood to flow from the extremities towards the heart, but oppose its return. They are most frequent in the smaller veins. As the column of blood increases, they seem to become less necessary; and therefore in the vena cava ascendens, we meet with only one valve, which is near its origin.

The arteries are composed of several tunics. Some writers enumerate five of these tunics; but perhaps we may more properly reckon only three, viz. the *nervous*, *muscular*, and *cuticular* coats. The veins are by some anatomists described as having the same number of coats as the arteries; and as they do not seem to be irritable, we cannot with propriety suppose them to have a muscular tunic. We are aware of Dr Verschuir's experiments to prove that the jugular and some other veins possess a certain degree of irritability; but it is certain, that his experiments, repeated by others, have produced a different result; and even he himself allows, that sometimes he was unable to distinguish any such property in the veins. Both these series of vessels are nourished by still more minute arteries and veins, which are seen creeping over their coats and ramifying through their whole substance, and are called *vasa vasorum*; they have likewise many minute branches of nerves.

De Arteriarum et Venarum vi irritabili, 4to.

The arteries are much stronger than the veins; and they seem to require this force, to be enabled to resist the impetus with which the blood circulates through them, and to impel it on towards the veins.

When the heart contracts, it impels the blood into the arteries, and sensibly distends them; and these vessels again contract, as the heart becomes relaxed to receive more blood from the auricles; so that the cause of the contraction and dilatation of the *arteries* seems to be easy to be understood, being owing in part to their own contractile power, and in part to the action of the heart; but in the *veins*, the effects of this impulse not being so sensibly felt, and the vessels themselves having little or no contractile power, the blood seems to flow in a constant and equal stream: and this, together with its passing gradually from a small channel into a larger one, seems to be the reason why the *veins*

(c) In the extremities, some of the deep-seated veins, and all the superficial ones, take a course different from that of the arteries.

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veins have no pulsatory motion, except the large ones near the heart; and in these it seems to be occasioned by the motion of the diaphragm, and by the regurgitation of the blood in the *cavas*.

Sect. XII. *Of the Action of the Heart, Auricles, and Arteries.*

127 The heart, at the time it contracts, drives the blood from the ventricles into the arteries; and the arteries being thus filled and distended, are naturally inclined to contract the moment the heart begins to dilate, and ceases to supply them with blood. These alternate motions of contraction and dilatation of the heart and arteries, are distinguished by the name of *systole* and *diastole*. When the heart is in a state of contraction or systole, the arteries are at that instant distended with blood, and in their diastole; and it is in this state we feel their pulsatory motion, which we call the *pulse*. When the heart dilates, and the arteries contract, the blood is impelled onwards into the veins, through which it is returned back to the heart. While the heart, however, is in its systole, the blood cannot pass from the veins into the ventricles, but is detained in the auricles, which are two reservoirs formed for this use, till the diastole, or dilatation of the heart, takes place; and then the distended auricles contract, and drive the blood into the ventricles; so that the auricles have an alternate systole and diastole as well as the heart.

Although both the ventricles of the heart contract at the same time, yet the blood passes from one to the other. In the same moment, for instance, that the left ventricle drives the blood into the aorta, the right ventricle impels it into the pulmonary artery, which is distributed through all the substance of the lungs. The blood is afterwards brought back into the left ventricle by the pulmonary vein at the same time that the blood is returned by the cavas, into the right ventricle, from all the other parts of the body.

This seems to be the mode of action of the heart and its vessels: but the cause of this action has, like all other intricate and interesting subjects, been differently explained. It seems to depend on the stimulus made on the different parts of the heart by the blood itself, which, by its quantity and heat, or other properties (D), is perhaps capable of first exciting that motion, which is afterwards continued through life, independent of the will, by a regular return of blood to the auricles, in a quantity proportioned to that which is thrown into the arteries.

The heart possesses the *vis insita*, or principle of irritability, in a much greater degree than any other muscle of the body. The pulse is quicker in young than in old subjects, because the former are *cæt. par.* more irritable than the latter. Upon the same principle we may explain, why the pulse is constantly quicker in weak than in robust persons.

Sect. XIII. *Of the Circulation.*

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After what has been observed of the structure and action of the heart and its auricles, and likewise of the arteries and veins, there seem to be but very few arguments required to demonstrate the *circulation of the blood*, which has long since been established as a medical truth. This circulation may be defined to be a perpetual motion of the blood, in consequence of the action of the heart and arteries, which impel it through all the parts of the body, from whence it is brought back by the veins to the heart.

A very satisfactory proof of this circulation, and a proof easy to be understood, may be deduced from the different effects of pressure on an artery and a vein. If a ligature, for instance, is passed round an artery, the vessel swells considerably between the ligature and the heart; whereas if we tie up a vein, it only becomes filled between the extremity and the ligature, and this is what we every day observe in bleeding. The ligature we pass round the arm on these occasions, compresses the superficial veins; and the return of the blood through them being impeded, they become distended. When the ligature is too loose, the veins are not sufficiently compressed, and the blood continues its progress towards the heart; and, on the contrary, when it is made too tight, the arteries themselves become compressed; and the flow of the blood through them being impeded, the veins cannot be distended.

Another phenomenon, which effectually proves the circulation, is the loss of blood that every living animal sustains by opening only a single artery of a moderate size; for it continues to flow from the wounded vessel till the equilibrium is destroyed which is essential to life. This truth was not unknown to the ancients; and it seems strange that it did not lead them to a knowledge of the circulation, as it sufficiently proves, that all the other vessels must communicate with that which is opened. Galen who lived more than 1500 years ago, drew this conclusion from it; and if we farther observe, that he describes (after Erasistratus, who flourished about 450 years before him) the several valves of the heart, and determines their disposition and uses, it will appear wonderful, that a period of near 2000 years should afterwards elapse before the true course of the blood was ascertained. This discovery, for which we are indebted to the immortal Harvey, has thrown new lights on physiology and the doctrine of diseases, and constitutes one of the most important periods of anatomical history.

Sect XIV. *Of the Nature of the Blood.*

Blood, recently drawn from a vein into a bason, 129
would seem to be an homogeneous fluid of a red colour (E); but when suffered to rest, it soon coagulates, and divides into two parts, which are distinguished by the

(D) Dr Harvey long ago suggested, that the blood is possessed of a living principle; and the late Mr J. Hunter has endeavoured to revive this doctrine; in support of which he has adduced many ingenious arguments. The subject is a curious one, and deserves to be prosecuted as an inquiry which cannot but be interesting to physiologists.

(E) The blood, as it flows through the arteries, is observed to be more florid than it is in the veins; and this redness is acquired in its passage through the lungs. Vid. Sect. VII.

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the names of *crassamentum* and *serum*. The crassamentum is the red coagulum, and the serum is the water in which it floats. Each of these may be again separated into two others; for the crassamentum, by being repeatedly washed in warm water, gives out all its red globules, and what remains appears to be composed of the coagulable lymph (F), which is a gelatinous substance, capable of being hardened by fire till it becomes perfectly horny: and if we expose the serum to a certain degree of heat, part of it will be found to coagulate like the white of an egg, and there will remain a clear and limpid water, resembling urine both in its appearance and smell.

The serum and crassamentum differ in their proportion in different constitutions; in a strong person, the crassamentum is in a greater proportion to the serum than in a weak one *; and the same difference is found to take place in diseases (G).

Hewson's xperim. iq. Part I.

Sect. XV. *Of Nutrition.*

130 The variety of functions which we have described as being incessantly performed by the living body, and the continual circulation of the blood through it, must necessarily occasion a constant dissipation of the several parts which enter into its composition. In speaking of the insensible perspiration, we observed how much was incessantly passing off from the lungs and the surface of the skin. The discharge by urine is likewise every day considerable; and great part of the bile, saliva, &c. are excluded by stool. But the solid, as well as the fluid parts of the body, require a constant renewal of nutritious particles. They are exposed to the attrition of the fluids which are circulated through them; and the contraction and relaxation they repeat so many thousand times in every day, would necessarily occasion a dissolution of the machine, if the renewal was not proportioned to the waste.

It is easy to conceive how the chyle formed from the aliment is assimilated into the nature of blood, and repairs the loss of the fluid parts of our body; but how the solids are renewed, has never yet been satisfactorily explained. The nutritious parts of the blood are probably deposited by the arteries by exudation through their pores into the tela cellulosa; and as the solid parts of the body are in the embryo only a kind of jelly, which gradually acquires the degree of consistence they are found to have when the body arrives at a more advanced age; and these same parts which consist of bones, cartilages, ligaments, muscles, &c. are sometimes reduced again by disease to a gelatinous state; we may, with some degree of probability, consider the coagulable lymph as the source of nutrition.

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If the supply of nourishment exceeds the degree of waste, the body increases; and this happens in infancy and in youth: for at those periods, but more particularly the former one, the fluids bear a large proportion to the solids; and the fibres being soft and yielding, are proportionably more capable of extension and increase. But when the supply of nutrition only equals the waste, we neither increase nor decrease; and we find this to be the case when the body has attained its full growth or *acme:* for the solids having then acquired a certain degree of firmness and rigidity, do not permit a farther increase of the body. But as we approach to old age, rigidity begins to be in excess, and the fluids (H) bear a much less proportion to the solids than before. The dissipation of the body is greater than the supply of nourishment: many of the smaller vessels become gradually impervious (I); and the fibres losing their moisture and their elasticity, appear flaccid and wrinkled. The lilies and the roses disappear, because the fluids by which they were produced can no longer reach the extremities of the capillary vessels of the skin. As these changes take place, the nervous power being proportionably weakened, the irritability and sensibility of the body, which were formerly so remarkable, are greatly diminished; and in advanced life, the hearing, the eye-sight, and all the other senses, become gradually impaired.

Sect. XVI. *Of the Glands and Secretions.*

131 The glands are commonly understood to be small, roundish, or oval bodies, formed by the convolution of a great number of vessels, and destined to separate particular humours from the mass of blood.

They are usually divided into two classes; but it seems more

(F) It may not be improper to observe, that till of late the *coagulable lymph* has been confounded with the *serum* of the blood, which contains a substance that is likewise coagulable, though only when exposed to heat, or combined with certain chemical substances; whereas the other coagulates spontaneously when exposed to the air or to rest.

(G) When the blood separates into *serum* and *crassamentum*, if the latter be covered with a crust of a whitish or buff colour, it has been usually considered as a certain proof of the blood's being in a state of too great viscidity. This appearance commonly taking place in inflammatory diseases, has long served to confirm the theory which ascribes the cause of inflammation to lentor and obstructions. But from the late Mr Hewson's experiments it appears, that when the action of the arteries is increased, the blood, instead of being more viscid, is, on the contrary, more fluid than in the ordinary state previous to inflammation; and that in consequence of this, the coagulable lymph suffers the red globules, which are the heaviest part of the blood, to fall down to the bottom before it coagulates: so that the crassamentum is divided into two parts; one of which is found to consist of the coagulable lymph alone (in this case termed the *buff*); and the other, partly of this and partly of the red globules.

(H) As the fluids become less in proportion to the solids, their acrimony is found to increase; and this may perhaps compensate for the want of fluidity in the blood, by diminishing its cohesion.

(I) In infancy, the arteries are numerous and large in respect to the veins, and the lymphatic glands are larger than at any other time of life; whereas, in old age, the capacity of the venous system exceeds that of the arteries, and the lymphatic system almost disappears.

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more proper to distinguish three kinds of glands, viz. the mucous, conglobate, and conglomerate.

The *mucous glands*, or follicles as they are most commonly called, are small cylindrical tubes continued from the ends of arteries. In some parts of the body, as in the tonsils, for example, several of these follicles may be seen folded together in one common covering, and opening into one common sinus. These follicles are the vessels that secrete and pour out mucus in the mouth, œsophagus, stomach, intestines, and other parts of the body.

The *conglobate glands* are peculiar to the lymphatic system. Every lymphatic vein passes through a gland of this kind in its way to the thoracic duct. They are met with in different parts of the body, particularly in the axilla, groin, and mesentery, and are either solitary or in distinct clusters.

The *conglomerate glands* are of much greater bulk than the conglobate, and seem to be an assemblage of many smaller glands. Of this kind are the liver, kidneys, &c. Some of them, as the pancreas, parotids, &c. have a granulated appearance. All these conglomerate glands are plentifully supplied with blood vessels: but their nerves are in general very minute, and few in number. Each little granulated portion furnishes a small tube, which unites with other similar ducts, to form the common excretory duct of the gland.

The principal glands, and the humours they secrete, have been already described in different parts of this work; and there only remains for us to examine the general structure of the glands, and to explain the mechanism of secretion. On the first of these subjects two different systems have been formed; each of which has had, and still continues to have, its adherents. One of these systems was advanced by Malpighi, who supposed that an artery entering into a gland ramifies very minutely through its whole substance; and that its branches ultimately terminate in a vesicular cavity or follicle, from whence the secreted fluid passes out through the excretory duct. This doctrine at first met with few opponents; but the celebrated Ruysch, who first attempted minute injections with wax, afterwards disputed the existence of these follicles, and asserted, that every gland appears to be a continued series of vessels, which, after being repeatedly convoluted in their course through its substance, at length terminate in the excretory duct. Anatomists are still divided between these two systems: that of Malpighi, however, seems to be the best founded.

The mode of secretion has been explained in a variety of ways, and they are all perfectly hypothetical. In such an inquiry, it is natural to ask, how one gland constantly separates a particular humour, while another gland secretes one of a very different nature from the blood? The bile, for instance, is separated by the liver, and the urine by the kidneys. Are these secretions to be imputed to any particular dispositions in the fluids? or is their cause to be looked for in the solids?

It has been supposed, that every gland contains within itself a fermenting principle, by which it is enabled to change the nature of the blood it receives, and to endue it with a particular property. Thus, according to this system, the blood, as it circulates through the kidneys, becomes mixed with the fermenting principle of those glands, and a part of it is converted into urine; and again in the liver, in the salival and other glands, the bile, the saliva, and other juices, are generated from a similar cause. But it seems to be impossible for any liquor to be confined in a place exposed to the circulation, without being carried away by the torrent of blood, every part of which would be equally affected; and this system of fermentation has long been rejected as vague and chimerical. But as the cause of secretion continued to be looked for in the fluids, the former system was succeeded by another, in which recourse was had to the analogy of the humours. It was observed, that if paper be moistened with water, and oil and water be afterwards poured upon it, the water only will be permitted to pass through it, but that, on the other hand, if the paper has been previously soaked in oil instead of water, the oil only, and not the water, will be filtered through it. These observations led to a supposition, that every secretory organ is originally furnished with a humour analogous to that which it is afterwards destined to separate from the blood; and that in consequence of this disposition, the secretory vessels of the liver for instance, will only admit the bilious particles of the blood, while all the other humours will be excluded. This system is an ingenious one, but the difficulties with which it abounds are unanswerable: for oil and water are immiscible; whereas the blood, as it is circulated through the body, appears to be a homogeneous fluid. Every oil will pass through a paper moistened only with one kind of oil; and wine, or spirits mixed with water, will easily be filtered through a paper previously soaked in water. Upon the same principle, all our humours, though differing in their other properties, yet agreeing in that of being perfectly miscible with each other, will all easily pass through the same filtre.—But these are not all the objections to this system. The humours which are supposed to be placed in the secretory vessels for the determination of similar particles from the blood, must be originally separated without any analogous fluid; and that which happens once, may as easily happen always. Again, It sometimes happens, from a vitious disposition, that humours are filtered through glands which are naturally not intended to afford them a passage; and when this once has happened, it ought, according to this system, to be expected always to do so: whereas this is not the case; and we are, after all, naturally led to seek for the cause of secretion in the solids. It does not seem right to ascribe it to any particular figure of the secretory vessels; because the soft texture of those parts does not permit them to preserve any constant shape, and our fluids seem to be capable of accommodating themselves to every kind of figure. Some have imputed it to the difference of diameter in the orifices of the different secretory vessels. To this doctrine objections have likewise been raised; and it has been argued, that the vessels of the liver, for instance, would upon this principle, afford a passage not only to the bile, but to all the other humours of less consistence with it. In reply to this objection, it has been supposed, that secondary vessels exist, which originate from the first, and permit all the humours thinner than the bile to pass through them.

Each of these hypotheses is probably very remote from the truth.

EXPLANATION

EXPLANATION of PLATE XXX.

This Plate represents the Heart in situ, all the large Arteries and Veins, with some of the Muscles, &c.

Muscles, &c.—Superior Extremity.—a, Masseter. b, Complexus. c, Digastricus. d, Os hyoides. e, Thyroid gland. f, Levator scapulæ. g, Cucullaris. h, The clavicles cut. i, The deltoid muscle. k, Biceps flexor cubiti cut. l, Coraco-brachialis. m, Triceps extensor cubiti. n, The heads of the pronator teres, flexor carpi radialis, and flexor digitorum sublimis, cut. o, The flexor carpi ulnaris cut at its extremity. p, Flexor digitorum profundus. q, Supinator radii longus, cut at its extremity. r, Ligamentum carpi transversale. s, Extensores carpi radiales. t, Latissimus dorsi. u, Anterior edge of the serratus anticus major. vv, The inferior part of the diaphragm. ww, Its interior edge cut. xx, The kidneys. y, Transversus abdominis. z, Os ilium.

Inferior Extremity.—*a*, Psoas magnus. *b*, Iliacus internus. *c*, The fleshy origin of the tensor vaginæ femoris. *dd*, The ossa pubis cut from each other. *e*, Musculus pectineus cut from its origin. *f*, Short head of the triceps adductor femoris cut. *g*, The great head of the triceps. *h*, The long head cut. *i*, Vastus internus. *k*, Vastus externus. *l*, Crureus. *m*, Gemellus. *n*, Soleus. *o*, Tibia. *p*, Peronæus longus. *q*, Peronæus brevis. *r*, Fibula.

Heart and Blood Vessels.—A, The heart, with the coronary arteries and veins. B, The right auricle of the heart. C, The aorta ascendens. D, The left subclavian artery. E, The left carotid artery. F, The common trunk which sends off the right subclavian and right carotid arteries. G, The carotis externa. H, Arteria facialis, which sends off the coronary arteries of the lips. I, Arteria temporalis profunda. K, Aorta descendens. LL, The iliac arteries,—which send off MM, The femoral or crural arteries. *N. B.* The other arteries in this figure have the same distribution as the veins of the same name:—And generally, in the anatomical plates, the description to be found on the one side points out the same parts in the other. 1, The frontal vein. 2, The facial vein. 3, Vena temporalis profunda. 4, Vena occipitalis. 5, Vena jugularis externa. 6, Vena jugularis interna, covering the arteria carotis communis. 7, The vascular arch on the palm of the hand, which is formed by 8, the radial artery and vein, and, 9, the ulnar artery and vein. 10 10, Cephalic vein. 11, Basilic vein, that on the right side, cut. 12, Median vein. 13, The humeral vein, which, with the median, covers the humeral artery. 14 14, The external thoracic or mammary arteries and veins. 15, The axillary vein, covering the artery. 16 16, The subclavian veins, which, with (66) the jugulars, form, 17, The vena cava superior. 18, The cutaneous arch of veins on the fore part of the foot. 19, The vena tibialis antica, covering the artery. 20, The vena profunda femoris, covering the artery. 21, The upper part of the vena saphena major. 22, The femoral vein. 23 23, The iliac veins. 24 24, Vena cava inferior. 25 25, The renal veins covering the arteries. 26 26, The diaphragmatic veins.

CHAP. V. OF THE BRAIN AND NERVES.

Sect. I. *Of the Brain and its Integuments.*

132 THE bones of the cranium were described in the osteological part of this work, as enclosing the brain and defending it from external injury: but they are not its only protection; for when we make a horizontal section through these bones, we find this mass everywhere surrounded by two membranes (K), the dura and pia mater.—The first of these lines the interior surface of the cranium, to which it everywhere adheres strongly (L), but more particularly at the sutures, and at the many foramina through which vessels pass between it and the pericranium. The *dura mater* (M) is perfectly smooth and inelastic, and its inner surface is constantly bedewed with a fine pellucid fluid, which everywhere separates it from the pia mater. The dura mater sends off

133 Integuments of the brain.

(K) The Greeks called these membranes *meninges;* but the Arabians, supposing them to be the source of all the other membranes of the body, afterwards gave them the name of *dura* and *pia mater;* by which they are now usually distinguished.

(L) In young subjects this adhesion is greater than in adults; but even then, in the healthy subject, it is nowhere easily separable, without breaking through some of the minute vessels by means of which it is attached to the bone.

(M) This membrane is commonly described as consisting of two laminæ; of which the external one is supposed to perform the office of periosteum internum to the cranium, while the internal one forms the folds and processes of the dura mater. In the natural state, however, no such separation is apparent; like other membranes, we may indeed divide it, not into two only, but many laminæ; but this division is artificial, and depends on the dexterity of the anatomist.

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off several considerable processes, which divide the brain into several portions, and prevent them from compressing each other. Of these processes there is one superior and longitudinal, called the *falx* or *falciform process*, from its resemblance to a scythe. It arises from the spine of the os frontis, near the crista galli, and extending along in the direction of the sagittal suture, to beyond the lambdoidal suture, divides the brain into two hemispheres. A little below the lambdoidal suture, it divides into two broad wings or expansions called the *transverse* or *lateral processes*, which prevent the lobes of the cerebrum from pressing on the cerebellum. Besides these there is a fourth, which is situated under the transverse processes, and being continued to the spine of the occiput, divides the cerebellum into two lobes.

The blood, after being distributed through the cavity of the cranium by means of the arteries, is returned, as in the other parts of the body, by veins which all pass on to certain channels situated between these several processes.

These canals or sinuses communicate with each other, and empty themselves into the internal jugular veins, which convey the blood into the vena cava. They are in fact triangular veins, running through the substance of the dura mater, and, like all the processes, are distinguished into *longitudinal* and *lateral;* and where these three meet, and where the fourth process passeth off, we observe a fourth sinus, which is called *torcular;* Herophilus, who first described it, having supposed that the blood, at the union of these two veins, is, as it were, in a press.

Besides these four canals, which were known to the ancients, modern anatomists enumerate many others, by giving the appellation of *sinuses* to other veins of the dura mater, which for the most part empty themselves into some of those we have just now described. There are the inferior longitudinal sinus, the superior and inferior petrous sinuses, the cavernous sinuses, the circular sinus, and the anterior and posterior occipital sinuses.

These sinuses or veins, by being conveyed through a thick dense membrane, firmly suspended, as the dura mater is, within the cranium, are less liable to rupture; at the same time they are well supported, and by running everywhere along the inner surface of the bones, they are prevented from pressing on the substance of the brain. To prevent too great a dilatation of them, we find filaments (called *chordæ Willisii*, from their having been first noticed by Willis) stretched across their cavities; and the oblique manner in which the veins from the brain run through the substance of the brain into these channels, serves the purpose of a valve, which prevents the blood from turning back into the smaller and weaker vessels of the brain.

The *pia mater* is a much softer and finer membrane than the dura mater: being exceedingly delicate, transparent, and vascular. It invests every part of the brain, and sends off an infinite number of elongations, which insinuate themselves between the convolutions, and even into the substance of the brain. This membrane is composed of two laminæ; of which the exterior one is named *tunica arachnoidea*, from its thinness, which is equal to that of a spider's web. These two laminæ are intimately adherent to each other, at the upper part of the brain, but are easily separable at the basis of the brain, and through the whole length of the medulla spinalis. The external layer, or tunica arachnoidea, appears to be spread uniformly over the surface of the brain, but without entering into the furrows as the inner layer does; the latter being found to insinuate itself between the convolutions, and even into the interior cavities of the brain. The blood-vessels of the brain are distributed through it in their way to that organ, and are therefore divided into very minute ramifications, before they penetrate the substance of the brain.

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134 The brain.

There are several parts included under the general denomination of *brain*. One of these, which is of the softest consistence, and fills the greatest part of the cavity of the cranium, is the *cerebrum* or *brain* properly so called. Another portion, which is seated in the inferior and posterior part of the head, is the *cerebellum;* and a third, which derives its origin from both these, is the *medulla oblongata*.

135 Cerebrum.

The *cerebrum* is a medullary mass of a moderate consistence, filling up exactly all the upper part of the cavity of the cranium, and divided into two hemispheres by the falx of the dura mater. Each of these hemispheres, is usually distinguished into *an interior*, *a middle*, and *a posterior lobe*. The first of these is lodged on the orbital processes of the os frontis; the middle lobes lie in the middle fossæ of the basis of the cranium, and the posterior lobes are placed on the transverse septum of the os occipitis, immediately over the cerebellum, from which they are separated by the lateral processes of the dura mater. These two portions afford no distinguishing mark of separation; and on this account Haller, and many other modern anatomists, omit the distinction of the middle lobe, and speak only of the anterior and posterior lobes of the brain.

The cerebrum appears to be composed of two distinct substances. Of these the exterior one, which is of a grayish or ash colour, is called the *cortex*, and is somewhat softer than the other, which is very white, and is called *medulla*, or *substantia alba*.

After having removed the falx, and separated the two hemispheres from each other, we perceive a white convex body, the corpus callosum, which is a portion of the medullary substance, uniting the two hemispheres to each other, and not invested by the cortex. By making a horizontal incision into the brain, on a level with this corpus callosum, we discover two oblong cavities, named the *anterior* or *lateral ventricles*, one in each hemisphere. These two ventricles, which, communicate with each other by a hole immediately under the plexus choroides, are separated laterally by a very fine medullary partition, called *septum lucidum*, from its thinness and transparency. The lower edge of this septum is fixed to the fornix, which is a kind of medullary arch (as its name implies) situated under the corpus callosum, and nearly of a triangular shape. Anteriorly the fornix sends off two medullary chords, called its *anterior crura;* which seem to be united to each other by a portion of medullary substance, named *commissura anterior cerebri*. These crura diverging from one another, are lost at the outer side of the lower and fore part of the third ventricle. Posteriorly the fornix is formed into two other crura, which unite with

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with two medullary protuberances, called *pedes hippocampi*, and sometimes *cornua ammonis*, that extend along the back part of the lateral ventricles. The concave edge of the pedes hippocampi is covered by a medullary lamina, called *corpus fimbriatum*.

Neither the edges of the fornix, nor its posterior crura, can be well distinguished, till we have removed the plexus choroides. This is a production of the pia mater, which is spread over the lateral ventricles. Its loose edges are collected, so as to appear like a vascular band on each side.

When we have removed this plexus, we discover several other protuberances included in the lateral ventricles. These are the corpora striata, the thalami nervorum opticorum, the tubercula quadrugemina, and the pineal gland.

The *corpora striata* are two curved oblong eminences, that extend along the anterior part of the lateral ventricles. They derive their name from their striated appearance, which is owing to an intermixture of the cortical and medullary substances of the brain. The *thalami nervorum opticorum* are so called, because the optic nerves arise chiefly from them, and they are likewise composed both of the cortex and medulla. They are separated from the corpora striata only by a kind of medullary chord, the geminum centrum semicirculare. The thalami are nearly of an oval shape, and are situated at the bottom of the upper cavity of the lateral ventricles. They are closely united, and at their convex part seem to become one body.

Anteriorly, in the space between the thalami, we observe an orifice by which the lateral ventricles communicate, and another leads down from this, under the different appellations of *foramen commune anterius*, *vulva*, *iter ad infundibulum*, but more properly *inter ad tertium ventriculum;* and the separation of the thalami from each other posteriorly, forms another opening or interstice called *anus*. This has been supposed to communicate with the third ventricle; but it does not, the bottom of it being shut up by the pia mater. The back part of the anus is formed by a kind of medullary band, which connects the thalami to each other, and is called *commissura posterior cerebri*.

Behind the thalami and commissura posterior, we observe a small, soft, grayish, and oval body, about the size of a pea. This is the glandula pinealis; it is described by Galen under the name of *conarion*, and has been rendered famous by Descartes, who supposed it to be the seat of the soul. Galen seems formerly to have entertained the same opinion. Some modern writers have, with as little reason, imagined that the soul is placed in the corpus callosum.

The pineal gland rests upon four remarkable eminences, disposed in pairs, and seated immediately below it. These tubercles, which by the ancients were called *testes* and *nates*, have, since the time of Winslow, been more commonly named *tubercula quadrugemina*.

Under the thalami we observe another cavity, the third ventricle, which terminates anteriorly in a small medullary canal, the infundibulum, that leads to the glandula pituitaria. It has been doubted, whether the infundibulum is really hollow; but some late experiments on this part of the brain * by Professor Murray of Upsal, clearly prove it to be a medullary canal, surrounded by both laminæ of the pia mater. After freezing the brain, this channel was found filled with ice; and De Haen tells † us, he found it dilated, and filled with a calcareous matter (N).

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* *Disp. de Infundibulo Cerebri.*

† *Ratio Med.* tom. vi. p. 271.

The soft spongy body in which the infundibulum terminates, was by the ancients supposed to be of a glandular structure, and destined to filter the serosity of the brain. Spigelius pretended to have discovered its excretory duct, but it seems certain that no such duct exists. It is of an oblong shape, composed, as it were, of two lobes. In ruminant animals it is much larger than in man.

From the posterior part of the third ventricle, we see a small groove or channel, descending obliquely backwards. This channel, which is called the *aqueduct of Sylvius*, though it was known to the ancients, opens into another cavity of the brain, placed between the cerebellum and medulla oblongata, and called the *fourth ventricle*.

136 Cerebellum.

The *cerebellum*, which is divided into two lobes, is commonly supposed to be of a firmer texture than the cerebrum; but the truth is, that in the greater number of subjects, there appears to be no sensible difference in the consistence of these two parts. It has more of the cortical than of the medullary substance in its composition.

The furrow that divides the two lobes of the cerebellum leads anteriorly to a process, composed of medullary and cortical substances, covered by the pia mater; and which, from its being divided into numerous furrows, resembling the rings of the earth-worm, is named *processus vermiformis*. This process forms a kind of ring in its course between the lobes.

The surface of the cerebellum does not afford those circumvolutions which appear in the cerebrum; but instead of these, we observe a great number of minute furrows, running parallel to each other, and nearly in a transverse direction. The pia mater insinuates itself into these furrows.

When we cut into the substance of the cerebellum, from above downwards, we find the medullary part running in a kind of ramifying course, and exhibiting an appearance that has gotten the name of *arbor vitæ*. These ramifications unite to form a medullary trunk; the middle, anterior, and most considerable part of which forms two processes, the crura cerebelli, which unite with the crura cerebri, to form the medulla oblongata. The rest furnishes two other processes, which lose themselves, under the nates, and thus unite the lobes of the cerebellum to the posterior part of the cerebrum. Under the nates we observe a transverse medullary line, or linea alba, running from one of these processes to the other; and between them we find a very thin medullary lamina, covered with the pia mater, which the generality of anatomists have (though seemingly without reason) considered as a valve formed for closing the communication between the fourth ventricle

(N) The under part of it, however, appears to be impervious; at least no injection that can be depended on has been made to pass from it into the glandula pituitaria without laceration of parts.

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tricle and the aquæductus Sylvii. Vieussens named it *valvula major cerebri*.

137 Medulla oblongata.

The *medulla oblongata* is situated in the middle, lower, and posterior part of the cranium, and may be considered as a production or continuation of the whole medullary substance of the cerebrum and cerebellum, being formed by the union of two considerable medullary processes of the cerebrum, called *crura cerebri*, with two other smaller ones from the cerebellum, which were just now spoken of under the name of *crura cerebelli*.

The crura cerebri arise from the middle and lower part of each hemisphere. They are separated from each other at their origin, but are united below, where they terminate in a middle protuberance, the *pons Varolii*, so called because Varolius compared it to a bridge. This name, however, can convey no idea of its real appearance. It is, in fact, nothing more than a medullary protuberance, nearly of a hemispherical shape, which unites the crura cerebri to those of the cerebellum.

Between the crura cerebri, and near the anterior edge of the pons Varolii, are two tubercles, composed externally of medullary, and internally of cineritious substance, to which Eustachius first gave the name of *eminentiæ mamillares*.

Along the middle of the posterior surface of the medulla oblongata, where it forms the anterior part of the fourth ventricle, we observe a kind of furrow which runs downwards and terminates in a point. About an inch above the lower extremity of this fissure, several medullary filaments are to be seen running towards it on each side in an oblique direction, so as to give it the appearance of a writing pen; hence it is called *calamus scriptorius*.

From the posterior part of the pons Varolii, the medulla oblongata descends obliquely backwards; at its fore part, immediately behind the pons Varolii, we observe two pair of eminences, which were described by Eustachius, but received no particular appellation till the time of Vieussens, who gave them the names of *corpora olivaria* and *corpora pyramidalia*. The former are the outermost, being placed one on each side. They are nearly of an oval shape, and are composed of medulla, with streaks of cortical substance. Between these are the corpora pyramidalia, each of which terminates in a point. In the human subject these four eminences are sometimes not easily distinguished.

138 Medulla spinalis.

The *medula spinalis*, or *spinal marrow*, which is the name given to the medullary chord that is extended down the vertebral canal, from the great foramen of the occipital bone to the bottom of the last lumbar vertebra, is a continuation of the medulla oblongata. Like the other parts of the brain, it is invested by the dura and pia mater. The first of these, in its passage out of the cranium, adheres to the foramen of the os occipitis. Its connection with the ligamentary substance that lines the cavity of the spine, is only by means of cellular membrane; but between the several vertebræ, where the nerves pass out of the spine, it sends off prolongations, which adhere strongly to the vertebral ligaments. Here, as in the cranium, the dura mater has its sinuses or large veins. These are two in number, and are seen running on each side of the medullary column, from the foramen magnum of the os occipitis to the lower part of the os sacrum. They communicate together by ramifying branches at each vertebra, and terminate in the vertebral, intercostal, and sacral veins.

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The pia mater is connected with the dura mater by means of a thin transparent substance, which from its indentations between the spinal nerves has obtained the name of *ligamentum denticulatum*. It is somewhat firmer than the tunica arachnoidea, but in other respects resembles that membrane. Its use is to support the spinal marrow, that it may not affect the medulla oblongata by its weight.

The spinal marrow itself is externally of a white colour; but, upon cutting into it, we find its middle part composed of a darker-coloured mass, resembling the cortex of the brain. When the marrow has reached the first lumbar vertebra, it becomes extremely narrow, and at length terminates in an oblong protuberance; from the extremity of which the pia mater sends off a prolongation or ligament, resembling a nerve, that perforates the dura mater, and is fixed to the os coccygis.

The medulla spinalis gives rise to 30 or 31 pair of nerves, but they are not all of the same size, nor do they all run in the same direction. The upper ones are thinner than the rest, and are placed almost transversely: as we descend, we find them running more and more obliquely downwards, till at length their course is almost perpendicular, so that the lowermost nerves exhibit an appearance that is called *cauda equina*, from its resemblance to a horse's tail.

The arteries that ramify through the different parts of the brain are derived from the internal carotid and from the vertebral arteries. The medulla spinalis is supplied by the anterior and posterior spinal arteries, and likewise receives branches from the cervical, the inferior and superior intercostal, the lumbar, and the sacral arteries.

Sect. II. *Of the Nerves.*

139

The nerves are medullary chords, differing from each other in size, colour, and consistence, and deriving their origin from the medulla oblongata and medulla spinalis. There are 39, and sometimes 40, pair of the nerves; nine (o) of which originate from the medulla oblongata, and 30 or 31 from the medulla spinalis. They appear to be perfectly inelastic, and likewise to possess no irritability. If we irritate muscular fibres, they immediately contract; but nothing of this sort happens if we irritate a nerve. They carry with them a covering from the pia mater; but derive no tunic from the dura mater, as hath been generally, though erroneously, supposed, ever since the time of Galen

(o) It has been usual to describe ten pair of nerves as arising from the medulla oblongata; but as the tenth pair arise in the same manner as the other spinal nerves, Santorini, Heister, Haller, and others, seem very properly to have classed them among the nerves of the spine.

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Galen (P), the outer covering of the nerves being in fact nothing more than cellular membrane. This covering is very thick where the nerve is exposed to the action of the muscles; but where it runs through a bony canal, or is secure from pressure, the cellular tunic is extremely thin, or altogether wanting. We have instances of this in the portio mollis of the auditory nerve, and in the nerves of the heart.

By elevating, carefully and gently, the brain from the basis of the cranium, we find the first nine pair arising in the following order: 1. The nervi olfactorii, distributed through the pituitary membrane, which constitutes the organ of smell. 2. The optici, which go to the eyes, where they receive the impressions of visible objects. 3. The oculorum motores, so called because they are distributed to the muscles of the eye. 4. The pathetici, distributed to the superior oblique muscles of the eyes, the motion of which is expressive of certain passions of the soul. 5. The nerves of this pair soon divide into three principal branches, and each of these has a different name. Its upper division is the ophthalmicus, which is distributed to various parts of the eyes, eyelids, forehead, nose, and integuments of the face. The second is called the *maxillaris superior*, and the third *maxillaris inferior;* both which names allude to their distribution. 6. The abductores; each of these nerves is distributed to the abductor muscle of the eye, so called, because it helps to draw the globe of the eye from the nose. 7. The auditorii (Q), which are distributed through the organs of hearing. 8. The par vagum, which derives its name from the great number of parts to which it gives branches, both in the thorax and abdomen. 9. The linguales, or hypoglossi, which are distributed to the tongue, and appear to contribute both to the organ of taste and to the motions of the tongue (R).

It has already been observed, that the spinal marrow sends off 30 or 31 pair of nerves; these are chiefly distributed to the exterior parts of the trunk and to the extremities. They are commonly distinguished into the *cervical*, *dorsal*, *lumbar*, and *sacral nerves*. The cervical, which pass out from between the several vertebræ of the neck, are eight (S) in number; the dorsal, twelve; the lumbar, five; and the sacral, five or six; the number of the latter depending on the number of holes in the os sacrum. Each spinal nerve at its origin is composed of two fasciculi of medullary fibres. One of these fasciculi arises from the anterior, and the other from the posterior, surface of the medulla. These fasciculi are separated by the ligamentum denticulatum; after which we find them contiguous to one another. They then perforate the dura mater, and unite to form a considerable knot or ganglion. Each of these ganglions sends off two branches; one anterior, and the other posterior. The anterior branches communicate with each other at their coming out of the spine, and likewise send off one, and sometimes more branches, to assist in the formation of the intercostal nerve.

The knots or ganglions of the nerves just now spoken of, are not only to be met with at their exit from the spine, but likewise in various parts of the body. They occur in the nerves of the medulla oblongata, as well as in those of the spine. They are not the effects of disease, but are to be met with in the same parts of the same nerves, both in the fœtus and adult. They are commonly of an oblong shape, and of a grayish colour somewhat inclined to red, which is perhaps owing to their being extremely vascular. Internally we are able to distinguish something like an intermixture of the nervous filaments.

Some writers have considered them as so many little brains; Lancisi fancied he had discovered muscular fibres in them, but they are certainly not of an irritable nature. A late writer, Dr Johnstone *, imagines they are intended to deprive us of the power of the will over certain parts, as the heart, for instance: but if this hypothesis were well founded, we should meet with them only in nerves leading to involuntary muscles; whereas it is certain, that the voluntary muscles receive their nerves through ganglions. Dr Monro, from observing the accurate intermixture of the minute nerves which compose them, considers them as new sources of nervous energy †.

* *Essay on the Use of the Ganglions of the Nerves.*

† *Observations on the Nervous System.*

The

(P) Baron Haller and Professor Zinn seem to have been the first who demonstrated, that the dura mater is reflected upon and adheres to the periosteum at the edges of the foramina that afford a passage to the nerves out of the cranium and vertebral canal, or is soon lost in the cellular substance.

(Q) This pair, soon after its entrance into the meatus auditorius internus, separates into two branches. One of these is of a very soft and pulpy consistence, is called the *portio mollis* of the seventh pair, and is spread over the inner part of the ear. The other passes out through the aqueduct of Fallopius in a firm chord, which is distinguished as the portio dura, and is distributed to the external ear and other parts of the neck and face.

(R) Heister has summed up the uses of these nine pair of nerves in the two following Latin verses:

"*Olfaciens, cernens, oculosque movens, patiensque,*
"*Gustans, abducens, audiensque, vagansque, loquensque.*"

(S) Besides these, there is another pair called *accessorii*, which arises from the medulla spinalis at its beginning; and ascending through the great foramen of the os occipitis into the cranium, passes out again close to the eighth pair, with which, however, it does not unite; and it is afterwards distributed chiefly to the muscles of the neck, back, and scapula. In this course it sends off filaments to different parts, and likewise communicates with several other nerves. Physiologists are at a loss how to account for the singular origin and course of these nervi accessorii. The ancients considered them as branches of the eighth pair, distributed to muscles of the scapula: Willis likewise considered them as appendages to that pair, and on that account named them *accessorii*. They are sometimes called the *spinal* pair; but as this latter name is applicable to all the nerves of the spine indiscriminately, it seems better to adopt that given by Willis.

Of the Brain and Nerves.

The nerves, like the blood vessels, in their course through the body, communicate with each other; and each of these communications constitutes what is called a *plexus*, from whence branches are again detached to different parts of the body. Some of these are constant and considerable enough to be distinguished by particular names, as the *semilunar plexus*, the *pulmonary plexus*, the *hepatic*, the *cardiac*, &c.

It would be foreign to the purpose of this work to follow the nerves through all their distribntions; but it may be remembered, that in describing the different viscera, mention was made of the nerves distributed to them. There is one pair, however, called the *intercostal*, or *great sympathetic nerve*, which seems to require particular notice, because it has an almost universal connexion and correspondence with all the other nerves of the body. Authors are not perfectly agreed about the origin of the intercostal; but it may perhaps not improperly be described, as beginning from filaments of the fifth and sixth pair; it then passes out of the cranium, through the bony canal of the carotid, from whence it descends laterally close to the bodies of the vertebræ, and receives branches from almost all the vertebral nerves: forming almost as many ganglions in its course through the thorax and abdomen. It sends off an infinite number of branches to the viscera in those cavities, and forms several plexus with the branches of the eighth pair or par vagum.

That the nerves are destined to convey the principles of motion and sensibility to the brain from all parts of the system, there can be no doubt; but how these effects are produced, no one has ever yet been able to determine. The inquiry has been a constant source of hypothesis in all ages, and has produced some ingenious ideas, and many erroneous positions, but without having hitherto afforded much satisfactory information.

Of the Brain and Nerves.

Some physiologists have considered a trunk of nerves as a solid chord, capable of being divided into an infinite number of filaments, by means of which the impressions of feeling are conveyed to the sensorium commune. Others have supposed it to be a canal, which afterwards separates into more minute channels; or, perhaps, as being an assemblage of many very small and distinct tubes, connected to each other, and thus forming a cylindrical chord. They who contend for their being solid bodies are of opinion, that feeling is occasioned by vibration; so that, for instance, according to this system, by pricking the finger, a vibration would be occasioned in the nerve distributed though its substance; and the effects of this vibration, when extended to the sensorium, would be an excital of pain. But the inelasticity, the softness, the connexion, and the situation of the nerves, are so many proofs that vibration has no share in the cause of feeling.

Others have supposed, that in the brain and spinal marrow a very subtle fluid is secreted, and from thence conveyed through the imperceptible tubes, which they consider as existing in the nerves. They have further supposed, that this very subtle fluid, to which they have given the name of *animal spirits*, is secreted in the cortical substance of the brain and spinal marrow, from whence it passes through the medullary substance. This, like the other system, is founded altogether on hypothesis; but it seems to be a hypothesis derived from much more probable principles, and there are many ingenious arguments to be brought in its support.

EXPLANATION OF PLATE XXXI.

FIG. 1. Represents the Inferior part of the Brain; —the Anterior part of the whole spine, including the Medulla Spinalis;—with the origin and large portions of all the NERVES.

AA, The anterior lobes of the cerebrum. BB, The lateral lobes of the cerebrum. CC, The two lobes of the cerebellum. D, Tuber annulare. E, The passage from the third ventricle to the infundibulum. F, The medulla oblongata, which sends off the medulla spinalis through the spine. GG, That part of the os occipitis which is placed above (HH) the transverse processes of the first cervical vertebra. II, &c. The seven cervical vertebræ, with their intermediate cartilages. KK, &c. The twelve dorsal vertebræ, with their intermediate cartilages. LL, &c. The five lumbar vertebræ, with their intermediate cartilages. M, The os sacrum. N, The os coccygis.

NERVES.—1 1, The first pair of nerves, named *olfactory*, which goes to the nose. 2 2, The second pair, named *optic*, which goes to form the tunica retina of the eye. 3 3, The third pair, named *motor oculi;* it supplies most of the muscles of the eyeballs. 4 4, The fourth pair, named *pathetic*,—which is wholly spent upon the musculus trochlearis of the eye. 5 5, The fifth pair divides into three branches.—The first, named *ophthalmic*, goes to the orbit, supplies the lachrymal gland, and sends branches out to the forehead and nose.—The second, named *superior maxillary*, supplies the teeth of the upper jaw, and some of the muscles of the lips.—The third, named *inferior maxillary*, is spent upon the muscles and teeth of the lower jaw, tongue, and muscles of the lips. 6 6, The sixth pair, which, after sending off the beginning of the intercostal or great sympathetic, is spent upon the abductor oculi. 7 7, The seventh pair, named *auditory*, divides into two branches.—The largest, named *portico mollis*, is spent upon the internal ear.—The smallest, *portio dura*, joins to the fifth pair within the internal ear by a reflected branch from the second of the fifth; and within the tympanum, by a branch from the third of the fifth, named *chorda tympani*.—Vid. fig. 3. near B. 8 8, &c. The eighth pair, named *par vagum*,—which accompanies the intercostal, and is spent upon the tongue, larynx, pharynx, lungs, and abdominal viscera. 9 9, The ninth pair, which are spent upon the tongue. 10 10, &c. The intercostal, or great sympathetic, which is seen from the sixth pair to the bottom of the pelvis on each side of the spine, and joining with all the nerves of the spine; in its progresss supplying the heart, and, with the par vagum, the contents of the abdomen and pelvis. 11 11, The accessorius, which is spent upon the sternocleido-mastoidæus and trapezius muscles.

muscles. 12 12, The first cervical nerves; 13 13, The second cervical nerves; both spent upon the muscles that lie on the neck, and teguments of the neck and head. 14 14, The third cervical nerves, which, after sending off (15 15, &c.) the phrenic nerves to the diaphragm, supply the muscles and teguments that lie on the side of the neck, and top of the shoulder. 16 16, The brachial plexus, formed by the fourth, fifth, sixth, seventh cervicals, and first dorsal nerves,—which supply the muscles, and teguments of the superior extremity. 17 17, The twelve dorsal, or proper intercostal nerves, which are spent upon the intercostal muscles and some of the large muscles which lie upon the thorax. 18 18, The five lumbar pairs of nerves which supply the lumbar and abdominal muscles, and some of the teguments and muscles of the inferior extremity. 19 19, The sacro-sciatic, or posterior crural nerve, formed by the two inferior lumbar, and three superior of the os sacrum. This large nerve supplies the greatest part of the muscles and teguments of the inferior extremity. 20, The stomachic plexus, formed by the eighth pair. 21 21, Branches of the solar or cæliac plexus, formed by the eighth pair and intercostals, which supply the stomach and chylopoietic viscera. 22 22, Branches of the superior and inferior mesenteric plexuses, formed by the eighth pair and intercostals, which supply the chylopoictic viscera, with part of the organs of urine and generation. 23 23, Nerves which accompany the spermatic chord. 24 24, The hypogastric plexus, which supplies the organs of urine and generation within the pelvis.

FIG. 2, 3, 4, 5. Show different views of the Inferior part of the Brain, cut perpendicularly through the Middle—with the Origin and large portions of all the Nerves which pass out through the Bones of the Cranium,—and the three first Cervicals.

A, The anterior lobe. B, The lateral lobe of the cerebrum. C, One of the lobes of the cerebellum. D, Tuber annulare. E, Corpus pyramidale, in the middle of the medulla oblongata. F, The corpus olivare, in the side of the medulla oblongata. G, The medulla oblongata. H, The medulla spinalis.

NERVES.—1 2 3 4 5 6 7 8 and 9, Pairs of nerves. 10 10, Nervus accessorius, which comes from—11, 12, and 13, the three cervical nerves.

CHAP. VI. OF THE SENSES, AND THEIR ORGANS.

140 IN treating of the senses, we mean to confine ourselves to the external ones of *touch*, *taste*, *smelling*, *hearing*, and *vision*. The word *sense*, when applied to these five, seems to imply not only the sensation excited in the mind by certain impressions made on the body, but likewise the organs destined to receive and transmit these impressions to the sensorium. Each of these organs being of a peculiar structure, is susceptible only of particular impressions, which will be pointed out as we proceed to describe each of them separately.

SECT. I. *Of Touch.*

141 THE sense of touch may be defined to be the faculty of distinguishing certain properties of bodies by the feel. In a general acceptation, this definition might perhaps not improperly be extended to every part of the body possessed of sensibility (T); but it is commonly confined to the nervous papillæ of the cutis, or true skin, which, with its appendages, and their several uses, have been already described.

The exterior properties of bodies, such as their solidity, moisture, inequality, smoothness, dryness or fluidity, and likewise their degree of heat, seem all to be capable of making different impressions on the papillæ, and consequently of exciting different ideas in the sensorium commune. But the organ of touch, like all the other senses, is not equally delicate in every part of the body, or in every subject; being in some much more exquisite than it is in others.

SECT. II. *Of Taste.*

142 THE sense of taste is seated chiefly in the tongue; the situation and figure of which are sufficiently known.

On the upper surface of this organ we may observe a great number of papillæ, which, on account of their difference in size and shape, are commonly divided into three classes. The largest are situated towards the basis of the tongue. Their number commonly varies from seven to nine, and they seem to be mucous follicles. Those of the second class are somewhat smaller, and of a cylindrical shape. They are most numerous about the middle of the tongue. Those of the third class are very minute, and of a conical shape. They are

(T) In the course of this article, mention has often been made of the sensibility or insensibility of different parts of the body: it will therefore, perhaps, not be amiss to observe in this place, that many parts which were formerly supposed to possess the most exquisite sense, are now known to have but little or no feeling, at least in a sound state; for in an inflamed state, even the bones, the most insensible parts of any, become susceptible of the most painful sensations. This curious discovery is due to the late Baron Haller. His experiments prove, that the bones, cartilages, ligaments, tendons, epidermis, and membranes (as the pleura, pericardium, dura and pia mater, periosteum, &c.) may in a healthy state be considered as insensible. As sensibility depends on the brain and nerves, of course different parts will possess a greater or less degree of feeling, in proportion as they are supplied with a greater or smaller number of nerves. Upon this principle it is, that the skin, muscles, stomach, intestines, urinary bladder, ureters, uterus, vagina, penis, tongue, and retina, are extremely sensible, while the lungs and glands have only an obscure degree of feeling.

Of the Senses.

are very numerous on the apex and edges of the tongue, and have been supposed to be formed by the extremities of its nerves.

We observe a line, the *linea linguæ mediana*, running along the middle of the tongue, and dividing it as it were into two portions. Towards the basis of the tongue, we meet with a little cavity, named by Morgagni *foramen cæcum*, which seems to be nothing more than a common termination of some of the excretory ducts of mucous glands situated within the substance of the tongue.

We have already observed, that this organ is everywhere covered by the cuticle, which, by forming a reduplication, called the *frænum*, at its under part, serves to prevent the too great motion of the tongue, and to fix it in its situation. But, besides this attachment, the tongue is connected, by means of its muscles and membranous ligaments, to the lower jaw, the os hyoides, and the styloid processes.

The principal arteries of the tongue are the linguales, which arise from the external carotid. Its veins empty themselves into the external jugulars. Its nerves arise from the fifth, eighth, and ninth pair.

The variety of tastes seems to be occasioned by the different impressions made on the papillæ by the food. The different state of the papillæ with respect to their moisture, their figure, or their covering, seems to produce a considerable difference in the taste, not only in different people, but in the same subject, in sickness and in health. The great use of the taste seems to be to enable us to distinguish wholesome and salutary food from that which is unhealthy; and we observe that many quadrupeds, by having their papillæ (u) very large and long, have the faculty of distinguishing flavours with infinite accuracy.

Sect. III. *Of Smelling.*

143 The sense of smelling, like the sense of taste, seems intended to direct us to a proper choice of aliment, and is chiefly seated in the nose, which is distinguished into its external and internal parts. The situation and figure of the former of these do not seem to require a definition. It is composed of bones and cartilages, covered by muscular fibres and by the common integuments. The bones make up the upper portion, and the cartilages the lower one. The septum narium, like the nose, is likewise in part bony, and in part cartilaginous. These bones and their connexions were described in the osteology.

The internal part of the nose, besides the ossa spongiosa, has six cavities or sinuses, the maxillary, the frontal, and the sphenoid, which were all described with the bones of the head. They all open into the nostrils; and the nose likewise communicates with the mouth, larynx, and pharynx, posteriorly behind the velum palati.

All these several parts, which are included in the internal division of the nose, viz. the inner surface of the nostrils, the lamellæ of the ossa spongiosa and the sinuses, are lined by a thick and very vascular membrane which, though not unknown to the ancients, was first well described by Schneider *, and is therefore now commonly named *membrana pituitaria Schneideri*. This membrane is truly the organ of smelling; but its real structure does not yet seem to be perfectly understood. It appears to be a continuation of the cuticle, which lines the inner surface of the mouth. In some parts of the nose it is smooth and firm, and in others it is loose and spongy. It is constantly moistened by a mucous secretion; the finer parts of which are carried off by the air we breathe, and the remainder, by being retained in the sinuses, acquires considerable consistence. The manner in which this mucus is secreted has not yet been satisfactorily ascertained; but it seems to be by means of mucous follicles.

Of the Senses.

* *De Catarrho*, lib. iii.

Its arteries are branches of the internal maxillary and internal carotid. Its veins empty themselves into the internal jugulars. The first pair of nerves, the olfactory, are spread over every part of it, and it likewise receives branches from the fifth pair.

After what has been said of the pituitary membrane, it will not be difficult to conceive how the air we draw in at the nostrils, being impregnated with the effluvia of bodies, excites in us that kind of sensation we call *smelling*. As these effluvia, from their being exceedingly light and volatile, cannot be capable in a small quantity of making any great impression on the extremities of the olfactory nerves, it was necessary to give considerable extent to the pituitary membrane, that by this means a greater number of odoriferous particles might be admitted at the same time. When we wish to take in much of the effluvia of any thing, we naturally close the mouth, that all the air we inspire may pass through the nostrils: and at the same time, by means of the muscles of the nose, the nostrils are dilated, and a greater quantity of air is drawn into them.

In many quadrupeds, the sense of smelling is much more extensive and delicate than it is in the human subject; and in the human subject it seems to be more perfect the less it is vitiated by a variety of smells. It is not always in the same state of perfection, being naturally affected by every change of the pituitary membrane, and of the lymph with which that membrane is moistened.

Sect. IV. *Of Hearing.*

144 Before we undertake to explain the manner in which we are enabled to receive the impressions of sound, it will be necessary to describe the ear, which is the *organ of hearing*. It is commonly distinguished into external and internal. The former of these divisions includes all that we are able to discover without dissection, and the meatus auditorius, as far as the tympanum; and the latter, all the other parts of the ear.

The *external ear* is a cartilaginous funnel, covered by the common integuments, and attached, by means of its ligaments and muscles, to the temporal bone. Although

(u) Malpighi's description of the papillæ, which has been copied by many anatomical writers, seems to have been taken chiefly from the tongues of sheep.

Although capable only of a very obscure motion, it is found to have several muscles. Different parts of it are distinguished by different names; all its cartilaginous part is called *ala* or *wing*, to distinguish it from the soft and pendant part below, called the *lobe*. Its outer circle or border is called *helix*, and the semicircle within this, *antihelix*. The moveable cartilage placed immediately before the meatus auditorius, which it may be made to close exactly, is named *tragus;* and an eminence opposite to this, at the extremity of the antihelix, is called *antitragus*. The concha is a considerable cavity formed by the extremities of the helix and antihelix. The meatus auditorius, which at its opening is cartilaginous, is lined with a very thin membrane, which is a continuation of the cuticle from the surface of the ear.

In this canal we find a yellow wax, which is secreted by a number of minute glands or follicles, each of which has an excretory duct. The secretion, which is at first of an oily consistence, defends the membrane of the tympanum from the injuries of the air; and, by its bitterness, prevents minute insects from entering into the ear. But when from neglect or disease it accumulates in too great a quantity, it sometimes occasions deafness. The inner extremity of the meatus is closed by a very thin transparent membrane, the membrana tympani, which is set in a bony circle like the head of a drum. In the last century Rivinus, professor at Leipsic, fancied he had discovered a hole in this membrane, surrounded by a sphincter, and affording a passage to the air, between the external and internal ear. Cowper, Heister, and some other anatomists, have admitted this supposed foramen, which certainly does not exist. Whenever there is any opening in the membrana tympani, it may be considered as accidental. Under the membrana tympani runs a branch of the fifth pair of nerves, called *chorda tympani;* and beyond this membrane is the cavity of the tympanum, which is about seven or eight lines wide, and half so many in depth; it is semispherical, and everywhere lined by a very fine membrane. There are four openings to be observed in this cavity. It communicates with the mouth by means of the Eustachian tube. This canal, which is in part bony and in part cartilaginous, begins by a very narrow opening at the anterior and almost superior part of the tympanum, increasing in size as it advances towards the palate of the mouth, where it terminates by an oval opening. This tube is everywhere lined by the same membrane that covers the inside of the mouth. The real use of this canal does not seem to have been hitherto satisfactorily ascertained; but sound would seem to be conveyed through it to the membrana tympani, deaf persons being often observed to listen attentively with their mouths open. Opposite to this is a minute passage, which leads to the sinuosities of the mastoid process; and the other two openings, which are in the internal process of the os petrosum, are the fenestra ovalis, and fenestra rotunda, both of which are covered by a very fine membrane.

There are three distinct bones in the cavity of the tympanum; and these are the malleus, incus, and stapes. Besides these there is a fourth, which is the *os orbiculare*, considered by some anatomists as a process of the stapes, which is necessarily broken off by the violence we are obliged to use in getting at these bones; but when accurately considered, it seems to be a distinct bone.

The *malleus* is supposed to resemble a hammer, being larger at one extremity, which is its head, than it is at the other, which is its handle. The latter is attached to the membrana tympani, and the head of the bone is articulated with the incus.

The *incus*, as it is called from its shape, though it seems to have less resemblance to an anvil than to one of the dentes molares with its roots widely separated from each other, is distinguished into its body and its legs. One of its legs is placed at the entry of the canal which leads to the mastoid process; and the other, which is somewhat longer, is articulated with the stapes, or rather with the os orbiculare, which is placed between them.

The third bone is very properly named *stapes*, being perfectly shaped like a stirrup. Its basis is fixed into the fenestra ovalis, and its upper part is articulated with the os orbiculare. What is called the *fenestra rotunda*, though perhaps improperly, as it is more oval than round, is observed a little above the other, in an eminence formed by the os petrosum, and is closed by a continuation of the membrane that lines the inner surface of the tympanum. The stapes and malleus are each of them furnished with a little muscle, the stapedeus and tensor tympani. The first of these, which is the smallest in the body, arises from a little cavern in the posterior and upper part of the cavity of the tympanum; and its tendon, after passing through a hole in the same cavern, is inserted at the back part of the head of the stapes. This muscle, by drawing the stapes obliquely upwards, assists in stretching the membrana tympani.

The tensor tympani (x), or internus mallei as it is called by some writers, arises from the cartilaginous extremity of the Eustachian tube, and is inserted into the back part of the handle of the malleus, which it serves to pull upwards, and of course helps to stretch the membrana tympani.

The labyrinth is the only part of the ear which remains to be described. It is situated in the os petrosum, and is separated from the tympanum by a partition which is every where bony, except at the two fenestræ. It is composed of three parts; and these are the vestibulum, the semicircular canals, and the cochlea.

The *vestibulum* is an irregular cavity, much smaller than the tympanum, situated nearly in the centre of the os petrosum, between the tympanum, the cochlea, and the semicircular canals. It is open on the side of the tympanum by means of the fenestra ovalis, and communicates with the upper portion of the cochlea by an oblong

(x) Some anatomists describe three muscles of the malleus; but only this one seems to deserve the name of muscle; what are called the *externus* and *obliquus mallei* seeming to be ligaments rather than muscles.

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oblong foramen, which is under the fenestra ovalis, from which it is separated only by a very thin partition.

Each of the three *semicircular canals* forms about half a circle of nearly a line in diameter, and running each in a different direction, they are distinguished into *vertical*, *oblique*, and *horizontal*. These three canals open by both their extremities into the vestibulum; but the vertical and the oblique being united together at one of their extremities, there are only five orifices to be seen in the vestibulum.

The *cochlea* is a canal which takes a spiral course, not unlike the shell of a snail. From its basis to its apex it makes two turns and a half; and is divided into two canals by a very thin lamina or septum, which is in part bony and in part membranous, in such a manner that these two canals only communicate with each other at the point. One of them opens into the vestibulum, and the other is covered by the membrane that closes the fenestra rotunda. The bony lamella which separates the two canals is exceedingly thin, and fills about two-thirds of the diameter of the canal. The rest of the septum is composed of a most delicate membrane, which lines the whole inner surface of the cochlea, and seems to form this division in the same manner as the two membranous bags of the pleura, by being applied to each other, form the mediastinum.

Every part of the labyrinth is furnished with a very delicate periosteum, and filled with a watery fluid, secreted as in other cavities. This fluid transmits to the nerves the vibrations it receives from the membrane closing the fenestra rotunda, and from the basis of the stapes, where it rests on the fenestrum ovale. When this fluid is collected in too great a quantity, or is compressed by the stapes, it is supposed to escape through two minute canals or aqueducts, lately described by Dr Cotunni *, an ingenious physician at Naples. One of these aqueducts opens into the bottom of the vestibulum, and the other into the cochlea, near the fenestra rotunda. They both pass through the os petrosum, and communicate with the cavity of the cranium where the fluid that passes through them is absorbed; and they are lined by a membrane which is supposed to be a production of the dura mater.

* *De Aquæductibus Auris Humanæ Internæ*, 8vo. 1760.

The arteries of the external ear come from the temporal and other branches of the external carotid, and its veins pass into the jugular. The internal ear receives branches of arteries from the basilary and carotids, and its veins empty themselves into the sinuses of the dura mater, and into the internal jugular.

The portio mollis of the seventh pair is distributed through the cochlea, the vestibulum, and the semicircular canals; and the portio dura sends off a branch to the tympanum, and other branches to the external ear and parts near it.

The *sense of hearing*, in producing which all the parts we have described assist, is occasioned by a certain modulation of the air collected by the funnel-like shape of the external ear, and conveyed through the meatus auditorius to the membrana tympani. That sound is propagated by means of the air, is very easily proved by ringing a bell under the receiver of an air-pump; the sound it affords being found to diminish gradually as the air becomes exhausted, till at length it ceases to be heard at all. Sound moves through the air with infinite velocity; but the degree of its motion seems to depend on the state of the air, as it constantly moves faster in a dense and dry, than it does in a moist and rarefied air.

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That the air vibrating on the membrana tympani communicates its vibration to the different parts of the labyrinth, and by means of the fluid contained in this cavity affects the auditory nerve so as to produce sound, seems to be very probable; but the situation, the minuteness, and the variety of the parts which compose the ear, do not permit much to be advanced with certainty concerning their mode of action.

Some of these parts seem to constitute the immediate organ of hearing, and these are all the parts of the vestibulum: but there are others which seem intended for the perfection of this sense, without being absolutely essential to it. It has happened, for instance, that the membrana tympani, and the little bones of the ear, have been destroyed by disease, without depriving the patient of the sense of hearing (Y).

Sound is more or less loud in proportion to the strength of the vibration; and the variety of sounds seems to depend on the difference of this vibration; for the more quick and frequent it is, the more acute will be the sound, and *vice versa*.

Before we conclude this article, it will be right to explain certain phenomena, which will be found to have a relation to the organ of hearing.

Every body has, in consequence of particular sounds, occasionally felt that disagreeable sensation which is usually called *setting the teeth on edge*: and the cause of this sensation may be traced to the communication which the portio dura of the auditory nerve has with the branches of the fifth pair that are distributed to the teeth, being probably occasioned by the violent tremor produced in the membrana tympani by these very acute sounds. Upon the same principle we may explain the strong idea of sound which a person has who holds a vibrating string between his teeth.

The humming which is sometimes perceived in the ear, without any exterior cause, may be occasioned either by an increased action of the arteries in the ears, or by convulsive contractions of the muscles of the malleus and stapes, affecting the auditory nerve in such a manner as to produce the idea of sound. An ingenious philosophical writer * has lately discovered, that there are sounds liable to be excited in the ear by irritation, and without any assistance from the vibrations of the air.

* *Elliot's Philosophical Observations on the Senses of Vision and Hearing*, 8vo.

SECT.

(Y) This observation has led to a supposition, that a perforation of this membrane may in some cases of deafness be useful; and Mr Cheselden relates, that some years ago, a malefactor was pardoned, on condition that he should submit to this operation; but the public clamour raised against it was so great, that it was thought right not to perform it.

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Sect. V. *Of Vision.*

See *Optics*, n. 147.

The eyes, which constitute the organ of vision, are situated in two bony cavities named *orbits*, where they are surrounded by several parts, which are either intended to protect them from external injury, or to assist in their motion.

The globe of the eye is immediately covered by two eyelids or palpebræ, which are composed of muscular fibres, covered by the common integuments, and lined by a very fine and smooth membrane, which is from thence extended over part of the globe of the eye, and is called *tunica conjunctiva*. Each eyelid is cartilaginous at its edge; and this border, which is called *tarsus*, is furnished with a row of hairs named *cilia* or *eyelashes*.

The cilia serve to protect the eye from insects and minute bodies floating in the air, and likewise to moderate the action of the rays of light in their passage to the retina. At the roots of these hairs there are sebaceous follicles, first noticed by Meibomius, which discharge a glutinous liniment. Sometimes the fluid they secrete has too much viscidity, and the eyelids become glued to each other.

The upper border of the orbit is covered by the eyebrows or supercilia, which by means of their two muscles are capable of being brought towards each other, or of being carried upwards. They have been considered as serving to protect the eyes, but they are probably intended more for ornament than utility (z).

The orbits, in which the eyes are placed, are furnished with a good deal of fat, which affords a soft bed on which the eye performs its several motions. The inner angle of each orbit, or that part of it which is near the nose, is called *canthus major*, or the *great angle;* and the outer angle, which is on the opposite side of the eye, is the *canthus minor*, or *little angle*.

The little reddish body which we observe in the great angle of the eyelids, and which is called *caruncula lachrymalis*, is supposed to be of a glandular structure, and, like the follicles of the eyelids, to secrete an oily humour. But its structure and use do not seem to have been hitherto accurately determined. The surface of the eye is constantly moistened by a very fine limpid fluid called the *tears*, which is chiefly, and perhaps wholly, derived from a large gland of the conglomerate kind, situated in a small depression of the os frontis near the outer angle of the eye. Its excretory ducts pierce the tunica conjunctiva just above the cartilaginous borders of the upper eyelids. When the tears were supposed to be secreted by the caruncle, this gland was called *glandula innominata;* but now that its structure and uses are ascertained, it very properly has the name of *glandula lachrymalis*. The tears poured out of the ducts of this gland are, in a natural and healthy state, incessantly spread over the surface of the eye, to keep it clear and transparent by means of the eyelids, and as constantly pass out at the opposite corner of the eye or inner angle, through two minute orifices, the puncta lachrymalia (A); being determined into these little openings by a reduplication of the tunica conjunctiva, shaped like a crescent, the two points of which answer to the puncta. This reduplication is named *membrana* or *valvula semilunaris*. Each of these puncta is the beginning of a small excretory tube, through which the tears pass into a little pouch or reservoir, the sacculus lachrymalis, which lies in an excavation formed partly by the nasal process of the os maxillare superius, and partly by the os unguis. The lower part of this sac forms a duct called the *ductus ad nares*, which is continued through a bony channel, and opens into the nose, through which the tears are occasionally discharged (B).

The motions of the eye are performed by six muscles; four of which are straight and two oblique. The straight muscles are distinguished by the names of *elevator*, *depressor*, *adductor*, and *abductor*, from their several uses in elevating and depressing the eye, drawing it towards the nose, or carrying it from the nose towards the temple. All these four muscles arise from the bottom of the orbit, and are inserted by flat tendons into the globe of the eye. The oblique muscles are intended for the more compound motions of the eye. The first of these muscles, the obliquus superior, does not, like the other four muscles we have described, arise from the bottom of the orbit, but from the edge of the foramen that transmits the optic nerve, which separates the origin of this muscle from that of the others. From this beginning it passes in a straight line towards a very small cartilaginous ring, the situation of which is marked in the skeleton by a little hollow in the internal orbitar processes of the os frontis. The tendon of the muscle, after passing through this ring, is inserted into the upper part of the globe of the eye, which it serves to draw forwards, at the same time turning the pupil downwards.

The obliquus inferior arises from the edge of the orbit, under the opening of the ductus lachrymalis; and is inserted somewhat posteriorly into the outer side of the globe, serving to draw the eye forwards and turn the pupil upwards. When either of these two muscles act separately, the eye is moved on its axis; but when they act together, it is compressed both above and below. The eye itself, which is now to be described, with its tunics, humours, and component parts, is nearly of a spherical figure. Of its tunics, the conjunctiva has been already described as a partial covering, reflected from the inner surface of the eyelids over the anterior portion of the eye. What has been named

(z) It is observable, that the eyebrows are peculiar to the human species.

(A) It sometimes happens, that this very pellucid fluid, which moistens the eye, being poured out through the excretory ducts of the lachrymal gland faster than it can be carried off through the puncta, trickles down the cheek, and is then strictly and properly called *tears*.

(B) When the ductus ad nares becomes obstructed in consequence of disease, the tears are no longer able to pass into the nostrils; the sacculus lachrymalis becomes distended; and inflammation, and sometimes ulceration, taking place, constitute the disease called *fistula lachrymalis*.

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named *albuginea* cannot properly be considered as a coat of the eye, being in fact nothing more than the tendons of the straight muscles spread over some parts of the sclerotica.

The immediate tunics of the eye, which are to be demonstrated, when its partial coverings, and all the other parts with which it is surrounded, are removed, are the sclerotica, cornea, choroides, and retina.

The *sclerotica*, which is the exterior coat, is everywhere white and opaque, and is joined at its anterior edge to another, which has more convexity than any other part of the globe, and being exceedingly transparent is called *cornea* (c). These two parts are perfectly different in their structure; so that some anatomists suppose them to be as distinct from each other as the glass of a watch is from the case into which it is fixed. The sclerotica is of a compact fibrous structure; the cornea, on the other hand, is composed of a great number of laminæ united by cellular membrane. By macerating them in boiling water, they do not separate from each other, as some writers have asserted; but the cornea soon softens, and becomes of a glutinous consistence.

The ancients supposed the sclerotica to be a continuation of the dura mater. Morgagni and some other modern writers are of the same opinion; but this point is disputed by Winslow, Haller, Zinn, and others. The truth seems to be, that the sclerotica, though not a production of the dura mater, adheres intimately to that membrane.

The *choroides* is so called because it is furnished with a great number of vessels. It has likewise been named *uvea*, on account of its resemblance to a grape. Many modern anatomical writers have considered it as a production of the pia mater. This was likewise the opinion of the ancients; but the strength and thickness of the choroides, when compared with the delicate structure of the pia mater, are sufficient proofs of their being two distinct membranes.

The choroides has of late generally been described as consisting of two laminæ; the innermost of which has been named after Ruysch, who first described it. It is certain, however, that Ruysch's distinction is ill founded, at least with respect to the human eye, in which we are unable to demonstrate any such structure, although the tunica choroides of sheep and some other quadrupeds may easily be separated into two layers.

The choroides adheres intimately to the sclerotica round the edge of the cornea; and at the place of this union we may observe a little whitish areola, named *ligamentum ciliare*, though it is not of a ligamentous nature.

They who suppose the choroides to be composed of two laminæ, describe the external one as terminating in the ligamentum ciliare, and the external one as extending farther to form the iris, which is the circle we are able to distinguish through the cornea; but this part is of a very different structure from the choroides; so that some late writers have perhaps not improperly considered the iris as a distinct membrane. It derives its name from the variety of its colours, and is perforated in its middle. This perforation, which is called the *pupil* or *sight* of the eye, is closed in the fœtus by a very thin vascular membrane. This membrana pupillaris commonly disappears about the seventh month.

On the under sides of the iris, we observe many minute fibres, called *ciliary processes*, which pass in radii or parallel lines from the circumference to the centre. The contraction and dilatation of the pupil are supposed to depend on the action of these processes. Some have considered them as muscular, but they are not of an irritable nature; others have supposed them to be filaments of nerves; but their real structure has never yet been clearly ascertained.

Besides these ciliary processes, anatomists usually speak of the circular fibres of the iris, but no such seem to exist.

The posterior surface of the iris, the ciliary processes, and part of the tunica choroides, are covered with a black mucus for the purposes of accurate and distinct vision; but the manner in which it is secreted has not been determined.

Immediately under the tunica choroides we find the third and inner coat, called the *retina*, which seems to be merely an expansion of the pulpy substance of the optic nerve, extending to the borders of the crystalline humour.

The greatest part of the globe of the eye, within these several tunics, is filled by a very transparent and gelatinous humour of considerable consistence, which from its supposed resemblance to fused glass, is called the *vitreous humour*. It is invested by a very fine and delicate membrane, called *tunica vitrea*, and sometimes *arachnoides*.—It is supposed to be composed of two laminæ; one of which dips into its substance, and by dividing the humour into cells adds to its firmness. The fore part of the vitreous humour is a little hollowed, to receive a very white and transparent substance of a firm texture, and of a lenticular and somewhat convex shape, named the *crystalline humour*. It is included in a capsula, which seems to be formed by a separation of the two laminæ of the tunica vitrea.

The fore part of the eye is filled by a very thin and transparent fluid, named the *aqueous humour*, which occupies all the space between the crystalline and the prominent cornea.—The part of the choroides which is called the *iris*, and which comes forward to form the pupil, appears to be suspended as it were in this humour, and has occasioned this portion of the eye to be distinguished into two parts. One of these, which is the little space between the anterior surface of the crystalline and the iris, is called the *posterior chamber*; and the other, which is the space between the iris and the cornea, is called the *anterior chamber* of the eye (d).

Both

(c) Some writers, who have given the name of *cornea* to all this outer coat, have named what is here and most commonly called *sclerotica*, *cornea opaca*; and its anterior and transparent portion, *cornea lucida*.

(d) We are aware that some anatomists, particularly Lieutaud, are of opinion, that the iris is everywhere in close contact with the crystalline, and that it is of course right to speak only of one chamber of the eye; but as this

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Both these spaces are completely filled with the aqueous humour (E).

The eye receives its arteries from the internal carotid, through the foramina optica; and its veins pass through the foramina lacera, and empty themselves into the lateral sinuses. Some of the ramifications of these vessels appear on the inner surface of the iris, where they are seen to make very minute convolutions, which are sufficiently remarkable to be distinguished by the name of *circulus arteriosus*, though perhaps improperly, as they are chiefly branches of veins.

The optic nerve passes in at the posterior part of the eye, in a considerable trunk, to be expanded for the purposes of vision, of which it is now universally supposed to be the immediate seat. But Messrs Mariotte and Mery contended, that the choroides is the seat of this sense; and the ancients supposed the crystalline to be so. Besides the optic, the eye receives branches from the third, fourth, fifth, and sixth pair of nerves.

The humours of the eye, together with the cornea, are calculated to refract and converge the rays of light in such a manner as to form at the bottom of the eye a distinct image of the object we look at; and the point where the rays meet is called the *focus* of the eye. On the retina, as in a *camera obscura*, the object is painted in an inverted position; and it is only by habit that we are enabled to judge of its true situation, and likewise of its distance and magnitude. To a young gentleman who was born blind, and who was couched by Mr Cheselden, every object (as he expressed himself) seemed to touch his eyes, as what he felt did his skin; and he thought no objects so agreeable as those which were smooth and regular, although for some time he could form no judgment of their shape, or guess what it was in any of them that was pleasing to him.

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In order to paint objects distinctly on the retina, the cornea is required to have such a degree of convexity, that the rays of light may be collected at a certain point, so as to terminate exactly on the retina.—If the cornea is too prominent, the rays, by diverging too soon, will be united before they reach the retina, as is the case with near-sighted people or *myopes*; and, on the contrary, if it is not sufficiently convex, the rays will not be perfectly united when they reach the back part of the eye; and this happens to long-sighted people or *presbi*, being found constantly to take place as we approach to old age, when the eye gradually flattens (F). These defects are to be supplied by means of glasses. He who has too prominent an eye, will find his vision improved by means of a concave glass; and upon the same principles, a convex glass will be found useful to a person whose eye is naturally too flat.

EXPLANATION OF PLATE XXXII.

FIG. 1. Shows the Lachrymal Canals, after the Common Teguments and Bones have been cut away.

a, The lachrymal gland. b, The two puncta lachrymalia, from which the two lachrymal canals proceed to c, the lachrymal sac. d, The large lachrymal duct. e, Its opening into the nose. f, The caruncula lachrymalis. g, The eyeball.

FIG. 2. An Interior View of the Coats and Humours of the Eye.

aaaa, The tunica sclerotica cut in four angles, and turned back. bbbb, The tunica choroides adhering to the inside of the sclerotica, and the ciliary vessels are seen passing over—cc, The retina, which covers the vitreous humour. dd, The ciliary processes, which were continued from the choroid coat. ee, The iris. f, The pupil.

FIG. 3. Shows the Optic Nerves, and Muscles of the Eye.

aa, The two optic nerves before they meet. b, The two optic nerves conjoined. c, The right optic nerve. d, Musculus attollens palpebræ superioris. e, Attollens oculi. f, Abductor. gg, Obliquus superior, or trochlearis. h, Adductor. i, The eyeball.

FIG. 4. Shows the Eyeball with its Muscles.

a, The optic nerve. b, Musculus trochlearis. c, Part of the os frontis, to which the trochlea or pulley is fixed, through which,—d, The tendons of the trochlearis pass. e, Attollens oculi. f, Adductor oculi. g, Abductor oculi. h, Obliquus inferior. i, Part of the superior maxillary bone to which it is fixed. k, The eyeball.

FIG. 5. Répresents the Nerves and Muscles of the Right Eye, after part of the Bones of the Orbit have been cut away.

A, The eyeball. B, The lachrymal gland. C, Musculus abductor oculi. D, Attollens. E, Levator palpebræ superioris. F, Depressor oculi. G, Adductor. H, Obliquus superior, with its pulley. I, Its insertion into the sclerotic coat. K, Part of the obliquus inferior. L, The anterior part of the os frontis cut.

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this does not appear to be the case, the situation of the iris and the two chambers of the eye are here described in the usual way.

(E) When the crystalline becomes opaque, so as to prevent the passage of the rays of light to the retina, it constitutes what is called a *cataract;* and the operation of couching consists in removing the diseased crystalline from its bed in the vitreous humour. In this operation the cornea is perforated, and the aqueous humour escapes out of the eye, but it is constantly renewed again in a very short time. The manner, however, in which it is secreted has not yet been determined.

(F) Upon this principle, they, who in their youth are near-sighted, may expect to see better as they advance in life, as their eyes gradually become more flat.

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cut. M, The crista galli of the ethmoid bone. N, The posterior part of the sphenoid bone. O, Transverse spinous process of the sphenoid bone. P, The carotid artery, denuded where it passes through the bones. Q, The carotid artery within the cranium. R, The ocular artery.

NERVES.—aa, The optic nerve. b, The third pair.—c, Its joining with a branch of the first branch of the fifth pair, to form l, the lenticular ganglion.—which sends off the ciliary nerves, d. ee, The fourth pair. f, The trunk of the fifth pair. g, The first branch of the fifth pair, named ophthalmic. h, The frontal branch of it. i, Its ciliary branches, along with which the nasal twig is sent to the nose. k, Its branch to the lachrymal gland. l, The lenticular ganglion. m, The second branch of the fifth pair, named superior maxillary. n, The third branch of the fifth pair, named inferior maxillary. o, The sixth pair of nerves,—which sends off, p, the beginning of the great sympathetic. q, The remainder of the sixth pair, spent on c, the abductor oculi.

FIG. 6. Represents the Head of a Youth, where the upper part of the Cranium is sawed off,—to show the Upper Part of the Brain, covered with the Pia Mater, the vessels of which are minutely filled with wax.

AA, The cut edges of the upper part of the cranium. B, The two tables and intermediate diplöe. BB, The two hemispheres of the cerebrum. CC, The incisure made by the falx. D, Part of the tentorium cerebello super expansum. E, Part of the falx, which is fixed to the crista galli.

FIG. 7. Represents the parts of the External Ear, with the Parotid Gland and its Duct.

aa, The helix. b, The antihelix. c, The antitragus. d, The tragus. e, The lobe of the ear. f, The cavitas innominata, g, The scapha. h, The concha. ii, The parotid gland. k, A lymphatic gland, which is often found before the tragus. l, The duct of the parotid gland. m, Its opening into the mouth.

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FIG. 8. A View of the Posterior Part of the External Ear, Meatus Auditorius, Tympanum, with its Small Bones, and Eustachian tube of the Right Side.

a, The back part of the meatus, with the small ceruminous glands. b, The incus. c, Malleus. d, The chorda tympani. e, Membrana tympani. f, The Eustachian tube. g, Its mouth from the fauces.

FIG. 9. Represents the Anterior Part of the Right External ear, the Cavity of the Tympanum—its Small Bones, Cochlea, and Semicircular Canals.

a, The malleus. b, Incus with its long leg, resting upon the stapes. c, Membrana tympani. d, e, The Eustachian tube, covered by part of—ff, the musculus circumflexus palati. 1, 2, 3, The three semicircular canals. 4, The vestible. 5, The cochlea. 6, The portio mollis of the seventh pair of nerves.

FIG. 10. Shows the Muscles which compose the fleshy substance of the Tongue.

aa, The tip of the tongue, with some of the papillæ minimæ. b, The root of the tongue. c, Part of the membrane of the tongue, which covered the epiglottis. dd, Part of the musculus hyo-glossus. e, The lingualis. f, Genio-glossus. gg, Part of the stylo-glossus.

PART II.

COMPARATIVE ANATOMY.

HAVING fully examined and described the structure of man, we are now to take a view of that of the inferior animals, and to consider in what the rest of animated nature differs from man.

145 Comparative anatomy was formerly, as we have shewn in the history, much more cultivated than that of the human body; but when the prejudices of bigotry and ignorance subsided, and allowed human dissection to be more freely exercised, the study of this species of anatomy was almost entirely neglected. Of late, however, it has attracted the attention of several of the most eminent naturalists and anatomists, particularly of Monro, Hunter, Vicq d'Azyr, and Cuvier, from whose labours it has received considerable improvement, and has attained a degree of accuracy and an extent of application, which render it an object of inquiry highly interesting to the philosopher and the physician.

146 Many advantages are derived from the study of comparative anatomy. First, It furnishes us with a sufficient knowledge of the several parts of animals, to prevent our being imposed on by those authors who have described and delineated many organs from brutes as belonging to the human body. That this is of importance, is evinced by examining the works of some of the earliest and greatest masters of anatomy, who, for want of human subjects, have often taken their descriptions from other animals; Galen is notoriously faulty in this respect, and the great Vesalius, though he justly reproved Galen, has fallen into the same error, as is plain from his delineations of the kidneys, the uterus, the muscles of the eye, and other parts. Nor is antiquity only chargeable with this, since in Willis's *Anatomia Cerebri* (the plates of which were revised by that accurate anatomist Dr Lower) there are several of the figures taken from different brutes, especially from the dog, besides what he acknowledges for such.

147 Secondly, It helps us to understand several passages in the ancient writers on medicine, especially Hippocrates and Galen, who have taken many of their descriptions from brutes, and reasoned from them.

Thirdly, It affords one of the best assistants and most certain guides in the study of natural history; and the best

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Fig. 3.

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Fig. 6.

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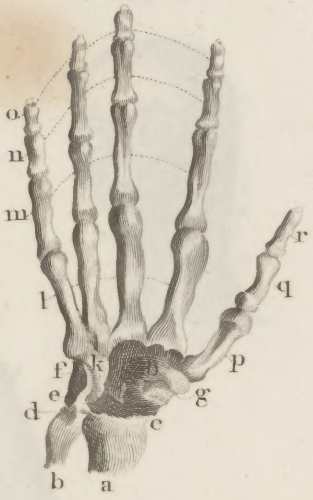

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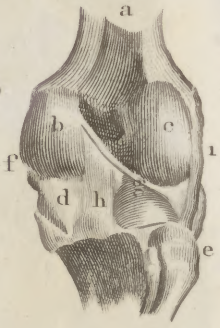

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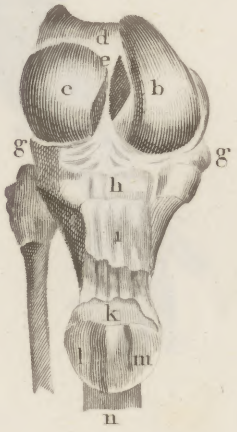

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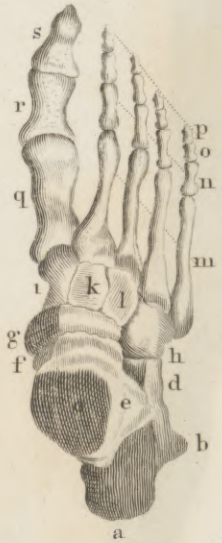

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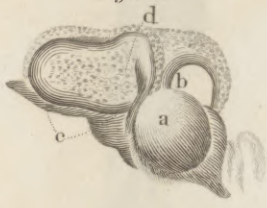

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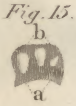

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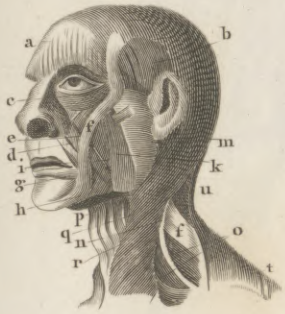

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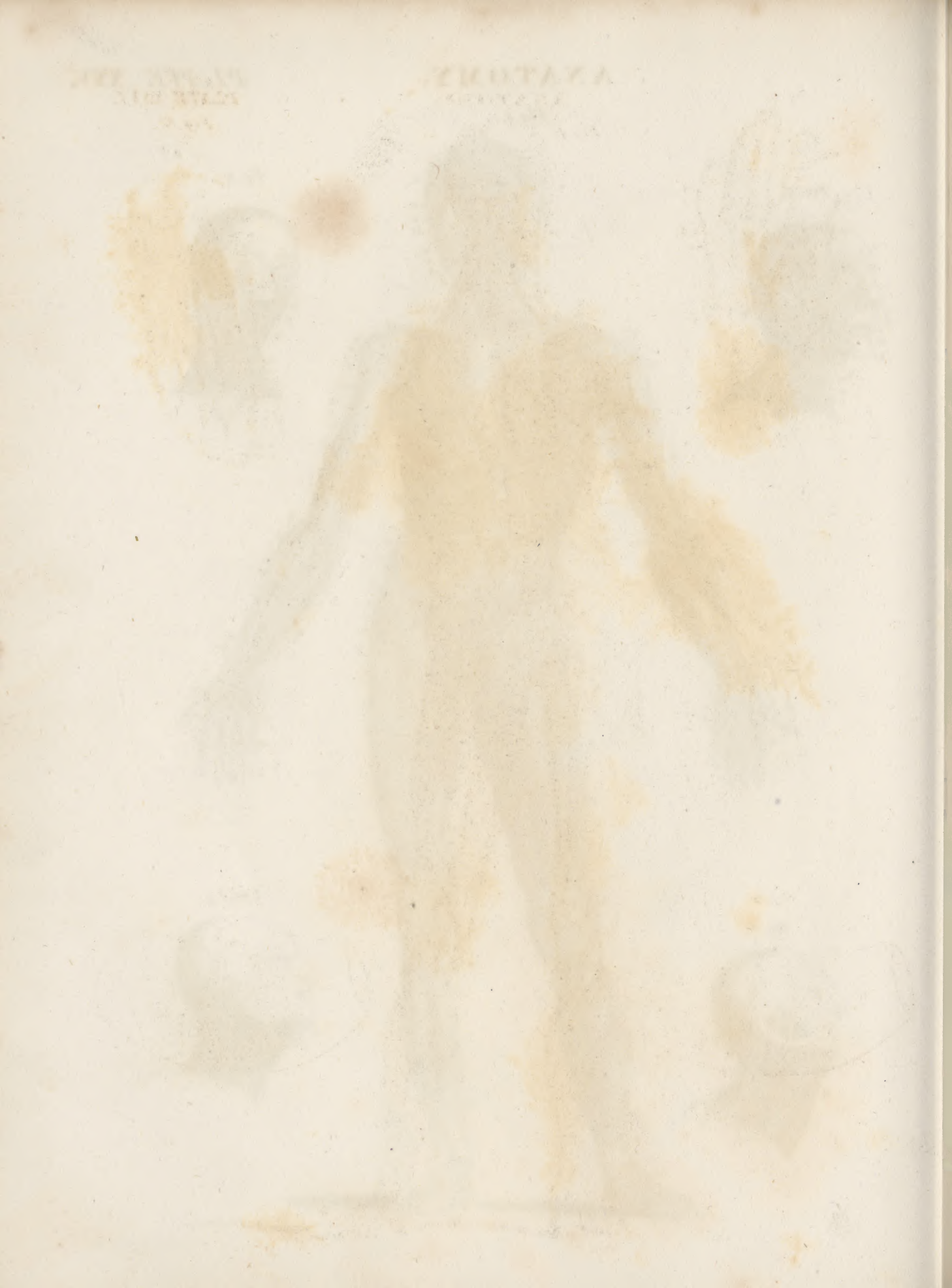

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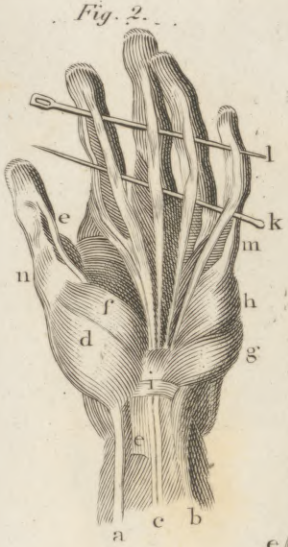

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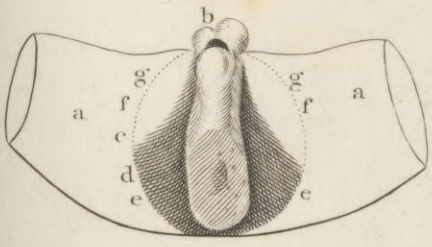

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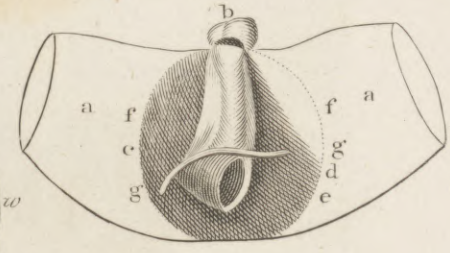

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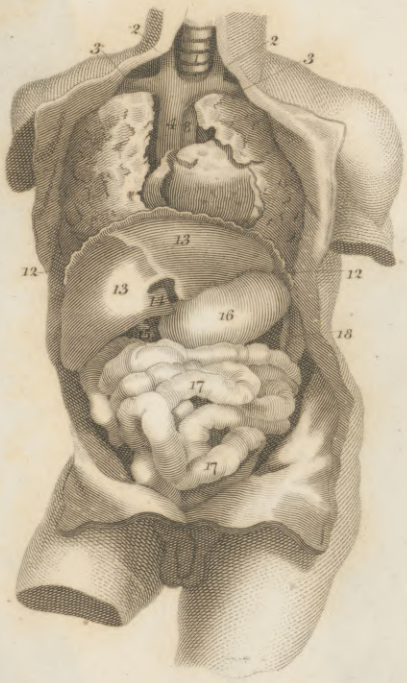

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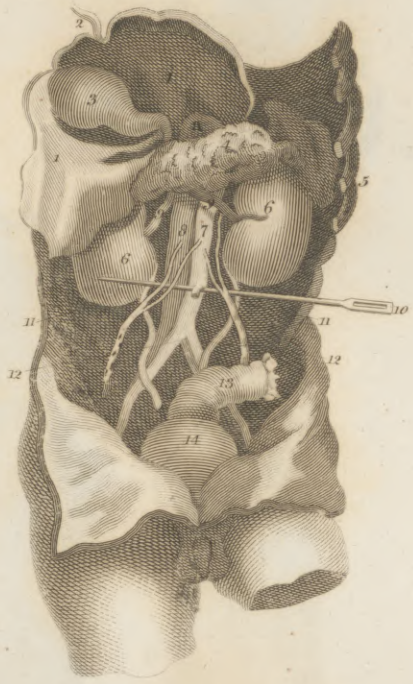

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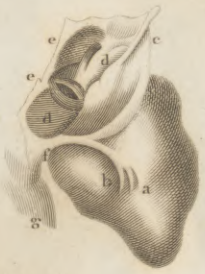

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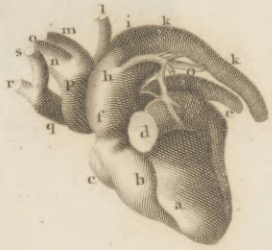

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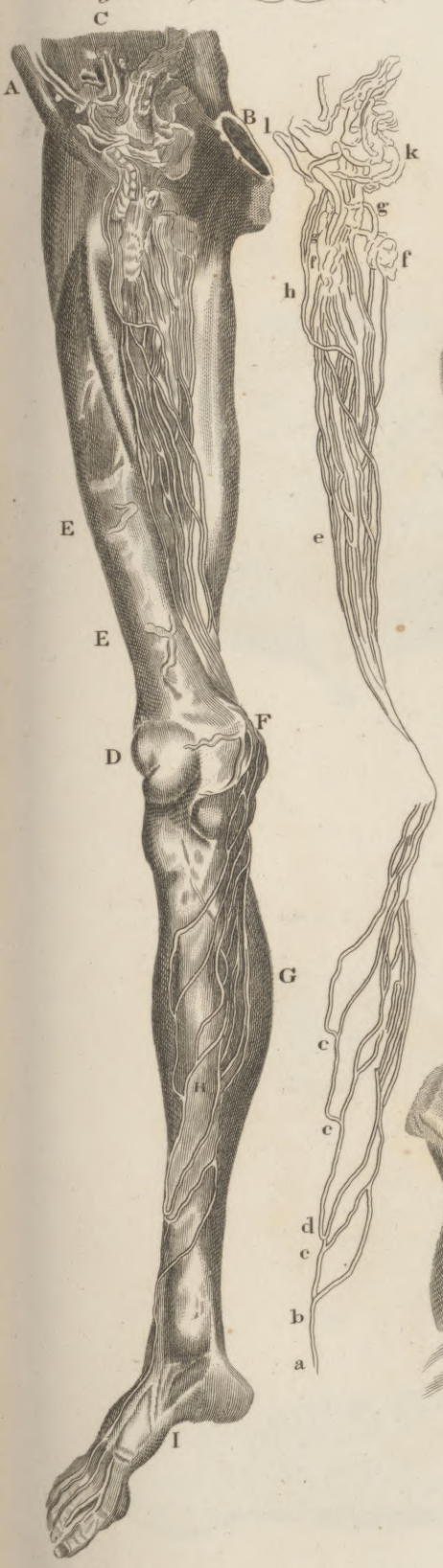

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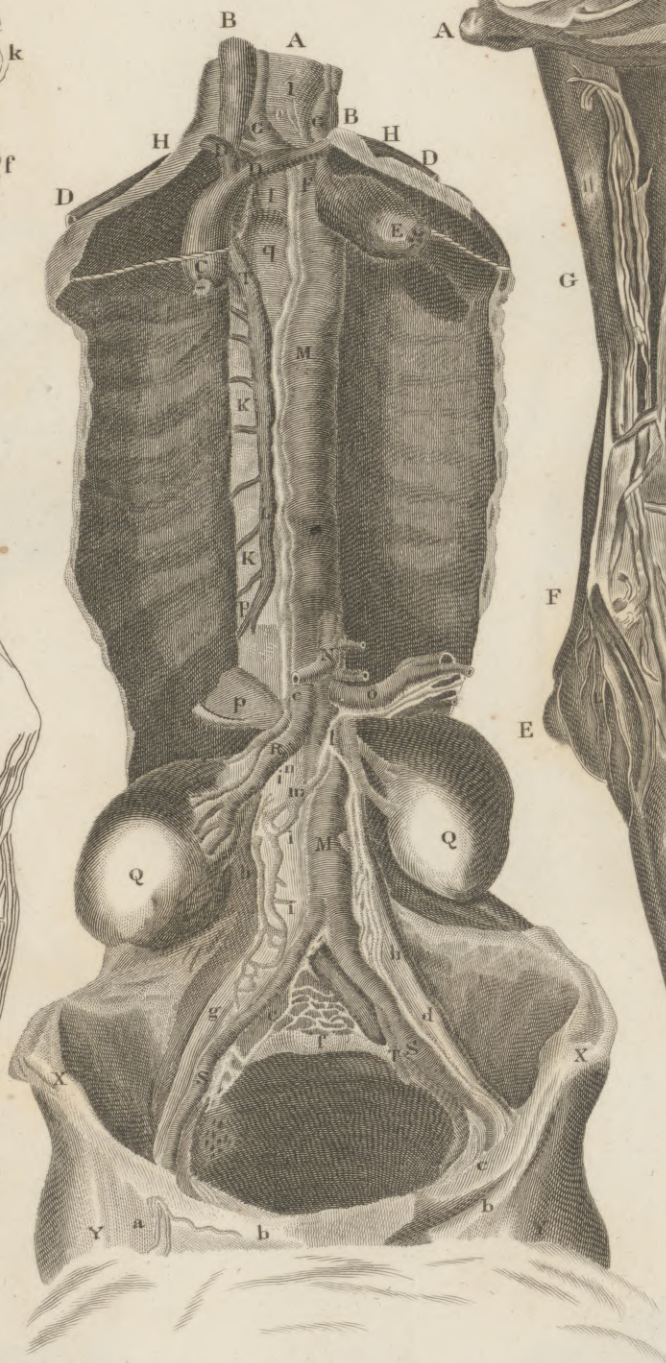

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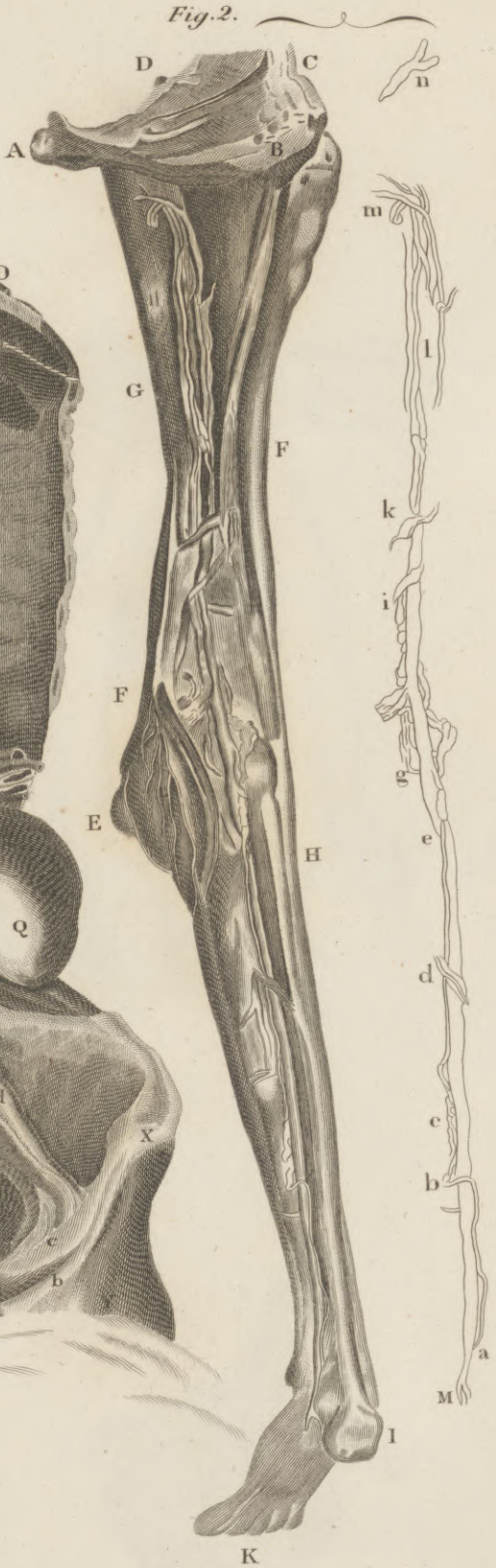

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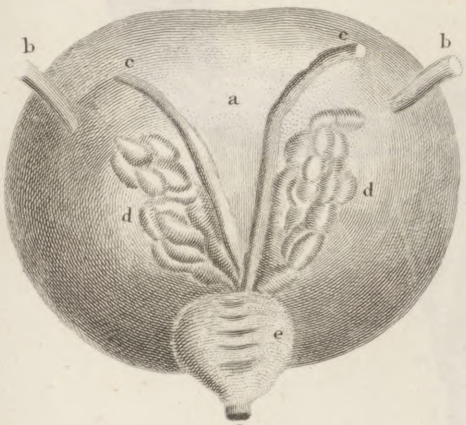

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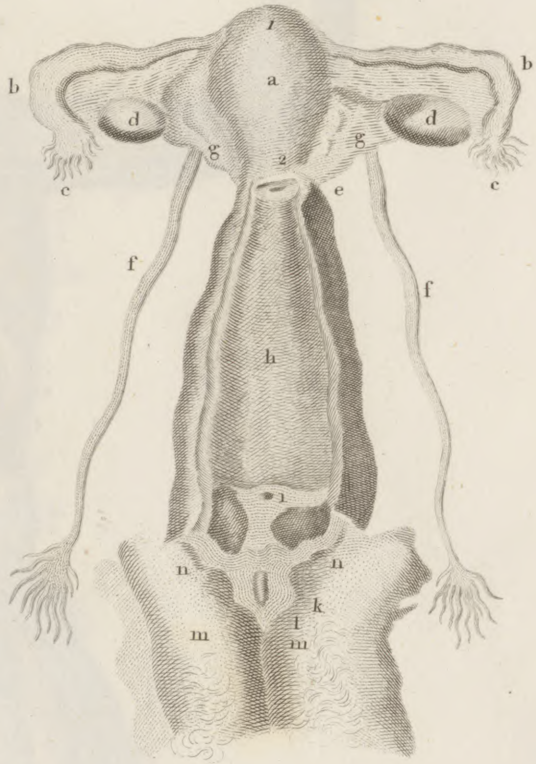

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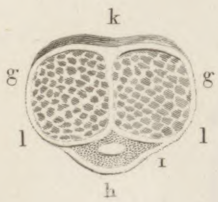

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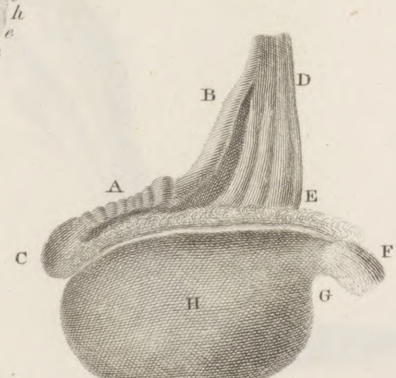

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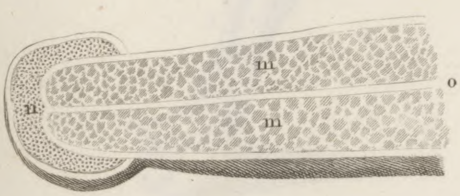

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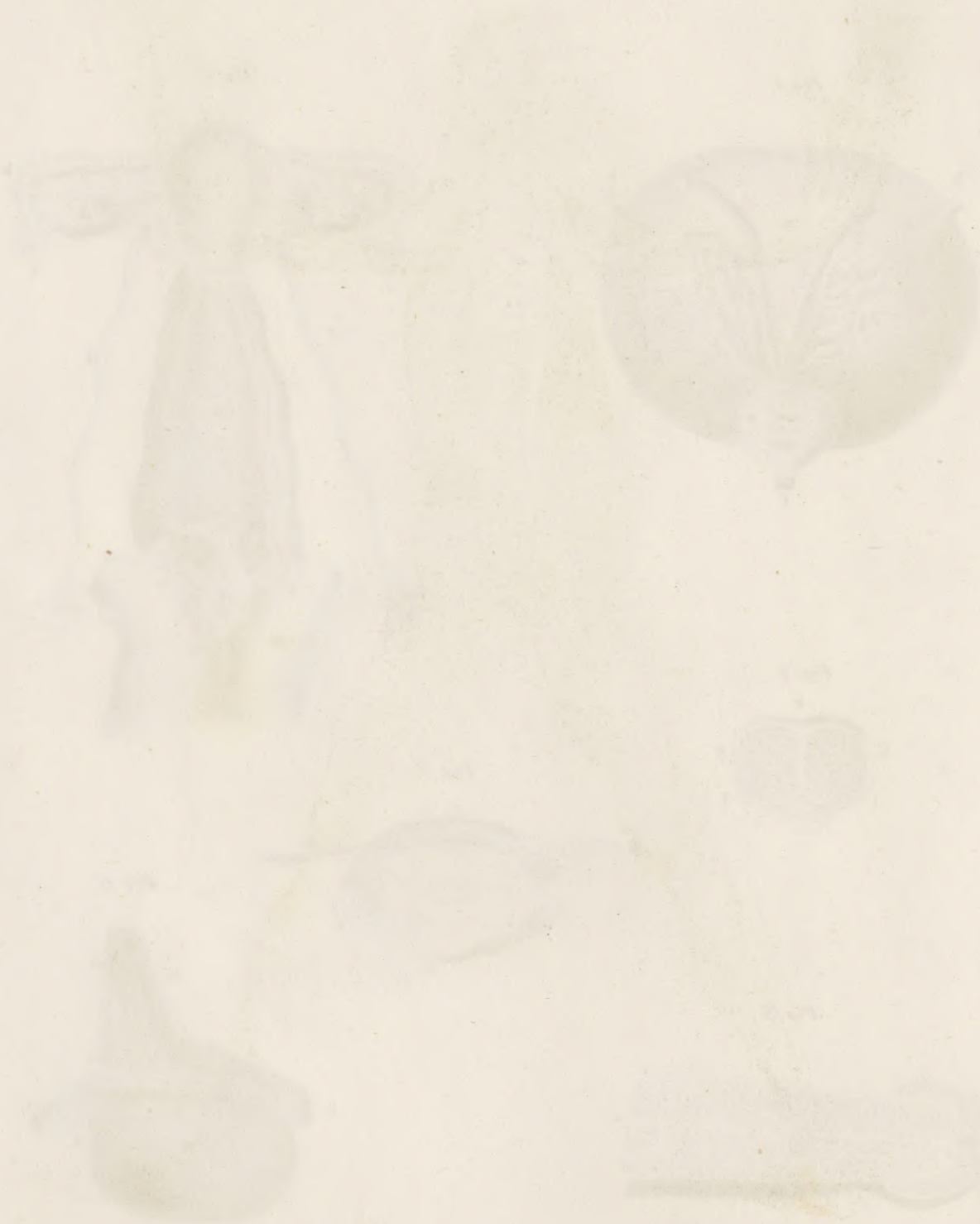

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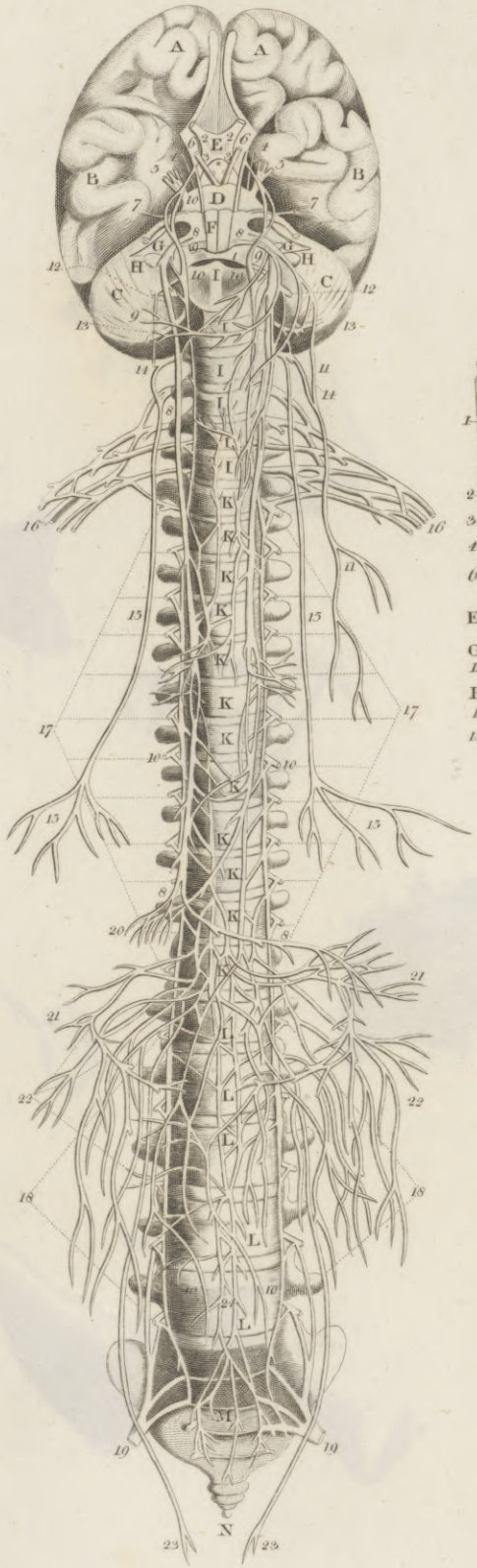

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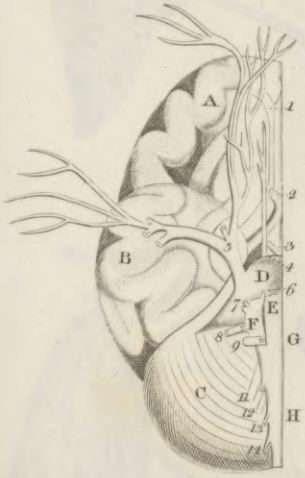

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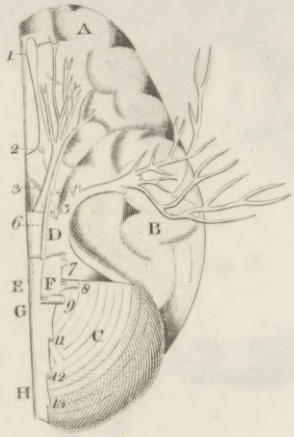

E. Mitchell sculp.

Fig. 3.

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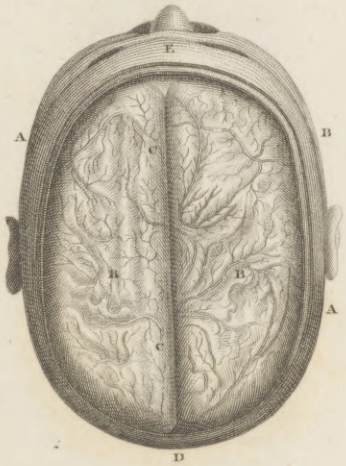


Fig. 2.

Fig. 7.

Fig. 4.

Fig. 5.

Fig. 10.

Fig. 9.

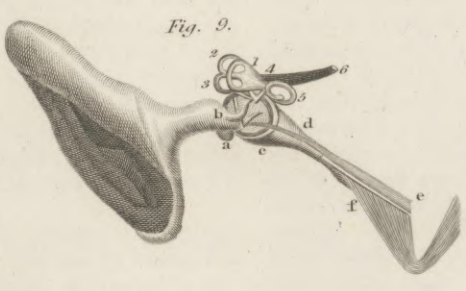
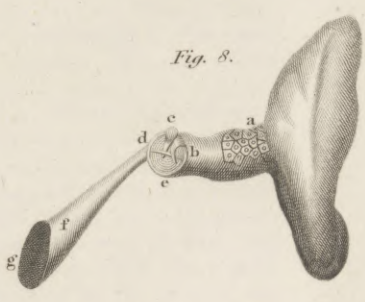


Fig. 8.



A.Wilson sculp.

General variations, &c.

best and most scientific methods of arranging the several classes of organized beings, are founded on their anatomical structure.

Fourthly, From comparing the organization of man with that of other animals, we derive considerable aid in our physiological researches, as many functions of the animal economy can be but imperfectly understood, without comparing in various classes the organs which are subservient to them. From a want of this comparative view, there have arisen among anatomists many disputes, which a more enlarged acquaintance with this subject has decided.

To these advantages of comparative anatomy, we may add, that it may be practised at all times and in all places; and this enables those, who from prejudice or delicacy, are withheld from the study of anatomy on the human subject, to acquire at an easy rate a knowledge of this useful science, sufficient for the usual purposes of a liberal education.

General variations, &c.

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In the view which we are here to take of comparative anatomy, it is by no means our intention to enter into a particular detail of the structure of the several species, or even genera of animals. We propose, however, to consider pretty fully the diversities of organization exhibited by the several classes, and to exemplify these by some well-known individuals of each. We shall thus, we trust, render the subject interesting to the general reader, for whom this article is calculated, rather than for professional men; and enable the naturalist, the veterinary student, the sportsman, and the artist, to profit by our labours. But before entering on the particular comparative view of the several classes, we think it proper to premise a few general observations on the variations which appear in the organizations and functions of animals, on the relations which take place among these variations, and the arrangement of animals founded on them.

CHAP. I. GENERAL VARIATIONS IN THE ORGANIZATION AND FUNCTIONS.

149 THE most obvious and simple function of an animal is motion, and we therefore begin with the organs by which this is produced. All animals are furnished with muscles, or muscular fibres, but a great proportion of them have nothing analogous to bone. In those which have bones, there are two striking distinctions; in one division they are situated within the muscles, forming an internal articulated skeleton; in the other they form an external scaly or shelly covering, within which the muscles are included.

Those animals which are furnished with articulated skeletons, and constituting what is called a *vertebral column*, are denominated vertebral animals. Of these there are four orders, the mammalia, birds, fishes, and reptiles. All other animals, comprehending the mollusca, insects, worms, and zoophytes, may be called *invertebral animals*.

150 The general differences in the organs of sensation are much less simple; they may be considered as respecting the internal nervous system, and the organs of the external senses. With respect to the former, some animals appear to have no nervous system, as the zoophytes; another class has all of this internal system except the brain, situated in the same cavity with the viscera, as the mollusca, insects, and some of the articulated worms; the third and most complete class, have the common origin of the nerves situated in a cavity, distinct from that of the viscera, within the vertebral column; this comprehends all the vertebral animals. The two first classes have the ganglia or nervous knots, (Vid. GANGLIA, *Anatomy*) forming protuberances in the general nervous cord, as is the case with insects and some articulated worms; or have them only within the larger cavities, as the mollusca: the last division have them either on the sides of the cord, or within the cavities, or both.

151 The external senses differ in number and energy. All the vertebral animals agree with man in having five senses. Of the invertebral animals, all appear to possess smell, taste, and feeling; most of the mollusca and insects, as far as is yet known, are without hearing; and the mollusca who want heads, the larvæ of some insects, many of the articulated worms, and all the zoophytes, are not possessed of sight. The energy of the senses varies very considerably in different classes, and in different individuals; some, as most of the dogs, the vulture, and most of the sarcophaga, or animals which prey on carrion, have the sense of smelling extremely acute, and in these the membrane lining the nasal cavities appears to be proportionally more extended than in others. Some excel in the sense of feeling, particularly man and the monkey tribe, in whom the extremities are most divided, most delicate, and furnished with the most minute ramifications of the superficial nerves. Man, and those animals who, like man, have the power of moving the head in all directions, possess a great extent of vision, both as to circuit and distance; and these have two eyes sunk and fixed within the head: others, as most insects, which are to see minute objects near at hand, have either several eyes, or at least eyes containing several lenses. But the differences which appear in these organs will be fully noticed in comparing the several classes.

152 The organs of digestion furnish us with two great distinctions. Some animals, as most of the zoophytes, have only one opening to the alimentary canal, which serves both for the taking in of aliment, and the rejection of the excrement; in all others this canal has two distinct openings, at a greater or less distance from each other, according as the convolutions of this canal are more or less numerous. Another difference which has a considerable influence on the nature of the aliment, adapted to the several species is, that some animals have the mouth furnished with teeth or other hard bodies for the purpose of breaking down solids, and that others want these organs. In the latter case, the animal, if its mouth be large, can swallow its food entire, or if its mouth be in the form of a tube, can only suck in fluid substances. The nature of the bodies which the animal is to masticate, is also influenced by the form of the teeth: thus some animals have only teeth formed for cutting and tearing, and therefore can only subsist on flesh, or are carnivorous; others have chiefly grinding teeth, calculated only for bruising herbs and grain, and

General variations, &c.

and these are herbivorous; a third class have both, and are omnivorous. The difference of aliment is attended with a correspondent difference in the structure of the alimentary canal, as to its greater or smaller length, the number of stomachs, &c.

153 The chyle formed from the aliment by the action of these organs, is carried to its place of destination in one of two ways; it either exudes through the sides of the alimentary canal, or it is absorbed by particular vessels, by which it is conveyed into the general circulation. The former takes place in the zoophytes, and according to Cuvier in most insects, which appear to possess no proper circulating vessels. The latter is the case in the mollusca, and in all the vertebral animals; but these have the blood red and the chyle white, while those have all the fluids of the same whitish colour. Of the vertebral animals too, the chyle is opake in some, as the mammalia, and transparent like the lymph in others, as in birds, fishes, and reptiles.

154 In the organs of circulation several very important distinctions take place.

Some appear to have no circulating system, as insects and zoophytes. In those which possess circulating organs, some have a double circulation, or in them all the venous blood passes through the lungs, before it again enter the arterial system, as man, mammalia, birds, fishes, and many of the mollusca; others have only a single circulation, or in these a great part of the venous blood re-enters the arterial system, without passing through the lungs, as in reptiles. The structure and position of the heart is different in various classes. In some it is double, one part serving for circulating the blood through the lungs, and the other for distributing it through the rest of the body; and in this case the parts may be united, as in man, the mammalia, and birds, or they may be distinct, as in the cuttle-fish. In others the heart is single, or consists of one ventricle, which may be situated either at the base of the general artery, as in snails and some other mollusca, or at the base of the pulmonary artery, as in fishes.

155 The organs of respiration display striking varieties, first, according to the element which is to serve as the medium; if this be air, it is received into the interior of the respiratory organs; if it be water, it merely glides over the surface of lamellæ, which have been named branchiæ, as in fishes and many of the mollusca, or of fringes, as in some worms. The air may be admitted into the body by one opening or by many. The former is the case with all animals who have proper lungs; the tube which receives the air is subdivided into numerous branches terminating in cells, which are reunited, usually, into two masses, which the animal can at pleasure compress or dilate. In insects, which respire through many openings, the air vessels are most minutely ramified, so as to admit the air to every part of the body, and these animals are said to respire by tracheæ. Lastly, The zoophytes, with the exception of the echinodermata, appear to have no respiratory organs.

156 There are only two general differences in the organs of voice, and these respect the position of the glottis, where the sound is formed. In birds, this is situated at the base of the windpipe, where this divides into two branches going to the lungs; in quadrupeds and reptiles, it is placed at the commencement of the windpipe, at the root of the tongue. Only these three classes have a glottis; in others sounds are produced by various mechanical means, by which the external air, or that contained within some part of their bodies, is set in rapid motion.

General variations, &c.

The differences which take place in the organs of generation are of two kinds, as they relate to the action itself, and to the consequences of this action. In a few animals which mostly belong to the zoophytes, there is no copulation, but the young grows upon the body of the parent, like a shoot upon a tree: others propagate only by copulation, and are of course of two sexes; these, however, may be distinct in different animals, or united in the same; this last only takes place in the mollusca and the zoophytes: all the vertebral animals and insects have the sexes distinct.

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In hermaphrodite animals each individual can generate alone, as the bivalve shell fish; others copulate reciprocally, or each individual performs the double office of male and female; this is the case with snails, and such other of the mollusca as crawl on the belly.

As to the produce of generation, there are three modes in which the offspring is brought forth. Some animals, as some of the zoophytes and of articulated worms, produce shoots which remain for some time on the body of the animals, and these are gemmiparous. Others, as man and the mammalia, contain the fœtus within a uterus, to which it is connected by a net-work of blood vessels, and from which it is sent forth alive; these, therefore, are viviparous. A third class, comprehending all the other animals, have the young contained within a shell, and enveloped by a substance which it absorbs before it is hatched; the viper may seem an exception to this division, as it brings forth its young alive; but then these have been hatched in the receptacle which contained the eggs; these animals are called *oviparous*.

Lastly, The organs of secretion show some diversity. All the vertebral animals and some mollusca secrete by means of glands situated in various parts of the body, or at least by means of expansions of vessels. The only secretory organs in insects seem to be tubes of various lengths, which attract, with the spongy tissue of their sides, those fluids which they are to separate from the general nutritious mass. The secretory organs in the zoophytes are very imperfectly understood.

These are the principal general differences which we had to notice as taking place in animals. The following Table exhibits a comprehensive view of these, arranged in the order in which we have enumerated them.

1. OSSIFICATION.

A. a. Animals with an internal bony skeleton.
MAN, MAMMALIA, BIRDS, REPTILES, FISHES properly so called.

b. ——— with an internal cartilaginous skeleton.
CARTILAGINOUS FISHES.

B. a. ——— with an external horny skeleton.
PERFECT INSECTS, LITHOPHYTES.

b. Animals

General relations, &c.

b. Animals with an external cretaceous skeleton.
CRUSTACEA, and most of the ZOOPHYTES.

C. ——— without a skeleton.
LARVÆ of INSECTS, WORMS, POLYPI.

2. IRRITABILITY.

A. Animals which have the whole body muscular.
Most larvæ of INSECTS, WORMS, POLYPI.

B. ——— which have the muscles covering the skeleton.
MAN, MAMMALIA, BIRDS, FISHES, REPTILES.

C. ——— which have the muscles covered by the skeleton.
PERFECT INSECTS, CRUSTACEA.

3. SENSATION.

A. Animals which have a brain and nerves readily distinguished from the spinal marrow.
MAN, MAMMALIA, BIRDS, FISHES, REPTILES.

B. ——— which have a brain and nerves scarcely to be distinguished from the spinal marrow.
INSECTS, CRUSTACEA, WORMS.

C. ——— which have no apparent sensorium.
ZOOPHYTES.

4. DIGESTION.

A. Animals which have one stomach, or more, readily distinguished from the œsophagus and the alimentary canal.
MAN, MAMMALIA, BIRDS, CRUSTACEA.

B. ——— which have the stomach distinguished from the œsophagus and alimentary canal only by certain swellings.
FISHES and REPTILES.

C. ——— which have only an alimentary canal.
INSECTS, WORMS, ZOOPHYTES.

5. CIRCULATION.

A. a. Animals with red blood, and a heart having two ventricles and two auricles,
MAN, MAMMALIA, BIRDS.

b. ——— with a heart having one ventricle divided into several cavities, and two auricles.
REPTILES.

c. ——— with a heart having but one ventricle and one auricle.
FISHES.

B. Animals with white blood, and a heart formed of a longitudinal canal jointed and contractile. General relations, &c.
Most CRUSTACEA, WORMS.

C. ——— without a heart, but with fluids contained in vessels.
INSECTS, ZOOPHYTES.

6. RESPIRATION.

A. a. Animals which respire by means of lungs not adhering and spongy.
MAN, MAMMALIA.

b. ——— which respire by means of lungs not adhering, but formed of cells, and muscular.
REPTILES.

c. ——— which respire by means of lungs adhering to the ribs, and furnished with appendages.
BIRDS.

B. ——— which respire by means of gills of various forms.
FISHES, CRUSTACEA.

C. ——— which respire by means of stigmata, or holes situated in different rings.
INSECTS, TERRESTRIAL WORMS.

D. ——— which respire by means of tracheæ, or by external fringed bodies.
AQUATIC WORMS.

E. ——— which appear to have neither stigmata nor tracheæ.
ZOOPHYTES ex. ECHINODERMATA.

7. GENERATION.

A. Animals viviparous.
MAN, MAMMALIA.

B. ——— oviparous.
BIRDS, FISHES, REPTILES, INSECTS, CRUSTACEA, WORMS.

C. ——— which may be propagated by cuttings.
WORMS, POLYPI.

8. SECRETION.

A. Animals secreting by means of glands.
MAN, MAMMALIA, BIRDS, FISHES, REPTILES, and some MOLLUSCA.

B. ——— which appear to have no glands.
Some MOLLUSCA, INSECTS, WORMS, ZOOPHYTES.

CHAP. II. GENERAL RELATIONS WHICH TAKE PLACE AMONG THE VARIATIONS OF ORGANIZATION AND FUNCTIONS.

WE shall best observe these relations by comparing together the several functions, two by two.

To begin with one of the most obvious, respiration, we perceive that this is always regulated by the motion of the nutritious fluid. In animals which are furnished with a heart and vessels, there is a central receptacle, in which this fluid is collected, and from which it is distributed to every part of the body; the heart is its great goal, from which it sets out, and to which it must return before performing a new circuit.

It must, therefore, at its source undergo the action

General relations, &c.

of the air, and accordingly, before it is sent through the general artery, to the various organs, it is circulated through the lungs or branchiæ for this purpose. But in animals, as insects, which have neither heart nor vessels, this correspondence is unnecessary. In them the nutritious fluid has no regular motion, no general source; it could not have been prepared in a separate organ, before its distribution to the rest of the body, as, exuding through the pores of the intestinal canal, it continually bathes the several parts, and introduces fresh particles between those which compose them. The air, therefore, could exert its action only at the very points of this introduction, and the very instant when it happens. This is extremely well provided for by the disposition of the tracheæ, as there is no one solid point in the bodies of insects to which the fine ramifications of the air-vessels do not extend, and at which the chemical action of the air does not take place. As we clearly see the causes of these relations between the organs belonging to these two functions of respiration and circulation, we are authorized to conclude that other relations, which are found to hold between them, depend upon causes of the same kind, though perhaps not equally evident.

158 For instance, of those animals who have blood-vessels and a double circulation, some respire by admitting the air immediately into the spongy substance of the lungs, and in these the two trunks of the large arteries approach each other, and are furnished with muscular ventricles united into one fleshy mass; others respire through the medium of water passing between the folds of their branchiæ, and in these the two trunks are always separated, whether each be furnished with a separate ventricle as in the cuttle-fish, or both have a common ventricle as in fishes and the mollusca.

159 The relation which subsists between respiration and motion is more easily explained. We find, that those animals which move quickest, and are constantly resident in the air, stand most in need of pure air, and can obtain it with the greatest facility. The constant demand for fresh air, is found by modern chemistry to be owing to the loss of irritability in the muscular fibre, which is supplied by something from the air. Birds, therefore, who, from the swiftness of their motion, and consequent loss of irritability, have the greatest demand for fresh air, have also the most complete and extensive respiratory organs. In reptiles, again, whose motion is generally very slow, and whose irritability is retained with great obstinacy, these organs are incomplete, and their vessels confounded with those of the general circulation, and they can exist long without air. The mammalia seem to hold the middle rank between these two extremes.

160 The relations which take place between the differences of the organs of sensation, with those of respiration, likewise deserve attention.

Gener relatio &c.

In animals with cold blood, the external senses are much less acute than in the warm-blooded animals; and in the former the brain is less, and does not completely fill the skull. This is doubtless owing to the slower motion of the cold-blooded animals requiring less nervous energy.

The digestive organs are found to possess more power 161
in proportion as those of respiration are more active, as the great waste occasioned by these must be compensated by a proportional supply of aliment received. Hence in birds, the stomach is extremely powerful, the digestion very vigorous, and the demand for food frequent and importunate; while reptiles require very little nourishment, and can remain very long without a fresh supply.

We have seen the relations which subsist between the organs of respiration and those of digestion. These last are also immediately related to the organs of motion and of sensation; for the nature of the aliment by which the animal is to be nourished is completely determined by the disposition of the alimentary canal; but if the animal had not its organs of sensation and of motion calculated for distinguishing and procuring its proper food, it is evident that it could not exist: thus an animal who can digest only flesh, must of necessity be enabled to perceive, to pursue, to seize, to overcome, and tear in pieces its proper prey. It must therefore possess a piercing sight, an acute smell, a rapid motion, agility, and considerable strength in its jaws and talons. Accordingly, we never see existing in the same animal a tooth formed for cutting flesh together with a horny foot; this explains why every animal with hoofs is herbivorous, and why hoofs indicate grinding teeth with flattened crowns, a very long alimentary canal, a large stomach, or several stomachs, and many other similar relations. Among all these relations there are many which have something in common, and there are always some in which the differences are few, so that by bringing together those which have the nearest resemblance, we are enabled to form a kind of series, which will appear gradually to proceed from a primitive standard. Hence the idea of a scale of beings, which some naturalists have formed, exhibiting a regular gradation, beginning at the most perfect, and descending to the most simple state of organization, or *vice versa*. As the links which constitute this chain are by no means entirely known, a perfect scale of beings is at present not to be expected.

The following table displays a series of animals, beginning with the most simple state of organization, and ascending to the most perfect.

SCALE

Arrangement of Animals, &c.

SCALE of ANIMALS according to the greater or less simplicity of their Structure.

1. Having only a stomach,	Polypes. *Hydra.*	*Linnè.*
	Biphores.	
	Vinegar eels.	*Forskall.*
	Vibrio.	
2. A stomach and intestines,	Sea anemonies.	
	Actinias.	*Linnè.*
	Nettles.	
	Medusæ.	
	Argonauts.	
	Berõe.	
	Most animalcula of vegetable infusions.	
3. Having beside these an external organ for respiration in the water,	Flower-polypes.	
	Vorticellæ.	*Miller.*
	Brachioni.	
	Botrylli.	*Pallas.*
4. Having besides these, some viscera, a system of absorbents, organs of generation, (but not of copulation) and a net-work of nerves,	Thetis.	*Linnè.*
	Anomiæ.	
	Nereïs.	
	Animals of the bivalve shells.	
5. Having beside, a blood-vessel, and sometimes the sense of seeing,	Intestinal worms.	
6. Having beside, organs of copulation (hermaphrodites) a heart without auricles, but with distinct pulsations, nervous ganglia, the sense of vision, and an imperfect organ of mastication,	Leeches.	
	Snails.	
	Animals of the univalve shells.	
7. Having besides a brain, organs of locomotion, male and female organs of generation distinct, sometimes the sense of hearing, and an external bony system,	Insects.	
8. Having rudiments of an internal bony system, a heart and blood-vessels,	Cartilaginous fishes.	
9. Having a complete internal bony system,	Fishes properly so called.	
10. Having internal lungs, and an organ of smelling,	Amphibia.	
11. Having besides a bilocular heart,	Birds.	
12. Having perfect organs of taste and mastication, organs for secreting milk, and a uterus,	Mammalia.	
	Man.	

CHAP. III. ARRANGEMENT OF ANIMALS FOUNDED ON THE GENERAL DIFFERENCE OF THEIR ORGANIZATION.

HAVING taken a survey of the general differences which take place in the organization and functions of animals, and of the relations which subsist among these differences; we are now to proceed to a summary view of the whole animal kingdom, and consider what is common in the organization of the various classes of which it is composed.

The whole animal kingdom is generally divided into two great families, that of the vertebral animals, who have red blood; and that of the invertebral animals, almost all of which have white blood.

In the first division we always find an interior articulated skeleton, of which the principal support is the vertebral column, having the head at its atlantal extremity, and containing within its cavity the general origin of the nerves; its sacral extremity is commonly prolonged to form a tail. The ribs, which are seldom wanting, are situated on both sides of this column (G). These

(G) As the terms generally employed in the human anatomy are by no means calculated for describing the

Of Quadrupeds.

These animals have never more than four limbs; but in some of them two of these are wanting, in others all.

Their brain is always contained within a peculiar cavity of the head called the *cranium*; all the spinal nerves send off filaments to assist in forming a nervous chord, which is derived from one of the nerves of the cranium, and is distributed to most of the viscera.

They have always five senses: two eyes which they can move at pleasure; the ear has always at least three semicircular canals; the organ of smell is always confined to cavities in the fore part of the head; there is always at least one fleshy ventricle, by which the circulation of the blood is carried on; sometimes there are two ventricles, which are always united.

The lymphatic vessels are always distinct from the blood-vessels.

The jaws are always situated horizontally, and separate from above downwards.

The alimentary canal is continued from the mouth to the anus, which is always situated behind the bones with which the sacral extremities are articulated.

The intestines are enveloped in a membranous bag, called *peritonæum*.

There are always a liver, and a pancreas or sweetbread, by which liquors are secreted for the purposes of digestion, and a spleen, in which one part of the blood, which goes afterwards to the liver, undergoes some previous change.

The urine is always separated by two kidneys, which are situated on both sides of the vertebral column without the peritonæum, and above which are always two bodies called *atrabiliary capsules*, the use of which is unknown. The vertebral animals are subdivided into two sections; the hot-blooded, and the cold-blooded.

In the hot-blooded vertebral animals there is always a heart and a double circulation. Respiration is carried on by means of lungs, and without the exercise of this function they cannot exist.

The brain in these animals completely fills the cavity of the skull, and their eyes close by means of lids. The tympanum of their ear is sunk in the solid bone of the skull, as the parts of the labyrinth are entirely surrounded by bone; besides the semicircular canal, there is always an organ with two spiral cavities, like the shell of a snail; the nostrils serve for the passage of the air in breathing, and form a communication with the mouth. The trunk is always surrounded by the ribs, and there are for the most part four limbs.

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The cold-blooded vertebral animals are deficient in several of these particulars; many of them want ribs, and some of them have no limbs. In them the brain never entirely fills the cavity of the skull, and their eyelids are seldom moveable; the tympanum of their ear, as also the small bones, is often wanting, the spiral cavity always; when the tympanum is present, it is never sunk within the skull.

Each of these two divisions is again subdivided into two classes; the former into the mammalia and the birds; the latter into the fishes and the reptiles: the structure of these classes will be considered in their proper place.

The invertebral animals have fewer common circumstances, and constitute a less regular series than those of which we have been speaking; their hard parts, when they are present, are generally, at least when articulated, placed externally. No part of their nervous system is contained within a bony sheath, but floats in a common cavity with the viscera.

The brain only is placed above the alimentary canal; from it proceed two branches which embrace the gullet like a collar, and from which the general bundle of the nerves is formed. In these animals respiration is never carried on by means of cellular lungs, and they are all destitute of voice; their jaws have no particular direction, and their mouths are often merely suckers; they have no kidneys, and consequently secrete no urine; if they have limbs, these are always at least six in number.

Considered in an anatomical point of view, they may be divided into five classes, namely, the mollusca, the crustacea, insects, worms, and zoophytes. We shall treat of these several classes in the order in which we have enumerated them.

CHAP. IV. MAMMALIA, OR QUADRUPEDS.

Sect. I. *General Observations.*

162 Whether man is naturally a biped or a quadruped.

A QUESTION has been started by some fanciful philosophers, "Whether man is naturally a *biped* or a *quadruped*?" and much ingenuity has been employed to establish the latter opinion. But it is presumed that few of their readers have been made converts to such an opinion, and that not many of ours will require much argument to persuade them of their erect destination. It may therefore suffice to observe, that this erect position is best adapted to the conformation of the human head, and the ponderous quantity of human brains:—that the articulation of the *os occipitis* with the first vertebra of the neck, is differently constructed from that of quadrupeds, with the obvious design that man should be able to move his head in every direction with the greatest facility:—that the human species (and also monkeys) are destitute of that strong ligament or tendinous aponeurosis, vulgarly called *paxwax*, which quadrupeds possess (as a kind of *staytape*), to prevent the head from sinking to the earth; to which, from its natural position, it must be very prone:—and that our eyes and ears are, fortunately, not

structure of the inferior animals, we shall in this article make use of others, with which we have been favoured by Dr Barclay, the ingenious lecturer on anatomy, to whose publication on anatomical nomenclature we refer the reader for their explanation.

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not placed as those of the quadrupeds. The axis of the human eye is nearly perpendicular with a vertical section of the head; whereas, in the brute creation (the larger ape excepted), the position of the eyes forms an acute angle:—nature has also furnished other animals with a *suspensorium oculi*, a muscle which the *erect* attitude renders needless, though highly necessary in the *prone*; consequently, whoever tries the experiment will find that, in the inclined direction, both his eyes and his ears are in the most unfavourable situation possible for quick hearing or extensive vision. In fine, the shape, breadth, strength of the vertebræ of the back and loins, are all coincident with the erect attitude of the trunk.

ALL quadrupeds have a covering of hair, wool, &c. to defend them from the injuries of the weather, which varies in thickness according to the season of the year and difference of the climate; thus in Russia and the northern countries, the furs are very thick and warm, while the little Spanish lap-dogs, and Barbary cows, have little or no hair at all.

163 Cuticula, cutis, panniculus carnosus.

The cutis and cuticula in quadrupeds are disposed much in the same way as the human, only more elastic; immediately under this, there is a very thin cutaneous muscular substance called *panniculus carnosus*, which is common to all quadrupeds, the porcine kind excepted; this principally covers the trunk, serving to shrivel the skin, in order to drive off insects, their tails and heads not being sufficient for this purpose, while their extremities are employed in their support and progression.

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164 Whence the motion of the panniculus carnosus, &c.

It has probably been from observing some muscles of the human body, such as the platysma myoides, cremaster, and frontales, and the collapsed tunica cellulosa of emaciated subjects, to resemble this thin muscle, that some of the oldest anatomists reckoned such a panniculus among the common teguments of the human body. This Carolus Stephanus has well observed.

165 Why most quadrupeds want clavicles.

Most part of quadrupeds want clavicles, whereby their atlantal extremities fall upon their chest, so as to make their thorax proportionally narrower than the human. This small distance of their atlantal extremities is very necessary for their uniform progression: apes indeed and squirrels have clavicles to allow them a more full use of their extremities in climbing; but when they walk on all-fours, they move but indifferently.

Their head is connected to the first vertebra of the neck by two eminences as in man. The vertebræ of the neck are never less than six, or more than nine. The number of the dorsal and other vertebræ differs considerably in the various individuals. The following table exhibits these differences in each species. The brain of these animals is more complicated than that of the other classes.

TABLE of the Proportional Number of SPINAL VERTEBRÆ in various species of MAMMALIA.

SPECIES.	*Dorsal Vertebræ.*	*Lumbar Vertebræ.*	*Sacral Vertebræ.*	*Coccygian Vertebræ.*
Man,	12	5	5	4
Simia satyrus, Lin. Orang-outang,	12	4	3	4
—— *troglodytes.* Jocko,	13	5	4	5
—— *lar.* Gibbon,	14	3	6	0
—— *paniscus.* Coaïta,	14	3	2	32
—— *capucina.* Weeping monkey, saï,	14	7	4	25
—— *rosalia.* Silky money, marakina,	12	7	1	26
—— *patas.* Patas,	12	7	3	16+
—— Maimon, rib-nosed ape,	12	7	1	13
—— *cynomolgus.* Macaca,	12	7	1	5
—— *chinensis.* Chinese monkey,	11	7	3	20
—— *sphinx.* Baboon, papion,	12	7	1	31
—— *inuus.* Magot,	12	7	1	3
—— *maimon.* Mandrill,	12	7	3	13
—— *pongo.* Pongo,	12	4	3	4
—— *beelzebul.* Alosti, howling baboon,	14	4	5	25
Lemur catta. Macauco,	12	7	3	18
—— *gracilis.* Lori,	15	9	1	9
—— *tarsius.* Tarsier,	14	5	3	17+
Vespertilio vampyrus. Rousette, vampyre bat,	12	4	1	0
—— *murinus.* Common bat,	11	5	4	12
—— *noctula.* Noctule, great bat,	12	7	3	6
—— *ferrum equinum.* Horse-shoe bat,	12	6	3	12

TABLE,

TABLE, &c. continued.

Specifs.	*Dorsal Vertebræ.*	*Lumbar Vertebræ.*	*Sacral Vertebræ.*	*Coccygian Vertebræ.*
Lemur volans. Flying lemur,	12	6	1	22
Erinaceus europæus. Hedgehog,	15	7	4	12
——— *ecaudatus.* Tanrec,	15	6	3	8
Sorex, mus araneus. Musetta, shrew,	12	7	3	17
Talpa europæa. Mole,	13	6	7	11
Ursus maritimus. White bear,	13	6	7	11
—— *arctos.* Brown bear.	14	6	5	4+
—— *meles.* Badger,	15	5	3	16
—— *gulo.* Glutton,	16	5	3	18
Viverra. Coati,	14	6	1	10+
Ur. lotor. Racoon,	14	7	3	20
Mustela lutra. Otter,	14	6	3	21
——— *martes.* Marten,	14	6	3	18
——— *vulgaris.* Weasel,	14	6	3	14
Viverra civetta. Civet,	13	6	3	20
Felis leo. Lion,	13	6	3	23
—— *tigris.* Tiger,	13	7	4	19
—— *pardus.* Panther,	13	7	3	24
—— *concolar.* Couguar,	13	7	3	22
—— *catus.* Cat,	13	7	3	22
Canis familiaris. Wolf-dog,	13	6	3	22
—— *lupus.* Wolf,	13	7	3	19
—— *vulpes.* Fox,	13	7	3	20
—— *hyæna.* Hyæna,	16	4	2	8+
Didelphis cancriphaga. Cayenne opossum, crab-eater,	13	6	5	16+
——— *murina.* Marmose,	13	6	1	29
——— *orientalis.* Phalarger,	13	6	1	30
Histrix cristata. Porcupine,	14	5	4	8+
Lepus timidus. Hare,	12	7	4	20
—— *cuniculus.* Rabbit,	12	7	2	20
Cavia capybara. Cabæ,	13	6	2	4+
—— *cobaya.* Guinea pig,	13	6	4	6
—— *paca.* Paca, or spotted cavy,	13	6	5	7
—— *aguti.* Agouti,	12	8	4	7
Castor fiber. Beaver,	15	5	3	23
Sciurus volans. Flying squirrel,	12	8	3	13
Mus marmotta. Marmotte,	13	7	6	22
—— *arvalis.* Field mouse,	13	7	3	15
—— *amphibius.* Water rat,	13	7	4	23
—— *rattus.* Black rat,	13	9	3	26
—— *decumanus.* Norway rat,	13	7	4	23
—— *musculus.* Common mouse,	12	7	4	24
—— *sylvaticus.* Field or harvest rat,	12	7	3	23
—— *cricetus.* Hamster,	13	6	4	15
—— *glis.* Fat dormouse,	13	7	2	18
—— *quercinus.* Garden dormouse,	13	7	4	24
Myrmecophaga didactyla. Ant-eater,	16	2	4	40
Manis pentadactyla. Pangolin,	15	5	3	28
—— *tetradactyla.* Long-tailed manis,	13	5	2	45
Dasypus. Armadillo,	11	4	3	30
Bradypus didactylus. Two toed sloth,	23	2	4	7+
Elephas indicus. Elephant,	20	3	4	14
Sus scrofa. Hog,	14	5	3	4

TABLE, &c. continued.

Species.	*Dorsal Vertebræ.*	*Lumbar Vertebræ.*	*Sacral Vertebræ.*	*Coccygian Vertebræ.*
Tapirus. Tapir,	20	4	3	12
Rhinoceros,	19	3	4	22
Camelus bactrianus. Camel,	12	7	4	17
——— *dromedarius.* Dromedary,	12	7	4	18
Cervus elaphus. Stag,	13	6	3	11
Camelo-pardalis. Camelopard,	14	5	4	18
Antelope cervicapra. Antelope,	13	6	5	15
——— *dorcas.* Gazelle,	13	5	5	11
——— *rupicapra.* Chamois goat,	13	5	4	7†
Capra hircus. Goat,	13	6	4	12
Ovis aries. Sheep,	13	6	4	16
Bos taurus. Ox,	13	6	4	16
Equus caballus. Horse,	18	6	2	17
——— *quagga.* Couaga,	18	6	7	18
Phoca vitulina. Seal,	15	5	2	12
Delphinus delphis. Dolphin,	13	} in all	—	—
——— *phocæna.* Porpoise,	13	} 66	—	—

Their eyes have only two lids, and they agree with man in having the internal ear furnished with four little bones articulated with each other, and a completely spiral cochlea, and a tongue entirely soft and fleshy. Their heart, lungs, and diaphragm resemble those of man in their general structure; and differ only in a few circumstances, which will be best seen in the exemplification of their structure, which is presently to be given.

In treating of quadrupeds we shall divide them into the carnivorous, or rather those which feed indifferently on flesh and vegetables, and the granivorous. The structure of the former we shall exemplify in the dog, that of the latter in the cow.

Sect. II. *The Anatomy of a Dog.*

We may first observe of this animal, as of most *quadrupeds*, that its legs are much shorter in proportion to its trunk than in man, the length of whose steps depends entirely on the length of his sacral extremities; however, to balance this, the trunk of the animal is proportionally longer and smaller, his spine more flexible, by which he is able at each step to bring his sacral nearer to his atlantal extremities. His common teguments are much a-kin to those of other quadrupeds, only they allow little or no passage for sweat; but when he is over-heated, the superfluous matter finds an exist by the salivary glands, for he lolls out his tongue and slavers plentifully. We are not, however, to suppose, that because a dog does not sweat, he has no insensible perspiration. That a dog perspires is evident, because one of these animals can trace another by the scent of his footsteps; which could not happen if a large quantity of perspirable matter was not constantly going off.

The pyramidal muscles are wanting, to supply which the rectus is inserted fleshy into the os pubis.

166 Brain.

The brain is proportionally much smaller than the human; but as in man, it is divided into cerebrum and cerebellum, and these two parts bear nearly the same proportion to one another as in us. There was no such occasion for so great a quantity of brain in these animals as in man; seeing that in them all its energy is employed in their progression, while man has a great waste of spirits in the exercise of his reason and intellectual faculties. And besides all this, a bulky brain would be inconvenient to these creatures, in so far as it would add considerably to the weight of the head; which having the advantage of a long lever to act with, would require a much greater force to support it than it does now; for the heads of the greatest part of quadrupeds are not near so heavy as they would at first sight seem to be, from the frontal sinuses being produced a great way upwards to enlarge the organ of smelling.

The pits in the anterior part of their skull are much more conspicuous than in the human; which may be occasioned by the depending posture of these creatures heads while they gather their food: The brain at this time gravitating much on the bones while they are as yet soft, will gradually make impressions upon them at those places where it rises into eminences. This is prevented in man mostly by his erect posture.

167 Falx.

The *falx* is not near so large in quadrupeds as in man, as they have little occasion to lie on either side, and the two hemispheres of the brain are in a great measure hindered from justling against one another in violent motions, by the brain's insinuating itself into the above-mentioned pits.

The second process of the *dura mater*, or *tentorium cerebello super-expansum*, is considerably thicker and stronger

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stronger than in man. This membrane is generally ossified, or we find the place of it supplied by a bone, that it may the more effectually keep off the superincumbent brain from the cerebellum in rapid motions, which otherwise would be of bad consequence.

168 Processus mamillaris.

The olfactory nerves are very large, and justly deserve the name of *processus mamillaris*. They are hollow, and consist of a medullary and cineritious substance, and at first sight appear to be the frontal ventricles of the brain produced; but in man they are small, and without any discernible cavity. The reason of this is pretty evident, if we consider how this animal's head is situated; for the lymph continually gravitating upon the inferior part of the ventricles, may thus elongate and produce them; but from this very inferior part the olfactory nerves rise, and are sent immediately through the ethmoid bone into the nose. Hence the ancients, thinking they were continued hollow into the nose, believed they were the emunctories of the brain: in the brain of sheep, which by its firm texture is the best subject of any for searching into the structure of this part, we evidently see, that the name of the *sigmoid cavity* was very properly applied by the ancients to the lateral ventricles of the brain; which are really of a greater extent than they are ordinarily painted by anatomists, reaching farther backwards, and forwards again under the substance of the brain. The cortical and medullary parts, as well as the corpus callosum, are similar to those parts in man.

169 Nates, testes.

The *nates* and *testes* deserve this name much better here than in the human body, with respect to each other. They are larger in the quadrupeds; and hence we perceive that there is no great reason for ascribing the different operations to any particular size or shape of these parts. They are here also of different colours; the *nates* being of the colour of the cortical, and the *testes* of the medullary substance of the brain; whereas in man they are both of one colour. The reason of these differences, and others of the like nature to be met with, we shall not pretend to determine; for we have hitherto such an imperfect knowledge of the brain itself, that we are entirely ignorant of the various uses of its different parts. We may in general conclude, that the varying in one animal from what it is in another, is fitted to the creature's particular way of living.

170 Rete mirabile Galeni.

The *rete mirabile Galeni*, situated on each side of the *sella turcica*, about which there has been so much dispute, is very remarkable in these animals. This network of vessels is nothing else than a continuation of the internal carotid arteries, which entering the skull, divide into a vast number of minute branches running along the side of the sella turcica; and, uniting afterwards, are spent on the brain in the common way. Galen seems with justice to suppose, that this plexus of vessels serves for checking the impetuosity of the blood destined for the brain.

171 Tongue.

The tongue, in consequence of the length of the jaws, is much longer than ours; and as this creature feeds with his head in a depending posture, the bolus would always be in danger of falling out of the mouth, were it not for several prominences or papillæ placed mostly at the root of the tongue, and crooked backwards in such a manner as to allow any thing to pass easily down to the jaws, but to hinder its return. By the papillæ also the surface of the tongue is increased, and a stronger impression is made on the sensation of taste. In some animals who feed on living creatures, these tenter-hooks are still more conspicuous; as in several large fishes, where they are almost as large as their teeth in the fore part of their mouth, and near as firm and strong.

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172 Nose.

The *nose* is generally longer than in man, and its external passage much narrower. The internal structure is also better adapted for an acute smelling, having a larger convoluted surface on which the *membrana schneideriana* is spread; and this is to be observed in most quadrupeds, who have the ossa spongiosa commonly large, and these too divided into a great number of excessively fine thin lamellæ. The sensibility seems to be increased in proportion to the surface; and this will also be found to take place in all the other senses. The elephant, which has a head pretty large in proportion to its body, has the greatest part of it taken up with the cavity of the nose and frontal sinuses; which last extend almost over their whole head, and leave but a small cavity for their brains. A very nice sense of smelling was not so absolutely necessary for man, who has judgment and experience to direct him in the choice of his food; whereas brutes, who have only their senses, must of necessity have these acute, some having one sense in greater perfection than others, according to their different way of life. We not only conclude *à priori* from the large expanded membrana schneideriana, that their sense of smelling is very acute, but we find it so by cows and horses distinguishing so readily betwixt noxious and wholesome herbs, which they do principally by this sense.

173 Ear.

The external *ear* in different quadrupeds is differently framed, but always calculated for the creature's manner of life. In shape it commonly resembles the oblique section of a cone from near the apex to the basis. Hares, and such other animals as are daily exposed to insults from beasts of prey, have large ears directed backwards, their eyes warning them of any danger before; rapacious animals, on the other hand, have their ears placed directly forwards, as we see in the lion, cat, &c. The slow hounds, and other animals that are designed to hear most distinctly the sounds coming from below, have their ears hanging downwards; or their ears are flexible, because they move their head for the most part with greater difficulty than man. Man, again, who must equally hear sounds coming from all quarters, but especially such as are sent from about his own height, has his external ear placed in a vertical manner, somewhat turned forward. In short, wherever we see a specialty in the make of this organ in any creature, we shall, with very little reflection, discover this form to be more convenient for that creature than another. The animal also has the power of directing the cone of the ear to the sonorous body without moving the head. There are some differences to be observed in the structure of the internal ear in different animals; but we know so very little of the use of the particular parts of that organ in the human subject, that it is altogether impossible to assign reasons for these variations in other creatures.

174 Membrana nictitans.

All quadrupeds have at the internal canthus of the eye a strong firm membrane with a cartilaginous edge, which may be made to cover some part of their eye; and

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and this is greater or less in different animals as their eyes are more or less exposed to danger, in searching after their food. This *membrana nictitans*, as it is called, is not very large in this animal. Cows and horses have it so large as to cover one half of the eye like a curtain, and at the same time it is sufficiently transparent to allow abundance of the rays of light to pass through it. Fishes have a cuticle always over their eyes, as they are ever in danger in that inconstant element. In this then we may also observe a sort of gradation.

175 usculus pense- s.

All quadrupeds have a seventh muscle belonging to the eye, called *suspensorius*. It surrounds almost the whole optic nerve, and is fixed into the sclerotic coat as the others are. Its use is, to sustain the weight of the globe of the eye, and prevent the optic nerve from being too much stretched, without obliging the four straight muscles to be in a continual contraction, which would be inconvenient; at the same time this muscle may be brought to assist any of the other four, by causing one particular portion of it to act at a time.

176 pilla.

The next thing to be remarked is the figure of the *pupil*, which is different in different animals, but always exactly accommodated to the creature's way of life, as well as to the different species of objects that are viewed. Man has it circular, for obvious reasons: an ox has it oval, with the longest diameter placed transversely, to take in a larger view of his food; cats, again, have theirs likewise oval, but the longest diameter placed perpendicularly; they can either exclude a bright light altogether, or admit only as much as is necessary. The pupil of different animals varies in wideness, according as the internal organs of vision are more or less acute: Thus cats and owls, who seek their prey in the night, or in dark places (and consequently must have their eyes so formed as that a few rays of light may make a lively impression on the retina), have their pupils in the day-time contracted into a very narrow space, as a great number of rays would oppress their nice organs; while in the night, or where the light is faint, they open the pupil, and very fully admit the rays. In the same way, when the retina is inflamed, a great number of rays of light would occasion a painful sensation; therefore the pupil is contracted: on the contrary, in dying people, or in a beginning amaurosis, it is generally dilated, as the eyes on such occasions are very difficultly affected, and as it were insensible.

177 apetum.

The posterior part of the choroid coat, which is called *tapetum*, is of different colours in different creatures. For oxen, feeding mostly on grass, have this membrane of a green colour, that it may reflect upon the retina all the rays of light which come from objects of that colour, while other rays are absorbed: Thus the animal sees its food better than it does other objects. Cats and owls have their tapetum of a whitish colour; and for the same reasons have the pupil very dilatable, and their organs of vision acute: And we shall find, that all animals see more or less distinctly in the dark, according as their tapetum approaches nearer to a white or black colour. Thus dogs, who have it of a grayish colour, distinguish objects better in the night than man, whose tapetum is dark brown; and who, it is believed, sees worst in the dark of any creature: it being originally designed that he should rest from all kinds of employment in the night-time. The difference then of the colour of the tapetum, as indeed the fabric of any other part in different creatures, always depends on some particular advantage accruing to the animal in its peculiar manner of life from this singularity.

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178 Neck.

We look on it as a general rule, that all quadrupeds, as having occasion to gather their food from the ground, are provided with longer necks than man; but as a long neck not only gives the advantage of too long a lever to the weight of the head, but also, when the animal is gathering his food, makes the brain in danger of being oppressed with too great a quantity of blood, by the liquor in the arteries having the advantage of a descent, while that in the veins must remount a considerable way contrary to its own gravity; it was therefore necessary that a part of the length of the neck should be supplied by the length of the jaws. Thus we see horses, cows, &c. who have no occasion for opening their mouths very wide, yet have long jaws. Bulldogs, indeed, and such animals as have occasion for very strong jaws, must of necessity have them short; because the longer they are, the resistance to be overcome acts with a longer lever. Another exception to this general rule, is such animals as are furnished with something analogous to hands to convey their food to their mouths, as cats, apes, &c. The teeth of this creature plainly show it to be of the carnivorous kind; for there are none of them made for grinding its food, but only for tearing and dividing it. It has six remarkably sharp teeth before, and two very long tusks behind; both of which the ruminating animals want. These are evidently calculated for laying very firm hold of substances, and tearing them to pieces; and the vast strength of the muscles inserted into the lower jaw, assists greatly in this action; while the grinders have sharp cutting edges, calculated for cutting flesh, and breaking the hardest bones. Even its posterior teeth are not formed with rough broad surfaces as ours are; but are made considerably sharper, and press over one another when the mouth is shut, that so they may take the firmer hold of whatever comes betwixt them.

179 Jaws.

180 Teeth.

181 Amygdals.

When we open the mouth, we see the amygdalæ very prominent in the posterior part of it; so that it would appear at first view, that these were inconveniently placed, as being continually exposed to injuries from the hard substances this creature swallows; but upon a more narrow scrutiny, we find this provided for by two membranous capsules, into which the amygdalæ, when pressed, can escape, and remove themselves from such injuries.

182 Velum pendulum palati.

The *velum pendulum palati* is in this creature considerably longer than in man, to prevent the food from getting into his nose; which would happen more frequently in this animal than in man, because of its situation while feeding.

183 Glottis.

184 Epiglottis.

In this subject, as well as in other quadrupeds, there is no *uvula;* but then the *epiglottis*, when pressed down, covers the whole rima entirely, and naturally continues so: there is therefore a ligament, or rather muscle, that comes from the os hyoides and root of the tongue that is inserted into that part of the epiglottis where it is articulated with the cricoid cartilage, which serves

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to raise it from the rima, though not so strongly but that it may with a small force be clapped down again.

185 The use of the uvula.

It may be asked, however, Why the uvula is wanting here, and not in man? This seems to be, that quadrupeds, who swallow their food in a horizontal situation, have no occasion for an uvula, though it is necessary in man on account of his erect situation.

In the upper part of the pharynx, behind the cricoid cartilage, there is a pretty large gland to be found, which serves not only for the separation of a mucous liquor to lubricate the bolus as it passes this way, but also supplies the place of a valve, to hinder the food from regurgitating into the mouth, which it would be apt to do by reason of the descending situation of the creature's head. In man, the muscle of the epiglottis is wanting, its place being supplied by the elasticity of the cartilage.

186 Gullet.

The *gullet* is formed very much in the same way as the human. Authors indeed generally allege, that quadrupeds have their gullet composed of a double row of spiral figures decussating one another; but this is peculiar to ruminating animals, who have occasion for such a decussation of fibres. The action of these you may easily observe in a cow chewing her cud.

187 Omentum.

The omentum reaches down to the os pubis, which, considering the posture of the animal, we shall find to be a wise provision, since its use is to separate an oily liquor for lubricating the guts and facilitating their peristaltic motion; so in our erect posture the natural gravity of the oil will determine it downward, but in the horizontal position of these creatures, if all the intestines were not covered, there would be no favourable derivation of the fluid to the guts lying in the sacral part of the abdomen, which is the highest; and besides, had the omentum reached much farther down in us, it would not only have supplied too great a quantity of oil to the lower part of the abdomen, but we should have been in continual danger of herniæ; and even at present the omentum frequently passes down with some of the other viscera, and forms part of these tumours. To these, however, the dog is not subject, as his viscera do not press so much on the rings of the abdominal muscles, and besides are prevented from passing through by a pendulous flap of fat mentioned N° 35. The sacral and sternal lamella of the omentum is fixed to the spleen, fundus of the stomach, pylorus, liver, &c. in the same way as the human; but the superior having no colon to pass over, goes directly to the back-bone. This serves to explain the formation of the small omentum in the human body; which is nothing but the large omentum, having lost its fat, passing over the stomach and colon, where it reassumes its fat, so proceeds, and is firmly attached to the liver, spine, &c. The striæ of fat are pretty regularly disposed through it, accompanying the distribution of the blood-vessels to guard them from the pressure of the superincumbent viscera.

188 Stomach.

This animal's stomach, though pretty much resembling the human in its shape, is somewhat differently situated. It lies more longitudinal, as indeed all the other viscera do, to accommodate themselves to the shape of the cavity in which they are contained; that is, its sacral orifice is much farther down with respect to the atlantal than the human: by this means the gross food has an easier passage into the duodenum. Again, the fundus of the human stomach, when distended, stands almost directly sternal, which is occasioned by the little omentum tying it so close down to the back bone, &c. at its two orifices; but it not being fixed in that manner in the dog, the fundus remains always dorsal: this also answers very well the shape of the different cavities, the distance betwixt the cardia and fundus being greater than that betwixt the two sides. It seems to be much larger in proportion to the bulk of the animal than the human, that it might contain a greater quantity of food at once; which was very necessary, since this animal cannot at any time get its sustenance as men do. The turbillion is not so large, nor is there any coarction forming the *antrum Willesii*, as in the stomach of man. It is considerably thicker and more muscular than ours, for breaking the cohesion of their food, which they swallow without sufficient chewing. Hence it is evident the force of the stomach is not so great as some would have it, nor its contraction so violent: otherwise that of dogs would be undoubtedly wounded by the sharp bones, &c. they always take down; for the contraction here is still greater than in the human stomach, which is much thinner. The rugæ of the tunica villosa are neither so large, nor situated transversely, as in the human, but go from one orifice to the other: the reason of which difference is, perhaps, that they might be in less danger of being hurt by the hard substances this creature frequently feeds upon; and for the same reason there is not the like stricture at their pylorus.

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189 Intestine.

The intestines of this animal are proportionally much shorter than ours; for the food which these creatures mostly use, soon dissolves, and then putrefies; on which account there was no occasion for a long tract of intestines, but on the contrary that it should be quickly thrown out of the body. The same is to be observed of all the carnivorous animals. The muscular coat of the intestines is also thicker and stronger than the human, to protrude the contents quickly and accurately.

The valvulæ conniventes are less numerous, and in a longitudinal direction; and the whole tract of the alimentary canal is covered with a slime, which lubricates the intestines, saves them from the acrimony of the excrementitious part, and facilitates its passage.

190 Duodenum.

The *duodenum* differs considerably in its situation from the human. For in man it first mounts from the pylorus upwards, backwards, and to the right side; then passes down by the gall bladder; and, marching over the right kidney and superior part of the psoas muscles, makes a curvature upwards; and passes over the back bone and vena cava inferior, to the left hypochondrium, where it gets through the omentum, mesentery, and mesocolon, to commence the *jejunum*, being firmly tied down all the way, the biliary and pancreatic ducts entering in at its most depending part: Whereas, in the dog, the duodenum is fixed at the pylorus to the concave surface of the liver, and hangs loose and pendulous with the mesentery backwards into the cavity of the abdomen; then turning up again, is fixed to the back bone, where it ends in the jejunum; the bile and pancreatic juice are poured into it at the most depending part. Therefore the same intention

191 Jejunum.

seems

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seems to have been had in view in the formation of this part in both, viz. the giving the chyle, after the liquors of the liver and pancreas are poured into it, a disadvantageous course, so that it might be the more intimately blended with the humours before its entry into the jejunum, where the lacteals are very numerous: And thus, by reason of their different posture, the same design (though by a very different order of the parts) is brought about in both.

192 Intestina tenuia.

The other small guts are much the same with ours, only shorter. The great guts are also shorter and less capacious than in the human body; and we take it for a general rule, that all animals that live on vegetable food, have not only their small guts considerably longer, but also their great guts more capacious, than such creatures as feed on other animals. Hence man, from this form of his intestines, and that of the teeth, seems to have been originally designed for feeding on vegetables chiefly; and still the most of his food, and all his drink, is of that class.

The reason of this difference seems to be, that as animal food is not only much more easily reduced into chyle, but also more prone to putrefaction, too long a delay of the juices might occasion the worst consequences. So it was necessary that their receptacles should not be too capacious; but, on the contrary, being short and narrow, might conduce to the seasonable discharge of their contents. Whereas vegetable food being more difficultly dissolved and converted into an animal nature, there was a necessity for such creatures as fed on it to be provided with a long intestinal canal, that this food in its passage might be considerably retarded, and have time to change its quality into one more agreeable to our nature. Besides which there is another advantage which accrues to man in particular, from having his great guts very capacious: for as he is a rational being, and mostly employed in the functions of social life, it would have been very inconvenient as well as unbecoming for him to be too frequently employed in such ignoble exercises; so that, having this large reservoir for his fæces alvinæ, he can retain them for a considerable time without any trouble.

193 Appendix vermiformis.

The *appendix vermiformis* justly enough deserves the name of an *intestinum cæcum* in this subject, though in the human body it does not; and it has probably been from the largeness of this part in this and some other animals, that the oldest anatomists came to reckon that small appendicle in man as one of the great guts. On its internal surface we observe a great number of mucous glands. As all these throw out slime, their principal office would seem to be the procuring a sufficient quantity of that matter for the purposes above mentioned. Still, however, there seems to be some unknown use for this organ in other animals; for the appendicula vermiformis in them is either of great size or of great length. In a rat, it is rather larger than the stomach; in others, as swine, and some of the animals which live on vegetables, it has long convolutions, so that the food must be lodged in it for a long time. Thus, probably, some change takes place in the food, which requires a considerable time to effectuate, and though unknown to us, may answer very useful purposes to the animal.

The *colon* has no longitudinal ligaments; and consequently this gut is not pursed up into different bags or cells as the human: nor does this intestine make any circular turn round the abdomen; but passes directly across it to the top of the os sacrum, where it gets the name of *rectum*.

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194 Colon.

195 Rectum.

At the extremity of the *intestinum rectum*, or verge of the anus, there are found two bags or pouches, which contain a most abominable fetid mucus of a yellow colour, for which we know no use, unless it serves to lubricate the strained extremity of the rectum, and defend it against the asperity of the fæces, or to separate some liquor that might otherwise prove hurtful to their bodies. There is nothing analogous to those sacs in the human subject, unless we reckon the mucilaginous glands that are found most frequent and largest about the lower part of the rectum.

196 Mesentery.

The *mesentery* is considerably longer than in the human body; that, in his horizontal situation, the intestines may rest securely on the soft cushion of the abdominal muscles. The fat is here disposed in the same way, and for the same reason, as in the omentum. The interstices betwixt the fat are filled with a fine membrane. Instead of a great number of glandulæ vagæ to be found in the human mesentery, we find the glands few in number, and those are closely connected together; or there is only one large gland to be observed in the middle of the mesentery of a dog, which, from its imagined resemblance to the pancreas and the name of his discoverer, is called *pancreas Aselli*; but the resemblance, if there is any, depends chiefly on the connexion, the structure being entirely different. The reason why this in man is as it were subdivided into many smaller ones, may possibly be, that as the guts of a human body are proportionally much longer than those of this creature, it would have been inconvenient to have gathered all the *lactea primigeneris* into one place; whereas, by collecting a few of these vessels into a neighbouring gland, the same effect is procured much more easily. Whether the food in this animal needs less preparation in its passage through these glands, is a matter very much unknown to us; though it is certain that some changes really do take place.

197 Pancreas Asellii.

198 Pancreas.

The *pancreas* in man lies across the abdomen, tied down by the peritonæum; but the capacity of this creature's abdomen not allowing of that situation, it is disposed more longitudinally, being tied to the duodenum, which it accompanies for some way. Its duct enters the duodenum about an inch and a half below the ductus communis.

199 Spleen.

The *spleen* of this animal differs from the human very much, both in figure and situation. It is much more oblong and thin, and lies more according to the length of the abdomen, like the pancreas. Though the spleen of this creature is not firmly tied to the diaphragm (which was necessary in our erect posture to hinder it from falling downwards), yet by the animal's prone position, its dorsal parts being rather higher than the sternal, it comes to be always contiguous to this muscle, and is as effectually subjected to an alternate pressure from its action as the human spleen is.

200 Liver.

The human *liver* has no fissures or divisions, unless we may reckon that small one betwixt the two *pylæ*, where the large vessels enter: Whereas in a dog, and all

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all other creatures that have a large flexion in their spine, as lions, leopards, cats, &c. the liver and lungs are divided into a great many lobes by deep sections, reaching the large blood-vessels, which in great motions of the back bone may easily slide over one another; and so be in much less danger of being torn or bruised, than if they were formed of one entire piece, as we really see it is in horses, cows, and such creatures as have their back bone stiff and immoveable. There is here no *ligamentum latum* connecting the liver to the diaphragm, which, in our situation, was necessary to keep the viscus in its place: Whereas, in this creature, it naturally gravitates forwards, and by the horizontal position of the animal is in no danger of pressing against the vena cava; the preventing of which is one use generally assigned to this ligament in man. Had the liver of the dog been thus connected to the diaphragm, the respiration must necessarily have suffered; for, as we shall see afterwards, this muscle is here moveable at the centre as well as at the sides: But in man the liver is fixed to the diaphragm, mostly at its tendinous part; that is, where the pericardium is fixed to it on the other side; so that it is in no danger of impeding the respiration, being suspended by the mediastinum and bones of the thorax. In consequence of this viscus being divided into so many lobes, it follows, that the hepatic ducts cannot possibly join into one common trunk till they are quite out of the substance of the liver; because a branch comes out from every lobe of the liver; all of which, by their union, form the hepatic duct: whence we are led to conclude, that the hepatico-cystic ducts, mentioned by former authors, do not exist. The gall-bladder itself is wanting in several animals, such as the deer, the horse, the ass, &c.; but, in place of it, in such animals, the hepatic duct, at its beginning, is widened into a reservoir of considerable size, which may answer the same purpose in them that the gall-bladder does in others.

201 Mediastinum.

The *mediastinum* in this creature is pretty broad. The pericardium is not here contiguous to the diaphragm, but there is an inch of distance betwixt them, in which place the small lobe of the lungs lodges; and by this means the liver, &c. of this animal, though continually pressing upon the diaphragm, yet cannot disturb the heart's motion.

202 Heart.

The heart is situated with its point almost directly sternally, according to the creature's posture, and is but very little inclined to the left side. Its point is much sharper, and its shape more conoidal, than the human.

203 Vena cava.

The animal has the *vena cava* of a considerable length within the thorax, having near the whole length of the heart to run over ere it gets at the *sinus Lowerianus dexter*. In man, as soon as it pierces the diaphragm, it enters the pericardium, which is firmly attached to it, and immediately gets into the *sinus Lowerianus;* which sinus, in the human subject, by the oblique situation of the heart is almost contiguous to the diaphragm: and by this we discover, that several authors have taken their delineations of the human heart from brutes; which is easily detected by the shape and situation of the heart, and long vena cava, within the thorax. This was one of the faults of the curious wax work that was shown at London and Paris, which was plainly taken from a cow.

This situation of the heart of the creature agrees best with the shape of its thorax, which is lower than the abdomen. Of Quadrupeds.

204 Aorta ascendens, improperly so called.

The egress of the large blood-vessels from the heart is somewhat different from the human: For here the right subclavian comes off first: and as a large trunk runs some way upwards before it gives off the left carotid, and splits into the carotid and subclavian of the right side, then the left subclavian is sent off. So that neither here, properly speaking, is there an *aorta ascendens*, more than in the human; but this name has probably been imposed upon it from observing this in a cow, where indeed there is an ascending and descending aorta.

205 A mechanical account of the superior strength of the right arm, leg, &c.

From this specialty of the distribution of the vessels of the right side, which happens, though not in so great a degree, in the human subject, we may perhaps in some measure account for the general greater strength, readiness, or facility of motion, which is observable in the right arm. Upon measuring the sides of the vessels, the surface of the united trunk of the right subclavian and carotid is less than that of the left subclavian and carotid, as they are separated. If so, the resistance to the blood must be less in that common trunk than in the left subclavian and carotid: But if the resistance be smaller, the absolute force with which the blood is sent from the heart being equal, there must necessarily be a greater quantity of blood sent through them in a given time; and as the strength of the muscles is, *cæteris paribus*, as the quantity of blood sent into them in a given time, those of the right arm will be stronger than those of the left. Now children, being conscious of this superior strength, use the right upon all occasions; and thus from use comes that great difference which is so observable. That this is a sufficient cause, seems evident from fact; for what a difference is there betwixt the right and the left arm of one who has played much at tennis? View but the arms of a blacksmith and legs of a footman, and you will soon be convinced of this effect arising from using them. But if by any accident the right arm is kept from action for some time, the other from being used gets the better; and those people are left-handed: For it is not to be imagined, that the small odds in the original formation of the vessels should be sufficient to resist the effect of use and habit (instances of the contrary occur every day); it is enough for our present argument, that where no means are used to oppose it, the odds are sufficient to determine the choice in favour of the right. Now because it is natural to begin with the leg corresponding to the hand we have most power of, this is what gives also a superiority to the right leg.

This difference is not peculiar to man, but is still more observable in those creatures in whom the same mechanism does obtain in a greater degree. Do but observe a dog at a trot, how he bears forward with his right side; or look at him when a scraping up any thing, and you will presently see that he uses his right much oftener than he does his left foot. Something analogous to this may be observed in horses. It has been the opinion of some anatomists, that left-handed people, as well as those distinguished by the name of *ambidexter* (who use both hands alike), have the two carotid and subclavian arteries coming off in four distinct

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stinct trunks from the arch of the aorta: but no appearance of this kind has ever been observed in such bodies as have been examined for this purpose; though indeed these have been but few, and more experience might throw greater light on the subject.

206 Diaphragm. The *diaphragm*, in its natural situation, is in general more loose and free than the human; which is owing to its connexion with the neighbouring parts in a different manner from ours. The human *diaphragm* is connected to the pericardium; which again, by the intervention of the mediastinum, is tied to the sternum, spine, &c. but here there is some distance between the diaphragm and pericardium. We observe further, that its middle part is much more moveable, and the tendinous parts not so large. And indeed it was necessary their *diaphragm* should be somewhat loose, they making more use of it in difficult respiration than man. This we may observe by the strong heaving of the flanks of a horse or dog when out of breath; which corresponds to the rising of the ribs in us.

207 Sternum. The *sternum* is very narrow, and consists of a great number of small bones, moveable every way; which always happens in creatures that have a great mobility in their spine. The ribs are straighter, and by no means so convex as the human; whereby in respiration, the motion forward will very little enlarge their thorax, which is compensated by the greater mobility of their diaphragm; so our thorax is principally enlarged according to its breadth and depth, and theirs according to its length. The want of clavicles, and the consequent falling in of the atlantal extremities upon the chest, may contribute somewhat to the straightness of the ribs.

208 Ribs.

209 Kidneys. We come next to discourse of those organs that serve for the secretion and excretion of urine. And first of the kidneys: Which in this animal are situated much in the same way as in the human subject; but have no fat on their inferior surface, where they face the abdomen, and are of a more globular form than the human. The reason of these differences will easily appear, if we compare their situation and posture in this animal with those in a man who walks erect. They are placed in them in the sacral part of the body, so are not subject to the pressure of the viscera, which seems to be the principal cause of the fatness of those organs in us, and perhaps may likewise be the cause of our being more subject to the stone than other animals. Hence there is no need of any cellular substance to ward off this pressure where there would necessarily be fat collected; but the atlantal part of their kidneys is pretty well covered with fat, lest they should suffer any compression from the action of the ribs and spine.

210 Papillæ. In the internal structure there is still more considerable difference: For the *papillæ* do not here send out single the several *tubuli uriniferi;* but being all united, they hang down in form of a loose pendulous flap in the middle of the pelvis, and form a kind of partition; so that a dog has a pelvis formed within the substance of the kidney. The only thing that is properly analogous to a pelvis in man is that sac or dilatation of the ureters formed at the union of the *ductus uriniferi.* The external part of the kidney of a dog somewhat resembles one of the lobes of the kidney of a human fœtus: but in a human adult the appearance is very different; because, in man, from the continual pressure of the surrounding viscera, the lobes, which in the fœtus are quite distinct and separated, concrete, but the original cortical substance is still preserved in the internal parts of the kidney. The reason of these peculiarities may probably be, that the liquors of this animal, as of all those of the carnivorous kind, being much more acrid than those that live on vegetable food, its urine must incline much to an alkalescency, as indeed the smell and taste of that liquor in dogs, cats, leopards, &c. evidently show, being fetid and pungent, and therefore not convenient to be long retained in the body. For this end it was proper that the secreting organs should have as little impediment as possible by pressure, &c. in the performing their functions; and for that design, the mechanism of their kidneys seems to be excellently adapted: We have most elegant pictures in Eustachius of the kidneys of brutes, delineated as such, with a view to show Vesalius's error in painting and describing them for the human.

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212 Capsulæ atrabiliariæ. The *glandulæ* or *capsulæ atrabiliariæ* are thicker and rounder than the human, for the same reason as the kidneys.

213 Ureters. The *ureters* are more muscular than the human, because of the unfavourable passage the urine has through them; they enter the bladder near its large extremity.

214 Bladder. The bladder of urine differs considerably from the human; and first in its form, which is pretty much pyramidal or pyriform. This shape of the dog's bladder is likewise common to all quadrupeds, except the ape and those of an erect posture. In man it is by no means pyriform, but has a large sac at its dorsal and sacral part: this form depends entirely on the urine gravitating in our erect posture to its bottom, which it will endeavour to protrude; but as it cannot yield before, being contiguous to the os pubis, it will naturally stretch out where there is the least resistance, that is, at the posterior and lateral parts; and were it not for this sac, we could not so readily come at the bladder to extract the stone either by the lesser or lateral operation of lithotomy. Most anatomists have delineated this wrong: so much, that we know of none who have justly painted it, excepting Mr Cowper, in his *Myotomia*, and Mr Butty. It has certainly been from observing it in brutes and young children, that they have been led into this mistake. The same cause, viz. the gravity of the urine, makes the bladder of a different form in brutes: In their horizontal position the neck, from which the urethra is continued, is higher than its fundus; the urine must therefore distend and dilate the most depending part by its weight.

215 Connection. As to its *connection*, it is fastened to the abdominal muscles by a process of the peritoneum, and that membrane is extended quite over it; whereas in us its superior and posterior parts are only covered by it: hence in man alone the high operation of lithotomy can be performed without hazard of opening the cavity of the abdomen. Had the peritoneum been spread over the bladder in its whole extent, the weight of the viscera in our erect posture would have so borne upon it, that they would not have allowed any considerable quantity of urine to be collected there; but we must have been

216 Why the human bladder but in part covered by the peritoneum.

obliged

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obliged to discharge its contents too frequently to be consistent with the functions of a social life: Whereas by means of the peritoneum, the urine is now collected in sufficient quantity, the viscera not gravitating this way.

It may be taken for a general rule, that those creatures that feed upon animal food have their bladder more muscular and considerably stronger and less capacious, than those that live on vegetables, such as horses, cows, swine, &c. whose bladder of urine is perfectly membranous, and very large. This is wisely adapted to the nature of their food: For in these first, as all their juices are more acrid, so in a particular manner their urine becomes exalted; which, as its delay might be of very ill consequence, must necessarily be quickly expelled. This is chiefly effected by its stimulating this viscus more strongly to contract, and so to discharge its contents, though the irritation does not altogether depend upon the stretching, but likewise arises from the quality of the liquor. That a stimulus is one of the principal causes of the excretion of urine, we learn from the common saline diuretic medicines that are given, which are dissolved into the serum of the blood, and carried down by the kidneys to the bladder: The same appears likewise from the application of cantharides; or without any of these, when the parts are made more sensible, as in an excoriation of the bladder, there is a frequent desire to make water. Accordingly we find these animals evacuate their urine much more frequently than man, or any other creature that lives on vegetable food. And if these creatures, whose fluids have already a tendency to putrefaction, are exposed to heat or hunger, the liquids must for a considerable time undergo the actions of the containing vessels, and frequently perform the course of the circulation, without any new supplies of food; by which the fluids becoming more and more acrid, the creature is apt to fall into feverish and putrid diseases.

217 A stimulus proved to be a principal cause of the evacuation of the bladder.

218 Vasa spermatica.

Their *spermatic vessels* are within the peritoneum, which is spread over them, and from which they have a membrane like a mesentery, to hang loose and pendulous in the abdomen: whereas in us, they are contained in the cellular part of the peritoneum, which is tensely stretched over them. At their passage out of the lower belly, there appears a plain perforation, or holes; hence the adult quadruped, in this respect, resembles the human fœtus. And from observing this in quadrupeds, has arisen the false notion of *hernia* or *rupture* among authors. This opening, which leads down to the testicle, is of no disadvantage to them, but evidently would have been to us; for from the weight of our viscera, and our continually gravitating upon these holes, we must have perpetually laboured under enteroceles. This they are in no hazard of, since in them this passage is at the highest part of their belly; and in their horizontal posture, the viscera cannot bear upon it: And to prevent even the smallest hazard, there is a loose pendulous semilunar flap of fat; which serves two uses, as it both hinders the intestines from getting into the passage, and also the course of the fluids from being stopped in the vessels, which is secured in us by the cellular substance and tense peritoneum: And it may be worth while to observe, that this process remains almost unaltered, even after the animal has been almost exhausted of fat.

219 Whence the false notion of hernia or rupture.

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There is next a passage quite down into the cavity where the testicles lie. Had the same structure obtained in man, by the constant drilling down of the liquor which is secreted for the lubricating of the guts, we should always have laboured under an hydrocele; but their posture secures them from any hazard of this kind: indeed very fat lap-dogs, who consequently have an overgrown omentum, are sometimes troubled with an epiplocele.

220 Scrotum.

The *scrotum* is shorter and not so pendulous as the human in all the dog kind that want the *vesiculæ seminales*, that the seed at each copulation might the sooner be brought from the testes, thus in some measure supplying the place of the *vesiculæ seminales;* for the course of the seed through the *vasa deferentia* is thus shortened by placing the secerning vessels nearer the excretory organs. Perhaps its passage is likewise quickened by the muscular power of the vasa deferentia, which is stronger in this creature than in man. The want of *vesiculæ seminales* at the same time explains the reason why this creature is so tedious in copulation. But why these bodies are absent in the dog kind more than in other animals, is a circumstance we know nothing of.

221 The vesiculæ seminales, how supplied.

222 Testes.

The structure of the *testicles* is much the same with the human; as are likewise the *corpus pyramidale*, *varicosum*, or *pampiniforme*, and the *epididymis* or excretory vessel of the testicle. The *vasa deferentia* enter the abdomen where the blood vessels come out; and, passing along the upper part of the bladder, are inserted a little below the bulbous part of the urethra.

223 Penis.

The præputium has two muscles fixed to it: one that arises from the sphincter ani, and is inserted all along the *penis;* and this is called *retractor præputii*: But the other, whose office is directly contrary to this, is cutaneous; and seems to take its origin from the muscles of the abdomen, or rather to be a production of their tunica carnosa. The *corpora cavernosa* rise much in the same way as the human; but these soon terminate; and the rest is supplied by a triangular bone, in the inferior part of which there is a groove excavated for lodging the urethra. There are upon the penis two protuberant bulbous fleshy substances, resembling the glans penis in man, at the back of which are two veins, which by the *erectores penis* and other parts are compressed in the time of coition; and the circulation being stopped, the blood distends the large cavernous bodies. After the penis is thus swelled, the vagina by its contraction and swelling of its corpus cavernosum, which is considerably greater than in other animals, gripes it closely; and so the male is kept in action some time contrary to his will, till time be given for bringing a quantity of seed sufficient to impregnate the female: and thus, by that *orgasmus veneris* of the female organs, the want of the *vesiculæ seminales* is in some measure supplied. But as it would be a very uneasy posture for the dog to support himself solely upon his hinder feet, and for the bitch to support the weight of the dog for so long a time; therefore, as soon as the bulbous bodies are sufficiently filled, he gets off and turns averse to her. Had, then, the penis been pliable as in other animals, the urethra must of necessity

224 Coitus.

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necessity have been compressed by this twisting, and consequently the course of the seed intercepted; but this is wisely provided against by the urethra's being formed in the hollow of the bone. After the emission of the seed, the parts turn flaccid, the circulation is restored, and the bulbous parts can be easily extracted.

225 Prostata.

The *prostata* seems here divided into two, which are proportionably larger than the human, and afford a greater quantity of that liquid.

226 Uterus.

The *uterus* of multiparous animals is little else but a continuation of their vagina, only separated from it by a small ring or valve. From the *uterus* two long canals mount upon the loins, in which the fœtus are lodged: these are divided into different sacs, which are strongly constricted betwixt each fœtus; yet these coarctions give way in the time of birth. From these go out the *tubæ Fallopianæ*, so that the ovaria come to lodge pretty near the kidneys.

227 Mammæ.

The disposition and situation of the *mammæ* vary as they bear one or more young. Those of the uniparous kind have them placed between the sacral extremities, which in them is the highest part of their bodies, whereby their young get at them without the inconvenience of kneeling: Nevertheless, when the creatures are of no great size, and their breast large, as in sheep, the young ones are obliged to take this posture. In multiparous animals, they must have a great number of nipples, that their several young ones may have room at the same time, and these disposed over both thorax and abdomen; and the creatures generally lie down when the young are to be suckled, that they may give them the most favourable situation. From this it does not appear to be from any particular fitness of the vessels at certain places for giving a proper nourishment to the child, that the breasts are so placed in women as we find them, but really from that situation being the most convenient both for mother and infant.

Sect. III. *Anatomy of ruminating Animals, and particularly of the Cow.*

The animal whose structure we have been examining, being one of those which live chiefly on other animals, had a foot formed for running and seizing its prey. But the tribe of ruminating animals have their feet enveloped in a horny covering, fitting them for walking much, as is required of many of them, but totally disqualifying them for seizing living prey.

In these animals, the spinous processes of the vertebræ of the neck diminish in size according to the length of the neck; the atlas, or first vertebra, has its lateral processes flatted and bending forwards, and the mammillary processes of the back of the head are lengthened out; hence, they can move the head with difficulty sideways or forwards, but the motion of the neck is very extensive. The ribs are broad and thick. The scapula is narrow next the back, and lengthened out towards the neck, and it has neither acromion nor coracoid process. The great tuberosity near the head of the thigh bone, in the atlantal extremity is very large, and the rough line on the bone very prominent, to give greater room for the insertion of strong muscles. The two bones of the fore leg grow together almost their whole length, being only distinguished from it at the top by a furrow. Hence, the side motion of the foot in these animals is almost entirely prevented. The haunch bone is shaped something like a hammer, with the anterior part of the spine extremely large, and the muscles situated about these bones exceeding strong and bulky, as one would suppose they ought to be, in order to enable these animals to kick with greater power.

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There are no parietal bones in the skull of these animals, but their place is occupied by one very strong bone in the top of the head; the frontal bone is very large, and forms a large arch overhanging each orbit.

The brain, in these animals, is much smaller in proportion to the rest of their body, than in man; in the ox it constitutes $\frac{1}{860}$ of the weight of the body, whereas in man it amounts to about $\frac{1}{30}$; its general form does not differ much from that of man.

In the eye of the cow the pupil is oblong, rounded at the ends, and the tapetum is of a beautiful green colour, changing to an azure blue; the striæ at the back of the uvea are very large and conspicuous. The eye of this animal is usually the subject of dissection in examining the structure of this organ, which it exhibits to great advantage. It is in the organs of digestion, that these animals differ most essentially from the other mammalia; these therefore deserve a particular examination.

228 The history of the cow as a ruminant animal.

There are no cutting teeth in the upper jaw, but the gums are pretty hard, and the tongue rough. This roughness is occasioned by long sharp-pointed papillæ, with which the whole substance of it is covered. These papillæ are turned towards the throat; so that by their means the food, having once got into the mouth, is not easily pulled back. The animals therefore supply the defect of teeth by wrapping their tongue round a tuft of grass: and so, pressing it against the upper jaw, keep it stretched, and cut it with the teeth of the under jaw; then, without chewing, throw it down into the gullet, which in these creatures consists of a double row of spiral fibres crossing one another. All animals which ruminate must have more stomachs than one; some have two, some three; our present subject has no less than four. The food is carried directly down into the first, which lies upon the left side, and is the largest of all: it is called γαστηρ, *ventriculus*, and κοιλια, by way of eminence. It is what is called by the general name of *paunch* by the vulgar. There are no rugæ upon its internal surface; but instead of these there are a vast number of small blunt-pointed processes, by which the whole has a general roughness, and the surface is extended to several times the size of the paunch itself. The food, by the force of its muscular coat, and the liquors poured in here, is sufficiently macerated; after which it is forced up hence by the gullet into the mouth, and there it is made very small by mastication; this is what is properly called *chewing the cud*, or *rumination*; for which purpose the grinders are exceedingly well fitted: for instead of being covered with a thin crust, the enamel on them consists of perpendicular plates, between which the bone is bare, and constantly wearing faster than the enamel, so that the tooth remains good to extreme old age; and by means of these teeth the rumination is carried on for a long time without any danger of spoiling

229 It has four stomachs.

230 Their names and description.

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spoiling them. After rumination, the food is sent down by the gullet into the second stomach; for the gullet opens indifferently into both. It ends exactly where the two stomachs meet: and there is a smooth gutter with rising edges which leads into the second stomach, from thence to the third, and also to the fourth: however, the creature has the power of directing it into which it will. Some tell us, that the drink goes into the second; but that might be easily determined by making them drink before slaughter. The second stomach, which is the anterior and smaller, is called κηκρυφαλος, *reticulum*, *honeycomb*, the *bonnet* or *king's hood*. It consists of a great number of cells on its internal surface, of a regular pentagonal figure, like a honeycomb. Here the food is farther macerated; from which it is protruded into the third, called εχινος or *omasum*, *vulgo* the *manyplies*, because the internal surface rises up into a great many plicæ or folds, and *stratum super stratum*, according to the length of this stomach. Some of these plicæ are farther produced into the stomach than others; i. e. first two long ones on each side, and within these two shorter in the middle, &c. There are numberless glandular grains like millet seeds dispersed on its plicæ, from which some authors call this stomach the *millet*. From this it passes into the fourth, whose names are νηστεον, *abomasum*, *caillé*, or the *red*, which is the name it commonly has because of its colour. This much resembles the human stomach, or that of a dog; only the inner folds or plicæ are longer and looser; and it may also be observed, that in all animals there is only one digestive stomach, and that has the same coagulating power in the fœtus as the fourth stomach in this animal; whence this might not improperly be called the only true stomach. *Caillé* signifies *curdled;* and hence the French have given that as a name to this fourth stomach, because any milk that is taken down by young calves is there curdled. It is this fourth stomach, with the milk curdled in it, that is commonly taken for making runnet: but after the bile and pancreatic juice enter, this coagulation is not to be found, which shows the use of these liquors. There are other creatures which use the same food, that have not such a mechanism in their digestive organs. Horses, asses, &c. have but one stomach, where grass is macerated, and a liquor for their nourishment extracted, and the remainder sent out by the anus very little altered. From this different structure of the stomach in these creatures, a ruminant animal will be served with one-third less food than another of equal bulk: grasiers are sufficiently acquainted with this. The reason is, that ruminating animals have many and strong digestive organs; all their food is fully prepared, and almost wholly converted into chyle: But a horse's stomach is not fitted for this; so that he requires a much greater quantity of food to extract the same nourishment.

231 Intestina.

The guts of these creatures are of a considerable length in proportion to the bulk of the body; and this confirms what we said formerly on the subject of the intestines of a dog, viz. that the length and capacity of the guts were different in different animals, according to the nature of their food.

232 Duodenum.

The *duodenum* is formed here much the same way as in a dog, and the general intention kept in view with regard to the mixture of the bile and pancreatic lymph. The great guts here hardly deserve that name, their diameter differing very little from that of the small; but to compensate this, they are much longer proportionally than a dog's, being convoluted as the small guts are. The cæcum is very large and long. The digestion of the cow, as well as some other animals, is accomplished with *rumination;* the intention of which seems to be, that the food may be sufficiently comminuted, and thus more fully acted upon by the stomach: for it is not observed that a calf ruminates as long as it is fed only upon milk, though the action takes place as soon as it begins to eat solid food. But it is to be observed, that as long as a calf feeds only upon milk, the food descends immediately into the fourth stomach (which, as has been already mentioned, seems only capable of performing the operation of digestion) without stopping in any of the first three. The rumination does not take place till after the animal has eaten a pretty large quantity: after which she lies down, if she can do it conveniently, and begins to chew, though the operation will take place in a standing posture, if she cannot lie down. In this action a ball is observed to rise from the stomach with great velocity, almost as if shot from a musket. This ball the animal chews very accurately, and then swallows it again, and so on alternately, till all the food she has eaten has undergone this operation. This is easily explained from the structure of the gullet, which has one set of fibres calculated for bringing up the grass, and another for taking it down.

By means of rumination, the cow extracts a much larger proportion of nourishment from her food than those animals which do not ruminate; and hence she is contented with much worse fare, and smaller quantities of it, than a horse; hence also the dung of cows, being much more exhausted of its fine parts than horse-dung, proves much inferior to it as a manure.

233 Spleen.

The *spleen* differs not much either in figure or situation from that of a dog; but it is a little more firmly fixed to the diaphragm, there not being here so much danger of this viscus's being hurt in the flexions of the spleen.

234 Liver.

The *liver* is not split into so many lobes in this creature as either in a man or dog; which depends on the small motion this creature enjoys in its spine, which made such a division needless. This also confirms what we formerly advanced on this head.

235 Heart.

The situation of the *heart* is pretty much the same with that of a dog, only its point is rather sharper: In us, the heart beating continually against the ribs, and both ventricles going equally far down to the constitution of the apex, it is very obtuse: but here the apex is made up only of the left ventricle, so is more acute.

236 Aorta ascendens and descendens.

The *aorta* in this creature is justly divided into *ascending* and *descending*, though this division is ill founded either in a dog or man; and it has certainly been from this subject that the older anatomists took their descriptions when they made this division; for here the aorta divides into two, the ascending and descending.

237 Bladder.

Their urinary bladder is of a pyramidal shape. It is very large, and more membranaceous; for the urine

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of these creatures not being so acrid as that of carnivorous animals, there was no such occasion for expelling it so soon.

238 Scrotum. Vesiculæ seminales.

The male is provided with a loose pendulous *scrotum*, and consequently with *vesiculæ seminales*. The female organs differ from those of a bitch, mostly as to the form of the cornua uteri, which are here contorted in form of a snail. In this, and all uniparous animals, they contain only part of the secundines; but in bitches, and other multiparous animals, they run straight up in the abdomen, and contain the fœtus themselves.

239 Uterus. 240 Cornua uteri.

The form of a cow's *uterus* differs from the human in having two pretty large cornua. This is common to it with other brutes; for a bitch has two long *cornua uteri:* But these again differ (as being multiparous and uniparous) in this, that in the bitch's cornua the fœtus are contained; whereas here there is only part of the secundines, being mostly the allantois with the included liquor. The muscular fibres of the uterus are more easily discovered; its internal surface has a great number of spongy, oblong, protuberant, glandular bodies fixed to it. These are composed of vessels of the uterus terminating here. In an unimpregnated uterus we can easily press out of them a chylous mucilaginous liquor; they are composed of a great many processes or digituli, and deep caverns, answering to as many caverns and processes of the placenta. Their resemblance has occasioned the name of *papillæ* to be given them: and hence it was that Hippocrates was induced to believe that the fœtus sucked *in utero*. The papillæ are found in all the different stages of life, in the various stages of pregnancy, and likewise in the unimpregnated state. It is not easy to determine whether the uterus grows thicker or thinner in the time of gestation. The membranes, it is plain (by the stretching of the parts), must be made thinner; but then it is as evident, that the vessels are at that time enlarged, upon which principally the thickness of any part depends; so there seems to be as much gained the one way as lost the other.

241 Uterus if thicker in time of gestation.

The *os uteri* is entirely shut up by a glutinous mucilaginous substance, that is common to the females of all creatures when with young: by this the external air is excluded, which would soon make the liquors corrupt: it also prevents the inflammation of the membranes, and the hazard of abortion. By this means also the lips of the womb are kept from growing together, which otherwise they would certainly at this time do. There are mucous glands placed here to secrete this gluten, which on the breaking of the membranes with the contained waters makes a soap that lubricates and washes the parts, and makes them easily yield. The first of the proper involucra of the fœtus is the chorion.

242 Chorion.

The *chorion* is a pretty strong firm membrane, on whose external surface are depressed a great many red fleshy bodies of the same number, size, and structure, with the papillæ, with which they are mutually indented. They have been called *cotyledones*, from κοτυλη, "cavity." This is greatly disputed by some as a name very improper; but we think without reason, since the surface that is connected to the papillæ is concave, though when separated it appears rather convex. To shun all dispute, they may be called properly enough

243 Cotyledones.

placentulæ, since they serve the same use as the placenta in woman. The separation of these from the papillæ without any laceration, and our not being able to inject coloured liquors from the vessels of the glands of the uterus into the placentulæ, seem to prove beyond a reply, that there can be here no anastomoses betwixt the vessels. On their coats run a great number of vessels that are sent to the present placentulæ, on the external side next to the uterus; whereas in creatures that have but one placenta, as in the human subject, cats, dogs, &c. the adhesion is somewhat firmer: The placentæ are likewise joined to the papillæ in the cornua uteri. We shall next give the history of the *allantois*.

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244 Allantois.

This is a fine transparent membrane contiguous to the former. It is not a general involucrum of the fœtus in the mother, for it covers only a small part of the amnios. It is mostly lodged in the cornua uteri. In mares, bitches, and cats, it surrounds the amnios, being everywhere interposed betwixt it and the chorion. In sheep and goats it is the same as in this animal; and in swine and rabbits it covers still less of the amnios. This sac is probably formed by the dilatation of the urachus, which is connected at its other end to the fundus of the bladder, through which it receives its contents; and a great quantity of urine is commonly found in it. The membrane is doubled at the extremity of the canal, to hinder the return of the urine back into the bladder. Its vessels are so excessively fine and few, that we cannot force an injected liquor farther than the beginning of this coat. This membrane is so far analogous to the cuticula, as not to be liable to corruption, or easily irritated by acrid liquors. The existence of this membrane in women has been very warmly disputed on both sides. Those who are against its existence deny they could ever find it; and, allowing it were so, allege, that since the urachus is impervious, as appears by our not being able to throw liquors from the bladder into it, or *vice versa*, it cannot serve the use that is agreed by all it does serve in beasts; and therefore in the human body there is no such thing. But if we consider, on the other hand, first, that there seems to be the same necessity for such a reservoir in man as in other animals; secondly, that we actually find urine contained in the bladder of the human fœtus; thirdly, that urine has been evacuated at the navel when the urethra was stopped, which urine without this conduit would have fallen into the cavity of the abdomen; fourthly, that midwives have pretended to remark two different sorts of waters come away at the time of birth: and, lastly, that Dr Littre and Dr Hale have given in this membrane of a human subject, with all the other secundines, curiously prepared, the one to the Royal Academy at Paris, the other to the Royal Society at London; by which societies their respective accounts are attested; not to mention Verheyen, Heister, Keill, &c. who affirm their having seen it; and Albinus is said to have shewn to his college every year a preparation of it: On all these accounts it seems most probable, that there is such a membrane in the human body.

245 The arguments for and against the human allantois.

246 Amnios.

The third proper integument of the fœtus is the *amnios*. It is thinner and firmer than the chorion; it has numerous ramifications of the umbilical vessels spread upon it, the lateral branches of which separate a liquor into its cavity. This is the proper liquor of the amnios;

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nios; which at first is in a small quantity, afterwards increases for some months, then again decreases; and in a cow near her time, the quantity of this liquor is not above a pound. The membrane does not enter the *cornua uteri* in this creature, being confined to the body of the uterus; whereas the allantois occupies chiefly its cornua. But for what further relates to the structure of the involucra, with the nature of the liquors contained in them, we must refer to the second volume of Medical Essays, from page 121, where you have the sum of all we know of this matter.

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There are here two *venæ umbilicales*, and but one in the human subject; because the extreme branches coming from the several placentulæ could not unite so soon as they would have done had they come all from one cake, as in the human.

There is a small round fleshy body that swims in the urine of this creature, mares, &c. which is the *hippomanes* of the ancients. Several idle opinions and whims have been entertained as to its use; but that seems to be still unknown, or how it is generated or nourished, for it has no connection with the fœtus or placentulæ.

CHAP. V. THE ANATOMY OF BIRDS.

SECT. I. *Of Birds in General.*

THE structure of the greater part of these animals is obviously calculated for the most rapid of all motions. That part of the vertebral column which constitutes the back is immoveable; but the neck is exceedingly flexible, the vertebræ being articulated together, not by flat surfaces, but by portions of cylinders, but in such a manner as that the more atlantal vertebræ can move only forward, the more sacral only backward. The neck is generally long, but its length differs in various species, being determined by their manner of life and other circumstances. The head is small in proportion to the body, and generally ends in a sharp bill, that the animal may the more easily make its way through the air. The breast bone is shaped like a shield, and has in the middle a large and broad spine, like the keel of a ship, thus forming a considerable extent of surface for the insertion of muscles. This ridge is most conspicuous in birds that fly. On each side of the breast bone, next the wings, are two bones, which correspond to the clavicle or collar bone in man, by which the wings are connected to the breast bone, and between these is a very elastic bone with two horns, shaped like a V, and commonly known by the name of *merry thought*. The wings are composed in a manner similar to the atlantal extremity in the mammalia, and are generally divided into two portions; the *wing*, to which the principal muscles are attached, and the *pinion*.

247 Their wings, how furnished.

Fowls have the strongest muscles of their whole body inserted into their wings; whence by the way we may observe, that it is altogether impossible for man to buoy himself up into the air like birds, even though he had proper machines in place of wings, unless he were likewise provided with muscles strong enough for moving them, which he has not. In the next place, their wings are not placed in the middle of their bodies, but a good deal farther forwards; whence it would at first view appear, that their heads would be erect, and their posterior parts most depending when raised in the air; but by stretching out their heads which act upon the lever of a long neck, they alter their centre of gravity pretty much; and also by filling the sacs or bladders in the inside of their abdomen with air, and expanding their tail, they come to make the posterior part of their bodies considerably higher; and thus they fly with their bodies nearly in a horizontal situation. Hence we find, that if their necks are kept from being stretched out, or if you cut away their tails, they become incapable of flying any considerable way.

248 Why not placed in the middle of the body.

The largeness of the wings in different fowls varies according to the wants of the creature. Thus birds of prey, who must fly a considerable way to provide their food, have large strong wings; whereas domestic birds, who find their nourishment almost everywhere, have very short and but small wings. Their tail is of use in assisting to raise them in the air; though the chief purpose of it is to serve as a rudder in guiding their flight, whilst they use their wings as we do oars in putting forward a boat. The best account of this manner of progression of fowls is given by Alfonsus Borellus, in his treatise *De Motu Animalium;* and in the *Religious Philosopher* we have Borelli's doctrine stripped pretty much of its mathematical form. The sacral extremities are situated so far back, as to make us at first think they would be in continual hazard of falling down forwards when they walk: but this is prevented by their holding up their head and neck, so as to make the centre of gravity fall upon the feet; and when they have occasion for climbing up a steep place, they stretch out their heads and necks forward, especially if they are short-legged, the better to preserve properly the balance of the body. Thus we may observe a goose entering a barn door, where generally there is an ascending step, to stretch out its neck, which before was raised, and incline its body forwards. This is laughed at by the common people, who ascribe it to a piece of folly in the goose, as if afraid of knocking its head against the top of the door.

249 A peculi mechani in the te of fowls.

Carnivorous birds are provided with strong crooked claws for catching their prey: water fowls use them for swimming; and, principally for this purpose, have a strong firm membrane interposed betwixt the toes. There is a beautiful mechanism to be observed in the toes of fowls, which is of considerable use to them. For their toes are naturally drawn together, or bend, when the foot is bended: this is owing to the shortness of the tendons of the toes, which pass over them, which is analogous to our heel; and that the toes are set in the circumference of a circle, as our fingers are: Hence, when the foot is bended, the tendons must consequently be much stretched; and, since they are inserted into the toes, must of necessity bend them when the foot is bended; and when the foot is extended, the flexors of the toe are again relaxed, and they are therefore expanded. This is also of great use to different kinds of fowls; thus the hawk descending

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scending with his legs and feet extended, spreads his talons over his prey; and the weight of his body bending his feet, the toes are contracted, and the prey is seized by the talons. This is also of great use to water fowls: for had there been no such contrivance as this, they must have lost as much time when they pulled their legs in as they had gained by the former stroke: but, as the parts are now framed, whenever the creature draws in its foot, the toes are at the same time bended and contracted into less space, so that the resistance made against the water is not near so great as before: on the contrary, when they stretch their foot, their toes are extended, the membrane betwixt them expanded, and consequently a greater resistance made to the water. Again, such fowls as live mostly in the air, or have occasion to sustain themselves on branches of trees in windy weather, and even in the night-time when asleep, while all their muscles are supposed to be in a state of relaxation, have only to lean down the weight of their bodies, and their toes continue bended without any muscles being in action; and whenever they would disentangle themselves, they raise up their bodies, by which their feet, and consequently their toes, are extended.

250 Their covering.

Fowls have a particular covering of feathers different from all other creatures, but exactly well suited to their manner of life: for it not only protects them from the injuries of the weather, but serves them in their progression through that thin aerial element they are, for the most part, employed in; and as fowls live much in the water, their feathers being continually besmeared with an oily liquor, keeps the water from soaking into their skins, and so prevents the bad effects which it would infallibly otherwise produce.

The brain in birds is large in proportion to their heads: it has neither *corpus callosum*, *fornix*, nor *corpora quadrigemina*. Hence we may conclude, that these parts are not essential to life, nor probably to reason.

The organ of smelling is placed at the base of the beak; the nostrils are sometimes naked, sometimes concealed by feathers, and by a small scale, or even by a fleshy substance.

251 The organ of smelling.

The organ of *smelling* is very large, and well provided with nerves; hence they have this sensation very acute. Ravens and other birds of prey give a sure proof of this, by their being able to find out their prey, though concealed from their sight and at a considerable distance.

Those birds that grope for their food in the waters, mud, &c. have large nerves, which run quite to the end of their bills, by which they find out and distinguish their food.

252 Eye.

The anterior part of their *eyes* (instead of having the sclerotic coat continued, so as to make near a sphere as in us) turns all of a sudden flat: so that here the sclerotic makes but half a sphere; and the cornea rises up afterwards, being a portion of a very small and distinct sphere: so that in these creatures there is a much greater difference betwixt the sclerotic and cornea than in us. Hence their eyes do not jut out of their heads, as in man and quadrupeds. As most of these creatures are continually employed in hedges and thickets, therefore, that their eyes might be secured from these injuries, as well as from too much light when flying in the face of the sun, there is a very elegant mechanism in their eyes. A membrane rises from the internal canthus, which at pleasure, like a curtain, can be made to cover the whole eye; and this by means of a proper muscle that rises from the sclerotic coat, and passing round the optic nerves, runs through the *musculus oculi attollens* (by which however the optic nerves are not compressed) and palpebra, to be inserted into the edge of this membrane. Whenever this muscle ceases to act, the membrane by its own elasticity again discovers the eye. This covering is neither pellucid nor opaque, both which would have been equally inconvenient; but, being somewhat transparent, allows as many rays to enter as to make any object just visible, and is sufficient to direct them in their progression. By means of this membrane it is that the eagle is said to look at the sun.

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253 Bourse noir. Its description and uses.

Besides, all birds have another peculiarity, the use of which is not so well understood: and that is, a pretty long black triangular purse, rising from the bottom of their eye just at the entry of the optic nerve, and stretched out into their vitreous humour, and one would imagine it gave some threads to the crystalline. To this the French (who probably were the first who took notice of it in their dissections before the Royal Academy) gave the name of *bourse noir*. This may probably serve to suffocate some of the rays of light, that they may see objects more distinctly without hurting their eyes. It has a connection with the vitreous, and seems to be joined also to the crystalline humour. If we suppose it to have a power of contraction (which may be as well allowed as that of the iris), it may so alter the position of the vitreous and crystalline humours, that the rays from any body may not fall perpendicularly upon the crystalline: and this seems to be necessary in them, since they cannot change the figure of the anterior part of their eye so much as we can do: and as this animal is exposed often to too great a number of rays of light, so they have no tapetum, but have the bottom of their eye wholly black on the retina; and in consequence of this, fowls see very ill in the dark.

254 Organ of hearing.

They have no external ear; but in place of it a tuft of very fine feathers covering the *meatus auditorius*, which easily allows the rays of sound to pass them, and likewise prevents dust or any insect from getting in. An external ear would have been inconvenient in their passing through thickets, and in flying, &c. A liquor is separated in the external part of the ear, or *meatus auditorius*, to lubricate the passage, and further prevent the entrance of any insects, &c. The *membrana tympani* is convex externally; and no muscles are fixed to the bones of their ear, which are rather of a cartilaginous consistence: any tremulous motions impressed on the air are communicated in these creatures merely by the spring and elasticity of these bones; so probably, the membrane is not so stretched as in the human ear by muscles. The semicircular canals are very distinct, and easily prepared.

255 The variety in the beaks of fowls. Its uses, &c.

The rostrum, bill, or beak of fowls, is composed of two mandibles; and, as in quadrupeds, the upper one has no motion but what it possesses in common with the head, But parrots are an exception to this rule; for they can move the upper mandible at pleasure: that is exceedingly convenient, as it enables them to lay hold of whatever comes in their way. Carnivorous

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fowls have their beaks long, sharp, and crooked; the domestic fowls, such as the hen kind, &c. have strong short beaks, commodiously fitted to dig up and break their food; the water-fowls, again, have long or very broad scoop-like beaks, which is most convenient for them.

The other circumstances in which the structure of birds differs from that of other animals, particularly as to the organs of digestion, respiration, and generation, will be best explained by describing them in an individual instance; and we shall select for this purpose the domestic cock, taking an opportunity of contrasting the viscera of a carnivorous bird with those of this species as a granivorous bird.

Sect. II. *Anatomy of a Cock.*

Though this kind of birds live upon food somewhat similar to that of man, yet as they have no teeth to separate or break down this food, we should expect to find something to compensate for the want of teeth, something remarkable in the organs of digestion: we shall therefore begin with these parts.

256 Crop.

The *gullet* of this creature runs down its neck, somewhat inclined to the right side; and terminates in a pretty large membranous sac, which is the ingluvies or crop, where the food is macerated and dissolved by a liquor separated by the glands, which are easily observed everywhere on the internal surface of this bag. The effect of this maceration may be very well observed in pigeons, who are sometimes in danger of being suffocated by the pease, &c. they feed upon, swelling to such an immense bulk in their ingluvies, that they can neither get upwards nor downwards. If it be a favourite fowl, it might be preserved by opening the sac, taking out the pease, and sewing up the wound.

257 Ventriculus succenturiatus seu infundibulum.

The food getting out of this sac goes down by the remaining part of the gullet into the *ventriculus succenturiatus*, or *infundibulum Peyeri*, which is a continuation of the gullet with more numerous glands, which separate a liquor to dilute the food still more, which at length gets into the true stomach or gizzard, *ventriculus callosus*, which consists of two very strong muscles covered externally by a tendinous aponeurosis, and lined on the inside by a very thick firm membrane, which we evidently discover to be a production of the cuticula. This might have been proved in some measure *à priori*, from taking notice, that this membrane, which in chicks is only a thin slight pellicle, by degrees turns thicker and stronger the more attrition it suffers: but there is no other animal substance, so far as we know, which grows more hard and thick by being subjected to attrition, excepting the cuticula.—

258 Epidermis invests the internal surface of all the cavities and vessels of the human body.

Hence may be drawn some kind of proof of what has been affirmed concerning the tunica villosa of the stomach and intestines in the human body, viz. that it was in part a continuation of the epidermis; nay, all the hollow parts of the body, even arteries, veins, &c. seem to be lined with a production of this membrane, or one analogous to it. The use of the internal coat of the stomach of fowls is to defend the more tender parts of that viscus from the hard grains and little stones those creatures take down. The use of the gizzard is to compensate for the want of teeth; and it is well fitted for this purpose, from the great strength which it possesses. Of Birds

The digestion of these animals is performed merely by attrition, as is evinced by many experiments; and it is further assisted by the hard bodies they swallow. We see them daily take down considerable numbers of the most solid rugged little flints they find; and these can serve for no other purpose than to help the trituration of their aliments. After these pebbles, by becoming smooth, are unfit for this office, they are thrown up by the mouth. Hence fowls that are long confined, though ever so well fed, turn lean for want of these stones to help their digestion. This was put beyond all dispute by Mr Tauvry, who gave a piece of metal to an ostrich, convex on one side and concave on the other, but carved on both; and opening the creature's body some time after, it was found, that the carving on the convex side was all obliterated, while the engraved character remained the same as before on the concave side, which was not subjected to the stomach's pressure: which could not have happened had digestion been performed by a menstruum, or any other way whatsoever; but may be easily solved by allowing a simple mechanical pressure to take place. We are, however, by no means to conclude from this, as some have too rashly done, that in the human body digestion is performed by simple attrition; otherwise we may, with equal strength of reason, by as good arguments drawn from what is observed in fishes, prove that the aliments are dissolved in our stomachs by the action of a menstruum. But this method of reasoning is very faulty; nor can it ever bring us to the true solution of any philosophical or medical problem. It is very plain, since the structure of the parts of the human stomach are so very different from that of this creature, that it is foolish and unreasonable to imagine both of them capable of producing the same effects. At each end of the stomach, there are as it were two particular sacs of a different texture from the rest of the stomach, not consisting of strong muscular fibres; they seem to be receptacles for the stones (especially at the end which is farthest from the orifice), while the digested aliment is protruded into the intestines.

Spallanzani, however, has lately found, that pebbles are not at all necessary to the trituration of the food of these animals. At the same time, he does not deny, that when put in motion by the gastric muscles, they are capable of producing some effect on the contents of the stomach; but is inclined to believe, that they are not sought for and selected by design, as many suppose, but because they frequently happen to be mixed with the food.

259 Duodenum

The *duodenum* begins pretty near the same place at which the gullet enters; yet notwithstanding the vicinity of these two tubes, the aliments are in no danger of getting out before they are perfectly digested, by reason of a protuberance betwixt the orifices; and in those creatures who have such a strong muscular stomach, it is a matter of great indifference whether the entry of the gullet or pylorus be highest, provided that the entry from the gullet does not allow the food to regurgitate, since the force of the stomach can easily protrude it towards the duodenum. This gut is mostly in the right side, and hangs pendulous in their abdomen, having

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having its two extremities fixed to the liver. The *ductus choledochus* enters near its termination, where it mounts up again to be fixed to the liver; and lest, by the contraction of the intestines, the bile should pass over without being intimately blended with the chyle, that duct enters downwards, contrary to the course of the food, and contrary to what is observed in any of the animals we have yet mentioned. But still the general intention is kept in view, in allowing these juices the fairest chance of being intimately blended with the food.

260 Ductus choledochus.

261 Intestina tenuia.

The *small guts* are proportionally longer than those of carnivorous birds, for the general cause already assigned. At the end of the ilium they have two large *intestina cæca*, one on each side, four or five inches long, coming off from the side of the rectum, and ascending; and we find them containing part of the food: These serve as reservoirs to the feces; which, after some delay there, regurgitate into what soon becomes the rectum; which, together with the excretories of urine and organs of generation, empties itself into the common cloaca. The small intestines are connected by a long loose mesentery, which has little or no fat accompanying the blood vessels, there being no hazard of the blood's being stopped.

262 Carnivorous birds.

The principal difference to be observed in carnivorous birds is in their chylopoietic viscera, which may be accounted for from their different way of life.

263 Ingluvies.

Immediately under their clavicles, you will observe the œsophagus expanded into their *ingluvies*, which is proportionally less than in the granivorous kind, since their food does not swell so much by maceration; and for the same reason, there is a less quantity of a menstruum to be found here.

264 Ventriculus succenturiatus.

They have also a *ventriculus succenturiatus*, plentifully stored with glands, situated immediately above their stomach, which we see here is thin and musculomembranous, otherwise than in the granivorous kind: and this difference, which is almost the only one we shall find betwixt the two different species of fowls, is easily accounted for from the nature of their food, which requires less attrition, being easier of digestion than that of the other kind; nevertheless, it seems requisite it should be stronger than the human, to compensate the want of abdominal muscles, which are here very thin.

265 Intestina.

The same mechanism obtains in this creature's *duodenum* that we have hitherto observed. As being a carnivorous animal, its guts are proportionally shorter than those of the granivorous kind: for the reason first given, viz. its food being more liable to corrupt, therefore not proper to be long detained in the body; and for that reason it has no *intestina cæca*, of which the other species of fowls have a pair. The difference in their wings, backs, and claws, is obvious; and has been already in some measure observed.

266 Pancreas.

The *pancreas* in this creature lies betwixt the two folds of the duodenum, and sends two or three ducts into this gut pretty near the biliary.

267 The spleen.

The *spleen* is here of a round globular figure, situated between the liver and stomach; and betwixt these and the back bone it enjoys the same properties as in other animals, viz. large blood vessels, &c. All its blood is sent into the *vena portarum*, and has a perpetual conquassation. It has no excretory, as far as we know. Their *liver* is divided into two equal lobes by a pellucid membrane, running according to the length of their body: and hence we may observe, that it is not peculiar to that bowel to lie on the right side; which is still more confirmed by what we observe in fishes, where the greatest part of it lies in the left side.

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268 Liver.

269 Vesica fellis.

The shape of their *gall bladder* is not much different from that of quadrupeds; but is thought to be longer in proportion to the size of the animal, and is farther removed from the liver.

270 Cor.

The principal difference to be remarked in their *heart*, is the want of the *valvulæ tricuspides*, and their place being supplied by one fleshy flap.

271 Pulmones, their structure and uses.

The *lungs* are not loose within the cavity of the thorax, but fixed to the bone all the way; neither are they divided into lobes, as in those animals that have a larger motion in their spine. They are two red spongy bodies, covered with a membrane that is pervious, and which communicates with the larger vesicles or air-bags that are dispersed over the whole abdomen; which vesicles, according to Dr Monro, serve two very considerable uses. The one is to render their bodies specifically light, when they have a mind to ascend and buoy themselves up when flying, by distending their lungs with air, and also straiten their windpipe, and so return the air. Secondly, They supply the place of a muscular *diaphragm* and strong abdominal muscles; producing the same effects on the several contained viscera, as these muscles would have done, without the inconveniency of their additional weight; and conducing as much to the exclusion of the egg and feces.

272 The use of the vesicles in the abdomen.

273 The diaphragm, how supplied.

Dr Hunter has made some curious discoveries relative to these internal receptacles of air in the bodies of birds. Some of them are lodged in the fleshy parts, and some in the hollow bones; but all of them communicate with the lungs. He informs us, that the air cells which are found in the soft parts have no communication with the cellular membrane which is common to birds as well as other animals. Some of them communicate immediately with each other; but all of them by the intervention of the lungs as a common centre. Some of them are placed in cavities, as the abdomen; others in the interstices of parts, as about the breast. The bones which receive air are of two kinds; some of them divided into innumerable cells; others hollowed out into one large canal. They may be distinguished from such as do not receive air, by having less specific gravity; by being less vascular; by containing little oil; by having no marrow nor blood in their cells; by having less hardness and firmness than others; and by the passage for the air being perceivable.

The mechanism by which the lungs are fitted for conveying air to these cavities is, their being attached to the diaphragm, and connected also to the ribs and sides of the vertebræ. The diaphragm is perforated in several places by pretty large holes, allowing a free passage of air into the abdomen. To each of these holes is attached a distinct membranous bag, thin and transparent. The lungs open at their interior part into membranous cells, which lie upon the side of the pericardium, and communicate with the cells of the sternum. The superior parts of the lungs open into cells of a loose net-work, through which the windpipe and gullet pass. When these cells are distended with

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with air, it indicates passion, as in the case of the turkey-cock, pouting-pigeon, &c.

These cells communicate with others in the axilla, and under the large pectoral muscle; and those with the cavity of the os humeri, by means of small openings in the hollow surface near the head of that bone. Lastly, The posterior edges of the lungs have openings into the cells of the vertebræ, ribs, os sacrum, and other bones of the pelvis, from which the air finds a passage to the cavity of the thigh bone.

Concerning the use of these cavities the doctor conjectures, that they are a kind of appendage to the lungs; and that, like the bags continued through the bellies of amphibious animals, they serve as a kind of reservoirs of air. They assist birds during their flight, which must be apt to render frequent respiration difficult. He farther insinuates, that this construction of the organs of respiration may assist birds in singing; which, he thinks, may be inferred from the long continuance of song between the breathings of a canary bird. On tying the windpipe of a cock, the animal breathed through a canula introduced into his belly; another through the os humeri, when cut across; and a hawk through the os femoris. In all these cases the animal soon died. In the first, the doctor ascribes the death to an inflammation of the bowels; but in the last, he owns it was owing to difficult breathing. What took place, however, was sufficient to show that the animals did really breathe through the bone.

When we examine the upper end of the *trachea*, we observe a *rima glottidis* with muscular sides, which may act in preventing the food or drink from passing into the lungs: for there is no *epiglottis* as in man and quadrupeds.

274 Windpipe.

The *windpipe*, near where it divides, is very much contracted; and their voice is principally owing to this coarctation. If you listen attentively to a cock crowing, you will be sensible that the noise does not proceed from the throat, but deeper; nay, this very pipe, when taken out of the body, and cut off a little after its division, and blown into, will make a squeaking noise something like the voice of these creatures. On each side, a little higher than this contraction, there is a muscle arising from the sternum, which dilates the trachea. The cartilages, of which the pipe is composed in this animal, go quite round it; whereas in man and quadrupeds they are discontinued for about one-fourth on the back part, and the intermediate space is filled up by a membrane. Neither is the trachea so firmly attached to their vertebræ as in the other creatures we have examined. This structure we shall find of great service to them, if we consider, that had the same structure obtained in them as in us, their breath would have been in hazard of being stopped at every flection or twisting of the neck, which they are frequently obliged to. This we may be sensible of by bending our necks considerably on one side, upon which we shall find a great straitness and difficulty in breathing; whereas their trachea is better fitted for following the flexions of the neck by its loose connexion to the vertebræ.

In place of a *muscular diaphragm*, this creature has nothing but a thin membrane connected to the pericardium, which separates the thorax and abdomen. But besides this, the whole abdomen and thorax are divided by a longitudinal membrane or *mediastinum* connected to the lungs, pericardium, liver, stomach, and to the fat lying over their stomach and guts, which is analogous to an *omentum*, and supplies its place.

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275 Lymphat system.

The *lymphatic system* in birds consists, as in man, of lacteal and lymphatic vessels, with the thoracic duct.

The lacteals, indeed, in the strictest sense, are the lymphatics of the intestines; and, like the other lymphatics, carry only a transparent lymph; and instead of one thoracic duct, there are two, which go to the jugular veins. In these circumstances, it would seem that birds differ from the human subject, so far at least as we may judge from the dissection of a *goose*, the common subject of this inquiry, and from which the following description is taken.

The lacteals run from the intestines upon the mesenteric vessels: those of the duodenum pass by the side of the pancreas; afterward they get upon the cæliac artery, of which the superior mesenteric is a branch. Here they are joined by the lymphatics of the liver, and then they form a plexus which surrounds the cæliac artery. Here also they receive a lymphatic from the gizzard, and soon after another from the lower part of the gullet. At the root of the cæliac artery they are joined by the lymphatics from the glandulæ renales, and near the same part by the lacteals from the other small intestines, which vessels accompany the lower mesenteric artery; but, before they join those from the duodenum, receive from the rectum a lymphatic, which runs from the blood vessels of that gut. Into this lymphatic some small vessels from the kidneys seem to enter at the root of the cæliac artery. The lymphatics of the sacral extremities probably join those from the intestines. At the root of the cæliac artery and contiguous part of the aorta, a net-work is formed by the vessels above described. From this net-work arise two thoracic ducts, of which one lies on each side of the spine, and runs obliquely over the lungs to the jugular vein, into the inside of which it terminates, nearly opposite to the angle formed by this vein and the subclavian one. The thoracic duct of the left side is joined by a large lymphatic, which runs upon the gullet. The thoracic ducts are joined by the lymphatics of the neck, and probably by those of the wings, where they open into the jugular veins. The lymphatics of the neck generally consist of two large branches, on each side of the neck, accompanying the blood vessels; and these two branches join near the lower part of the neck, and form a trunk which runs close to the jugular vein, and opens into a lymphatic gland; from the opposite side of this gland a lymphatic comes out, which ends in the jugular vein.

On the left side, the whole of this lymphatic joins the thoracic duct of the same side; but, on the right one, part of it goes into the inside of the jugular vein a little above the angle; while another joins the thoracic duct, and with that duct forms a common trunk, which opens into the inside of the jugular vein, a little below the angle which that vein makes with the subclavian. This system in birds differs most from that of quadrupeds, in the chyle being transparent and colourless, and in there being no visible lymphatic glands, neither in the course of the lacteals, nor in that of the lymphatics of the abdomen, nor near the thoracic ducts.

The

276 Kidneys.

The *kidneys* lie in the hollow excavated in the side of the back-bone, from which there is sent out a bluish coloured canal running along by the side of the *vas deferens*, and terminating directly in the common cloaca. This is the *ureter*, which opens by a peculiar aperture of its own, and not at the penis. Fowls having no urinary bladder, it was thought by some they never passed any urine, but that it went to the nourishment of the feathers: but this is false; for that whitish substance that we see their greenish fæces covered with, and which turns afterwards chalky, is their urine. Let us next consider the organs of generation of both sexes, and first those of the male.

277 The organs of generation in the male.

The *testicles* are situated one on each side of the back-bone; and are proportionally very large to the creature's bulk. From these run out the *vasa seminifera;* at first straight; but after they recede farther from the body of the testicle, they acquire an undulated or convoluted form, as the epididymis in man. These convolutions partly supply the want of *vesiculæ seminales*, their coition being at the same time very short: These terminate in the penis, of which the cock has two, one on each side of the common cloaca, pointing directly outwards. They open at a distance from each other, and are very small and short; whence they have escaped the notice of anatomists, who have often denied their existence. In birds there is no prostate gland. This is what is chiefly remarkable in the organs of the male.

278 Vitellarium.

The *racemus vitellorum*, being analogous to the ovaria in the human subject, is attached by a proper membrane to the back-bone. This is very fine and thin, and continued down to the uterus. Its orifice is averse with respect to the ovaria; yet notwithstanding, by the force of the *orgasmus venereus*, it turns round and grasps the *vitellus*, which in its passage through this duct, called the *infundibulum*, receives a thick gelatinous liquor, secreted by certain glands. This, with what it receives in the uterus, composes the white of the egg. By this tube then it is carried into the uterus. The shell is lined with a membrane; and in the large end there is a bag full of air, from which there is no outlet.

279 Uterus.

The *uterus* is a large bag, placed at the end of the *infundibulum*, full of wrinkles on its inside; here the egg is completed, receiving its last involucrum, and is at last pushed out at an opening on the side of the common cloaca. From the testes in the male being so very large in proportion to the body of the creature, there must necessarily be a great quantity of semen secreted; hence the animal is salacious, and becomes capable of impregnating many females. The want of the *vesiculæ seminales* is in some measure supplied by the convolutions of the *vasa deferentia*, and by the small distance betwixt the secerning and excretory organs. The two *penes* contribute also very much to their short coition; at which time the opening of the uterus into the cloaca is very much dilated, that the effect of the semen on the vitelli may be the greater.

280 The want of the vesiculæ seminales, how supplied.

A hen will of herself indeed lay eggs; but these are not impregnated, and yet appear entirely complete, except that the small black spot, which comes afterwards to be the rudiments of the chick, is not here to be observed.

TABLE of the Proportional Number of Ribs and Vertebræ in various species of Birds.

Species.	Verteb. of Neck.	Verteb. of Back.	Anter. false Ribs.	True Ribs.	Poster. false Ribs.	N° of Ribs.	Sacral Verteb.	Coccyg. Verteb.
Vultur. Vulture,	13	7	-	-	-	-	11	7
Falco fulvus. Eagle,	13	8	0	7	0	7	17	8
—— *haliaëtus.* Bald buzzard,	14	8	0	7	1	8	11	7
—— *buteo.* Buzzard,	11	7	-	-	-	-	10	8
—— *nisus.* Sparrow hawk,	11	8	-	-	-	-	11	8
—— *milvus.* Kite,	12	8	-	-	-	-	11	8
Strix ulula. Owl,	11	8	-	7	-	-	11	8
Muscicapa grisola. Fly-catcher,	10	8	-	-	-	-	10	8
Turdus merula. Black-bird,	11	8	-	-	-	-	10	7
Tanagra taldo. Tanagra,	10	8	-	-	-	-	9	8
Corvus corone. Crow,	13	8	1	5	1	7	13	7
—— *pica.* Magpie,	13	8	1	5	1	7	13	8
—— *glandarius.* Jay,	12	7	1	5	1	7	11	8
Sturnus vulgaris. Starling,	10	8	1	5	1	7	10	9
Loxia coccothraustes. Grosbeak,	10	7	-	-	-	-	12	7
—— *pyrrhula.* Bullfinch,	10	6	-	-	-	-	11	6
Fringilla domestica. Sparrow,	9	9	1	5	1	7	10	0
—— *carduelis.* Goldfinch,	11	8	1	5	1	7	11	8
Parus major. Titmouse,	11	8	6	6	1	7	11	7
Alauda arvensis. Lark,	11	9	1	5	1	7	10	7

TABLE, &c. continued.

Species.	Verteb. of Neck.	Verteb. of Back.	Anter. false Ribs.	True Ribs.	Poster false Ribs.	N° of Ribs.	Sacral Verteb.	Coccyg. Verteb.
Motacilla rubecula. Redbreast, -	10	8	-	-	-	-	10	8
Hirundo urbica. Swallow, -	11	8	-	-	-	-	11	9
Caprimulgus europæus. Goatsucker,	11	8	-	-	-	-	11	8
Trochilus pella. Topaz humming-bird,	12	9	-	-	-	-	9	8
Upupa epops. Hoopoe, - -	12	7	-	-	-	-	10	7
Alcedo ispida. King's fisher, - -	12	7	-	-	-	-	8	7
Picus viridis. Woodpecker, - -	12	8	1	6	1	8	10	9
Ramphastos. Toucan, - - -	12	8	-	-	-	-	12	7+
Psittacus crithacus. Parrot, -	12	9	-	-	-	-	11	8
Columba œnas. Stockdove, - -	13	7	1	5	1	6	13	7
Pavo cristatus. Peacock, - -	14	7	-	-	-	-	12	8
Phasianus colchicus. Pheasant, -	13	7	2	8	1	11	15	5
Meleagris gallo-pavo. Turkey, -	15	7	-	-	-	-	10	5
Crax nigra. Curassow bird. Hoceo,	15	8	2	4	1	7	10	7
Struthio camelus. Ostrich, -	18	8	-	-	-	-	20	9
——— *causarius.* Cassawary, -	15	11	-	-	-	-	19	7
Phœnicopterus. Flamingo, - -	18	7	-	-	-	-	12	7
Ardea cinerea. Heron, - -	18	7	1	7	-	8	10	7
——- *alba.* Stork, - - -	19	7	-	-	-	-	11	8
——- *grus.* Crane, - - -	19	9	1	7	1	9	12	7
Platalea aïaïa. Spoonbill, -	17	7	-	-	-	-	14	8
Recurvirostra. Avoset, - -	14	9	-	-	-	-	10	8
Charadrius pluvialis. Plover, -	15	8	1	6	1	8	10	7
Tringa vanellus. Lapwing, -	14	8	-	-	-	-	10	7
Scolopax rusticata. Woodcock, -	18	7	-	-	-	-	13	8
——— *arquata.* Curlew, - -	13	8	-	-	-	-	10	8
Hæmatopus ostralegus. Oyster-catcher,	12	9	-	-	-	-	15	0
Rallus crex. Rail, - -	13	8	-	-	-	-	13	8
Fulica atra. Coot, - - - -	15	9	-	-	-	-	7	8
Parra. Jacana, - - -	14	8	-	-	-	-	12	7
Pelicanus onocratalus. Pelican, -	16	7	-	-	-	-	14	7
——— *carbo.* Cormorant, - -	16	9	-	-	-	-	14	8
Sterna hirundo. Sea swallow, -	14	8	-	-	-	-	10	8
Procellaria. Petril, - - -	14	8	-	-	-	-	??	8
Anas cygnus. Swan, - - -	23	11	2	8	1	11	14	8
—— *anser.* Goose, - -	15	10	-	-	-	-	14	7
—— *bernicla.* Bernacle, - -	18	10	-	-	-	-	14	9
—— *boschas.* Duck, - - -	14	8	-	7	1	8	15	8
—— *tadorna.* Sheldrake, - -	16	11	-	-	-	-	11	9
—— *nigra.* Black diver, - -	15	9	-	-	-	-	14	7
Mergus merganser. Merganser, -	15	8	2	6	1	9	13	7
Colymbus cristatus. Grebe, - -	14	10	-	-	-	-	13	7

CHAP. VI. ANATOMY OF REPTILES.

Sect. I. *Of Reptiles in general.*

These animals, like the fishes, have their blood nearly of the same temperature with the element in which they live. They have indeed a lung, and respire air; but their pulmonary vessels are only branches of the large general artery and vein, and do not, as in the hot-blooded animals, form a peculiar system equal to the vascular system of the rest of the body.

With respect to their organs of motion, reptiles may be divided into two orders. In the one, the serpents, the body is cylindrical and entirely without limbs: their motion is a kind of writhing or creeping.

The others have four feet very similar in structure to those of the mammalia, whence these animals have been called *oviparous quadrupeds.* Such of them as live in the water have frequently membranes between their toes, which they employ like the fins of fishes for swimming. One species has a kind of membranaceous

Of Reptiles. branaceous wings. We know two species which are called *bipedal reptiles*, which are only distinguished from serpents, in having two very small feet. In the whole class the feet are so short, and so close to the body, that they are not unaptly termed reptiles or creeping animals.

Their eyes are large and fiery, and are furnished with three lids. Their ear has neither concha nor external passage, and its tympanum lies flat to the head, and is often covered with scales or flesh: internally it has only one little bone composed of a plate furnished with a sort of handle. In some species the tympanum and its little bone are entirely wanting, as also the cochlea; but they have all semicircular canals, and a vestibule. Their nostrils are generally small. In the serpents, whose tongue is almost horny, the sense of taste cannot be very exquisite, but in the other species where the tongue is softer it may be pretty acute.

Their skin is naked or covered with scales. The tortoises are remarkable for being covered with a kind of buckler.

Some species of oviparous quadrupeds have six toes. Serpents exercise the sense of touch by wrapping their body round the object which they desire to feel.

The brain of reptiles is very small, and divided into very distinct tubercles. Their sensation seems less to depend on a common centre than in the other animals which we have been considering, as they can live for a long time without the head, and after being deprived of the heart and all the viscera; their limbs when separated from the body preserve their irritability for a considerable time; the heart of a frog will beat for many hours after it has been cut out. Reptiles have also a considerable power of reproduction. The tail of a lizard and several parts of water salamanders will grow again after being cut off. The jaws in these animals are for the most part armed with teeth which are conical and pointed, but some of them have only fleshy or horny gums. Their alimentary canal is but small, and has no cæcum, but it receives fluids similar to those of the hot-blooded animals. The urine, which is secreted by the kidneys, is received into a bladder, but is evacuated by the anus.

Their heart has only one ventricle, from which proceeds a single artery divided into two large branches, which furnish each a twig to the lung of that side, and are then united to be distributed to the other parts of the body. Hence these animals can at pleasure suspend respiration without stopping the circulation of the blood, so that they can remain a long time under water, or in a close vessel. The cells of the lungs are much larger than in the hot-blooded animals; and these organs resemble oblong bags, which float in the same cavity with the other viscera, without the interposition of a diaphragm. Some of these animals have the power of inflating their lungs to a great extent. They have a windpipe and a larynx, by which they can produce sounds as in other animals which are provided with nerves.

The females of reptiles have a double receptacle for eggs, furnished with two tubes, which open at the anus. In some species copulation takes place, and the eggs are covered with a shell more or less hard. In others the male merely sprinkles with semen the eggs already laid, and these are merely covered with a membrane. Reptiles, no more than other animals with cold blood, have the power of hatching their eggs. Of Reptiles.

Sect. II. *Tortoise.*

231 Their shell or covering, &c.

The covering of this animal is composed of a shell so remarkably hard and firm in its texture, that a loaded waggon may go over it without hurting the shell or the animal within it. In the young animal, this shell grows harder in proportion as its contents expand; and this creature never changes its shell as some others do; hence it was necessary for it to be made up of different pieces; and these are more or less distinct in different animals. Their feet are small and weak; and they are exceedingly slow in motion.

It has neither tongue nor teeth; to make up for which, their lips are so hard as to be able to break almost the hardest bodies.

The alimentary canal very much resembles that of the former class.

The principal difference is in the circulation of the blood. The heart has two distinct auricles, without any communication; and under these there is the appearance of two ventricles similar in shape to those of the former class: but they may be considered as one cavity; for the ventricle sends out not only the pulmonary artery, but likewise the aorta; for there is a passage in the septum, by which the ventricles communicate freely, and the blood passes from the left into the right one. From the aorta, the blood returns into the right auricle, while that from the pulmonary artery returns to the left auricle, from which it is sent to the left auricle, &c. so that only a part of the blood is sent to the lungs, the rest going immediately into the aorta; hence the animal is not under the necessity of breathing so often as otherwise it would be.

282 Blood-vessels.

From the base of the right ventricle goes out the pulmonary artery and aorta. The pulmonary artery is spent upon the lungs. The aorta may be said to be three in number; for the aorta sinistra ascends through the pericardium in company with the pulmonary artery; and afterwards turns down, and sends off a considerable branch, which splits into two; one of which joins the right aorta, while the other is distributed upon the liver, stomach, intestines, &c. What remains of this aorta runs to the kidneys or posterior extremities of that side. An aorta descendens, &c. after piercing the pericardium, runs down and communicates with the branch already mentioned, is distributed upon the right kidney and inferior extremity, and also upon the bladder and parts of generation. An aorta ascendens, after getting out of the pericardium, supplies the fore-legs, neck, and head. The blood in the superior part of the body returns to the right auricle by two jugular veins, which unite after perforating the pericardium. From the inferior part it returns to the same auricle by two large veins; one on the right side receives the blood in the right lobe of the liver; the other on the left side receives the blood in the left lobe, and also a trunk which

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corresponds with the inferior vena cava in other animals. The pulmonary vessels run in the left auricle in the common way.

The absorbent system in the turtle, like that in the former class, consists of lacteals and lymphatics, with their common trunks the thoracic ducts; but differs from it in having no obvious lymphatic glands on any part of its body, nor plexus formed at the termination in the red veins.

283 Lacteals.

The *lacteals* accompany the blood-vessels upon the mesentery, and form frequent net-works across these vessels: near the root of the mesentery a plexus is formed, which communicates with the lymphatics coming from the kidneys and parts near the anus. At the root of the mesentery on the left side of the spine, the lymphatics of the spleen join the lacteals; and immediately above this a plexus is formed, which lies upon the right aorta. From this plexus a large branch arises, which passes behind the right aorta to the left side, and gets before the left aorta, where it assists in forming a very large receptaculum, which lies upon that artery.

From this receptaculum arise the thoracic ducts. From its right side goes one trunk, which is joined by that large branch that came from the plexus to the left side of the right aorta, and then passes over the spine. This trunk is the thoracic duct of the right side; for, having got to the right side of the spine, it runs upwards on the inside of the right aorta, towards the right subclavian vein; and when it has advanced a little above the lungs, it divides into branches, which near the same place are joined by a large branch that comes up on the outside of the aorta. From this part upwards, those vessels divide and subdivide, and are afterwards joined by the lymphatics of the neck, which likewise form branches before they join those from below. So that between the thoracic duct and the lymphatics of the same side of the neck, a very intricate net-work is formed; from which a branch goes into the angle between the jugular vein and the lower part or trunk of the subclavian. This branch lies therefore on the inside of the jugular vein, whilst another gets to the outside of it, and seems to terminate in it, a little above the angle, between that vein and the subclavian.

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284 Lymphatics.

Into the above-mentioned receptaculum, the lymphatics of the stomach and duodenum likewise enter. Those of the duodenum run by the side of the pancreas, and probably receive its lymphatics and a part of those of the liver. The lymphatics of the stomach and duodenum have very numerous anastomoses, and form a beautiful net-work on the artery which they accompany. From this receptaculum likewise (besides the trunk already mentioned, which goes to the right side) arise two other trunks pretty equal in size; one of which runs upon the left side, and the other upon the right side of the left aorta, till they come within two or three inches of the left subclavian vein; where they join behind the aorta, and form a number of branches which are afterwards joined by the lymphatics of the left side of the neck; so that here a plexus is formed as upon the right side. From this plexus a branch issues, which opens into the angle between the jugular and subclavian vein.

SECT. III. *Serpent and Crocodile.*

285 Circulation in serpents, &c.

THE circulation in these is similar to that of the turtle; but we find only one ventricle. The blood goes from the right auricle to the ventricle which sends out the pulmonary artery and aorta; the blood from the pulmonary artery returns to the left auricle, that from the aorta going to the right auricle, and both the auricles opening into the ventricle.

SECT. IV. *Frog and Lizard.*

THESE differ from the former animals, in having only one auricle and a ventricle: and besides, the ventricle sends out a single artery, which afterwards splits into two parts; one to supply the lungs, the other runs to all the rest of the body: from the lungs and from the other parts, the blood returns into the auricle.

CHAP. VII. ANATOMY OF FISHES.

286 Cuticula, likeness to the human.

OF these we may first observe, that they have a very strong thick *cuticle*, covered with a great number of scales, laid one on another like the tiles of houses. This among other arguments is supposed to prove the human epidermis to be of a squamous structure: but the scales resemble the hairs, wool, feathers, &c. of the creatures that live in air; and below these we observe their proper *cuticula* and *cutis*.

The generality of fishes, particularly those shaped like the cod, haddock, &c. have a line running on each side. These lines open externally by a number of ducts, which throw out a mucous or slimy substance that keeps them soft and clammy, and seems to serve the same purpose with the mucous glands or ducts which are placed within many of our internal organs.

In the next place, these creatures have neither atlantal nor sacral extremities, as quadrupeds and fowls; for their progression is performed in a different way from either of those species of animals: for this purpose they are provided with machines, properly consisting of a great number of elastic beams, connected to one another by firm membranes, and with a tail of the same texture; their spine is very moveable towards the posterior part, and the strongest muscles of their bodies are inserted there. Their tails are so framed as to contract to a narrow space when drawn together to either side, and to expand again when drawn to a straight line with their bodies; so, by the assistance of this broad tail, and the fins on their sides, they make their progression much in the same way as a boat with oars on its sides and rudder at its stern. The perpendicular fins situated on the superior part of their body keep them *in æquilibrio*, hindering the belly from turning uppermost; which it would readily do, because of the air-bag

287 Swimming how performed. Several uses of their fins, tail, air-bags, &c.

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air-bag in the abdomen rendering their belly specifically lighter than their back; but by the resistance these fins meet with when inclined to either side, they are kept with their backs always uppermost.

It may be next observed, that these creatures have nothing that can be called a *neck*, seeing they seek their food in a horizontal way, and can move their bodies either upwards or downwards, as they have occasion, by the contraction or dilatation of the air-bag; a long neck, as it would hinder their progression, would be very disadvantageous in the element they live in.

In the bony fishes the bodies of the vertebræ are sometimes cylindrical, sometimes angular, and frequently compressed: they are articulated only by their bodies, as there are no articulatory processes. They may be divided into two classes: those of the tail, which are furnished with a spinous process both above and below; and those of the belly or back, which have it only above. These last are usually furnished, at the sides, with transverse processes for the attachment of the ribs. The spinous processes, both dorsal and sternal, are very long, especially in flat fish. At the base of the dorsal processes there is a canal for lodging the spinal marrow; and the blood vessels pass through a similar canal at the base of the sternoid processes. There is nearly the same structure in the cartilaginous fishes; but in these all the cartilages are so firmly fixed together, that only the spinous processes can be distinguished. The vertebra of a fish differs from that of other animals in the structure of its body, at each extremity of which there is a conical cavity, so that between each pair of vertebræ there is a hollow space formed by these two cones joined base to base, filled with a very soft cartilaginous or mucous substance on which the motions of the vertebræ are easily performed. The annexed table shows the proportional number of vertebræ of several species of fish.

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TABLE of the Number of VERTEBRÆ in several species of FISHES.

SPECIES.	*Cervical Vertebræ.*	*Dorsal Vertebræ.*	*Lumbar Vertebræ.*	*Coccygian Vertebræ.*	*Total N° of Vertebræ.*
Raia bates. Ray,	Ossified into one piece.	4	–	80+	–
Squalus. Shark,	–	–	–	–	207
Accipenser sturio. Sturgeon,	–	–	–	–	28
Syngnathus acus. Sea-needle,	–	–	–	–	50+
——— *hippocampus.* Sea-horse,	–	–	–	–	62
Balistes,	–	7	–	10	–
Ostracion quadricornis,	–	–	–	–	13
Murena anguilla. Eel,	–	–	–	–	115
Anarrhichas lupus. Sea-wolf,	2	24	–	50	–
Trachinus draco. Sea-dragon,	2	13	–	30	–
Uranoscopus. Uranoscope,	1	9	–	15	–
Gadus merlangus. Whiting,	2	17	4	32	55
Cottus scorpius. Sea-scorpion,	–	8	2	15	–
Trigla loricata. Armed trigla,	–	12	–	23	–
——— *cuculus.* Red gurnard,	–	13	–	21	–
——— *volitans.* Flying trigla,	3	8	–	12	–
Echineis remora. Remora,	–	12	–	15	–
Pleuronectes platessa. Plaice,	–	13	–	30	–
Gasterosteus pungitius. Stickle-back,	–	70	–	22	–
Perca fluviatilis. Perch,	–	21	–	20	–
Zeus faber. Doree,	4	9	2	16	31
——— *vomer,*	–	10	–	13	–
Chætodon cornu. Horned chætodon,	–	9	–	12	–
——— *teïra.* Striped chætodon,	–	9	–	12	–
Cyprinus carpio. Carp,	1	15	9	16	41
——— *nasus,*	1	19	5	19	44
Clupea harengus. Herring,	4	38	–	18	–
Salmo rhombus. Rhomboid salmon,	1	12	–	20	–
Esox lucius. Pike,	4	35	–	20	–
——— *brasiliensis.* Brasilian pike,	–	34	3	15	–
Silurus felis. Sea-cat,	1	12	1	30	44
Loricaria. Armour-fish,	1	6	1	28	36
Fistularia tabaccaria. Tobacco-pipe fish,	–	59	–	22	–

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288 Cerebrum.

The *brain* in fishes is formed pretty much in the same way as that of fowls; only we may observe, that the posterior lobes bear a greater proportion to the anterior.

289 Organ of smell.

The organ of *smelling* is large; and they have a power of contracting and dilating the entry into their nose as they have occasion. It seems to be mostly by their acute smell that they discover their food; for their tongue seems not to have been designed for a very nice sensation, being of a pretty firm cartilaginous substance; and common experience evinces, that their sight is not of so much use to them as their smell in searching for their nourishment. If you throw a fresh worm into the water, a fish will distinguish it at a considerable distance; and that this is not done by the eye, is plain from observing, that after the same worm has been a considerable time in the water, and lost its smell, no fishes will come near it; but if you take out the bait, and make several little incisions into it, so as to let out more of the odoriferous effluvia, it will have the same effect as formerly. Now it is certain, that had the creatures discovered this bait with their eyes, they would have come equally to it in both cases. In consequence of their smell being the principal means which they have of discovering their food, we may frequently observe their allowing themselves to be carried down with the stream, that they may ascend again leisurely against the current of the water; thus the odoriferous particles swimming in that medium, being applied more forcibly to their smelling organs, produce a stronger sensation.

290 Optic nerve.

The *optic nerves* in these animals are not confounded with one another in their middle progress betwixt their origin and the orbit, but the one passes over the other without any communication; so that the nerve that comes from the left side of the brain goes distinctly to the right eye, and *vice versa*.

Indeed it would seem not to be necessary for the optic nerves of fishes to have the same kind of connection with each other as those of man have: for their eyes are not placed in the fore part, but in the sides of their heads; and of consequence, they cannot so conveniently look at any object with both eyes at the same time.

291 The crystalline humour a complete sphere, and why.

The *crystalline lens* is here a complete sphere, and more dense than in terrestrial animals, that the rays of light coming from water might be sufficiently refracted.

As fishes are continually exposed to injuries in the uncertain element in which they live, and as they are in perpetual danger of becoming a prey to the larger ones, it was necessary that their eyes should never be shut; and as the cornea is sufficiently washed by the element they live in, they are not provided with palpebræ: but then, as in the current itself the eye must be exposed to several injuries, there was a necessity it should be sufficiently defended; which in effect it is by a firm pellucid membrane, that seems to be a continuation of the cuticula, being stretched over here. The epidermis is so very proper for this purpose, as being insensible and destitute of vessels, and consequently not liable to obstructions, or, by that means, of becoming opaque. In the eye of the skate tribe, there is a digited curtain which hangs over the pupil, and may shut out the light when the animal rests, and it is similar to the tunica adnata of other animals.

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292 Organs of hearing.

Although it was formerly much doubted whether fishes possessed a sense of hearing, yet there can be little doubt of it now; since it is found that they have a complete organ of hearing as well as other animals, and likewise as the water in which they live is proved to be a good medium. Fishes, particularly those of the skate kind, have a bag at some distance behind the eyes, which contains a fluid and a soft cretaceous substance, and supplies the place of vestibule and cochlea. There is a nerve distributed upon it, similar to the portio mollis in man. They have three semicircular canals, which are filled with a fluid, and communicate with the bag: they have likewise, as the present professor of anatomy at Edinburgh has discovered, a meatus externus, which leads to the internal ear. The cod fish, and others of the same shape, have an organ of hearing somewhat similar to the former: but instead of a soft substance contained in the bag, there is a hard cretaceous stone. In this kind of fish no meatus externus has been yet observed: And Dr Monro is inclined to think that they really have not one, from the consideration that the common canal or vestibule, where the three semicircular canals communicate, is separated from the cavity of the cranium by a thin membrane only; that this cavity, in the greater number of fishes, contains a watery liquor in considerable quantity; and that, by the thinness of the cranium, the tremor excited by a sonorous body may readily and easily be transmitted through the cranium to the water within it, and so to the ear.

The belly is covered on the inferior part with a black-coloured thin membrane resembling our peritoneum. It is divided from the chest by a thin membranous partition, which has no muscular appearance; so that we have now seen two different sorts of animals that have no muscular diaphragm.

293 Teeth, for what made

These creatures are not provided with *teeth* proper for breaking their aliment into small morsels, as the food they use is generally small fishes, or other animals that need no trituration in the mouth, but spontaneously and gradually dissolve into a liquid chyle. Their teeth serve to grasp their prey, and hinder the creatures they have once catched from escaping again. For the same purpose, the internal cartilaginous basis of the bronchi, and the two round bodies situated in the posterior part of the jaws, have a great number of tenter-hooks fixed into them, in such a manner as that any thing can easily get down, but is hindered from getting back. The water that is necessarily taken in along with their food in too great quantities to be received into their jaws in deglutition, passes betwixt the interstices of the bronchi and the flap that covers them. The compression of the water on the bronchi is of considerable use to the creature, as we shall explain by and by.

294 Digestion performed solely by a menstruum

The *gullet* in these creatures is very short, and scarcely distinguished from their stomach, seeing their food lies almost equally in both. The stomach is of an oblong figure. There are commonly found small fishes in the stomach of large ones still retaining their natural form; but when touched, they melt down into

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into a jelly. From this, and the great quantity of liquors poured into their stomachs, we may conclude, that digestion is solely brought about in them by the dissolving power of a menstruum, and that no trituration happens there.

295 estina.

The *guts* in these animals are very short, making only three turns; the last of which ends in the common cloaca for the feces, urine, and semen, situated about the middle of the inferior part of their bodies.

297 ncreas.

To what we call *pancreas*, some give the name of *intestinula cæca:* it consists of a very great number of small threads, like so many little worms, which all terminate at last in two large canals that open into the first gut, and pour into it a viscous liquor much about the place where the biliary ducts enter. That kind of pancreas formed of intestinula cæca is peculiar to a certain kind of fishes; for the cartilaginous, broad, and flat kind, as the skate, sole, flounder, &c. have a pancreas resembling that of the former class of animals. Their intestines are connected to the back-bone by a membrane analogous to a mesentery.

298 iver, gall- adder, id their icts.

The *liver* is very large, of a whitish colour, and lies almost in the left side wholly, and contains a great deal of fat or oil.

The *gall-bladder* is situated a considerable way from their liver; and sends out a canal, the cystic duct, which joins with the hepatic duct just at the entry into the gut. Some fibres being observed stretched from the liver to the gall-bladder, but without any apparent cavity, the bile was supposed not to be carried into the gall-bladder in the usual way, but that it must either be secerned on the sides of the sac, or regurgitate into it from the canalis choledochus. It is certain, however, that hepato-cystic ducts exist in fish as well as in fowls. This, for example, is very obvious in the salmon, where large and distinct ducts run from the biliary ducts of the liver, and open into the gall bladder.

299 pleen, its se drawn om ana- gy.

The *spleen* is placed near the back-bone, and at a place where it is subjected to an alternate pressure from the constriction and dilatation of the air-bag, which is situated in the neighbourhood. Since, in all the different animals we have dissected, we find the spleen attached to somewhat that may give it a conquassation; as in the human subject and quadrupeds, it is contiguous to the diaphragm; in fowls, it is placed betwixt the back bone, the liver, and stomach; in fishes, it lies on the saccus acrius; and since we find it so well served with blood-vessels, and all its blood returning into the liver, we must not conclude the spleen to be an *inutile pondus*, only to serve as a balance to the animal *pro æquilibrio*, but particularly designed for preparing the blood to the liver.

300 The heart as but one uricle and ne ventri- le.

The *heart* is of a triangular form, with its base downwards, and apex uppermost; which situation it has because of the *branchiæ*. It has but one *auricle* and one *ventricle*, because they want lungs; and one great artery. The size of the auricle and that of the ventricle are much the same; the artery sends out numberless branches to the branchiæ or gills. And what is rather curious, this artery, instead of supporting all parts as in the frog, is distributed entirely upon the gills; every branch terminating there, and becoming so extremely small as at last to escape the naked eye.

These creatures have a *membranous diaphragm*, which forms a sac in which the heart is contained. It is very tense, and almost perpendicular to the vertebræ. Of Fishes.

301 Diaphragm.

302 The branchiæ, their structure and use.

The *branchiæ* lie in two large slits at each side of their heads, and seems to be all they have that bears any analogy to lungs. Their form is semicircular: they have a vast number of red fibrillæ standing out on each side of them like a fringe, and very much resemble the vane of a feather. These branchiæ are perpetually subjected to an alternate motion and pressure from the water; and we may here remark, that we have not found any red blood but in places subjected to this alternate pressure. This observation will help us in explaining the action of the lungs upon the blood. Over these gills there is a large flap, allowing a communication externally; by which the water they are obliged to take into their mouths with their food finds an exit without passing into their stomach; it is owing to these flaps coming so far down that the heart is said commonly to be situated in their heads. The blood is collected again from the gills by a vast number of small veins, somewhat in the same manner as our pulmonary vein; but instead of going back to the heart a second time, they immediately unite, and form an aorta descendens, without the intervention of an auricle and ventricle. Hence a young anatomist may be puzzled to find out the power by which the blood is propelled from the gills to the different parts of the body; but the difficulty will be considerably lessened when we consider the manner in which the blood is carried through the liver from the intestines in man and quadrupeds. The aorta in fishes sends off branches which supply all the parts of the body excepting the gills. From the extremity of those branches the blood returns to the heart somewhat in the same manner as in the former class of animals; only there are two inferior venæ cavæ, whereas the former has but one.

Absorbent System in Fishes. We shall take the haddock as a general example; for the other fishes, particularly those of the same shape, will be found in general to agree with it.

303 Lymphatic vessels.

On the middle of the belly of a haddock, immediately below the outer skin, a lymphatic vessel runs upwards from the anus, and receives branches from the parietes of the belly, and from the fin below the anus; near the head this lymphatic passes between the two pectoral fins; and having got above them, it receives their lymphatics. It then goes under the symphysis of the two bones which form the thorax, where it opens into a net-work of very large lymphatics, which lie close to the pericardium, and almost entirely surrounds the heart. This net-work, besides that part of it behind the heart, has a large lymphatic on each side, which receives lymphatics from the kidney, runs upon the bone of the thorax backwards; and when it has got as far as the middle of that bone, it sends off a large branch from its inside to join the thoracic duct. After detaching this branch, it is joined by the lymphatics of the thoracic fins, and soon after by a lymphatic which runs upon the side of the fish. It is formed of branches, which give it a beautiful penniform appearance.

Besides these branches, there is another set deeper which

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which accompanies the ribs. After the large lymphatic has been joined by the above-mentioned vessels, it receives lymphatics from the gills, orbit, nose, and mouth. A little below the orbit, another net-work appears, consisting in part of the vessels above described, and of the thoracic duct. This net-work is very complete, some of its vessels lie on each side of the muscles of the gills; and from its internal part a trunk is sent out, which terminates in the jugular vein.

304 The lacteals.

The lacteals run on each side of the mesenteric arteries, anastomosing frequently across these vessels. The receptaculum into which they enter is very large, in proportion to them; and consists at its lower part of two branches, of which one lies between the duodenum and stomach, and runs a little way upon the pancreas, receiving the lymphatics of the liver, pancreas, those of the lower part of the stomach, and the lacteals from the greatest part of the small intestines. The other branch of the receptaculum receives the lymphatics from the rest of the alimentary canal. The receptaculum formed by these two branches lies on the right side of the upper part of the stomach, and is joined by some lymphatics in that part, and also by some from the sound and gall-bladder, which in this fish adheres to the receptaculum. This thoracic duct takes its rise from the receptaculum, and lies on the right side of the œsophagus, receiving lymphatics from that part; and running up about half an inch, it divides into two ducts, one of which passes over the œsophagus to the left side, and the other goes straight upon the right side, passes by the upper part of the kidney, from which it receives some small branches, and soon afterwards is joined by a branch from the large lymphatic that lies above the bone of the thorax, as formerly mentioned: near this part it likewise sends off a branch to join the duct of the opposite side; and then, a little higher, is joined by those large lymphatics from the upper part of the gills, and from the fauces.

The thoracic duct, after being joined by these vessels, communicates with the net-work near the orbit, where its lymph is mixed with that of the lymphatics from the posterior part of the gills, and from the superior fins, belly, &c. and then from this net-work a vessel goes into the jugular vein just below the orbit. This last vessel, which may be called the termination of the whole system, is very small in proportion to the net-work from which it rises; and indeed the lymphatics of the part are so large, as to exceed by far the size of the sanguiferous vessels.

The thoracic duct from the left side, having passed under the gullet from the right, runs on the inside of the vena cava of the left side, receives a branch from its fellow of the opposite side, and joins the large lymphatics which lie on the left side of the pericardium, and a part of those which lie behind the heart; and afterwards makes, together with the lymphatics from the gills, upper fins, and side of the fish, a net-work, from which a vessel passes into the jugular vein of this side. In a word, the lymphatics of the left side agree exactly with those of the right side above described. Another part of the system is deeper seated, lying between the roots of the spinal processes of the back-bone. This part consists of a large trunk that begins from the lower part of the fish, and as it ascends receives branches from the dorsal fins and adjacent parts of the body. It goes up near the head, and sends a branch to each thoracic duct near its origin.

Of Fishes.

305 Organs of generation.

The only *organs of generation* in this animal are two bags situated in the abdomen uniting near the podex. These in the male are filled with a whitish firm substance called the *milt*, and in the female with an infinite number of little ova clustered together, of a reddish yellow colour, called the *roe*. Both these at spawning time we find very much distended; whereas at another time the male organs can scarcely be distinguished from the female; nor is there any proper instrument in the male for throwing the seed into the organs of the female, as in other creatures. We shall not take upon us to determine the way whereby the female sperm is impregnated: but we find that the spawn of frogs consists in the small specks wrapped up in a whitish glutinous liquor: these specks are the rudiments of the young frogs, which are nourished in that liquor till they are able to go in search of their food. In the same way, the ova of fishes are thrown out and deposited in the sand, the male being for the most part ready to impregnate them, and they are incubated by the heat of the sun. It is curious enough to remark with what care they seek for a proper place to deposite their ova, by swimming to the shallow, where they can better enjoy the sun's rays, and shun the large jaws of other fishes. The river-fishes, again, spawn in some creek free from the hazard of the impetuous stream. But whether this mixture be brought about in fishes by a simple application of the genitals to each other, or if both of them throw out their liquors at the same time in one place, and thus bring about the desired mixture, it is not easy to determine. Spallanzani has found, that the eggs of frogs, toads, and water newts, are not fecundated in the body of the female; that the male emits his semen upon the spawn while it is flowing from the female; and that the fœtus pre-exists in the body of the female: but whether impregnation takes place in the same manner in fishes, he has not yet been able to determine, though he seems to think it probable. These creatures are so shy, that we cannot easily get to observe their way of copulation, and are consequently but little acquainted with their natural history. Frogs, it is very evident, do not copulate: at least no farther than to allow both sexes an opportunity of throwing their sperm. Early in the spring the male is found for some days in close contact upon the back of the female, with his fore legs round her body in such a manner that makes it very difficult to separate them, but there is no communication. At this time the female lays her spawn in some place that is most secure, while the male emits his sperm upon the female spawn.

306 The air-bladder, and its uses.

After raising up the black peritoneum in fishes, there comes in view an oblong white membranous bag, in which there is nothing contained but a quantity of elastic air. This is the *swimming-bladder*: it lies close to the back-bone; and has a pretty strong muscular coat, whereby it can contract itself. By contracting this bag, and condensing the air within it, they can make their bodies specifically heavier than water, and so readily fall to the bottom; whereas the muscular fibres ceasing to act, the air is again dilated, and they become specifically lighter than water, and so swim above.

Mollusca.

above. According to the different degrees of contraction and dilatation of this bladder, they can keep higher or lower in the water at pleasure. Hence flounders, soles, raia or skate, and such other fishes as want this sac, are found always grovelling at the bottom of the water: it is owing to this that dead fishes (unless this membrane has been previously broken) are found swimming a-top, the muscular fibres then ceasing to act, and that with their bellies uppermost; for the backbone cannot yield, and the distended sac is protruded into the abdomen, and the back is consequently heaviest at its upper part, according to their posture. There is here placed a glandular substance, containing a good quantity of red blood; and it is very probable that the air contained in the swimming-bladder is derived from this substance. From the anterior part of the bag go out two *processes* or *appendices*, which, according to the gentlemen of the French academy, terminate in their fauces; in a variety of other fishes we find communications with some part of the alimentary canal, particularly the œsophagus and stomach. The salmon has an opening from the fore end of the air-bag into the œsophagus, which is surrounded by a kind of muscular fibres. The herring has a funnel-like passage leading from the bottom of the stomach into the air-bag; but it is not determined whether the air enters the air-bag by this opening, or comes out by it: the latter, however, seems to be the more probable opinion, as the glandular body is found in all fishes, whereas there are several without this passage of communication.

Of Mollusca.

307 proces-, or communication h the ntriculus.

At the superior part of this bag there are other red-coloured bodies of a glandular nature, which are connected with the kidneys. From them the *ureters* go down to their insertion in the *vesica urinaria*, which lies in the lower part of the abdomen; and the urethra is there produced, which terminates in the podex.

308 Ureters, vesica urinaria. Urethra.

CHAP. VIII. OF MOLLUSCA.

IN these animals the muscles or fleshy fibres are white, and possessed of great irritability: they retain the power of motion even after being cut into small pieces; and many parts of their body are capable of being reproduced after being separated. Their external surface is always moist, as there commonly exudes from it a viscous fluid. It is extremely sensible, and is furnished with organs called *tentacula*, which are capable of being lengthened out or contracted, so as to enable the animal to feel the better. It is uncertain whether or not these animals possess the sensation of smell, but if they do, the organ of this sense is probably situated at the entrance of their pulmonary vessels. Many of them have eyes, and some appear to be possessed of ears.

Their body is usually provided with, or at least partly enveloped by, a membranous covering. In many this covering is more or less crustaceous, produced from a calcareous juice exuding from the surface of the animal, and forming a shell composed of one or more pieces or valves. The body of the animal is attached to this shell by muscles, which enable it to retire within the valves, or to shut these together. These muscles change their place, separating from one part, and growing to another, so as always to preserve the same relative position, notwithstanding the unequal growth of the shell. Most of these animals are inhabitants of the sea: some of them reside in fresh water; and some of them reside entirely on land.

The mollusca may be divided into three orders.

1. The *cephalopoda*, so called because their feet, or at least the organs with which they seize their prey, are situated in the head. Their body is in the form of a sack, which, when the external covering is removed, exhibits the appearance of a compact network of fleshy fibres in three distinct layers. Of these the outermost are placed lengthwise, the middle in a cross direction, and the innermost in no regular order. By the various actions of these fibres the sack of the animal is lengthened, contracted, bent, or twisted in various directions. These animals are furnished below the skin of the back with a solid body, which is for the most part exceedingly elastic and transparent, and is sometimes furrowed longitudinally. In all the species of sepia or cuttle-fish, except the *S. octopus*, which wants it, this body is a sort of bone, formed of thin concentric plates, separated by small columns, arranged so as to form a quincunx. It is oval and lenticular, or thickest in the middle.

The feet in this order are eight in number, and form a circle round the mouth; they end in suckers, by which the animal fixes itself to any substance, and are furnished with numerous muscles, by which they are moved in every direction. The other species of sepia (except the *octopus* and the calmar), have, besides these eight feet, two others which are longer and smaller.

They have three hearts; their respiration is carried on in the water by means of branchiæ; they have very large eyes, and organs of hearing situated within the head; their stomach is very fleshy, so as to resemble the gizzard of a fowl, and they have a very large liver. They are also furnished with a peculiar gland for the purpose of secreting an inky fluid, which, when they wish to conceal themselves, they throw out, and thus obscure the water round them.

2. The *gasteropoda*, which have upon the belly a muscular plane, by the contraction of which they creep upon the belly, as may be observed in the snail; and hence their name. They have no heart; their branchiæ are situated sometimes within the body, sometimes they surround the body, and are often on the back: they are naked in the first case, and in the others are covered with a kind of lid, and are of various forms. The common trunk of the blood-vessels is subdivided for the purpose of distributing to the branchiæ the blood which has circulated through the body. The most of this order are hermaphrodite, but require reciprocal copulation. There is almost always situated near the matrix a bag, containing a fluid, which

Of Crustacea, &c.

which is generally thought to be the substance employed by the ancients in the dyeing of purple; the use of this fluid in these animals is unknown. The intestines consist of a stomach more or less fleshy, and an alimentary canal; they have a very large liver, and a considerable number of them are provided with brain and nerves.

3. The *acephala*, so called because they have no heads. These animals are commonly contained within two shells, and have their body entirely enveloped in a membranaceous covering, which opens either in one part or two; and to this covering, especially at that part where the water enters, are attached the tentacula, the only external organ of sensation which the animals of this order appear to possess. Their organs of respiration are composed of large vascular laminæ, situated at the two sides, immediately beneath the covering; their heart is placed towards the back. The stomach and great part of the intestinal canal passes through the liver. Their mouth, which opens immediately into the stomach, is placed between the branchiæ, at the orifice opposite to that by which the water enters, and round it are placed four triangular bodies which appear to be tentacula. The brain, where it is present, is placed between the branchiæ and the intestinal canal. They appear to be all hermaphrodites, and do not require copulation.

Of Crustacea, &c.

CHAP. IX. OF THE CRUSTACEA.

THE animals which compose this order have commonly been ranked among the insects; but we have thought it better to separate them, as they are possessed of character by which they are sufficiently distinguished. They have the body enveloped in a sort of armour composed of several pieces or scales, and are usually provided with a great number of jointed limbs.

The head in these animals is immoveable, their principal motions being confined to the tail and feet. The tail forms a considerable portion of the animal, and is furnished with very large and strong muscles, by the action of which the animal is enabled to leap and swim with great celerity.

Their feet are of different forms in the several species, and also vary in number, and in some species answer several very different purposes. What in these animals is analogous to the brain, is a long knotted nervous cord, from the knots of which the nerves are distributed to the body. Their eyes are hard and complex, and are usually placed on a sort of footstalks, which enable them to move with great facility in all directions. They are furnished with feelers and antennæ, as we shall see in insects. Their organs of hearing are very imperfect. They have a heart, and both an arterial and a venous system of blood-vessels. They breathe by means of branchiæ. Their jaws are generally numerous, very strong, and situated in a transverse direction. They are of distinct sexes, and the male has two penes.

CHAP. X. OF INSECTS.

AS under ENTOMOLOGY, now become a study so fashionable, and which has been carried to a high degree of perfection, we propose to give a particular account of the structure and economy of insects, we shall at present only offer a short sketch of their anatomy.

Insects differ from the former classes, by their bodies being covered with a hard crust or scale, by their having feelers or antennæ arising from their head, and many of them breathing the air through lateral pores. As to the shape of their bodies, though it somewhat differs from that of birds, being in general not so sharp before to cut and make way through the air, yet it is well adapted to their manner of life. The base of their bodies is not formed of bones, as in many other animals, but the hard external covering serves them for skin and bone at the same time. Their feelers, beside the use of cleaning their eyes, are a guard to them in their walk or flight. Their legs and wings are well fitted for their internal surface; but the latter vary so much in different insects, that from them naturalists have given names to the several orders of the class. As, first, the

Coleoptera, or beetle tribe, which have a crustaceous elytra or shell, that shuts together, and forms a longitudinal suture down their back.

Hæmiptera—as in cimex, cockroach, bug, &c. which have the upper wings half crustaceous and half membranaceous; not divided by a longitudinal suture, but incumbent on each other.

Lepidoptera—as the butterfly, have four wings, covered with fine scales in the form of powder.

Neuroptera—as the dragon-fly, spring-fly, &c. have four membranaceous transparent naked wings, generally reticulated.

Hymenoptera—as wasps, bees, &c. have four membranaceous wings, and a tail furnished with a sting.

Diptera—as the common house-fly, have only two wings.

Aptera—as the scorpion, spider, &c. have no wings.

The structure of the eye in many insects is a most curious piece of mechanism. The outer part is remarkably hard, to guard against injuries; and has commonly a reticular appearance, or the whole may be looked upon as an assemblage of smaller eyes; but whether they see objects multiplied before them, has not yet been determined.

Linnæus,

Worms, &c.

Linnæus, and several others following him, deny the existence of a brain in these creatures.

Their ear has been lately discovered to be placed at the root of their antennæ or feelers, and can be distinctly seen in some of the larger kinds.

They have a stomach, and other organs of digestion.

They have a heart and blood vessels, and circulation is carried on in them somewhat as in the former class; but the blood is without red globules; or, as naturalists speak, is colourless. In some of the larger kind, when a piece of the shell is broken, the pulsation of the heart is seen distinctly, and that sometimes for several hours after it has been laid bare.

Lungs. The existence of these by some has been denied. But late experiments and observations show that no species want them, or at least something similar to them; and in many insects, they are larger in proportion than in other animals: in most of them they lie on or near the surface of their body; and send out lateral pores or tracheæ, by which, if the animal is besmeared with oil, it is instantly suffocated.

Generation. The same difference in sex exists in insects as in other animals, and they even appear more disposed to increase their species; many of them, when become perfect, seeming to be created for no other purpose but to propagate their like. Thus the silkworm, when it arrives at its perfect or moth state, is incapable of eating, and can hardly fly; it endeavours only to propagate its species: after which the male immediately dies, and so does the female as soon as she has deposited her eggs.

Besides those of the male and female, a third sex exists in some insects, which we call *neuter*. As these have not the distinguishing parts of either sex, they may be considered as eunuchs or infertile. We know of no instance of this kind in any other class of animals; and it is only found among those insects which form themselves into societies, as bees, wasps, and ants: and here these eunuchs are real slaves, as on them lies the whole business of the economy. No hermaphrodites have as yet been discovered among insects.

Of Worms, &c.

Many have imagined that the generality of insects were merely the production of putrefaction, because they have been observed to arise from putrified substances; but a contrary opinion is now more generally adopted; and it is pretty certain, that if putrid bodies be shut up in a close vessel, no insects are ever generated unless their ova have been originally deposited there. They are oviparous animals, and lay their eggs in places most convenient for the nourishment of their young; some in water, others in flesh; some in fruit and leaves; while others make nests in the earth or in wood, and sometimes even in the hardest stone. The eggs of all insects first become (*larva*) caterpillar, or maggot; from which they are changed into (*pupa*) chrysalis or aurelia, so named from their being inclosed in a case; and these dying, or seeming to die, the (*imago*) fly, or butterfly, or perfect state, succeeds; and during each of these changes their appearance differs wonderfully.

CHAP. XI. OF WORMS.

THE worms form a class in the system of Linnè, comprehending the mollusca, and the next assemblage of which we are to speak, viz. the *Zoophytes*, besides the worms properly so called.

We have seen that insects in one part of their existence appear in the state of larvæ, or organized beings resembling the common caterpillar or larva of the butterfly. In some of these the organs of motion are very perfect, and they are furnished with regular articulated members, provided with solid parts. From these there is a gradation to the worms, which have no feet, but move forwards either by means of bristles or hairs fixed in the surface of their bodies, as in the common earth-worm and the lumbricus of the intestines, or they are provided at each extremity with a circular sucker, as in the leech, by which they fasten one end of their body to the surface on which they are to move, and proceed forward by the contractions of the muscular rings of which their body is chiefly composed. Within their body is found a white nervous cord. Those which inhabit the water carry on respiration by means of membranaceous branchiæ; in others there are pores or stigmata, analogous to the tracheæ of insects; some of them are furnished with feelers. Of the most important of this class, the worms which inhabit the intestines of other animals, we propose to give a particular account in a future article.

CHAP. XII. OF THE ZOOPHYTES.

THE zoophytes form the lowest class of animated nature; and many of them bear so close a resemblance to plants and minerals, that they would seem to belong rather to these kingdoms than to that in which modern naturalists have agreed to arrange them. The mollusca possess organs of digestion, sensation, circulation, and respiration, and are furnished with viscera not very unlike those of the vertebral animals. Insects form the next degree, which have no distinct circulation, and very imperfect respiratory organs; but in them we see something like a brain, and well-marked organs of sensation. We observe the same in many worms, in most of which they probably exist. But in the zoophytes there is no appearance of circulation; there are no nerves, and no sensorium or common centre of sensation; there is but little appearance

Of Zoophytes.

of respiration, and often scarcely any thing which may be termed an organ of digestion. Every point of their body seems independently to attract nourishment, and independently to possess the faculty of sensation; hence the extreme degree of irritability, the great power of vitality and of reproduction, which we find in these animals. For propagation, they need only be cut in pieces, and do not require a difference of sex or organs of generation to preserve the species: They may be divided into two orders; the first of which, as bearing a resemblance to both animals and plants, may be properly called *zoophytes*; and the last, as resembling both plants and stones, may be called *lithophytes*. See LITHOPHYTES and ZOOPHYTES. We have in this comparative view of organized beings, purposely avoided giving any description of the anatomy of plants. This will be found to be copiously treated in the article ANATOMY, VEGETABLE, in the SUPPLEMENT.

Of Zoophytes.

See also the articles ANATOMY, ANIMAL and COMPARATIVE, in the SUPPLEMENT.

INDEX.

ANA

Anattom, Anaxagoras.

ANATTOM, in *Geography*, the most southerly island of the New Hebrides, in the southern Pacific ocean. S. Lat. 20. 3. E. Long. 170. 4.

ANAXAGORAS, an eminent philosopher of antiquity, was born in the first year of the 70th Olympiad, or 500 years before Christ. In consequence of the eminent talents of this philosopher he obtained the appellation of *Mind*. Pythagoras represents philosophers as mere spectators of the affairs of human life, and who, neglecting all other pursuits, devote their exertions to the investigation of nature, and the search after wisdom. According to this definition of a philosopher, Anaxagoras strictly merited the honourable appellation; for though he was of a respectable descent, and possessed of a considerable fortune, yet he relinquished both, so that, in the language of Cicero, he might "give himself wholly to the divine pleasures of learning and inquiry." The sons of wealth, and the lovers of money, will probably unite in the ridicule cast upon him by the age in which he lived, even "that he philosophized very foolishly;" but the mind of Anaxagoras disregarded their scorn, and persevered in his plan; and although the reader may hesitate in giving applause to the man who deprives society of the benefits of his social talent, yet the eager thirst of his mind after knowledge is entitled to becoming credit.

Leaving his lands to be cultivated and enjoyed by his friends, Anaxagoras placed himself under the care of Anaximenes the Milesian. About the age of twenty he went to Athens and entered upon the study of philosophy, where he continued 30 years. Some suppose that he was the first disciple of the Ionian school, founded by Thales a teacher of philosophy in Athens. When Anaxagoras assumed the character of a public teacher of philosophy, he quickly rose to high eminence, and produced many famous scholars, among whom were Euripides the tragedian, Pericles the statesman, and the renowned Socrates. This philosopher contented himself with serving the republic in his own station, without interfering in any of the public affairs of the state. Both by the principles of wisdom which he inspired into the minds of the Athenian youth, and also by his daily advice in the most important affairs, particularly in the case of Pericles, he was of singular service to his country. But neither the friendship of the famous Pericles, nor his own general disinterestedness of character, nor his immense stores of learning, could ward off the shafts of persecution. Cleo accused him of impiety, and the introduction of new opinions concerning the gods, because he taught that the sun was a burning mass of stone, or an inanimate fiery substance. By this opinion he was said to rob the sun of his divinity, because in the popular opinion he was deemed Apollo, one of the greatest deities. But although Cleo made religion the avowed cause of the accusation of Anaxagoras, it is highly probable that civil causes chiefly operated towards his condemnation. It is, however, abundantly evident, that he did not hesitate to expose the vulgar superstitions on several occasions; but the evidence is not sufficient which pretends to prove that he was condemned for teaching the doctrine of a supreme intelligence, the creator of this world. His judges condemned him to death; but Pericles appearing in his defence, the sentence was changed from that of death to banishment and a pecuniary fine.

Anaxagoras.

It is reported, that when one of his friends regretted his exile, he replied: "It is not I who have lost the Athenians, but the Athenians who have lost me." Whilst a small degree of vanity appears in this sentiment, it nevertheless informs posterity with what calmness of mind he endured the changes of fortune. But other sayings tend more fully to unfold his character. During the course of a lecture one day, he was interrupted with the unpleasant news of the death of a son; he calmly replied, "I knew that I begat him mortal." When he received the sentence of condemnation, he consoled himself by this consideration: "Nature,

Anaxagoras.

ture, (said he) long ago pronounced the same sentence against me."

Expelled from Athens, Anaxagoras passed the remainder of his days at Lampsacus, teaching philosophy in the school of his deceased master Anaximenes, until the infirmities of nature terminated his useful life in the year 428 before Christ. Before his death his friends inquired if they should carry his bones to his native city: he returned for answer, that this was quite "unnecessary, the way to the regions below is everywhere alike open." When the magistrates of Lampsacus sent a message to him before his death, requesting to know in what manner he wished them to honour his memory, he said, "Only let the day of my death be annually kept as a holiday by the boys in the schools of Lampsacus." This was complied with, and the custom remained even in the time of Diogenes Laertius. This great philosopher died at the advanced age of 72, and the inhabitants of Lampsacus erected a tomb over his remains, with the following epitaph.

Ενθαδε, πλειστον αληθειας επι τερμα περησας
Ουρανιω κοσμω, κειται Αναξαγορας.

This tomb great Anaxagoras confines,
Whose mind explor'd the paths of heavenly truth.

It is also reported, that there was an altar erected to his memory, upon which were inscribed the words *Truth* and *Mind.*

Many fabulous reports are narrated concerning this philosopher, of which it appears unnecessary to take any particular notice; and Diogenes Laertius has collected with little care and judgment, after an interval of more than 700 years, the remains concerning this philosopher, which were scattered through various writings. With no small degree of diffidence then the pen must record a summary of his doctrine collected from such unsatisfactory information; especially since his biographer himself has given full proof both of his ignorance and negligence, and as the whole narrative abounds with chronological contradictions and other inconsistencies.

It appears, however, that in the midst of some extravagant conceptions Anaxagoras held opinions which indicate a considerable acquaintance with the laws of nature. His idea of the heavens appears to have been, that they were a solid vault, originally composed of stones, elevated from the earth by the violent motion of the ambient æther, inflamed by its heat, and by the rapid circular motion of the heavens fixed in their respective places. The testimonies of several writers, among which is that of the respectable Xenophon, unite in proving that he considered the sun to be a large fiery stone; and Xenophon introduces Socrates as refuting that doctrine, and delivering an unfavourable opinion concerning his other writings. From his perceiving that the rainbow is the effect of the reflection of the solar rays from a dark cloud, and that wind is produced by the rarefaction, and sound by the percussion of the air, Anaxagoras seems to have paid considerable attention to the phenomena of nature. He must have had some knowledge of the nature of the atmosphere, and the doctrine of eclipses, if, according to report, he could predict a fall of rain and darkness at noonday.

Anaxagoras, Anaxarchus.

Our information is more correct concerning his opinions of the principles of nature and the origin of things. He imagined that in nature there are as many kinds of principles as there are species of compound bodies, and that the peculiar form of the primary particles of which any body is composed, is the same with the quality of the compound body itself. For instance, he supposed that a piece of gold is composed of small particles which are themselves gold, and a bone of a great number of small bones; thus, according to Anaxagoras, bodies of every kind are generated from similar particles. That part of his system is more agreeable to reason which explains the active principle in nature. According to Diogenes Laertius, Anaxagoras taught, that "the universe consists of small bodies composed of similar parts, and that mind is the beginning of motion." "He was the first, (says the same writer) who superadded mind to matter, opening his work in this pleasing and sublime language: "All things were confused; then came mind, and disposed them in order." Plato informs us that this philosopher taught the existence of a disposing mind, the cause of all things. Anaxagoras, according to Aristotle, taught that mind was "the cause of the world, and of all order; and that while all things else are compounded, this alone is pure and unmixed;" and that "he ascribes to this principle two powers, to know and to move, saying, that mind put the universe into motion." Cicero expressly asserts, that Anaxagoras was the first who taught, that "the arrangement and order of all things was contrived and accomplished by the understanding and power of an infinite mind." (*Gen. Biog.*).

ANAXARCHUS, a Grecian philosopher, who lived under Philip of Macedon and Alexander, was born in Abdera, and belonged to the sect generally known by the name of the Eleatic. He is said to have been conducted in the progress of his early studies by the skilful hands of Diomenes of Smyrna and Metrodorus of Chios. He had the honour to be a companion of Alexander; and a few anecdotes transmitted to posterity concerning him render it evident that he treated him with the usual freedom of a friend. This philosopher candidly checked the vain glory of Alexander (when elated with pride he aspired to the honours of divinity), by pointing to his finger when it bled, saying, "See the blood of a mortal, not of a god." It is likewise reported, that, on another occasion, while indulging immoderately at a banquet, he repeated a verse from Euripides, reminding Alexander of his mortality. It is, however, to be regretted, that the fidelity of the philosopher was wanting at the time when the mind of Alexander was tortured with remorse at having slain his friend Clitus; for it is reported that he, on that occasion, endeavoured to soothe the agitated mind of Alexander, by saying, that "kings, like the gods, could do no wrong." It is reported that Nicocreon, king of Cyprus, exposed him to the torture of being pounded in a mortar, and that he endured this torture with incredible patience; but as the same fact is reported of Zeno the Eleatic, there is reason to suppose that it is fabulous; and it may be added, that this narrative is inconsistent with the general character of Anaxarchus, who, on account of his easy and peaceable life, received the appellation of "The Fortunate." (*Gen. Biog.*).

ANAXIMANDER,

Anaximander, Anaximenes.

ANAXIMANDER, a famous Greek philosopher, born at Miletus in the 42d Olympiad, in the time of Polycrates tyrant of Samos. He was the first who publicly taught philosophy, and wrote upon philosophical subjects. He carried his researches into nature very far for the time in which he lived. It is said, that he discovered the obliquity of the zodiac, was the first who published a geographical table, invented the gnomon, and set up the first sun-dial in an open place at Lacedæmon. He taught, that infinity of things was the principal and universal element; that this infinite always preserved its unity, but that its parts underwent changes; that all things came from it; and that all were about to return into it. According to all appearance, he meant by this obscure and indeterminate principle the chaos of the other philosophers. He asserted, that there is an infinity of worlds; that the stars are composed of air and fire, which are carried in their spheres, and that these spheres are gods; and that the earth is placed in the midst of the universe, as in a common centre. He added, that infinite worlds were the product of infinity, and that corruption proceeded from separation.

ANAXIMENES, born at Miletus, an eminent Greek philosopher; friend, scholar, and successor of Anaximander. He diffused some degree of light upon the obscurity of his master's system. He made the first principle of things to consist in the air, which he considered as immense or infinite, and to which he ascribed a perpetual motion. He asserted, that all things which proceeded from it were definite and circumscribed; and that this air, therefore, was God, since the divine power resided in it and agitated it. Coldness and moisture, heat and motion, rendered it visible, and dressed it in different forms, according to the different degrees of its condensation. All the elements thus proceed from heat and cold. The earth was, in his opinion, one continued flat surface.

ANAXIMENES, a Greek historian and rhetorician, was born at Lampsacus about 580 years before Christ. Diogenes, the Cynic, laid the principles of erudition in the mind of this great man. Some writers ascribe to him, "A Treatise on the Principles of Rhetoric," which bears the name of Aristotle; and it is reported that Philip of Macedon invited him to his court to instruct his son Alexander in that science. Alexander was attended in his expedition against Persia by this learned philosopher and many other eminent men. The inhabitants of the city, which had the honour to give him birth, having espoused the cause of Darius, upon Alexander's conquering them, they entreated their countryman Anaximenes to intercede with Alexander in their behalf. He humanely undertook to interpose for them; but the king being informed of his intention, as soon as he came into his presence, swore that he would grant him nothing that he should ask. He instantly replied, "I entreat you to destroy Lampsacus, to burn its temples, and to sell the inhabitants for slaves." Alexander, struck with this dexterous reply, kept his word, and saved the city.

Another pleasing anecdote is related of Anaximenes. For some unrecorded cause, he being displeased with the historian Theopompus, in order to revenge himself, wrote a severe satire against the Spartans and Thebans, in a stile exactly similar to that of Theopompus, and under his name addressed it to the Athenians. Theopompus was generally believed to be the author of that work, and consequently it brought upon him the odium and indignation of all Greece. Whilst this action afforded an illustrious proof of the strength of his talents, it afforded an equal evidence of the quality of his heart. The history of Philip, of Alexander, and likewise twelve books on the early history of Greece, were the productions of his pen, but are now unfortunately lost. (*Gen. Biog.*).

Anaximenes ‖ Ancestors.

ANAXIMANDRIANS, in the history of philosophy, the followers of Anaximander, the most ancient of the philosophical atheists, who admitted of no other substance in nature but matter.

ANAZARBUS (Pliny), ANAZARBA (Stephanus); a town of Cilicia, on the river Pyramus, the birthplace of Dioscorides, and of the poet Oppian. It was sometimes called *Cæsarea*, in honour either of Augustus or of Tiberius. The inhabitants are called *Anazarbeni* (Pliny), and on coins *Anazarbeis* after the Greek idiom. It was destroyed by a dreadful earthquake in the year 525, along with several other important cities: but they were all repaired at a vast expence by the emperor Justin; who was so much affected with their misfortune, that putting off the diadem and purple, he appeared for several days in sackcloth.

ANBERTKEND, in the eastern language, a celebrated book of the Brachmans, wherein the Indian philosophy and religion are contained. The word in its literal sense denotes the cistern wherein is the water of life. The anbertkend is divided into 50 beths or discourses, each of which consists of 10 chapters. It has been translated from the original Indian into Arabic, under the title of *Morat al Maani*, q. d. "the marrow of intelligence."

ANCARANO, a town of Italy, in the marquisate of Ancona. E. Long. 14. 54. N. Lat. 42. 48.

ANCASTER, a town of Lincolnshire, situated in W. Long. 30. N. Lat. 52. 30. It gives title of duke to the noble family of Bertie.

ANCENIS, a town of France in the department of the Lower Loire. W. Long. 1. 9. N. Lat. 47. 20.

ANCESTORS, those from whom a person is descended in a straight line. The word is derived from the Latin *ancessor*, contracted from *antecessor*, q. d. "goer before."

Most nations have paid honours to their ancestors. It was properly the departed souls of their forefathers that the Romans worshipped under the denominations of *lares*, *lemures*, and *household gods*. Hence the ancient tombs were a kind of temples, or rather altars, whereon oblations were made by the kindred of the deceased.

The Russians have still their anniversary feasts in memory of their ancestors, which they call *roditoli sabot*, q. d. "kinsfolk's sabbath;" wherein they make formal visits to the dead in their graves, and carry them provisions, eatables, and presents of divers other kinds. They interrogate them, with loud lamentable cries, what they are doing; how they spend their time; what it is they want; and the like.

The Quojas, a people of Africa, offer sacrifices of rice and wine to their ancestors before ever they undertake any considerable action. The anniversaries of their

Ancestors. their deaths are always kept by their families with great solemnity. The king invokes the souls of his father and mother to make trade flourish and the chase succeed.

The Chinese seem to have distinguished themselves above all other nations in the veneration they bear their ancestors. By the laws of Confucius, part of the duty which children owe their parents consists in worshipping them when dead. This service, which makes a considerable part of the natural religion of the Chinese, is said to have been instituted by the emperor Kun, the fifth in order from the foundation of that ancient empire. Bibl. Un. tom. vii. The Chinese have both a solemn and ordinary worship which they pay their ancestors. The former is held regularly twice a year, viz. in spring and autumn, with much pomp. A person who was present at it gives the following account of the ceremonies on that occasion: The sacrifices were made in a chapel well adorned, where there were six altars furnished with censers, tapers, and flowers. There were three ministers, and behind them two young acolites. The three former went with a profound silence, and frequent genuflexions, towards the five altars, pouring out wine: afterwards they drew near to the sixth, and when they came to the foot of the altar, half bowed down, they said their prayers with a low voice. That being finished, the three ministers went to the altar; the officiating priest took up a vessel full of wine, and drank; then he lifted up the head of a deer or goat; after which, taking fire from the altar, they all lighted a bit of paper: and the minister of the ceremonies turning towards the people, said with a loud voice, That he gave them thanks in the name of their ancestors for having so well honoured them; and in recompense he promised them, on their part, a plentiful harvest, a fruitful issue, good health, and a long life, and all those advantages that are most pleasing to men.

The Chinese give their ancestors another simpler and more private worship. To this end they have in their house a niche or hollow place, where they put the names of their deceased fathers, and make prayers and offerings of perfumes and spices to them at certain times, with bowing, &c. They do the like at their tombs.

The Jews settled in China are said to worship their ancestors like the heathens, and with the same ceremonies, except that they offer not swines flesh. Near their synagogue they have a hall, or court of ancestors, wherein are niches for Abraham, Isaac, &c. The Jesuits also conformed, and were permitted by their general to conform to this and many other superstitious customs of the Chinese.

There is one peculiarity of another kind, wherein the Chinese show their regard for their ancestors; in proportion as any of their descendants are preferred to a higher degree of dignity, their dead ancestors are at the same time preferred and ennobled with them. The kings Ven Van, Veu Van, and Cheu Cum, who were descended from vassal kings, when they mounted the imperial throne, raised their ancestors from the vassal or depending state wherein these had lived to the dignity of emperors; so that the same honours were for the future rendered them as if they had been emperors of China. The same example was followed by the subsequent kings, and now obtains among the grandees and literati: all now worship their ancestors, according to the rank which they themselves hold in the world. If the son be a mandarin, and the father only a doctor, the latter is buried as a doctor, but sacrificed to as a mandarin. The like holds in degradations, where the condition of the fathers is that of their sons. Ancestors ‖ Anchor.

ANCHILOPS, *αγκυλη, contraction*, and *ωψ, eye*, in *Medicine*, denotes an abscess, or collection of matter, between the great angle of the eye and the nose. If suffered to remain too long, or unskilfully managed, it degenerates, the stagnating humours corrupt, and an ulcer is produced. When the tumour is broke, and the tears flow involuntarily, whilst the os lachrymale is not carious, it is an *ægylops;* but when the ulcer is of a long standing, deep, fetid, and the os lachrymale becomes carious, it is a *fistula*. The cure is by restriction and excision, tying it at the root on the glandula lachrymalis, and, when ready, cutting it off. See SURGERY *Index*.

ANCHISES, in fabulous history, a Trojan prince, descended from Dardanus, and the son of Capys. Venus made love to him in the form of a beautiful nymph; and bore him Æneas, the hero of Virgil's Æneid.

ANCHOR (*anchora*, Lat. from *αγκυρα*, Greek), a heavy, strong, crooked instrument of iron, dropped from a ship into the bottom of the water, to retain her in a convenient station in a harbour, road, or river.

The most ancient anchors are said to have been of stone; and sometimes of wood, to which a great quantity of lead was usually fixed. In some places, baskets full of stones, and sacks filled with sand, were employed for the same use. All these were let down by cords into the sea, and by their weight stayed the course of the ship. Afterwards they were composed of iron, and furnished with teeth, which being fastened to the bottom of the sea, preserved the vessel immoveable; whence *οδοντης* and *dentes* are frequently taken for anchors in the Greek and Latin poets. At first there was only one tooth, whence anchors were called *ελεοσομοι*; but in a short time, the second was added by Eupalamus, or Anacharsis the Scythian philosopher. The anchors with two teeth were called *αμφιβολοι* or *αμφισομοι*; and from ancient monuments appear to have been much the same with those used in our days, only the transverse piece of wood upon the handles (the stock) is wanting in all of them. Every ship had several anchors; one of which, surpassing all the rest in bigness and strength, was peculiarly termed *ιερα* or *sacra*, and was never used but in extreme danger; whence *sacram anchoram solvere*, is proverbially applied to such as are forced to their last refuge.

The anchors now made are contrived so as to sink into the ground as soon as they reach it, and to hold a great strain before they can be loosened or dislodged from their station. They are composed of a shank, a stock, a ring, and two arms with their flukes. The stock, which is a long piece of timber fixed across the shank, serves to guide the flukes in a direction perpendicular to the surface of the ground: so that one of them sinks into it by its own weight as soon as it falls, and is still preserved steadily in that position by the stock,

Anchor. stock, which, altogether with the shank, lies flat on the bottom. In this situation it must necessarily sustain a great effort before it can be dragged through the earth horizontally. Indeed this can only be effected by the violence of the wind or tide, or both of them, sometimes increased by the turbulence of the sea, and acting upon the ship so as to stretch the cable to its utmost tension, which accordingly may dislodge the anchor from its bed, especially if the ground be soft and oozy, or rocky. When the anchor is thus displaced, it is said, in the sea phrase, to *come home*.

That the figure of this useful instrument may be more clearly understood, let us suppose a long massy beam of iron erected perpendicularly, *b*, at the lower end of which are two arms, *d e*, of equal thickness with the beam (usually called the *shank*), only that they taper towards the points, which are elevated above the horizontal plane at an angle of 30 degrees, or inclined to the shank at an angle of 60 degrees; on the upper part of each arm (in this position) is a fluke or thick plate of iron, *g h*, commonly shaped like an isosceles triangle whose base reaches inwards to the middle of the arm. On the upper end of the shank is fixed the stock transversed with the flukes; the stock is a long beam of oak, *f*, in two parts, strongly bolted and hooped together with iron rings. See also N° 2. Close above the stock is the ring *a*, to which the cable is fastened or *bent;* the ring is curiously covered with a number of pieces of short rope, which are twisted about it so as to form a very thick texture or covering called the *puddening*, and used to preserve the cable from being fretted or chafed by the iron.

Plate XXXII. Fig. 2. N° 1.

Every ship has, or ought to have, three principal anchors, with a cable to each, viz. the sheet, *maitresse-ancre* (which is the *anchora sacra* of the ancients); the best bower, *second ancre;* and small bower, *ancre d'affourche*, so called from their usual situation on the ship's bows. There are besides smaller anchors, for removing a ship from place to place in a harbour or river, where there may not be room or wind for sailing; these are the stream anchor, *ancre de tone;* the kedge and grappling, *grapin:* this last, however, is chiefly designed for boats.

Method of Making ANCHORS. The goodness of the anchor is a point of great importance. Great care is therefore to be taken, that the metal it is made of be neither too soft nor too brittle; the latter rendering it liable to break, and the former to straighten.

The shank, arms, and flukes, are first forged separately; then the hole is made at one end of the shank for the ring, which being also previously forged, is put into the hole of the shank, and the two ends shut together. After which the arms are shut to the shank one after the other, and the anchor is finished.

Proof is made of anchors by raising them to a great height, and then letting them fall again on a kind of iron block placed across for the purpose. To try whether the flukes will turn to the bottom and take hold of the ground, they place the anchor on an even surface, with the end of one of the flukes, and one of the ends of the stock resting on the surface: in case the anchor turns, and the point of the fluke rises upwards, the anchor is good.

In England, France, and Holland, anchors are made of forged iron; but in Spain they are sometimes made of copper, and likewise in several parts of the South sea. Anchor.

For the proportions of anchors, according to Manwaring, the shank is to be thrice the length of one of the flukes, and half the length of the beam. According to Aubin, the length of the anchor is to be four-tenths of the greatest breadth of the ship; so that the shank, *e. gr.* of an anchor in a vessel 30 feet wide, is to be 12 feet long. When the shank is, for instance, eight feet long, the two arms are to be seven feet long, measuring them according to their curvity. As to the degree of curvity given the arms, there is no rule for it; the workmen are here left to their own discretion.

The latter writer observes, that the anchor of a large heavy vessel is smaller in proportion than that of a lesser and lighter one. The reason he gives is, that though the sea employs an equal force against a small vessel as against a great one, supposing the extent of wood upon which the water acts to be equal in both, yet the little vessel, by reason of its superior lightness, does not make so much resistance as the greater; the defect whereof must be supplied by the weight of the anchor.

From these and other hydrostatic principles, the following table has been formed; wherein is shown, by means of the ship's breadth within, how many feet the beam or shank ought to be long, giving it four-tenths or two-fifths of the ship's breadth within: by which proportion might be regulated the length of the other parts of the anchor. In this table is represented likewise the weight an anchor ought to be for a ship from eight feet broad to 45, increasing by one foot's breadth; supposing that all anchors are similar, or that their weights are as the cubes of the lengths of the shanks.

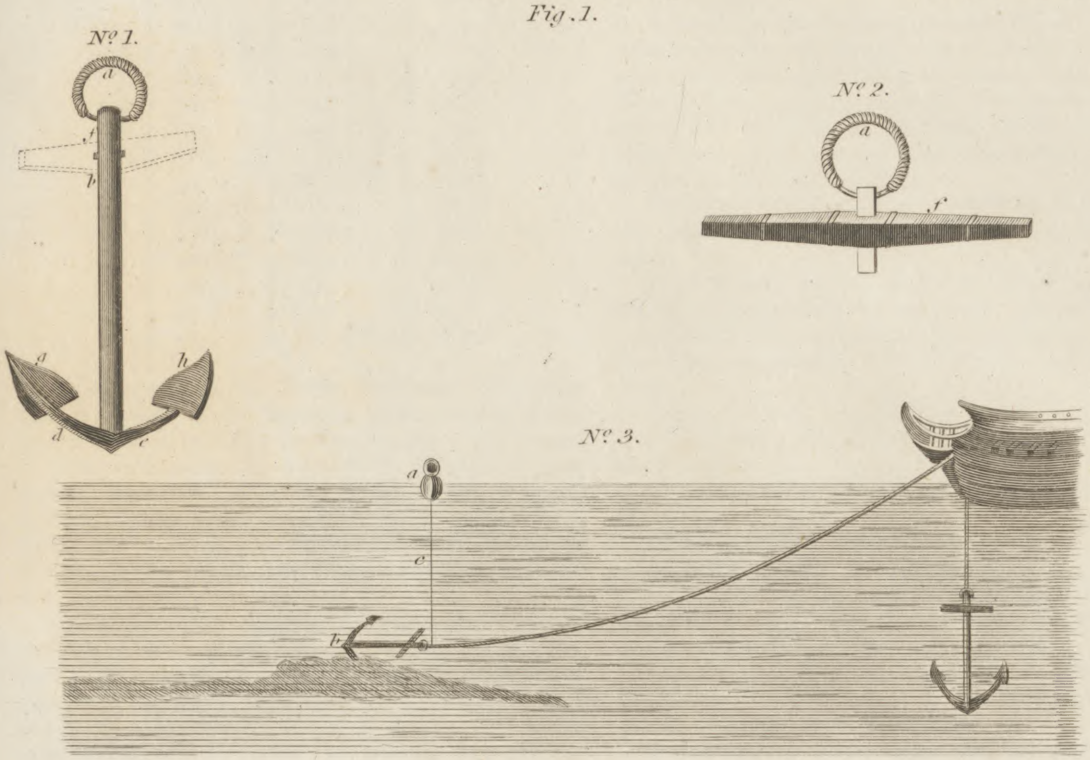
Breadth of the Vessel. Feet.	Length of the Anchor. Feet.	Weight. Pounds.
8	3 1/5	33
9	3 3/5	47
10	4	64
11	4 2/5	84
12	4 4/5	110
13	5 1/5	140
14	5 2/5	175
15	6	216
16	6 2/5	262
17	6 4/5	314
18	7 2/5	373
19	7 3/5	439
20	8	512
21	8 2/5	592
22	8 4/5	681
23	9 1/5	778
24	9 3/5	884
25	10	1000
26	10 2/5	1124
27	10 4/5	1259
28	11 1/5	1405
29	11 3/5	1562
30	12	1728
31	12 2/5	1906

Breadth

ANCHOR.

PLATE XXXIII.

Fig. 1.



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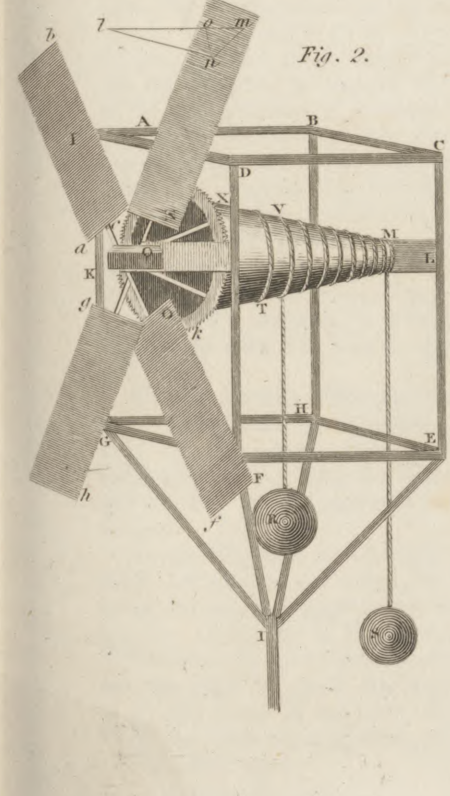

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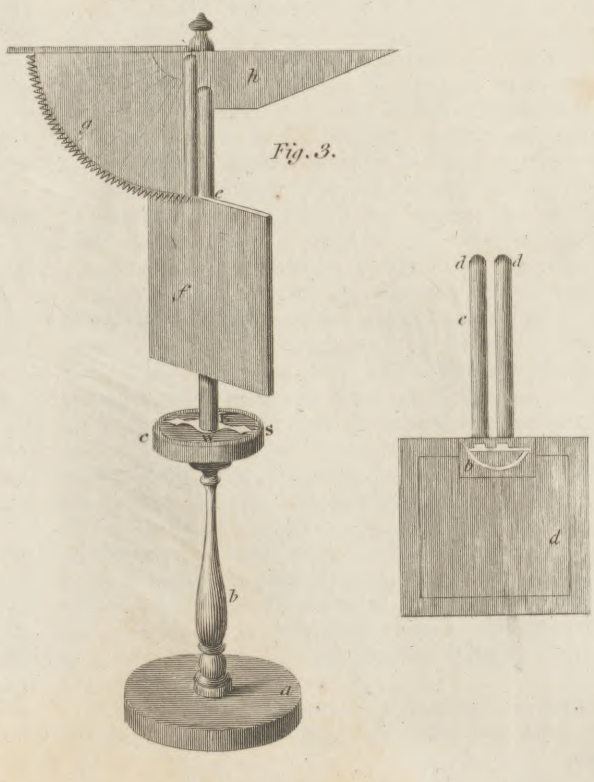

Roffe Sculp.t

Anchor.

Breadth of the Vessel. Feet.	Length of the Anchor. Feet.	Weight. Pounds.
32	$12\frac{4}{5}$	2097
33	$13\frac{1}{5}$	2300
34	$13\frac{3}{5}$	2514
35	14	2742
36	$14\frac{2}{5}$	2986
37	$14\frac{4}{5}$	3242
38	$15\frac{1}{5}$	3512
39	$15\frac{3}{5}$	3796
40	16	4096
41	$16\frac{2}{5}$	4426
42	$16\frac{4}{5}$	4742
43	$17\frac{1}{5}$	5088
44	$17\frac{3}{5}$	5451
45	18	5832

M. Bouguer, in his *Traité de Navire*, directs to take the length of the shank in inches, and to divide the cube of it by 1160 for the weight. The reason is obvious; because the quotient of the cube of 201 inches, which is the length of an anchor weighing 7000lb. divided by the weight, is 1160; and therefore, by the rule of three, this will be a common divisor for the cube of any length, and a single operation will suffice.

The same author gives the following dimensions of the several parts of an anchor. The two arms generally form the arch of a circle, whose centre is three-eighths of the shank from the vertex, or point where it is fixed to the shank; and each arm is equal to the same length, or the radius; so that the two arms together make an arch of 120 degrees: the flukes are half the length of the arms, and their breadth two-fifths of the said length. With respect to the thickness, the circumference at the throat, or vertex of the shank, is generally made about a fifth part of its length, and the small end two-thirds of the throat; the small end of the arms of the flukes, three-fourths of the circumference of the shank at the throat. These dimensions should be greater when the iron is of a bad quality, especially if cast iron is used instead of forged iron. See ANCHOR, SUPPLEMENT.

At ANCHOR, the situation of a ship which rides by her anchor in a road or haven, &c. Plate XXXII. fig. 1. N° 3. represents the fore part of a ship as riding in this situation. See also *Buoy-Rope*.

To fish the ANCHOR, to draw up the flukes upon the ship's side after it is catted. See the articles DAVIT and FISH.

To steer the ship to her ANCHOR, is to steer the ship's head towards the place where the anchor lies when they are heaving the cable into the ship; that the cable may thereby enter the hause with less resistance, and the ship advance towards the anchor with greater facility.

ANCHOR-Ground, is a bottom which is neither too deep, too shallow, nor rocky; as in the first the cable bears too nearly perpendicular, and is thereby apt to jerk the anchor out of the ground; in the second, the ship's bottom is apt to strike at low water, or when the sea runs high, by which she is exposed to the danger of sinking; and in the third, the anchor is liable to hood the broken and pointed ends of rocks, and tear away its flukes, whilst the cable, from the same cause, is constantly in danger of being cut through as it rubs on their edges.

Anchor || Ancienty.

ANCHOR, in *Architecture*, is a sort of carving somewhat resembling an anchor. It is commonly placed as part of the enrichment of the boultins of capitals of the Tuscan, Doric, and Ionic orders, and also of the boultins of bed mouldings of the Doric, Ionic, and Corinthian cornices, anchors and eggs being carved alternately through the whole building.

ANCHORS, in *Heraldry*, are emblems of hope, and are taken for such in a spiritual as well as a temporal sense.

ANCHORAGE, in *Law*, is a duty upon ships for the use of the port or harbour where they cast anchor.

ANCHOVY, in *Ichthyology*, the English name of the clupea encrasicolus. See CLUPEA, ICHTHYOLOGY *Index*.

ANCHOVY-Pear. See GRIAS.

ANCHUSA, ALKANET or BUGLOSS. See BOTANY *Index*.

ANCHYLOBLEPHARON. See ANCYLOBLEPHARON.

ANCHYLOPS. See ANCHILOPS.

ANCHYLOSIS. See ANCYLOSIS.

ANCIENT, or ANTIENT, a term applied to things which existed long ago; thus we say, ancient nations, ancient customs, &c. See ANTIQUITIES.

ANCIENT, sometimes denotes elderly, or of long standing, in opposition to young, or new; thus we say, an ancient barrister, ancient buildings.

ANCIENT, in a military sense, denotes either the ensign or colours.

ANCIENT, in ships of war, the streamer or flag borne in the stern.

ANCIENT DEMESNE, in *English Law*, is a tenure, whereby all manors belonging to the crown in William the Conqueror's and St Edward's time were held. The numbers, names, &c. hereof were entered by the Conqueror, in a book called *Domesday Book*, yet remaining in the Exchequer; so that such lands as by that book appeared to have belonged to the crown at that time, are called *ancient demesne*.—The tenants in ancient demesne are of two sorts; one who hold their lands frankly by charter; the other by copy of court-roll, or by the verge, at the will of the lord, according to the custom of the manor.—The advantages of this tenure are, 1. That tenants holding by charter cannot be rightfully impleaded out of their manor; and, when they are, they may abate the writ, by pleading the tenure. 2. They are free from toll for all things relating to their livelihood and husbandry; nor can be impannelled on any inquest.—These tenants held originally by ploughing the king's land, plashing his hedges, and the like service, for the maintenance of his household; and it was on this account that such liberties were given them, for which they may have writs of *monstraverunt* to such as take the duties of tolls, &c.—No lands are to be accounted ancient demesne, but such as are held in socage. Whether land be ancient demesne or not, shall be tried by the book of DOMESDAY.

ANCIENTY, in some ancient statutes, is used for eldership or seniority. The elder sister can demand no more

Ancillon. more than her other sisters, beside the chief mesne, by reason of her ancienty. This word is used in the statute of Ireland, 14 Henry III.

ANCILLON, DAVID, a minister of the reformed church at Metz, where he was born the 17th of March 1617. He studied from the ninth or tenth year of his age in the Jesuits college, where he gave such proofs of his genius, that the heads of the society tried every means to draw him over to their religion and party; but he continued firm against their attacks. He went to Geneva in 1633; and studied divinity under Spanheim, Diodati, and Tronchin, who conceived a very great esteem for him. He left Geneva in April 1641, and offered himself to the synod of Charenton in order to take upon him the office of a minister: his abilities were greatly admired by the examiners, and the whole assembly were so highly pleased with him, that they gave him the church of Meaux, the most considerable then unprovided for. Here he acquired a vast reputation for his learning, eloquence, and virtue, and was even highly respected by those of the Roman Catholic communion. He returned to his own country in the year 1653, where he remained till the revocation of the edict of Nantes in 1685. He returned to Francfort after this fatal blow; and having preached in the French church at Hanau, the whole congregation were so edified by it, that they immediately called together the heads of the families, in order to propose that he might be invited to accept of being minister there. The proposition was agreed to; and he began the exercise of his ministry in that church about the end of the year 1685. His preaching made so great a noise at Hanau, that the professors of divinity, and the German and Dutch ministers, attended his sermons frequently: the count of Hanau himself, who had never before been seen in the French church, came thither to hear Mr Ancillon; they came from the neighbouring parts, and even from Francfort; people who understood nothing of French flocked together with great eagerness, and said, they loved to see him speak. This occasioned a great jealousy in the two other ministers; which tended to make his situation uneasy. He therefore went to Berlin; where he met with a kind reception from his highness the elector, and was made minister of the city. Here he had the pleasure of seeing his eldest son made judge and director of the French in the same city, and his other son rewarded with a pension, and entertained at the university of Francfort upon the Oder. He had likewise the satisfaction of seeing his brother made judge of all the French in the states of Brandenburg; and Mr Cayart his son-in-law, engineer to his electoral highness. He enjoyed these agreeable circumstances, and several others, till his death, which happened at Berlin the 3d of September 1692, when he was 75 years of age. —Mr Ancillon having got a considerable fortune by marriage, was enabled thereby to gratify his passion for books; his library was accordingly very curious and large, and he increased it every day with all that appeared new and important in the republic of letters, so that at last it was one of the noblest collections in the hands of a private person in the kingdom. He published a book, in quarto, in which the whole dispute concerning Traditions is fully examined: he also wrote an apology for Luther, Zuinglius, Calvin, and Beza, and several other pieces.

Anclam ‖ Ancony.

ANCLAM, a strong town of Germany, in the circle of Upper Saxony, and duchy of Pomerania, remarkable for its excellent pastures. It is seated on the river Pene. E. Long. 14. 5. N. Lat. 54. 10.

ANCLE, or ANKLE. See ANKLE.

ANCONA, MARQUISATE OF, a province in the pope's territories in Italy. It lies between the gulf of Venice and the Appenines, which bound it on the north; Abruzzo on the east; the duchy of Spoletto, and that of Urbino, on the west. The air is indifferent; but the soil is fruitful, particularly in hemp and flax; and there is great plenty of wax and honey. It contains several large towns, as Fermo, Loretto, Recanati, Macerata, Jesi, Tolentino, Ascoli, Osimo, St Severino, Monte Alto, Camerino, and Ripatransone, which are all archiepiscopal or episcopal sees.

ANCONA, a sea-port town of Italy, the capital of the marquisate of that name, and the see of a bishop. It was formerly the finest port in all Italy, being built by the emperor Trajan, about the year 115; but was almost ruined, and its trade lost: however, it has again begun to revive. Its harbour is the best in all the pope's dominions. The town lies round it on two hills; one of which is at the point of Cape St Syriaco, from whence there is a delightful prospect. On the other stands the citadel, which commands the town and harbour. The streets of this city are narrow and uneven; and the public and private buildings inferior to those of the other great towns in Italy. The cathedral is a low dark structure; and though the front is covered with fine marble, the architecture has neither beauty nor regularity. The church of St Dominic, and that of the Franciscans, have each an excellent picture by Titian. The exchange, where the merchants meet, is a handsome square portico, in which is an equestrian statue of Trajan, who first built the port. At the four corners are four other statues. The triumphal arch of Trajan remains almost entire, with its inscription. The common people in this town are a little particular and fantastical in their dress, but the better sort follow the French mode. It is a great thoroughfare from the north of Italy to Loretto; which renders provisions very dear. The tide does not rise here above a foot, and near the Mediterranean it is scarce visible. E. Long. 13. 35. N. Lat. 43. 36.

ANCONES, in *Architecture*, the corners or quoins of walls, cross beams, or rafters.—Vitruvius calls the *consoles* by the same name.

ANCONY, in the iron-works, a piece of half-wrought iron, of about three quarters of 100 weight, and of the shape of a bar in the middle, but rude and unwrought at the ends. The process for bringing the iron to this state is this: They first melt off a piece from a sow of cast iron, of the proper size; this they hammer at the forge into a mass of two feet long, and of a square shape, which they call a *bloom;* when this is done, they send it to the finery; where, after two or three heats and workings, they bring it to this figure, and call it an *ancony*. The middle part beat out at the finery, is about three feet long, and of the shape and thickness the whole is to be; this is then sent to the chafery, and there the ends are wrought to the shape

Ancony || Ancyle.

of the middle, and the whole made into a bar. See BAR.

ANCORARUM URBS (Αγκυρων Πολις), a city in the Nomos Aphroditopolites, towards the Red sea; so called because there was in the neighbourhood a stone quary, in which they hewed stone anchors (Ptolemy) before iron anchors came to be used. The gentilitious name is *Ancyropolites* (Stephanus).

ANCOURT, FLORENT CARTON D', an eminent French actor and dramatic writer, was born at Fontainbleau, October 1661. He studied in the Jesuits college at Paris under Father de la Rue; who, discovering in him a remarkable vivacity and capacity for learning, was extremely desirous of engaging him in their order; but Ancourt's aversion to a religious life rendered all his efforts ineffectual. After he had gone through a course of philosophy, he applied himself to the civil law, and was admitted advocate at 17 years of age. But falling in love with an actress, he was induced to go upon the stage, and he married her. As he had all the qualifications necessary for the theatre, he soon greatly distinguished himself; and not being satisfied with the applause only of an actor, he began to write pieces for the stage; many of which had such prodigious success, that most of the players grew rich from the profits of them. His merits in this way procured him a very favourable reception at court; and Louis XIV. showed him many marks of his favour. His sprightly conversation and polite behaviour made his company agreeable to all the men of figure both at court and in the city, and the most considerable persons were extremely pleased to have him at their houses. Having taken a journey to Dunkirk, to see his eldest daughter who lived there, he took the opportunity of paying his compliments to the elector of Bavaria, who was then at Brussels: this prince received him with the utmost civility; and having detained him a considerable time, dismissed him with a present of a diamond valued at 1000 pistoles: he likewise rewarded him in a very generous manner, when, upon his coming to Paris, Ancourt composed an entertainment for his diversion. Ancourt began at length to grow weary of the theatre, which he quitted in Lent 1718, and retired to his estate of Courcelles le Roy, in Berry, where he applied himself wholly to devotion, and composed a translation of David's Psalms in verse, and a sacred tragedy, which were never printed. He died the 6th of December 1726, being 65 years of age.—The plays which he wrote are 52 in all; most of which were printed separately at the time when they were first represented: They were afterwards collected into five volumes, then into seven, and at last into nine. This last edition is most complete.

ANCRE, a small town of France, in Picardy, with the title of a marquisate, seated on a little river of the same name. E. Long. 2. 45. N. Lat. 49. 59.

ANCUS MARTIUS, the fourth king of the Romans, succeeded Tullus Hostilius, 639 years before Christ. He defeated the Latins, subdued the Fidenates, conquered the Sabines, Volsci, and Veientines, enlarged Rome by joining to it Mount Janiculum, and made the harbour of Ostia. He died about 615 years before the Christian era.

ANCYLE, in antiquity, a kind of shield that fell, as was pretended, from heaven, in the reign of Numa Pompilius; at which time, likewise, a voice was heard declaring that Rome should be mistress of the world as long as she should preserve this holy buckler. It was kept with great care in the temple of Mars, under the direction of twelve priests; and lest any should attempt to steal it, eleven others were made so like, as not to be distinguished from the sacred one. These ancylia were carried in procession every year round the city of Rome.

Ancyle || Ancyra

ANCYLE, in *Surgery*. See ANCYLOSIS.

ANCYLOBLEPHARON, (from αγκυλος, *bent*, and βλεφαρον, an *eyelid*); a disease of the eye, which closes the eyelids. Sometimes the eyelids grow together, and also to the tunica albuginea of the eye, from carelessness when there is an ulcer in these parts. Both these cases are called *ancyloblepharon* by the Greeks. This disorder must be distinguished from that coalition of the eyelids which happens from viscid matter gluing them together. If the cohesion is on the corner, the sight is inevitably lost. This hath sometimes happened in the small pox. If there is only a growing together of the eyelids, they may be separated with the specillum, and pledgets kept between them to prevent their reunion. If the eyelids adhere to the eye, they are to be separated by a fine edged knife; and their reunion is to be prevented by a proper use of injections, and lint placed between them, after dipping it in some proper liniment.

ANCYLOGLOSSUM (from αγκυλος, *crooked*, and γλωσσα, *the tongue*); a contraction of the ligaments of the tongue. Some have this imperfection from their birth, others from some disease. In the first case, the membrane which supports the tongue is too short or too hard; in the latter, an ulcer under the tongue, healing and forming a cicatrix, is sometimes the cause: These speak with some difficulty. The ancyloglossi by nature are late before they speak; but when they begin, they soon speak properly. These we call *tongue-tied*. Mauriceau says, that in this case it is a small membranous production, which extends from the frænulum to the tip of the tongue, that hinders the child from sucking, &c. He justly condemns the cruel practice among nurses, of tearing this membrane with their nails; for thus ulcers are sometimes formed, which are of difficult cure: he advises to snip it with scissars in two or three places, taking care not to extend the points of the scissars so far as the frænulum. The instances rarely occur which require any kind of assistance; for if the child can thrust the tip of its tongue to the outer edge of its lip, this disease does not exist; and if the tongue is not greatly restrained, the frænulum will stretch by the child's sucking and crying.

ANCYLOSIS, in *Surgery*, implies a distortion or stiffness of the joints, caused by a settlement of the humours, or a distension of the nerves; and therefore remedies of a mollifying and relaxing nature are required.

ANCYRA, the capital of Galatia, (Livy, Pliny, Ptolemy); at no great distance from the river Halys, (Livy): said to be built by Midas, king of Phrygia, and to take its name from an anchor found there (Pausanias). It was greatly improved by Augustus, deem-

Ancyra || Andely.

ed the second founder of it, as appears from the *Marmor Ancyranum*. It is now called *Angura*, or *Angoura*. E. Long. 30°. N. Lat. 41. 20.

ANCYSTRUM. See BOTANY *Index*.

ANDABATÆ, in antiquity, a sort of gladiators, who, mounted on horseback or in chariots, fought hoodwinked, having a helmet that covered their eyes.

ANDALUSIA, is the most western province of Spain, having Estremadura and La Mancha on the north; the kingdom of Granada, the straits of Gibraltar, and the ocean, on the east and south; and on the west, the kingdom of Algarva in Portugal, from which it is separated by the river Guadiana. It is about 182 miles long, and 150 broad. The chief cities and towns are Seville the capital, Baeza, Gibraltar, Cordova, Cadiz, Medina Sidonia, Jaen, Port St Mary, &c. It is the best, most fruitful, and the richest part of all Spain. There is good air, a fertile soil, and a great extent of sea coast fit for commerce. The population in 1787 amounted to 738,153.

New ANDALUSIA, a division of the province of Terra Firma in South America, whose boundaries cannot be well ascertained, as the Spaniards pretend a right to countries in which they have never established any settlements. According to the most reasonable limits, it extends in length 500 miles from north to south, and about 270 in breadth from east to west. The interior country is woody and mountainous, variegated with fine valleys that yield corn and pasturage. The produce of the country consists chiefly in dyeing drugs, gums, medicinal roots, brazil wood, sugar, tobacco, and some valuable timber. To this province also belonged five valuable pearl fisheries. The capital of New Andalusia is Comana, Cumana, or New Cordnba, situated in N. Lat. 10. 5. about nine miles from the north sea. Here the Spaniards laid the foundation of a town in the year 1520. The place is strong by nature, and fortified by a castle capable of making a vigorous defence. The country is better known under the name of Guiana. The revolution which began there in 1810 is not yet terminated.

ANDAMAN or ANDEMAN Islands, in the East Indies, situated about 80 leagues distant from Tanasserim on the coast of Siam. They are but little known. The East India ships sometimes touch at them, and are supplied by the natives with rice, herbs, and fruits. The inhabitants are by some represented as a harmless inoffensive race of men, and by others as cannibals. E. Long. 92. 0. N. Lat. from 10° to 15°.

ANDANTE, in *Music*, signifies a movement moderately slow, between *largo* and *allegro*.

ANDECAVI, (Tacitus); ANDEGAVI, (Pliny); ANDES, (Cæsar); ANDI, (Lucan): A people of Gallia Celtica, having the Turones to the east, the Namnetes to the west, the Pictones to the south, and the Aulerci Cœnomani to the north: now Anjou.

ANDEGAVI, or ANDEGAVUS, a town of Gallia Celtica, (Pliny, Ptolemy;) now Angiers. Called *Andecavi*, (Tacitus). W. Long. 30. N. Lat. 47. 30.

ANDELY, a town of Normandy in France, parted in two by a paved causeway. Here is a fountain to which pilgrims flock from all parts, to be cured of their disorders, on the feast day of the saint to which it is dedicated. It is 20 miles south-east of Rouen, and 40 north-west of Paris. E. Long. 1. 30. Lat. 49. 20.

Andely || Anderson.

ANDENA, in old writings, denotes the swath made in the mowing of hay, or as much ground as a man could stride over at once.

ANDEOL, SAINT, a town of France, in the department of Lozere, five miles south of St Viviers, whose bishop formerly resided there. E. Long. 2. 50. N. Lat. 44. 24.

ANDERAB, the most southern city of the province of Balkh, possessed by the Usbeck Tartars. It is very rich and populous, but a place of no great strength. The neighbouring mountains yield excellent quarries of lapis lazuli, in which the Bukhars drive a great trade with Persia and India.—This city is situated at the foot of the mountains dividing northern India, and the Persian dominions, from Great Bukharia. As there is no other way of crossing these mountains but by the road through this city, all travellers with goods must pay 4 per cent. On this account the khan of Balkh maintains a good number of soldiers in the place.

ANDERNACHT, a city in the duchy of the Lower Rhine, belonging to Prussia. It is situated in a plain on the river Rhine; and is fortified with a wall, castle, and bulwarks. It has a trade in stone jugs and pitchers, which are sent to the mineral waters at Dunchstein. There are three monasteries here, and several churches. E. Long. 7. 4. N. Lat. 50. 27.

ANDERO, SAINT, a sea port town in the bay of Biscay, in Old Castile, seated on a small peninsula. It is a trading town, and contains about 700 houses, two parish churches, and four monasteries. Here the Spaniards build and lay up some of their men of war. W. Long. 3. 45. N. Lat. 43. 20.

ANDERSON, SIR EDMUND, a younger son of an ancient Scotch family settled in Lincolnshire. He was some time a student of Lincoln-college, Oxford; and removed from thence to the Inner Temple, where he applied himself diligently to the study of the law, and became a barrister. In the ninth of Queen Elizabeth he was both Lent and Summer reader, and in the 16th double reader. He was appointed her majesty's serjeant at law in the 19th year of her reign; and some time after, one of the justices of the assize. In 1582 he was made lord chief justice of the common pleas, and in the year following was knighted. He held his office to the end of his life, died in the year 1605, and was buried at Eyeworth in Bedfordshire. He was an able but punctilious lawyer; a scourge to the Puritans; and a strenuous supporter of the established church. His works are, 1. Reports of many principal cases argued and adjudged in the time of Queen Elizabeth in the common bench. Lond. 1644. fol. 2. Resolutions and judgements on the cases and matter agitated in all courts of Westminster, in the latter end of the reign of Queen Elizabeth. Published by John Goldsborough, Esq. Lond. 1655, 4to. Besides these, there is a manuscript copy of his readings still in being.

ANDERSON, *Adam*, a native of Scotland, was brother to the reverend James Anderson, D. D. editor of the *Diplomata Scotiæ* and *Royal Genealogies*, many years since minister of the Scots Presbyterian church in

Anderson, Andes.

in Swallow-street, Piccadilly, and well known in those days among the people of that persuasion resident in London by the name of Bishop Anderson, a learned but imprudent man, who lost a considerable part of his property in the fatal year 1720. He married, and had issue a son, and a daughter who was the wife of an officer in the army.

Adam Anderson was for 40 years a clerk in the South-sea house; and at length arrived at his acmé there, being appointed chief clerk of the Stock and New Annuities, which office he retained till his death. He was appointed one of the trustees for establishing the colony of Georgia in America; and was also one of the court of assistants of the Scots corporation in London. The time of the publication of his "Historical and Chronological Deduction of Trade and Commerce," a work replete with useful information, was about the year 1762. He was thrice married; and by the first wife he had issue a daughter. She was, like him, tall and graceful; and her face has been thought to have some resemblance to that of the ever-living countess of Desmond, given in Mr Pennant's first Tour in Scotland. Mr Anderson died at his house in Red-Lion street, Clerkenwell, January 10. 1775. He had a good library of books, which were sold by his widow, who survived him several years, and died in 1781.

ANDERSON, *Alexander*, a Scottish mathematician. See SUPPLEMENT.

ANDERSON, *Dr James*, an eminent agricultural writer. See SUPPLEMENT.

ANDES, a great chain of mountains in South America, which running from the most northern part of Peru to the straits of Magellan, between 3000 and 4000 miles, are the longest and most remarkable in the world. The Spaniards call them the *Cordillera de los Andes*. They form two ridges, the lowermost of which is overspread with woods and groves, and the uppermost covered with everlasting snow. Those who have been at the top, affirm, that the sky is always serene and bright; the air cold and piercing; and yet so thin, that they were scarce able to breathe, and the respiration was much quicker than ordinary; and this is attended with retching and vomiting; which, however, has been considered by some as merely accidental. When they looked downwards, the country was hid by the clouds that hovered on the mountain sides. The mountains just mentioned, which have been frequently ascended, are much inferior in height to many others in this enormous chain. The following is the account given of the mountain called *Pichincha*, by the mathematicians sent by the kings of France and Spain to make observations in relation to the figure of the earth.

Soon after our artists arrived at Quito, they determined to continue the series of the triangles for measuring an arch of the meridian to the south of that city: the company accordingly divided themselves into two bodies, consisting of French and Spaniards, and each retired to the part assigned them. Don George Juan and M. Godin, who were at the head of one party, went to the mountain of Pambamarca; while M. Bouguer, de la Condamine, and Don Ulloa, together with their assistants, climbed up to the highest summit of Pichincha. Both parties suffered extremely, as well from the severity of the cold as from the impetuosity of the winds, which on these heights blow with incessant violence; difficulties the more painful, as they had been little used to such sensations. Thus in the torrid zone, nearly under the equinoctial, where it is natural to suppose they had most to fear from the heat, their greatest pain was caused by the excessiveness of the cold. Andes.

Their first scheme for shelter and lodging in these uncomfortable regions, was to pitch a field-tent for each company; but on Pichincha this could not be done from the narrowness of the summit; they were therefore obliged to be contented with a hut so small that they could hardly all creep into it. Nor will this appear strange, if the reader considers the bad disposition and smallness of the place, it being one of the loftiest crags of a rocky mountain, 100 fathoms above the highest part of the desert of Pichincha. Such was the situation of their mansion, which, like all the other adjacent parts, soon became covered with ice and snow. The ascent up this stupendous rock, from the base or the place where the mules could come, to their habitation was so craggy as only to be climbed on foot; and to perform it cost them four hours continual labour and pain, from the violent efforts of the body, and the subtlety of the air; the latter being such as to render respiration difficult.

The strange manner of living to which our artists were reduced during the time they were employed in a geometrical mensuration of some degrees of the meridian, may not perhaps prove unentertaining to the reader; and therefore the following account is given as a specimen of it. The desert of Pichincha, both with regard to the operations performed there and its inconveniences, differing very little from others, an idea may be very easily formed of the fatigues, hardships, and dangers, to which they were continually exposed during the time they were prosecuting the enterprise, with the conduct of which they had been honoured. The principal difference between the several deserts consisted in their greater or lesser distance from places where they could procure provisions; and in the inclemency of the weather, which was proportionate to the height of the mountains, and the season of the year.

They generally kept within their hut. Indeed they were obliged to do this, both on account of the intenseness of the cold, the violence of the wind, and their being continually involved in so thick a fog, that an object at six or eight paces was hardly discernible. When the fog cleared up, the clouds by their gravity moved nearer to the surface of the earth, and on all sides surrounded the mountains to a vast distance, representing the sea, with their rock like an island in the centre of it. When this happened, they heard the horrid noises of the tempests, which then discharged themselves on Quito and the neighbouring country. They saw the lightnings issue from the clouds, and heard the thunders roll far beneath them: and whilst the lower parts were involved in tempests of thunder and rain, they enjoyed a delightful serenity; the wind was abated, the sky clear, and the enlivening rays of the sun moderated the severity of the cold. But their circumstances were very different when the clouds rose: their thickness rendered respiration difficult; the snow and hail fell continually; and the wind returned with all

Andes. all its violence; so that it was impossible entirely to overcome the fears of being, together with their hut, blown down the precipice, on whose edge it was built, or of being buried under it by the daily accumulations of ice and snow.

The wind was often so violent in these regions, that its velocity dazzled the sight, whilst their fears were increased from the dreadful concussions of the precipice, caused by the fall of enormous fragments of rocks. These crashes were the more alarming, as no other noises are heard in these deserts; and during the night, their rest, which they so greatly wanted, was frequently disturbed by such sudden sounds. When the weather was any thing fair with them, and the clouds gathered about some of the other mountains which had a connection with their observations, so that they could not make all the use they desired of this interval of good weather, they left their hut to exercise themselves. Sometimes they descended to some small distance; and at others, amused themselves with rolling large fragments of rocks down the precipice; and these frequently required the joint strength of them all, though they often saw the same effected by the mere force of the wind. But they always took care in their excursions not to go so far out, but that on the least appearance of the clouds gathering about their cottage, which often happened very suddenly, they could regain their shelter. The door of their hut was fastened with thongs of leather, and on the inside not the smallest crevice was left unstopped; besides which, it was very compactly covered with straw: but notwithstanding all their care, the wind penetrated through. The days were often little better than the nights; and all the light they enjoyed was that of a lamp or two, which they kept continually burning.

Though their hut was small, and crowded with inhabitants, besides the heat of the lamps; yet the intenseness of the cold was such, that every one of them was obliged to have a chafing-dish of coals. These precautions would have rendered the rigour of the climate supportable, had not the imminent danger of perishing by being blown down the precipice roused them, every time it snowed, to encounter the severity of the outward air, and sally out with shovels to free the roof of their hut from the masses of snow which were gathering on it. Nor would it, without this precaution, have been able to support the weight. They were not indeed without servants and Indians; but these were so benumbed with the cold, that it was with great difficulty they could get them out of a small tent, where they kept a continual fire. So that all our artists could obtain from them was to take their turns in this labour; and even then they went very unwillingly about it, and consequently performed it slowly.

It may easily be conceived what this company suffered from the asperities of such a climate. Their feet were swelled, and so tender, that they could not even bear the heat; and walking was attended with extreme pain. Their hands were covered with chilblains; their lips swelled and chopped; so that every motion in speaking, or the like, drew blood; consequently they were obliged to strict taciturnity, and little disposed to laugh, as, by causing an extension of the lips, it produced such fissures as were very painful for two or three days after.

Their common food in this inhospitable region was a little rice boiled with some flesh or fowl procured from Quito; and, intead of fluid water, their pot was filled with ice. They had the same resource with regard to what they drank: and while they were eating, every one was obliged to keep his plate over a chafing-dish of coals, to prevent his provisions from freezing. The same was done with regard to the water. At first they imagined the drinking strong liquors would diffuse a heat through the body, and consequently render it less sensible of the painful sharpness of the cold; but, to their surprise, they felt no manner of strength in such liquors, nor were they any greater preservative against the cold than common water. Andes.

At the same time, they found it impossible to keep the Indians together. On their first feeling of the climate, their thoughts were immediately turned on deserting their masters. The first instance they had of this kind was so unexpected, that had not one, of a better disposition than the rest, staid and acquainted them of their design, it might have proved of very bad consequence. The affair was this: There being on the top of the rock no room for pitching a tent for the Indians, they used every evening to retire to a cave at the foot of the mountain; where, besides a natural diminution of the cold, they could keep a continual fire; and consequently enjoyed more comfortable quarters than their masters. Before they withdrew at night, they fastened on the outside the door of the hut, which was so low that it was impossible to go in or out without stooping; and as every night the hail and snow which had fallen formed a wall against the door, it was the business of one or two of the Indians to come early and remove this obstruction. For though the negro servants were lodged in a little tent, their hands and feet were so covered with chilblains, that they would rather have suffered themselves to have been killed than move. The Indians therefore came constantly up to despatch this work betwixt nine and ten in the morning: but they had not been there above four or five days, when they were not a little alarmed to see ten, eleven, and twelve o'clock come, without any news of their labourers; when they were relieved by the honest servant mentioned above, who had withstood the seduction of his countrymen, and informed his masters of the desertion of the four others. As soon as the snow was cleared away from the door, they despatched the Indian to the corregidor of Quito, who with equal despatch sent other Indians, threatening to chastise them severely if they were wanting in their duty.

But the fear of punishment was not sufficient to induce them to support the rigour of this situation; for within two days they deserted. The corregidor therefore, to prevent any other inconvenience, sent four Indians under the care of an alcade, and gave orders for their being relieved every fourth day.

Twenty-three tedious days our artists spent on this rock, viz. to the sixth of September, and even without any possibility of finishing their observations of the angles: for when it was fair and clear weather with them, the others, on whose summits the signals which formed the triangles for measuring the degrees of the meridian, were hid in the clouds; and when those were clear, Pichincha was involved in clouds. It was therefore necessary to erect their signals in a lower situation, and

Andes. and in a more favourable region. This, however, did not produce any change in their habitation till the beginning of December; when, having finished the observations which particularly concerned Pichincha, they proceeded to others; but with no abatement either of inconveniences, cold, or fatigue; for the places where they made their observations being necessarily on the highest parts of the deserts, the only respite in which they enjoyed some little ease was during the short interval of passing from one to the other.

In all their stations subsequent to that on Pichincha, during their fatiguing mensuration of the degrees of the meridian, each company lodged in a field-tent, which, though small, they found less inconvenient than the hut on Pichincha; though at the same time they had more trouble, being oftener obliged to clear it from the snow, as the weight of it would otherwise have demolished the tent. At first, indeed, they pitched it in the most sheltered places; but on taking a resolution that the tents themselves should serve for signals, to prevent the inconvenience of having others of wood, they removed them to a more exposed situation, where the impetuosity of the winds sometimes tore up the piquets, and blew them down.

Though this mountain is famous for its great height, it is considerably lower than the mountain of Cotopaxi: but it is impossible to conceive the coldness of the summit of the last-mentioned mountain from that felt on this; since it must exceed every idea that can be formed by the human mind, though they are both seated in the midst of the torrid zone. In all this range of mountains, there is said to be a constant inferior boundary, beyond which the snow never melts: this boundary, in the midst of the torrid zone, is said by some to be 2434 fathoms above the level of the sea; by others, only 2400 fathoms. The snow indeed falls much lower, but then it is subject to be melted the very same day. According to Humboldt, there are in the Andes 40 volcanoes or burning mountains, which throw out fire and smoke with a terrible noise. The height of Chimborazo, said to be the highest peak of the Andes, has been determined by geometrical calculations to be 20,282 feet. Humboldt, who visited this region in 1802, found the height of the volcanic cone of Tunguragua to be 16,500 feet; the summit of Pichincha 15,840 feet; that of Antisana 19,150 feet. The dreadful volcano of Cotopaxi is only 260 feet lower than this last. Such is the climate on these mountains, that the region adapted to the growth of all kinds of European grain is between 6000 and 9000 feet above the level of the sea. The limit of perpetual congelation under the equator, has been fixed by Humboldt at 15,700 feet. On the declivity of the Andes, at the height of from 3000 to 5000 feet, there reigns a perpetual spring temperature, which never varies more than seven or nine degrees of Fahrenheit.

The Andes give birth to a vast number of rivers, some of which are very large. Some hurry along with a prodigious rapidity; while others form beautiful cascades, or run through holes in rocks, which look like bridges of a stupendous height. There is a public road through the mountains, 1000 miles in length, part of which runs from Quito to Cusco. See ANDES, SUPPLEMENT.

ANDES, a hamlet of Mantua in Italy, the birthplace of Virgil. Hence the epithet *Andinus* (Silius Italicus). Now called *Pietola*, two miles to the west of Mantua.

Andes || Andrapodocapeli.

ANDETRIUM; ANDRETIUM (Strabo): ANDECRIUM, or ANDRECIUM (Ptolemy): An inland town of Dalmatia. The genuine name is *Andetrium* (Inscription). It is described as situated near Salonæ, on a naturally strong and inaccessible rock, surrounded with deep valleys, with rapid torrents; from which it appears to be the citadel now called *Clissa*. E. Long. 17. 46. N. Lat. 43. 20.

ANDEUSE, a city of Languedoc in France, situated in E. Long. 3. 40. and N. Lat. 43. 45.

ANDOMADUNUM; ANDOMATUNUM (Ptolemy); and ANTEMATUNUM (Antonine); CIVITAS LINGONUM (Tacitus): A city of Gallia Belgica; now *Langres* in Champagne, situated on an eminence (which seems to justify the termination *dunum*), on the borders of Burgundy, at the springs of the Marne. Tacitus calls an inhabitant *Lingon*. E. Long. 5. 22. N. Lat. 48. 0.

ANDOVER, a large market town in Hampshire, which is situated on a branch of the river Test. It has several inns, which afford good accommodation for travellers; and has a market on Saturday, well stocked with provisions. It is governed by a bailiff, a steward, a recorder, ten approved men, and twenty-two capital burgesses, who yearly choose the bailiff. Population 3295 in 1811. The living is a vicarage valued at 171l. 4s. 4d. in the king's books. W. Long. 0. 56. N. Lat. 51. 20.

ANDRACHNE, BASTARD ORPINE. See BOTANY *Index*.

ANDRADA, DIEGO DE PAYVA D', or ANDRADIUS, a learned Portuguese, born at Coimbra, who distinguished himself at the council of Trent, where King Sebastian sent him as one of his divines. There is scarce any Catholic author who has been more quoted by the Protestants than he, because he maintained some opinions a little extravagant concerning the salvation of the Heathens. Andrada was esteemed an excellent preacher. His sermons were published in three parts, the second of which was translated into Spanish by Benedict de Alcoran. Many encomiums have been bestowed upon Andrada. Osorius, in his preface to the "Orthodox Explanations of Andradius," gives him the character of a man of wit, vast application, great knowledge in the languages, with all the zeal and eloquence necessary to a good preacher; and Rosweidus says, that he brought to the council of Trent the understanding of a most profound divine, and the eloquence of a consummate orator.

ANDRAPODISMUS, in ancient writers, the selling of persons for slaves. Hence also *andrapodistes*, a dealer in slaves, more particularly a kidnapper, who steals men or children to sell them; a crime for which the Thessalians were noted.

ANDRAPODOCAPELI, in antiquity, a kind of dealers in slaves. The *Andrapodocapeli* had a particular process for taking off moles and the like disfigurements on the faces of the slaves they kept for sale, by rubbing them with bran. At Athens, several places in the forum were appointed for the sale of slaves. Upon the first day of every month, the merchants called Ανδραποδοκαπηλοι brought them into the market, and exposed

Andrapodocapeli ‖ Andreas.

exposed them to sale; the crier standing upon a stone erected for that purpose, called the people together.

ANDREA, St, a small village on the Malabar coast in the East Indies, founded originally by the Portuguese. It takes its name from a church dedicated to St Andrew, and served by the priests of St Thomas.—On the shore of St Andrea, about half a league out in the sea, lies Mud-bay, a place which few in the world can parallel. It is open to the wide ocean, and has neither island nor bank to break the force of the billows, which come rolling with great violence from all parts, in the south-west monsoons: but on this bank of mud they lose themselves in a moment; and ships lie on it as secure as in the best harbour, without motion or disturbance. It reaches about a mile along shore, and has been observed to shift its place from the northward about three miles in 30 years. From St Andrea to Kranganor, about twelve leagues to the south, the water has the bad property of causing swellings in the legs of those who drink it constantly. Some it affects in one leg, and some in both. It causes no pain, but itching; nor does the swelled leg seem heavier to the owner than the small one, though some have been seen a yard in circumference at the ancle. The Romish legends impute the cause of this distemper (for which no preventive or cure hath been hitherto found) to a curse laid by St Thomas upon his murderers and their posterity; though, according to the Romans themselves, St Thomas was killed by the Tillinga priests at Meliaphur, on the coast of Coromandel, about 400 miles distant, and where the natives have not this distemper.

ANDREAS, John, a celebrated canonist in the 14th century, was born at Mugello, near Florence; and was professor of canon law at Padua, Pisa, and afterwards at Bologna. It is said that he macerated his body with fasting: and lay upon the bare ground every night for 20 years together, covered only with the skin of a bear. This is attested by very good authors; but if the story which Poggius tells of him in his jests be true, he must afterwards have relaxed much of this continency: "Joannem Andream (says he), doctorem Bononiensem, cujus fama admodum vulgata est, subagitantem ancillam domesticam uxor deprehendit: re insueta stupefacta mulier in virum versa, Ubi nunc, ait, Joannes, est sapientia vestra? Ille nil amplius locutus, In vulva istius, respondit, loco admodum sapientiæ accommodato." The French translation of this perhaps will not be displeasing.

Jean, dit André, fameux Docteur des Loix,
Fut pris un jour au péché d'amourette:
Il acolloit une jeune soubrette.
Sa femme vint, fit un signe de croix.
Ho ho, dit elle, est ce vous? non je pense:
Vous, dont par-tout en vante la prudence.
Qu'est devenu cet esprit si subtil?
Le bon André, poursuivant son négoce,
Honteux pourtant, ma foi, repondit-il,
Prudence, esprit, tout gît dans cette fosse.

Since it is agreed that John Andreas had a bastard, this story is at the bottom very probable; and it was perhaps with the mother of Banicontius that his wife found him. Andreas had a beautiful daughter, named *Novella*, whom he loved extremely: and he is said to have instructed her so well in all parts of learning, that when he was engaged in any affair which hindered him from reading lectures to his scholars, he sent his daughter in his room; and lest her beauty should prevent the attention of the hearers, she had a little curtain drawn before her. To perpetuate the memory of this daughter, he entitled his commentary upon the Decretals of Gregory IX. the *Novellæ*. He married her to John Calderinus, a learned canonist. The first work of Andreas was his Gloss upon the Sixth Book of the Decretals, which he wrote when he was very young. He wrote also Glosses upon the Clementines; and a Commentary *in regula Sexti*, which he entitled *Mercuriales*, because he either engaged in it on Wednesdays (*dicbus Mercurii*), or because he inserted his Wednesdays disputes in it. He enlarged the Speculum of Durant, in the year 1347. This is all which Mr Bayle mentions of his writings, though he wrote many more. Andreas died of the plague at Bologna in 1348, after he had been a professor 45 years; and was buried in the church of the Dominicans. Many eulogiums have been bestowed upon him. He has been called *Archidoctor decretorum*: In his epitaph, *Rabbi doctorum: lux, censor, normaque morum;* "Rabbi of the doctors, the light, censor, and rule of manners:" And it is said, that Pope Boniface called him *lumen mundi*, "the light of the world."

Andreas.

ANDREAS, *John*, was born a Mahometan, at Xativa in the kingdom of Valencia, and succeeded his father in the dignity of alfaqui of that city. He was enlightened with the knowledge of the Christian religion by being present at a sermon in the great church of Valencia on the day of Assumption of the Blessed Virgin, in the year 1487. Upon this he desired to be baptized; and, in memory of the calling of St John and St Andrew, he received the name John Andreas. "Having received holy orders (says he), and from an alfaqui and a slave of Lucifer, become a priest and minister of Christ; I began, like St Paul, to preach and publish the contrary of what I had erroneously believed and asserted; and, with the assistance of Almighty God, I converted at first a great many souls of the Moors, who were in danger of hell, and under the dominion of Lucifer, and conducted them into the way of salvation. After this, I was sent for by the most catholic princes King Ferdinand and Queen Isabella, in order to preach in Grenada to the Moors of that kingdom, which their majesties had conquered: by God's blessing on my preaching, an infinite number of Moors were brought to abjure Mahomet, and to turn to Christ. A little after this, I was made a canon by their grace; and sent for again by the most Christian Queen Isabella to Arragon, that I might be employed in the conversion of the Moors of those kingdoms, who still persisted in their errors, to the great contempt and dishonour of our crucified Saviour, and the prodigious loss and danger of all Christian princes. But this excellent and pious design of her majesty was rendered ineffectual by her death." At the desire of Martin Garcia, bishop of Barcelona, he undertook to translate from the Arabic, into the language of Arragon, the whole law of the Moors; and after having finished this undertaking, he composed his famous work of *The Confusion of the Sect of Mahumed;* it contains twelve chapters,

Andreini || Andrew.

chapters, wherein he has collected the fabulous stories, impostures, forgeries, brutalities, follies, obscenities, absurdities, impossibilities, lies, and contradictions, which Mahomet, in order to deceive the simple people, has dispersed in the writings of that sect, and especially in the Alcoran, which, as he says, was revealed to him in one night by an angel, in the city of Meke; though in another place he contradicts himself, and affirms that he was 20 years in composing it. Andreas tells us, he wrote this work, that not only the learned amongst Christians, but even the common people, might know the different belief and doctrine of the Moors; and on the one hand might laugh and ridicule such insolent and brutal notions, and on the other might lament their blindness and dangerous condition. This book, which was published at first in Spanish, has been translated into several languages; all those who write against the Mahometans quote it very much.

ANDREINI, Isabella, a native of Padua, was an excellent poetess, and one of the best comedians in Italy, towards the beginning of the 17th century. The Intenti of Pavia thought they did their society an honour by admitting her a member of it; and she, in acknowledgement of this honour, never forgot to mention amongst her titles that of *Academica Infanta;* her titles were these, "Isabella Andreini, comica, gelosa, academica infanta, detta l'accessa." She was also a woman of extraordinary beauty: which, added to a fine voice, made her charm both the eyes and ears of the audience. She died of a miscarriage, at Lyons, the 10th of June 1604, in the 42d year of her age. Her death being a matter of general concern and lamentation, there were many Latin and Italian elegies printed to her memory: several of these pieces were placed before her poems in the edition of Milan, in 1605. Besides her sonnets, madrigals, songs, and eclogues, there is a pastoral of hers entitled Myrtilla, and letters, printed at Venice in 1610. She sung extremely well, played admirably on several instruments, understood the French and Spanish languages, and was not unacquainted with philosophy.

ANDRELINUS, Publius Faustus, born at Forli in Italy. He was long time professor of poetry and philosophy in the university of Paris. Louis XII. of France made him his poet laureat; and Erasmus tells us he was likewise poet to the queen. His pen was not wholly employed in making verses; for he wrote also moral and proverbial letters in prose, which were printed several times. His poems which are chiefly in Latin, are inserted in vol. i. of the *Deliciæ Poetarum Italorum*. M. de la Monnoie tells us, "that Andrelinus, when he was about 22 years old, received the crown of laurel: That his love verses, divided into four Books, entitled *Livia*, from the name of his mistress, were esteemed so fine by the Roman Academy, that they adjudged the prize of the Latin elegy to the author." He died in 1518. This author's manner of life was not very exemplary; yet he was so fortunate, says Erasmus, that though he took the liberty of rallying the divines, he was never brought into trouble about it.

ANDREW, St, the apostle, born at Bethsaida in Galilee, brother to Simon Peter. He had been a disciple of John the Baptist, and followed Jesus upon the testimony given of him by the Baptist (John i. 30, 37, &c.). He followed our Saviour with another of John's disciples, and went into the house where Jesus lodged; here he continued from about four o'clock in the afternoon till it was night. This was the first disciple whom our Saviour received into his train. Andrew introduced his brother Simon, and they passed a day with Christ, after which they went to the marriage in Cana (*id.* ii.), and at last returned to their ordinary occupation. Some months after, Jesus meeting them while they were both fishing together, called them to him, and promised to make them fishers of men. Immediately they left their nets, followed him (Mat. iv. 19.), and never afterwards separated from him.

Andrew || Andrew's.

After our Saviour's ascension, his apostles having determined by lot what parts of the world they should severally take, Scythia and the neighbouring countries fell to St Andrew, who according to Eusebius, after he had planted the gospel in several places, came to Patræ in Achaia, where, endeavouring to convert the proconsul Ægeas, he was by that governor's orders scourged, and then crucified. The particular time of his suffering martyrdom is not known; but all the ancient and modern martyrologies, both of the Greeks and Latins, agree in celebrating his festival upon the 30th of November. His body was embalmed, and decently interred at Patræ by Maximilla, a lady of great quality and estate. Afterwards it was removed to Constantinople by Constantine the Great, and buried in the great church, which he had built to the honour of the apostles. There is a cross to be seen at this day in the church of St Victor at Marseilles, which is believed by the Romanists to be the same that St Andrew was fastened to. It is in the shape of the letter X, and is enclosed in a silver shrine. Peter Chrysologus says, that he was crucified upon a tree; and the spurious Hippolytus assures us it was an olive tree.

Andrew, or *Knights of St Andrew*, an order of knights, more usually called the order of the Thistle. See Thistle.

Knights of St Andrew, is also an order instituted by Peter the Great of Muscovy in 1698; the badge of which is a golden medal; on one side whereof is represented St Andrew's cross, with these words, *Cazar Pierre monarque de tout le Russie*. This medal, being fastened to a blue ribbon, is suspended from the right shoulder.

St Andrew's Cross, one in form of the letter X. See Cross.

St Andrew's Day, a festival of the Christian church, celebrated on the 30th of November, in honour of the apostle St Andrew.

ANDREW'S, St, a town of Fifeshire in Scotland, once the metropolis of the Pictish kingdom, lying in W. Long. 2. 25. N. Lat. 56. 18. If we may credit legend, St Andrew's owes its origin to a singular accident. St Regulus (or *Rule*, as he is likewise called), a Greek of Achaia, was warned by a vision to leave his native country, and visit Albion, an isle placed in the remotest part of the world; and to take with him the arm-bone, three fingers, and three toes, of St Andrew. He obeyed, and set sail with his companions, but had a very tempestuous passage. After being tossed for some time on a stormy sea, he was at last shipwrecked on the coast of Otholania, in the territories of Hergustus king of the Picts, in the year 370. On hear-

Andrew's. ing of the arrival of the strangers, with their precious relics, the king immediately gave orders for their reception, afterwards presenting the saint with his own palace, and building near it the church, which still bears the name of *St Regulus*.

At this time the place was styled *Mucross*, or the *land of boars:* all round was forest, and the lands bestowed on the saint were called *Byrehid*. The boars equalled in size the ancient Erymanthian; as a proof of which, two tusks, each sixteen inches long and four thick, were chained to the altar of St Andrew's. St Regulus changed the name to *Kilrymont;* and established here the first Christian priests of the country, called *Culdees*. The church was supreme in the kingdom of the Picts; Ungus having granted to God and St Andrew, that it should be the head and mother of all the churches in his dominion. He also directed that the cross of St Andrew should become the badge of the country. In 518, after the conquest of the Picts, he removed the episcopal see to St Andrew's, and the bishop was styled *maximus Scotorum episcopus*. In 1441, it was erected into an archbishopric by Sextus IV. at the intercession of James III. In 1616, the priory was suppressed; and, in 1617, the power of election was transferred to eight bishops, the principal of St Leonard's college, the archdeacon, the vicars of St Andrew's, Leuchars, and Cupar. This see contained the greatest part of the shire of Fife, with a part of Perth, Forfar, and Kincardine shires, and a great number of parishes, churches, and chapels in other dioceses.

The town of St Andrew's was erected into a royal borough by David I. in the year 1140, and its privileges afterwards confirmed. The charter of Malcolm II. is preserved in the tolbooth; and appears written on a bit of parchment, but the contents equally valid with what would at this time require whole skins. Here also are kept the silver keys of the city; which, for form's sake, are delivered to the king, if he should visit the place, or to a victorious enemy, in token of submission. In this place, likewise, is to be seen the monstrous axe which, in 1646, took off the heads of Sir Robert Spotswood and other distinguished loyalists. The town underwent a siege in 1337; at which time it was possessed by the English and other partizans of Baliol; but the loyalists, under the earls of March and Fife, made themselves masters of it in three weeks, by the help of their battering machines.

St Andrew's is now greatly reduced in the number of its inhabitants. In 1811 they were about 3300. It is impossible to ascertain the sum when it was the seat of the primate; all that can be known is, that during the period of its splendour, there were between sixty and seventy bakers; but now nine or ten are sufficient for the place. It is a mile in circuit, and contains three principal streets. On entering the west port, a well built street, straight, and of a vast length and breadth, appears; but so grass-grown, and presenting such a dreary solitude, that it forms the perfect idea of having been laid waste by the pestilence.

The cathedral of St Andrew's was founded by Bishop Arnold in 1161, but did not attain its full magnificence till 1318. Its length from east to west was 370 feet; that of the transept, 322. But though this vast pile was 157 years in building, John Knox, in June 1559, effected its demolition in a single day; and so effectually has it been destroyed, that nothing now remains but part of the east and west ends, and of the south side. Andrew's.

Near the east end is the chapel of St Regulus; the tower of which is a lofty equilateral triangle, of 20 feet each side, and 103 feet high; the body of the chapel remains, but the two side chapels are ruined. The arches of the windows and doors are round, and some even more than semicircles; an undoubted proof of their antiquity.

The priory was founded by Alexander I. in 1122; and the monks (canons regular of St Augustine) were brought from Scone in 1140, by Robert bishop of this see. By an act of Parliament, in the time of James I. the prior had precedence of all abbots and priors, and on the days of festival wore a mitre and all episcopal ornaments. Dependent on this priory were those of Lochleven, Portmoak, Monimusk, the isle of May, and Pittenweem, each originally a seat of the Culdees. The revenues of the house were vast, viz. in money 2237l. 2s. 10½d.; 38 chalders 1 boll 3 firlots of wheat; 132 ch. 7 bolls of bear; 114 ch. 3 bolls 1 peck of meal; 151 ch. 10 bolls 1 firlot 1 peck and a half of oats; 3 ch. 7 bolls of pease and beans: 480 acres of land also belonged to it. Nothing remains of the priory except the walls of the precinct, which show its vast extent. In one part is a most artless gateway, formed only of seven stones. This enclosure begins near the cathedral, and extends to the shore.

The other religious houses were, one of Dominicans founded in 1274, by Bishop Wishart; another of Observantines, founded by Bishop Kennedy, and finished by his successor Patrick Graham in 1478; and, according to some, the Carmelites had a fourth.

Immediately above the harbour stood the collegiate church of Kirk-heugh, originally founded by Constantine III. who, retiring from the world, became here a Culdee. From its having been first built on a rock, it was styled, *Præpositura Sanctæ Mariæ de rupe*.

On the east side of the city are the poor remains of the castle, on a rock overlooking the sea. This fortress was founded in 1481, by Bishop Trail, who was buried near the high altar of the cathedral, with this singular epitaph:

Hic fuit ecclesiæ directa columna, fenestra
Lucida, thuribulum redolens, campana sonora.

The castle was the residence of Cardinal Beaton; who, after the death of George Wishart, apprehending some danger, caused it to be fortified so strongly as to be at that time deemed impregnable. In this fortress, however, he was surprised and assassinated by Norman Lesly with 15 others. They seized on the gate of the castle early in the morning of May 29. 1546; it having been left open for the workmen who were finishing the fortifications: and having placed sentinels at the door of the cardinal's apartment, they awakened his numerous domestics one by one; and, turning them out of the castle, they, without violence, tumult, or offering an injury to any other person, inflicted on Beaton the death he justly merited. The conspirators were immediately besieged in this castle by the regent, earl of Arran; and notwithstanding they had acquired no greater strength than 150 men, they resisted all his efforts for five months. This, however, was owing to the

Andrew's. the unskilfulness of the besiegers more than to the strength of the place or the valour of the besieged; for in 1547 the castle was reduced and demolished. The entrance of it is still to be seen; and the window is shown, out of which it is said the cardinal leaned to glut his eyes with the cruel martyrdom of George Wishart, who was burnt on a spot beneath.

In the church of St Salvator is a most beautiful tomb of Bishop Kennedy, who died, an honour to his family, in 1466. The Gothic work is uncommonly elegant. Within the tomb were discovered six magnificent maces, which had been concealed here in troublesome times. One was given to each of the other three Scotch universities, and three are preserved here. In the top is represented our Saviour; around are angels, with the instruments of the passion.

With these are shown some silver arrows, with large silver plates affixed to them, on which are inscribed the arms and names of the noble youth, victors in the annual competitions in the generous art of archery, which were dropt but a few years ago; and golf is now the reigning game. That sport, and foot-ball, were formerly prohibited, as useless and unprofitable to the public; and at all *weapon schawings*, or reviews of the people, it was ordered, that *fute-ball and golfe be utterly cryed down, and that bowe-markes be made at ilk parish kirk, a pair of butts and schutting be used; and that ilk man schutte sex shottes at least, under the paine to be raiped upon them that cummes not, at least twa pennyes to be given to them that cummis to the bow-markes to drink.*

The celebrated university of this city was founded in 1411, by Bishop Wardlaw. It consisted once of three colleges. 1. St Salvator's, founded in 1458, by Bishop Kennedy. This is a handsome building, with a court or quadrangle within: on one side is the church, on another the library; the third contains apartments for students: the fourth is unfinished. 2. St Leonard's college was founded by Prior Hepburn, in 1522. This is now united with the last, and the buildings sold, and converted into private houses. 3. The new, or St Mary's college, was established by Archbishop Hamilton in 1552; but the house was built by James and David Bethune, or Beaton, who did not live to complete it. This is said to have been the site of a *schola illustris* long before the establishment even of the university, where several eminent clergymen taught, gratis, the sciences and languages. But it was called the *new college*, because of its late erection into a divinity college by the archbishop.

The university is governed by a chancellor, an office originally designed to be perpetually vested in the archbishop of St Andrews; but since the Reformation, he is elected by the two principals, and the professors of both the colleges.

The rector is the next great officer; to whose care are committed the privileges, discipline, and statutes of the university. The colleges have their rectors, and professors of different sciences, who are indefatigable in their attention to the instruction of the students, and to that essential article their morals. The place possesses several very great advantages respecting the education of youth. The air is pure and salubrious; the place for exercise, dry and extensive; the exercises themselves are healthy and innocent. The university is fixed in a peninsulated country; remote from all commerce with the world, the haunt of dissipation. From the smallness of the society, every student's character is perfectly known. No little irregularity can be committed, but it is instantly discovered and checked: vice cannot attain a head in this place, for the incorrigible are never permitted to remain the corrupters of the rest. Andrew's, Andrews.

The trade of St Andrew's was once very considerable. So late as the reign of Charles I. this place had thirty or forty trading vessels, and carried on a considerable herring and white fishery, by means of busses, in deep water; which fisheries had for ages been the grand source of their commerce, wealth, and splendour. After the death of the king, this whole coast, and St Andrew's in particular, became a scene of murder, plunder, and rapine: every town suffered in proportion to its magnitude and opulence. Nor were those hypocritical ruffians satisfied with the shipping, merchandise, plate, cattle, and whatever came within their sight; they also laid the whole coast under contribution. St Andrew's was required to pay 1000l.; but the inhabitants not being able to raise that sum after being thus plundered, the general compounded for 500l. which was raised by a loan at interest, and hath remained a burden upon the corporation, it is believed, ever since.

The harbour is artificial, guarded by piers, with a narrow entrance, to give shelter to vessels from the violence of a very heavy sea, by the encroachments of which it has suffered much. The manufactures this city might in former times possess, are now reduced to one, that of golf balls; which, trifling as it may seem, maintains a great number of people. It is, however, commonly fatal to the artists; for the balls are made by stuffing a great quantity of feathers into a leathern case, by help of an iron rod, with a wooden handle, pressed against the breast, which seldom fails to bring on a consumption.

ANDREWS, *Lancelot*, bishop of Winchester, was born at London in 1555, and educated at Cambridge. After several preferments, he was made bishop, first of Chichester, then of Ely, and, in 1610, was raised to the see of Winchester. This very learned prelate, who was distinguished by his piety, charity, and integrity, may be justly ranked with the best preachers and completest scholars of his age; he appeared to much greater advantage in the pulpit than he does now in his works, which abound with Latin quotations and trivial witticisms. His sermons, though full of puns, were suited to the taste of the times in which he lived, and were consequently greatly admired. He was a man of polite manners and lively conversation; and could quote Greek and Latin authors, or even pun, with King James. There is a pleasant story related of him in the life of Waller the poet. When that gentleman was young, he had the curiosity to go to court, and stood in the circle to see King James dine; where, among other company, there sat at table two bishops, Neale and Andrews. The king proposed aloud this question, Whether he might not take his subjects money when he needed it, without all this formality of parliament? Neale replied, "God forbid you should not; for you are the breath of our nostrils." Whereupon the king turned, and said to the bishop of Winchester, "Well, my lord, what

Andrews || Androgeus.

say you?" "Sir (replied the bishop), I have no skill to judge of parliamentary cases." The king answered, "No put-offs, my lord; answer me presently." "Then, Sir (said he), I think it lawful for you to take my brother Neale's money, for he offers it." Mr Waller says, the company was pleased with this answer, but the wit of it seemed to affect the king; for a certain lord coming soon after, his majesty cried out, "O, my lord, they say you lig with my lady." "No, Sir (says his lordship, in confusion), but I like her company because she has so much wit." "Why then (says the king) do not you lig with my lord of Winchester there?" This great prelate was in no less reputation and esteem with King Charles I. than he had been with his predecessors. He died at Winchester house in Southwark, September 27. 1626, in the 71st year of his age; and was buried in the parish church of St Saviour's, where his executors erected to him a very fair monument of marble and alabaster, on which is an elegant inscription, in Latin, written by one of his chaplains. Milton also, at 17 years of age, wrote a beautiful elegy on his death, in the same language. Bishop Andrews had, 1. A share in the translation of the Pentateuch, and the historical books from Joshua to the first book of Chronicles exclusively. He also wrote, 2. *Tortura Torti*, in answer to a work of Cardinal Bellarmine, in which that cardinal assumes the name of *Matthew Tortus*. 3. A Manual of Private Devotions; and, 4. A Manual of Directions for the Visitation of the Sick; besides the Sermons and Tracts, in English and Latin, published after his death.

ANDREWS, *James Pettit*, a late English writer. See SUPPLEMENT.

ANDRIA, in Grecian antiquity, public entertainments first instituted by Minos of Crete, and, after his example, appointed by Lycurgus at Sparta, at which a whole city or a tribe assisted. They were managed with the utmost frugality; and persons of all ages were admitted.

ANDRIA, a city and a bishop's see in the territory of Bari, in the kingdom of Naples. It is pretty large, well peopled, and seated in a spacious plain, four miles from the Adriatic coast. E. Long. 17. 4. N. Lat. 41. 15.

ANDRISCUS, a man of mean extraction, who, pretended to be the son of Perseus last king of Macedonia, took upon him the name of *Philip*, for which reason he was called *Pseudo-Philippus*, the *False Philip*. After a complete victory over Juventus, the Roman prætor sent against him, he assumed kingly power, but exercised it with vast cruelty. At last, the Romans obliged him to fly into Thrace, where he was betrayed and delivered into the hands of Metellus. This victory gained Macedonia once more into the power of the Romans, and to Metellus the name of *Macedonicus*, but cost the Romans 25,000 men. Andriscus adorned the triumph of Metellus, walking in chains before the general's chariot.

ANDROAS, or ANDRODAMAS, among ancient naturalists, a kind of pyritæ, to which they attributed certain magical virtues.

ANDROGEUS, in fabulous history, the son of Minos king of Crete, was murdered by the Athenian youth and those of Megara, who envied his being always victor at the Attic games. But Minos having taken Athens and Megara, obliged the inhabitants to send him an annual tribute of seven young men and as many virgins, to be devoured by the Minotaur; but Theseus delivered them from that tribute.

Androgynes.

ANDROGYNES, in *Natural History*, a name given to those living creatures which, by a monstrous formation of their generative parts, seem (for it is only seeming) to unite in themselves the two sexes, that of the male and of the female. This *lusus naturæ*, this defect, or perhaps redundancy, in the animal structure, is described by medical authors in the following manner: "There is a depravation in the structure of the parts intended by nature for propagation, when, besides those concealed parts that are found necessary for the discharge of prolific functions, the *pudenda* of the other sex likewise appear. This monstrous production of nature is diversified in four different ways; of which three appear in males and one in females. In men, the female pudendum, clothed with hair, sometimes appears contiguous to the perinæum; at other times, in the middle of the scrotum; at other times, which constitutes the third diversity, through that part itself which in the midst of the scrotum exhibits the form of a pudendum, urine is emitted. Near that part which is the test of puberty, and above the pudendum, even in females, the masculine genitals appear in some, conspicuous in all their three forms, one resembling the *veretrum* or yard, the other like the two testicles: but for the most part it happens, that, of the two instruments of generation, one is feeble and inert; and it is extremely rare that both are found sufficiently valid and proper for feats of love: nay, even in a great many, both these members are deficient and impotent, so that they can perform the office neither of a male nor of a female."

With respect to them, it appears, from a collation of all the circumstances which have been observed by naturalists worthy of credit, that there is no such thing as a perfect *androgyne*, or real hermaphrodite; that is to say, a living creature, which, by its unnatural, or rather preternatural structure, possesses the genuine powers of both sexes, in such a manner as to be qualified for performing the functions of either with success: the irregularity of their fabrication almost always consists in something superfluous added to one of the two sexes, which gives it the appearance of the other, without bestowing the real and characteristical distinction; and every *hermaphrodite* is almost always a very woman. Since this monstrous exhibition of nature is not such as to abrogate the rights or destroy the character of humanity amongst human beings, this involuntary misfortune implies no right to deprive those upon whom it is inflicted by nature of the privileges natural to every citizen; and as this deficiency is no more infectious than any other corporeal mutilation, it is not easy to see why marriage should be prohibited to one of these unhappy beings, merely on account of its equivocal appearance, which acts in the character of its prevailing sex. If such a creature, by the defect of its construction, should be barren, this does not infer any right of dissolving the marriage which it may have contracted, more than the same sterility proceeding from any cause whether known or unknown, if his or her consort should not on that account require a divorce.

It

Androgynes. It is only the licentious abuse either of one or the other sex which can be subjected to the animadversion of the police. See HERMAPHRODITE.

Such are the sentiments of the authors of the French Encyclopédie. After all, we cannot forbear to add that from such heterogeneous matches nature seems to recoil with innate and inextinguishable horror. Nor are any of these invincible aversions implanted in our frame without a final cause worthy of its Author. We would gladly ask these free-thinking gentlemen, In cases where the sexes are so unnaturally confounded, how the police can, by its most severe and rigorous animadversions, either detect or prevent those licentious abuses against which they remonstrate? Since, therefore, an evil so baneful to human society could no otherwise be prevented than by the sanction of Nature against such horrible conjunctions, the instinctive antipathy which they inspire was highly worthy of her wisdom and purity.

ANDROGYNES, in ancient mythology, creatures of whom, according to the fable, each individual possessed the powers and characters of both sexes, having two heads, four arms, and two feet. The word itself is compounded of two Greek radical words; ανηρ, in genitive ανδρος, a *male*; and γυνη, a *female*. Many of the rabbinical writers pretend, that Adam was created double, one body being male, the other female, which in their origin not being essentially joined, God afterwards did nothing but separate them.

The gods, says Plato in his *Banquet*, had formed the structure of man round, with two bodies and two sexes. This fantastic being, possessing in itself the whole human system, was endowed with a gigantic force, which rendered it insolent, insomuch that it resolved to make war against the gods. Jupiter, exasperated, was going to destroy it; but, sorry at the same time to annihilate the human race, he satisfied himself with debilitating this double being, by disjoining the male from the female, and leaving each half to subsist with its own powers alone. He assigned to Apollo the task of repolishing these two half bodies, and of extending their skins so that the whole surface might be covered. Apollo obeyed, and fastened it at the *umbilicus*: If this half should still rebel, it was once more to be subdivided by another section, which would only leave it one of the parts of which it was then constituted; and even this fourth of a man was to be annihilated, if it should persist in its obstinacy and mischief. The idea of these *androgynes* might well be borrowed from a passage in Moses, where that historian of the birth and infancy of nature, describes Adam as calling Eve *bone of his bone* and *flesh of his flesh*. However this may be, the fable of Plato has been used with great ingenuity by a French poet, who has been rendered almost as conspicuous by his misfortunes as by his verses. With the ancient philosopher, he attributes the propensity which attracts one of the sexes towards the other, to the natural ardour which each half of the *androgynes* feels for re-union; and their inconstancy, to the difficulty which each of the separated parts encounters in its efforts to recover its proper and original half. If a woman appears to us amiable, we instantly imagine her to be that moiety with whom we should only have constituted one whole, had it not been for the insolence of our original double-sexed progenitor: Androgynous, Androides.

> The heart, with fond credulity impress'd,
> Tells us the half is found, and hopes for rest;
> But 'tis our curse, that sad experience shows,
> We neither find our half, nor gain repose.

ANDROGYNOUS, in *Zoology*, an appellation given to animals which have both the male and female sex in the same individual.—In *Botany*, the term is applied to such plants as bear both male and female flowers on the same root.

ANDROIDES, in *Mechanics*, a human figure, which, by certain springs or other movements, is capable of performing some of the natural motions of a living man. The motions of the human body are more complicated, and consequently more difficult to be imitated, than those of any other creature; whence the construction of an *androides*, in such a manner as to imitate any of these actions with tolerable exactness, is justly supposed to indicate a greater skill in mechanics than any other piece of workmanship whatever.

A very remarkable figure of this kind appeared in Paris, in the year 1738. It represented a flute-player, and was capable of performing many different pieces of music on the German flute; which, considering the difficulty of blowing that instrument, the different contractions of the lips necessary to produce the distinctions between the high and low notes, and the complicated motions of the fingers, must appear truly wonderful.

This machine was the invention of M. Vaucanson, member of the Royal Academy of Sciences; and a particular description of it was published in the Memoirs of the Academy for that year.

The figure itself was about five feet and a half in height, situated at the end of an artificial rock, and placed upon a square pedestal four feet and a half high and three and a half broad. The air entered the body by three pipes separated one from the other. It was conveyed to them by nine pair of bellows, three of which were placed above and six below. These were made to expand and contract regularly in succession by means of an axis of steel turned round by some clock-work. On this axis were different protuberances at proper distances, to which were fixed cords thrown over pulleys, and terminating in the upper boards of the bellows, so that, as the axis turned, these boards were alternately raised and let down. A contrivance was also used to prevent the disagreeable hissing fluttering noise usually attending the motion of bellows. This was by making the cord, by which the bellows was moved, press, in its descent, upon one end of a smaller lever, the other end of which ascending forced open the small leathern valve that admitted the air, and kept it so, till, the cord being relaxed by the descent of the upper board, the lever fell, and the air was forced out. Thus the bellows performed their functions constantly without the least hissing, or other noise, by which it could be judged in what manner the air was conveyed to the machine. The upper boards of three of the pairs of bellows were pressed down by a weight of four pounds, that of three others by a weight of two pounds, and

Androides. and those of the three remaining ones by nothing but their own weight.

The three tubes, by which the air entered, terminated in three small reservoirs in the trunk of the figure. There they united, and, ascending towards the throat, formed the cavity of the mouth, which terminated in two small lips adapted in some measure to perform their proper functions. Within this cavity also was a small moveable tongue; which, by its play, at proper periods, admitted the air, or intercepted its passage to the flute.

The fingers, lips, and tongue, received their proper directions by means of a steel cylinder turned by clockwork. It was divided into 15 equal parts, which by means of pegs pressing upon the ends of 15 different levers, caused the other extremities to ascend. Seven of these levers directed the fingers, having wires and chains affixed to their ascending extremities, which being attached to the fingers, caused them ascend in proportion as the other extremity was pressed down by the motion of the cylinder, and *vice versa*. Thus the ascent or descent of one end of a lever produced a similar ascent or descent in the corresponding finger, by which one of the holes of the flute was occasionally opened or stopped, as by a living performer. Three of the levers served to regulate the ingress of the air, being contrived so as to open and shut, by means of valves, the three reservoirs of air above mentioned, so that more or less strength might be given, and a higher or lower note produced as occasion required. The lips were, by a similar mechanism, directed by four levers, one of which opened them, to give the air a freer passage; the other contracted them; the third drew them backward; and the fourth pushed them forward. The lips were projected upon that part of the flute which receives the air; and, by the different motions already mentioned, modified the tone in a proper manner.—The remaining lever was employed in the direction of the tongue, which it easily moved so as to shut or open the mouth of the flute.

Thus we see how all the motions necessary for a German flute player could be performed by this machine; but a considerable difficulty still remains, namely, how to regulate these motions properly, and make each of them follow in just succession. This, however, was effected by the following simple method. The extremity of the axis of the cylinder was terminated on the right side by an endless screw, consisting of twelve threads, each placed at the distance of a line and a half from the other. Above this screw was fixed a piece of copper, and in it a steel pivot, which, falling in between the threads of the screw, obliged the cylinder to follow the threads, and, instead of turning directly round, it was continually pushed to one side. Hence, if a lever was moved, by a peg placed on the cylinder, in any one revolution, it could not be moved by the same peg in the succeeding revolution, because the peg would be moved a line and a half beyond it by the lateral motion of the cylinder. Thus, by an artificial disposition of those pegs in different parts of the cylinder, the statue was made, by the successive elevation of the proper levers, to exhibit all the different motions of a flute-player, to the admiration of every one who saw it.

The construction of machines capable of imitating even the mechanical actions of the human body, show exquisite skill; but what shall we say of one capable, not only of imitating actions of this kind, but of acting as external circumstances require, as though it were endued with life and reason? This, nevertheless, has been done. M. de Kempelen, a gentleman of Presburg in Hungary, excited by the performances of M. de Vaucanson, at first endeavoured to imitate them, and at last far excelled them. This gentleman constructed an androides capable of playing at chess!—Every one who is in the least acquainted with this game must know, that it is so far from being mechanically performed, as to require a greater exertion of the judgment and rational faculties than is sufficient to accomplish many matters of greater importance. An attempt, therefore, to make a wooden chess-player, must appear as ridiculous as to make a wooden preacher or counsellor of state. That this machine really was made, however, the public have had ocular demonstration. The inventor came over to Britain in 1783, where he remained above a year with his automaton. Androides.

It is a figure as large as life, in a Turkish dress, sitting behind a table, with doors of three feet and a half in length, two in depth, and two and a half in height. The chair on which it sits is fixed to the table, which runs on four wheels. The automaton leans its right arm on the table, and in its left hand holds a pipe: with this hand it plays after the pipe is removed. A chess board of 18 inches is fixed before it. This table or rather cupboard, contains wheels, levers, cylinders, and other pieces of mechanism; all which are publicly displayed. The vestments of the automaton are then lifted over its head, and the body is seen full of similar wheels and levers. There is a little door in its thigh, which is likewise opened; and with this, and the table also open, and the automaton uncovered, the whole is wheeled about the room. The doors are then shut, and the automaton is ready to play; and it always takes the first move.

At every motion the wheels are heard; the image moves its head, and looks over every part of the chess board. When it checks the queen, it shakes its head twice, and thrice in giving check to the king. It likewise shakes its head when a false move is made, replaces the piece, and makes its own move; by which means the adversary loses one.

M. de Kempelen remarks as the most surprising circumstance attending his automaton, that it had been exhibited at Presburg, Vienna, Paris, and London, to thousands, many of whom were mathematicians and chess-players, and yet the secret by which he governed the motion of its arm was never discovered. He prided himself solely in the construction of the mechanical powers, by which the arm could perform ten or twelve moves. It then required to be wound up like a watch, after which it was capable of continuing the same number of motions.

The automaton could not play unless M. de Kempelen or his substitute was near it to direct its moves. A small square box, during the game, was frequently consulted by the exhibiter; and herein consisted the secret, which he said he could in a moment communicate. He who could beat M. de Kempelen was, of course, certain of conquering the automaton. It was made in 1769. His own account of it was:

" C'est

Androides ‖ Androna.

" C'est une bagatelle qui n'est pas sans merite du côté du mechanisme: mais les effets n'en paroissent si merveilleux que par la hardiesse de l'idée, et par l'heureux choix des moyens employés pour faire illusion."

The strongest and best armed loadstone was allowed to be placed on the machine by any of the spectators.

As the inventor of this admirable piece of mechanism hath not yet thought proper to communicate to the public the means by which it is actuated, it is in vain for any, except those who are exquisitely skilled in mechanics, to form conjectures concerning them.—Many other curious imitations of the human body, as well as that of other animals, have been exhibited, though none of them equal to the last mentioned one. See the article AUTOMATON.

ANDROLEPSY, in Grecian antiquity, an action allowed by the Athenians against such as protected persons guilty of murder. The relations of the deceased were empowered to seize three men in the city or house whither the malefactor had fled, till he were either surrendered, or satisfaction made some way or other for the murder.

ANDROMACHE, the wife of the valiant Hector, the mother of Astyanax, and daughter of Eëtion king of Thebes in Cilicia. After the death of Hector and the destruction of Troy, she married Pyrrhus; and afterwards Helenus the son of Priam, with whom she reigned over part of Epirus.

ANDROMEDA, in *Astronomy*, a northern constellation, behind Pegasus, Cassiopeia, and Perseus. It represents the figure of a woman chained; and is fabled to have been formed in memory of Andromeda, daughter of Cepheus and Cassiopeia, and wife of Perseus, by whom she had been delivered from a sea monster, to which she had been exposed to be devoured for her mother's pride. Minerva translated her into the heavens.

The stars in the constellation Andromeda, in Ptolemy's catalogue are 23, in Tycho's 22, in Bayer's 27, in Mr Flamsted's no less than 84.

ANDROMEDA, the name of a celebrated tragedy of Euripides, admired by the ancients above all the other compositions of that poet, but now lost.

It was the representation of this play, in a hot summer day, that occasioned that epidemic fever, or phrensy, for which the Abderites are often mentioned, wherein they walked about the streets, rehearsing verses, and acting parts of this piece. See ABDERA.

ANDROMEDA, or *March Cystus*. See BOTANY *Index*.

ANDRON, in Grecian antiquity, denotes the apartment in houses designed for the use of men; in which sense it stands opposed to *Gynæceum*.—The Greeks also gave their dining-rooms the title of *andron*, because the women had no admittance to feasts with the men.

ANDRONA, in ancient writers, denotes a street, or public place, where people met and conversed together. In some writers, *androna* is more expressly used for the space between two houses; in which sense, the Greeks also use the term ανδρωνας, for the way or passage between two apartments.

ANDRONA is also used, in ecclesiastical writers, for that part in churches destined for the men. Anciently it was the custom for the men and women to have separate apartments in places of worship, where they performed their devotions asunder; which method is still religiously observed in the Greek church. The ανδρων, or *androna*, was in the southern side of the church, and the women's apartment on the northern.

Androna, Andronicus.

ANDRONICUS I. COMNENUS, emperor of the East, was the son of Isaac, and grandson of Alexius Comnenus. Naturally endowed with a vigorous habit of body, and a firm mind, active, temperate, martial, and eloquent, he shines as one of the most conspicuous characters of his age. Following the bent of his inclination, he attended the Roman army in their retreat; but in their march through Asia Minor, wandering into the mountains, he fell into the hands of some Turkish huntsmen, was carried to the sultan, and remained his prisoner. But regaining his liberty, both his virtues and vices soon recommended him to the favour of his cousin Manuel, the reigning emperor. The vicious heart of Andronicus manifested itself clearly in maintaining a licentious correspondence with Eudocia the emperor's niece, while the emperor himself lived in public incest with her sister Theodora. His martial spirit gained him a considerable command in Cilicia, where he laid siege to Mopsuestia: but by a successful sally of the enemy, he was obliged to raise the siege, and retire in considerable disorder. Inflamed with a desire of revenging the infamy of their sister in his blood, the brothers of Eudocia made an unsuccessful attempt to assassinate Andronicus at midnight in his tent; but being providentially awakened, he defended himself with surprising bravery, forced his way through his enemies, and escaped in safety. Afterwards engaging in a treasonable correspondence, with the emperor of Germany and the king of Hungary, he was arrested, and thrown into confinement. He remained in this state about twelve years, and after several repeated attempts to escape, he at last effectuated his purpose, and fled for refuge to the court of the great duke of Russia. The cunning of Andronicus soon found means to regain his favour with the emperor Manuel; for having exerted all his influence, he succeeded in obtaining the Russian prince, to engage to join his troops with those of Manuel, in the invasion of Hungary. Accordingly, on account of his important service, he obtained a free pardon from the emperor, and after an expedition to the Danube, returned with him to Constantinople. He again fell under the displeasure of the emperor, by refusing to take an oath of allegiance to the prince of Hungary, his intended son-in-law, and consequently presumptive heir to the crown, and was thereupon returned to his former command in Cilicia. While residing here, his powerful address captivated the heart of Philippa, daughter of the Latin prince of Antioch, and sister to the empress Maria; and in her company, he spent his time in all the amusements that country could afford, till the emperor's resentment put a stop to their correspondence. Thus circumstanced, he collected a band of adventurers, and undertook a pilgrimage to the holy land, where by his insinuating turn of mind, he so far succeeded in gaining the favour of the king and clergy, as to be invested with the lordship of Berytus on the coast of Phœnicia. In this neighbourhood, Theodora the beautiful widow of Baldwin, king of Jerusalem, and nearly allied in blood to him, resided. The personal accomplishments and address of Andronicus captivated her heart, and she became

Andronicus.

came the third victim to his artful seduction, and lived publicly as his concubine. Still pursued by the emperor with unabating resentment, he was forced to take refuge in Damascus, and then in several other places in the east, till at length he settled in Asia Minor. While residing here, he made frequent incursions into the province of Trebizond, and seldom returned without success. After several occurrences, Theodora was made captive, by the governor of Trebizond, along with her two children, and sent to Constantinople: upon which Andronicus implored and obtained pardon. He acted the affected penitent in such a manner, that he again ingratiated himself into the favours both of the church and state: but was sent to dwell at Oenoë, a town situated on the Euxine coast.

In the year 1177 Manuel died, and was succeeded by his son Alexius II. a youth about twelve or fourteen years of age, without wisdom or experience, by which the ambition of Andronicus was again called into action. A civil war having been occasioned, by the misconduct of the empress in Constantinople, the public mind was directed towards Andronicus, as the only person whose rank and accomplishments could restore the public tranquillity. Incited by the patriarchs and patricians, he marched towards Constantinople, which he entered, took possession of the palace, confined the empress, consigned her minister to death, assumed the office of protector, put to death many persons of distinction, tried and executed the queen, on a charge of corresponding with the king of Hungary, and vowed fidelity to the young emperor upon his coronation, at the same time teaching the necessity of an experienced ruler, to assuage the evils that threatened the empire; upon which his adherents called out "Long live Alexius and Andronicus, Roman emperors." While he affected reluctance, he was elevated to a partnership in the empire. This conjunction of the royal power was soon dissolved, by the murder of the unfortunate Alexius. The body of the deceased being brought into his presence, striking it with his foot, he said, "Thy father was a knave, thy mother a whore, and thyself a fool." Having arrived at the dignity of sole emperor, A. D. 1183, he continued to sway the sceptre, with a mixture of justice and bounty towards his subjects at large, but those whom he feared or hated he governed with the most cruel tyranny. The noble families that were either cut off, or exiled by him, were all allied to the Comneni. Some of these were engaged in revolt; and the public calamity was heightened, by an invasion of the Sicilians, in which they took and sacked Thessalonica. A rival without merit, and a people without arms, at last overturned his throne. A descendant from the first Alexius, in the female line, named Isaac Angelus, being singled out by Andronicus, as a victim to his cruelty, he with courage and resolution defended his life and liberty, slew his executioner, fled to the church of St Sophia, and there took refuge with several of his friends. Isaac was instantly raised by the populace, from a sanctuary to a throne. When this event took place, Andronicus was absent from Constantinople; but he no sooner heard of it, than he with the utmost speed returned. Upon his arrival there, he found himself deserted by all, and was seized, and dragged in chains before the new emperor. All the eloquence he displayed was of no avail; for Isaac delivered him into the hands of those whom he had injured, and for the space of three days, he endured with uncommon patience, all the insults and torments that were inflicted upon him. In the midst of these he would frequently cry out, "Lord have mercy upon me," and, "why will you bruise a broken reed." At last, two friendly or furious Italians, plunging their swords into his body, put a period to his life. His death, in the 73d year of his age, terminated the dynasty of the Comneni. (*Gen. Biog.*).

Andronicus & Andros.

Andronicus of Cyrrhus, an Athenian astronomer, built at Athens an octagon tower, with figures carved on each side, representing the eight principal winds. A brass Triton at the summit, with a rod in its hand, turned round by the wind, pointed to the quarter from whence it blew. From this model is derived the custom of placing weathercocks on steeples.

ANDROPHAGI, in *Ancient Geography*, the name of a nation whose country, according to Herodotus, was adjacent to Scythia. Their name, compounded of two Greek words, signifies *man-eaters*. Herodotus does not inform us whether their manner of subsisting corresponded with their name: whether they were so savage as to eat human flesh. See the article ANTHROPOPHAGI. They are represented, however, as the most barbarous and fierce of all nations. They were not governed by laws; the care of their cattle was their chief employment. Their dress was like that of the Scythians; and they had a language peculiar to themselves.

ANDROPOGON, or MAN'S-BEARD. See BOTANY *Index*.

ANDROS, one of the ancient Cyclades, lying between Tenedos and Eubœa: being one mile distant from the former, and ten from the latter. The ancients gave it various names, viz. Cauros, Lasia, Nonagria, Epagris, Antandros, and Hydrusia. The name of *Andros* it received from one Andreus, appointed, according to Diodorus Siculus, by Rhadamanthus, one of the generals, to govern the Cyclades, after they had of their own accord submitted to him. As to the name of *Antandros*, the same author tells us, that Ascanius the son of Æneas, being taken prisoner by the Pelasgians, gave them this island for his ransom, which on that account was called *Antandros*, or "delivered for one man." The name of *Hydrusia* it obtained in common with other places well supplied with water. It had formerly a city of great note, bearing the same name, and situated very advantageously on the brow of a hill, which commanded the whole coast. In this city, according to Strabo and Pliny, stood a famous temple dedicated to Bacchus. Near this temple, Mutianus, as quoted by Pliny, tells us, there was a spring called the *gift of Jupiter*; the water of which had the taste of wine in the month of January, during the feast of Bacchus, which lasted seven days. The same author adds, that the waters, if carried to a place whence the the temple could not be seen, lost their miraculous taste. Pausanias makes no mention of this spring; but says, that, during the feast of Bacchus, wine flowed, or was at least by the Andrians believed to flow, from the temple of that god. The priests, no doubt, found their account in keeping up this belief, by conveying, through secret conduits, a great quantity of wine into the temple.

The Andrians were the first of all the islanders who joined

Andros. joined the Persians at the time Xerxes invaded Greece; and therefore Themistocles, after the victory at Salamis, resolved to attack the city of Andros, and oblige the inhabitants to pay large contributions for the maintenance of his fleet. Having landed his men on the island, he sent heralds to the magistrates, acquainting them, that the Athenians were coming against them with two powerful divinities, *persuasion* and *force;* and therefore they must part with their money by fair means or foul. The Andrians replied, That they likewise had two mighty deities who were very fond of their island, viz. *poverty* and *impossibility;* and therefore could give no money. Themistocles, not satisfied with this answer, laid siege to the town; which he probably made himself master of and destroyed, as we are informed by Plutarch, that Pericles, a few years after, sent thither a colony of 250 Athenians. It was, however, soon retaken by the Persians; and, on the overthrow of that empire by Alexander the Great, submitted to him, along with the other islands. On his death it sided with Antigonus, who was driven out by Ptolemy. The successors of the last mentioned prince held it till the time of the Romans; when Attalus, king of Pergamus, besieged the metropolis at the head of a Roman army; and, having taken it, was by them put in possession of the whole island. Upon the death of Attalus the republic claimed this island, as well as his other dominions, in virtue of his last will.

Andros is now subject to the Turks; and contains a town of the same name, with a great many villages. It is the most fruitful island in all the Archipelago, and yields a great quantity of silk. There are said to be about 12,000 inhabitants, besides those of the villages Arni and Amoldeos, who are about two hundred, have a different language and customs, and are called *Albanois*. There are seven monasteries, a great number of churches, and a cathedral for the bishops of the Roman Catholic persuasion; but most of the inhabitants are of the Greek communion. The Jesuits had a house and a church in this island; but they were forced to quit them long ago. Here are some delightful valleys; but the air is bad, and the water of the city worse. The women would be agreeable enough, if it was not for their dress, which is very unbecoming; for they stuff out their clothes without the least regard to their shape: but the Albanese women make a much better appearance. The peasants make wicker-baskets, wherewith they supply the greatest part of the Archipelago. They have all sorts of game in the woods and mountains, but know not how to take them for want of guns. Their principal food is goats flesh; for there is no fish to be met with on their coasts. When they are sick, they are obliged to let the disease take its natural course, having neither physician nor surgeon on the island. A cadi, assisted by a few of the principal persons of the island, has the management of civil affairs, and his residence is in the castle: an aga, who presides over the military force, lives in a tower without the city. About two miles from the present town are still to be seen the ruins of a strong wall, with the fragments of many columns, chapiters, bases, broken statues, and several inscriptions, some of which mention the senate and people of Andros, and the priests of Bacchus; from which it is probable that this was the site of the ancient city. E. Long. 25. 30. N. Lat. 37. 50. Andros || Anec.

ANDROS, in *Ancient Geography*, an island in the Irish sea (Pliny), called *Hedros* by Ptolemy. Now *Bardsey*, distant about a mile from the coast of North Wales.

ANDROSACE. See BOTANY *Index*.

ANDRUM, a kind of hydrocele, to which the people of Malabar are very subject.—Its origin is derived from the bad quality of the country waters, impregnated with certain salts, the source of most other diseases that affect the Malabrians. Its signs, or symptoms, are an erysipelas of the scrotum, returning every new moon, by which the lymphatics, being eroded, pour a serous saline humour into its cavity. The andrum is incurable; those once seized with it have it for life; but it is not dangerous nor very troublesome to those used to it; though sometimes it degenerates into an hydrosarcocele. The method of prevention is by a heap of sand fetched from a river of the province Mangatti, and strewed in the wells. This is practised by the rich. As to the cure, they have only a palliative one; which is by incision, or tapping, and drawing off the water from the scrotum, once in a month or two.

ANDRYALA, DOWNY SOW-THISTLE. See BOTANY *Index*.

ANDUXAR, a city in the province of Andalusia, in Spain, situated on the Guadalquiver. It is defended by a good castle, and contains about 14,000 inhabitants. It is adorned with handsome churches and several religious houses, and inhabited by many families of high rank. The land about it abounds in corn, wine, oil, honey, and fruit of all sorts; and the inhabitants carry on a considerable trade in silk. W. Long. 4. 2. N. Lat. 37. 45.

ANDUZE, a town of France, in the department of the Gard, seated on the river Gardon. It carries on a considerable trade in serges and woollen cloth. E. Long. 3. 42. N. Lat. 43. 39.

ANECDOTE, (*Anecdota*), a term used by some authors for the titles of *Secret Histories:* but it more properly denotes a relation of detached and interesting particulars. The word is Greek, ανεκδοτα, q. d. *things not yet known* or *hitherto kept secret*. Procopius gives this title to a book which he published against Justinian and his wife Theodora; and he seems to be the only person among the ancients who has represented princes such as they are in their domestic relation.—Varillas has published Anecdotes of the House of Medicis.

ANECDOTES is also an appellation given to such works of the ancients as have not yet been published. In which sense, M. Muratori gives the name *Anecdota Græca* to several writings of the Greek fathers, found in the libraries, and first published by him.—F. Martene has given a *Thesaurus Anecdotarum Novus*, in folio, 5 vols.

ANEE, in commerce, a measure for grain, used in some provinces of France. At Lyons it signifies also a certain quantity of wine, which is the load an ass can carry at once: which is fixed at 80 English quarts, wine measure.

Anemometer ‖ Anemoscope.

ANEMOMETER, in *Mechanics*, implies a machine for measuring the force and velocity of the wind.

Various machines of this kind have been invented at different times, and by different persons. The following has been often experienced, and found to answer the intention.

* Plate XXXIII. fig. 2.

An open frame of wood, ABCDEFGHI *, is supported by the shaft or arbor I. In the two cross-pieces HK, LM, is moved a horizontal axis QM, by means of the four sails *ah*, *cm*, O*f*, *gh*, exposed to the wind in a proper manner. Upon this axis is fixed a cone of wood, MNO; upon which, as the sails move round, a weight R, or S, is raised by a string round its superficies, proceeding from the smaller to the larger end NO. Upon this larger end or base of the cone, is fixed a rocket-wheel *k*, in whose teeth the click X falls, to prevent any retrograde motion from the depending weight.

The structure of this machine sufficiently shows that it may be accommodated to estimate the variable force of the wind; because the force of the weight will continually increase as the string advances on the conical surface, by acting at a greater distance from the axis of motion; consequently, if such a weight be added on the smaller part M, as will just keep the machine in equilibrio in the weakest wind, the weight to be raised, as the wind becomes stronger, will be increased in proportion, and the diameter of the cone NO may be so large in comparison to that of the smaller end at M, that the strongest wind shall but just raise the weight at the greater end.

If, for example, the diameter of the axis be to that of the base of the cone NO as 1 to 28; then, if S be a weight of one pound at M on the axis, it will be equivalent to 28 pounds when raised to the greater end: if therefore, when the wind is weakest, it supports one pound on the axis, it must be 28 times as strong as to raise the weight to the base of the cone. If therefore a line or scale of 28 equal parts be drawn on the side of the cone, the strength of the wind will be indicated by that number on which the string rests.

ANEMONE, Wind-flower. See Botany *Index*.

Sea-Anemone. See *Animal-Flower*.

ANEMOSCOPE, a machine that shows either the course or velocity of the wind. (See also the article *Wind-Gauge*).

The machine which shows the course of the wind, or from what point of the compass it blows, consists of an index moving upon an upright circular plate, like the dial of a clock, on which the 32 points of the compass are drawn instead of the hours. The index, which points to the divisions on the dial, is turned by a horizontal axis, having a trundle-head at its external extremity. This trundle-head is moved by a cog-wheel on a perpendicular axis; on the top of which a vane is fixed, that moves with the course of the wind, and puts the whole machine in motion. The whole contrivance is extremely simple; and nothing required in the construction, but that the number of cogs in the wheel, and rounds in the trundle-head, be equal; because it is necessary, that, when the vane moves entirely round, the index of the dial also make a complete revolution.—An anemoscope of this kind is placed in one of the turrets of the queen's palace. The anemoscope, calculated for indicating the force or velocity of the wind is the same with what most writers call an *anemometer;* and we have accordingly described one of those machines under that article. We shall here add another, contrived by the late Mr Pickering, and published in the Philosophical Transactions, N° 473. This anemoscope is a machine four feet and a quarter high, consisting of a broad and weighty pedestal, a pillar fastened into it, and an iron axis of about half an inch diameter fastened into the pillar. Upon this axis turns a wooden tube; at the top of which is placed a vane, of the same materials, 21 inches long, consisting of a quadrant, graduated, and shod with an iron rim, notched to each degree; and a counterpoise of wood, as in the figure, on the other. Through the centre of the quadrant runs an iron pin, upon which are fastened two small round pieces of wood, which serve as moveable radii to describe the degrees upon the quadrant, and as handles to a velum or sail, whose pane is one foot square, made of canvas, stretched upon four battens, and painted. On the upper batten, next to the shod rim of the quadrant, is a small spring which catches at every notch corresponding to each degree, as the wind shall, by pressing against the sail, raise it up; and prevents the falling back of the sail, upon lessening of the force of the wind. At the bottom of the wooden tube, is an iron index, which moves round a circular piece of wood fastened to the top of the pillar on the pedestal, on which are described the 32 points of the compass. The figure of this machine is given on Plate XXXIII. fig. 3. where *a* is the pedestal; *b*, the pillar on which the iron axis is fitted; *c*, the circle or wood, on which are described the 32 points of the compass; *e*, the wooden tube upon its axis; *f*, the velum; *g*, the graduated quadrant; *h*, the counterpoise of the vane. The adjoining figure represents the velum, which takes off: *a* is the plane of the velum; *b*, the spring; *cc*, the wooden radii; *dd*, the holes through which the pin in the centre of the quadrant goes. Its uses are the following.

Anemoscope.

1. Having a circular motion round the iron axis, and being furnished with a vane at top, and index at the bottom, when once you have fixed the artificial cardinal points, described on the round piece of wood on the pillar, to the same quarters of the heavens, it gives a faithful account of that quarter from which the wind blows. 2. By having a velum or sail elevated by the wind along the arch of the quadrant to a height proportionable to the power of the column of wind pressing against it, the relative force of the wind, and its comparative power, at any two times of examination, may be accurately taken. 3. By having a spring fitted to the notches of the iron with which the quadrant is shod, the velum is prevented from returning back upon the fall of the wind; and the machine gives the force to the highest blast, since the last time of examination, without the trouble of watching it.

The ingenious contriver of this machine tells us, that he carefully examined what dependence may be had upon it, during the storms of February 1743-4, and found that it answered exceedingly well; for that, in such winds as the sailors call *violent storms*, the machine had six degrees to spare for a more violent gust, before it comes to a horizontal position. It is cer-

tainly

Anemoscope || Angel.

tainly to be depended upon in ordinary weather, the velum being hung so tenderly as to feel the most gentle breeze. There is however reason to fear, that the exposing the anemoscope to all winds for a continuance, must disorder it, especially irregular blasts and squalls. It may not therefore be amiss, in violent weather, for the observer to take the tube with its vane and velum in his hand, in order to know the force of the wind; and when he has finished his observations, to carry the machine into the house, till the violence of the storm is abated, when it may be placed in its former situation.

ANETHUM, Dill and Fennel. See Botany *Index*.

ANEURISM, in *Surgery*, a throbbing tumor, distended with blood, and formed by a dilatation or rupture of an artery. See Surgery *Index*.

ANGARI, or Angarii, in antiquity, denote public couriers, appointed for the carrying of messages. The ancient Persians, Budæus observes, had their αγγαρειον δρομημα; which was a set of couriers on horseback, posted at certain stages or distances, always in readiness to receive the dispatches from one, and forward them to another, with wonderful celerity, answering to what the moderns call *posts*, q. d. *positi*, as being posted at certain places or stages. The angari were also called by the Persians *astandæ*; by the Greeks ἡμεροδρομοι, on account of the long journeys they made in one day, which, according to Suidas, amounted not to less than 1500 stadia.

ANGARIA, in Roman antiquity, a kind of public service imposed on the provincials, which consisted in providing horses and carriages for the conveyance of military stores and other public burdens. It is sometimes also used for a guard of soldiers, posted for the defence of a place. In a more general sense it is used for any kind of oppression, or services performed through compulsion.

ANGAZYA, one of the Comora islands, lying between the north end of Madagascar and the coast of Zanguebar in Africa, from Lat. 10° to 15° S. It is inhabited by Moors, who trade with divers parts of the continent, in cattle, fruits, and other commodities of the island; which they exchange for callicoes and other cotton cloths. The houses here are built of stone, and lime made of calcined oyster shells; with which the walls and roof are plastered in a very elegant manner. The government of Angazya is a pure aristocracy; the island being subject to ten lords, who have all the title of *Sultan*. The people are very careful of their women; never permitting strangers to see them, without permission from a sultan, or an order which the stranger brings with him. Many of them read and write Arabic with great facility: and some even understand Portuguese, which they learn from their intercourse with Mosambique, whither they trade in vessels of 40 tons burden.

ANGEIOTOMY, in *Surgery*, implies the opening a vein or artery, as in bleeding; and consequently includes both arteriotomy and phlebotomy.

ANGEL, a spiritual intelligent substance, the first in rank and dignity among created beings. The word *angel* is Greek, and signifies a *messenger*: the Hebrew מלאך signifies the same thing. The angels are in Daniel (chap. iv. ver. 13, &c.) called עירים, or *watchers*, from their vigilance: for the same reason they are, in the remains we have of the prophecy attributed to Enoch, named *Egregori*; which word imports the same in Greek. Angel.

Angels, therefore, in the proper signification of the word, do not import the nature of any being, but only the office to which they are appointed, especially by way of message or intercourse between God and his creatures; in which sense they are called the *ministers of God*, who do his pleasure, and *ministering spirits* sent forth to minister for them who shall be heirs of salvation. That there are such beings as we call *angels*, that is, certain permanent substances, invisible and imperceptible to our senses, endued with understanding and power superior to that of human nature, created by God, and subject to him as the Supreme Being; ministring to his divine providence in the government of the world by his appointment, and more especially attending the affairs of mankind; is a truth so fully attested by Scripture, that it cannot be doubted. Nay, the existence of such invisible beings was generally acknowledged by the ancient heathens, though under different appellations: the Greeks called them *demons*; and the Romans *genii*, or *lares*. Epicurus seems to have been the only one among the old philosophers who absolutely rejected them. Indeed, the belief of middle intelligences influencing the affairs of the world, and serving as ministers or interpreters between God and man, is as extensive as the belief of a God; having never, so far as we know, been called in question by those who had any religion at all.

The creation of angels is not indeed expressly mentioned by Moses in the first of Genesis, yet it is generally considered by judicious expositors as implied. The reason why the sacred historian is silent on this subject, is supposed by Berrington to be the natural proneness of the Gentile world, and even of the Jews, to idolatry*. And it is thought, if they worshipped mere material elements, which was the case, much more might they be inclined to worship such superior and sublime beings as angels. But a better reason is perhaps given by other writers, viz. that this first history was purposely and principally for information concerning the visible world; the invisible, of which we know but in part, being reserved for a better life†. When created.

* *On the Creation*, p. 81. See also *Severianus on the Creation*.

† *Assembly's Annot. on Gen.* i. 30.

On what day they were created has been matter of conjecture. It is a point on which learned men have differed. The Socinians, indeed, hold, says Bishop Hopkins‡, that it was long before the account given by Moses: but it must have been within the six days creation; because, as we are informed, that within this space God made heaven and earth, and all things that are therein. All the writers that we have seen on this subject, think they were included in the first day's work, when the heavens were framed.

‡ *Works*, p. 505.

It has been thought by some persons, that the words of Job, "When the morning stars sang together, and all the sons of God shouted for joy," militate against the creation of angels within the six days. About the meaning of these words, however, expositors are not agreed; but admitting that they refer literally to angels, Dr Lightfoot, Caryl, and others, see no difficulty in the passage. The Doctor thinks they were created on the first day with the heavens; and that they were spectators of God's works in the other parts of the creation,

Angel.

and praised and magnified the Lord for his works all along; singing and shouting when God laid the foundation of the temple, Ezra iii.

On a subject of this nature it would be imprudent to *indulge* a spirit of conjecture; Scripture is the only standard by which truth and error can be tried, and to this we must ultimately appeal. It is acknowledged that Moses has not expressly mentioned angels by name; yet, as we have remarked, their creation is undoubtedly implied; for the heavens must include all that are in them; and therefore it is that the divine penman says, in the conclusion of his narrative, "Thus the heavens and the earth were finished, and *all* the host of them." Of the *host* of heaven, the angels must form a considerable part; they are expressly called the *heavenly host*, and the *armies of heaven*, Dan. iv. 35. Luke ii. 13. And if divine authority be admitted as decisive, the reasons adduced by Jehovah for the sanctification of a sabbath, demonstrate that they did not exist previous to the creation of the heavens. It is, surely, asserted with propriety, that in *six days* the Lord made heaven and earth, the sea, and ALL that *in them is*. Similar to which is a declaration of the divine historian relating to the same fact.—"And God blessed the seventh day, and sanctified it; *because* that in it he had rested from ALL his work which God created and made," Gen. ii. 3. Now if angels existed prior to the six days of creation, the language of Moses is far from being accurate and intelligible; and especially when it is considered that the obscurity might have been removed by adding, "from all the work which God had *then* created and made."

† *Bod. Divin.* vol. i. p. 422.

But if angels were created before the heavens, where could they exist? For, as the learned Gill † has remarked, "though angels have no bodies, and so are not in place circumscriptively; yet as they are creatures, they must have an *ubi*, a somewhere in which they are definitely; so that they are here, and not there, and much less everywhere: Now where was there an *ubi*, a somewhere for them to exist in, before the heavens and the earth were made? It is most reasonable, therefore, to conclude, that as God prepared an habitation for all the living creatures before he made them; as the sea for the fishes, the expanse, or air, for the fowls, and the earth for men and beasts; so he made the heavens first, and then the angels to dwell in them."

That this was the fact, will appear very evident, if the words of Moses be impartially considered. "In the beginning (says he) God created the heavens and the earth;" which words must refer either to the beginning of *creation* or of *time*: if to the former, and angels previously existed, the language is neither *intelligible* nor conformable to *truth*; if to the latter, the difficulty remains; for what is time but the measure of created existence. "Time (says the judicious Charnock *) began with the foundation of the world: before the beginning of the creation and the beginning of time, there could be nothing but eternity: nothing but what was uncreated, that is, nothing but what was without beginning." But if angels were in a pre-existent state, the historian's language is unaccountably strange and inaccurate: for if the phrase *in the beginning*, which is remarkably emphatical, refer to the creation of the heavens and the earth *only*, they are unhappily expressed; so expressed, indeed, as to convey no meaning to those who consider words as the vehicle of thought, and as intended to express clearly to others the meaning of the writer. For the *natural obvious* sense is as follows—"In the beginning of the creation of the heavens and the earth, God created the heavens and the earth;" which language is not only a departure from that perspicuity and precision which distinguish all his narrations, but entirely irrational and absurd.

* *Works*, vol. i. 112.

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That the words *in the beginning* refer to the first creation, cannot be doubted, if it be remembered, that JEHOVAH himself founds a claim to *eternity* on this very ground: "Before the day was, I am he."—"Before the mountains were brought forth, or ever thou hadst formed the earth and the world, even from everlasting to everlasting thou art God," Isa. xliii. 13. Psal. ix. 2. See also Prov. viii. 22, 23, &c. Now there could be no propriety in this kind of reasoning, if angels or any other creature existed before the creation of the world, because all claims to eternity from such premises would apply even to Gabriel as well as to JEHOVAH. "Before the world was," is, in Scripture language, a phrase always expressive of eternity; and on this principle the evangelist John asserts the divinity of Jesus Christ in the first chapter of his history. For this purpose he alludes to the words of Moses, and introduces his divine master to notice by celebrating the first act of his creative power. "In the beginning (says he) was the Word," that is, Dr Doddridge remarks §, before the foundation of the world, or the first production of any creature: and Dr Sherlock ‡ is clearly of opinion, that the words, in their most common and usual acceptation, signify the first creation of all things, and are a demonstration of the divinity of Christ. Of the same mind was Dr Owen. He says, that if the phrase *beginning* does not absolutely and formally express *eternity*, yet it doth a pre-existence to the whole creation, which amounts to the same thing; for nothing can pre-exist before all creatures but the nature of God, which is eternal, unless we suppose a creature before the creation of any. But what is meant by this expression is fully declared by other passages of Scripture: "I was set up from everlasting, before the *beginning*, or ever the earth was;" "Glorify thou me with thine own self, with the glory which I had with thee before the world was;" both which passages not only explain the text, but undeniably prove the pre-existence of Christ the Son of God *. It should be remembered, that, in the passage under consideration, the evangelist's argument for the *divinity* of Jesus Christ is grounded on his pre-existing the creation of the world; and it is consequently asserted, that he is the creator of all things: but if angels had a being before the period to which he alludes, the argument loses all its force, and no more proves the divinity of Christ than the divinity of an angel (A).

§ *Family Expositor.*
‡ *Script. Proof of Christ's Divinity*, p. 129. See also *Whitby on John* i. 1.
* *On the Trinity*, p. 43.

If, therefore, the words of Moses be impartially viewed

(A) Of this Socinus and his followers were aware; and therefore they endeavoured to evade the force of the

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viewed in their natural obvious meaning, and compared with other passages of Scripture that relate to the same subject, we have no doubt but every unprejudiced mind will perceive, that as he intended to give a summary history of the creation of all things both in heaven and in earth, he has done it in language intelligible and accurate, and in terms sufficiently explicit.

Their nature, power, employment, &c.

As to the nature of these beings, we are told, that they are spirits: but whether pure spirits divested of all matter, or united to some thin bodies or corporeal vehicles, has been a controversy of long standing. Not only the ancient philosophers, but some of the Christian fathers, were of opinion that angels were clothed with ethereal or fiery bodies, of the same nature with those which we shall one day have when we come to be equal to them. But the more general opinion, especially of later times, has been, that they are substances entirely spiritual, though they can at any time assume bodies, and appear in human or other shapes.

That the angelical powers and abilities vastly excel those of man, cannot be denied, if we consider, that their faculties are not clogged or impeded, as ours are, by any of those imperfections which are inseparable from corporeal being: so that their understandings are always in perfect vigour; their inclinations regular; their motions strong and quick; their actions irresistible by material bodies, whose natural qualities they can controul, or manage to their purposes, and occasion either blessings or calamities, public or private, here below; instances of which are too numerous to mention.

Besides their attendance on God, and their waiting and executing of his commands, they are also presumed to be employed in taking care of mankind and their concerns: and that every man had such a tutelar or guardian angel, even from his birth, was a firm belief and tradition among the Jews; and our Saviour himself seems to have been of the same sentiment. The heathens were also of the same persuasion, and thought it a crime to neglect the admonitions of so divine a guide. Socrates publicly confessed himself to be under the direction of such an angel, or demon, as several others have since done. And on this tutelar genius of each person they believed his happiness and fortune depended. Every genius did his best for the interest of his client; and if a man came by the worst, it was a sign the strength of his genius was inferior to that of his opponent, that is, of an inferior order; and this was governed by chance. There were some genii, whose ascendant was so great over others, that their very presence entirely disconcerted them; which was the case of that of Augustus in respect of that of Mark Antony; and for the same reason, perhaps some persons have wit, and speak well, when others are absent, in whose presence they are confounded, and out of countenance. The Romans thought the tutelar genii of those who attained the empire to be of an eminent order; on which account they had great honours shown them. Nations and cities also had their several genii. The ancient Persians so firmly believed the ministry of angels, and their superintendance over human affairs, that they gave their names to their months, and the days of their months; and assigned them distinct offices and provinces: and it is from them the Jews confess to have received the names of the months and angels, which they brought with them when they returned from the Babylonish captivity. After which, we find they also assigned charges to the angels, and in particular the patronage of empires and nations; Michael being the prince of the Jews, as Raphael is supposed to have been of the Persians.

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The Mahometans have so great a respect for the angels, that they account a man an infidel who either denies their existence, or loves them not. They believe them to be free from sin, enjoying the presence of God, to whom they are never disobedient: that they have subtle pure bodies, being created of light; and have no distinction of sexes, nor do they need the refreshment of food or sleep. They suppose them to have different forms and offices: That some adore God in several postures; others sing his praises, and intercede for men; some carry and encompass his throne; others write the actions of men, and are assigned guardians to them.

As the number of these celestial spirits is very great, it is likewise reasonable to believe that there are several orders and degrees among them, which is also confirmed by Scripture; whence some speculative men have distributed them into nine orders, according to the different names by which they are there called; and reduced these orders into three *hierarchies*, as they call them; to the first of which belong seraphim, cherubim, and thrones; to the second, dominions, virtues, and powers; and to the third, principalities, archangels, and angels. They imagine, farther, that there are some who constantly reside in heaven; others who are ministers, and sent forth, as there is occasion, to execute the orders they receive from God by the former. The Jews reckon but four orders or companies of angels, each headed by an archangel; the first order being that of Michael, the second of Gabriel, the third of Uriel, and the fourth of Raphael; but though the Jews believe them to be four, yet it seems there were rather seven. The Persians also held, there were subordinate degrees among the angels.

Of the fallen angels.

Although the angels were originally created perfect, good, and obedient to their Master's will, yet some of them sinned, and kept not their first estate, but left their habitation; and so, of the most blessed and glorious, became the most vile and miserable of all God's creatures. They were expelled the regions of light, and cast down to hell, to be reserved in everlasting chains under darkness, until the day of judgment. With heaven they lost their heavenly disposition, which delighted once in doing good and praising God; and fell into a settled rancour against him, and malice against

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the apostle's reasoning, by interpreting the phrase *in the beginning* either in a figurative sense, or as referring to the beginning of John the Baptist's ministry. We will only subjoin, that we do not remember to have seen any writer deviate from the primary obvious meaning of the passage, who had not some hypothesis to support inimical to truth.

Angel. against men; their inward peace was gone; all desire of doing good departed from them; and, instead thereof, revengeful thoughts and despair took possession of them, and created an eternal hell within them.

When, and for what offence, these apostate spirits fell from heaven, and plunged themselves into such an abyss of wickedness and woe, are questions very hard, if not impossible to be determined by any clear evidence of Scripture. As to the time, we are certain that it could not be before the sixth day of creation; because on that day it is said, "God saw every thing that he had made, and behold it was very good:" but that it was not long after it is very probable, as it must have preceded the fall of our first parents. Some have imagined it to have been after; and that carnality, or lusting to converse with women upon earth, was the sin which ruined them: an opinion (B) built upon a mistaken interpretation of Scripture, as if angels were meant by *the sons of God* who are said to have begotten the mighty men of old on the daughters of men. Others have supposed, that the angels, being informed of God's intention to create man after his own image, and to dignify his nature by Christ's assuming of it, and thinking their glory to be eclipsed thereby, envied man's happiness, and so revolted; and with this opinion that of the Mahometans has some affinity; who are taught, that the devil, who was once one of those angels who are nearest to God's presence, and named *Azazil*, forfeited paradise for refusing to pay homage to Adam at the command of God. But on what occasion soever it first showed itself, pride seems to have been the leading sin of the angels; who, admiring and valuing themselves too much on the excellence of their nature and the height of their station, came at length to entertain so little respect for their Creator, as to be guilty of downright rebellion and apostasy.

It is certain from Scripture, that these fallen angels were in great numbers, and that there were also some order and subordination preserved among them; one especially being considered as their prince, and called by several names, *Beelzebub*, *Satan*, or *Sammael* by the Jews; *Ahârimam* by the Persians; and *Eblis* by the Mahometans. Their constant employment is not only doing evil themselves, but endeavouring by all arts and means to seduce and pervert mankind, by tempting them to all kind of sin, and thereby bringing them into the same desperate state with themselves.

ANGEL is likewise a title given to bishops of several churches. In this sense St Paul is understood by some authors, where he says, *Women ought to be covered in the church, because of the angels.* The learned Dr Prideaux observes, that the minister of the synagogue, who officiated in offering up the public prayers, being the mouth of the congregation, delegated by them as their representative, messenger, or angel, to speak to God in prayer for them, was therefore, in the Hebrew language, called the *angel* of the church; and from thence the bishops of the seven churches of Asia are, by a name borrowed from the synagogue, called the *angels* of those churches. Angel || Angelites.

ANGEL, in commerce, the name of a gold coin formerly current in England. It had its name from the figure of an angel represented upon it, weighed four pennyweights, and was twenty-three and a half carats fine. It had different values in different reigns; but is at present only an imaginary sum, or money of account, implying ten shillings.

ANGEL-fish. See SQUALUS, ICHTHYOLOGY *Index.*

ANGELIC, or ANGELICAL, something belonging to, or that partakes of, the nature of angels. We say an *angelical* life, &c. St Thomas is styled the *angelical doctor.* The angelical salutation is called by the Romanists *Ave Maria;* sometimes simply *angelus.*

ANGELIC Garment (*Angelica vestis*), among our ancestors, was a monkish garment, which laymen put on a little before their death, that they might have the benefit of the prayers of the monks. It was from them called *angelical*, because they were called *angeli*, who by these prayers *animæ saluti succurrebant.* Hence, where we read the phrase *monachus ad succurrendum* in our old books, it must be understood of one who had put on the habit when he was at the point of death.

ANGELICA. See BOTANY *Index.*

ANGELICS, ANGELICI, in church history, an ancient sect of heretics, supposed by some to have got this appellation from their excessive veneration of angels; and by others, from their maintaining that the world was created by angels.

ANGELICS is also the name of an order of knights, instituted in 1191, by Angelus Flavius Comnenus, emperor of Constantinople.

ANGELICS is also a congregation of nuns, founded at Milan in 1534, by Louisa Torelli, countess of Guastalla. They observe the rule of St Augustine.

ANGELITES, in ecclesiastical history, a sect of Christian heretics, in the reign of the emperor Anastasius, and the pontificate of Symmachus, about the year 494, so called from Angelium, a place in the city of Alexandria, where they held their first meetings. They were called likewise *Severites*, from one Severus, who was the head of their sect; as also *Theodosians*, from one

(B) This opinion seems to have been originally occasioned by some copies of the Septuagint, which, in the days of St Austin, had in this place *the angels of God.* Lactantius supposes the angels, who were guilty of this enormity, had been sent down by God to guard and take care of mankind; and being endued with free-will, were charged by him not to forfeit the dignity of their celestial nature, by defiling themselves with the corruptions of the earth; but that the devil at length enticed them to debauch themselves with women. He adds, that not being admitted into heaven by reason of the wickedness into which they had plunged themselves, they fell down to the earth, and became the devil's ministers; but that those who were begotten by them, being neither angels nor men, but of a middle nature, were not received into hell, no more than their parents were into heaven. Hence arose two kinds of demons, celestial and terrestrial. These are unclean spirits, the authors of whatever evils are committed, and whose prince is the devil. From hence very probably proceeded the notions of *Incubi*, or demons who are supposed to have carnal knowledge of women.

Angelites || Angelos.

one among them named Theodosius, whom they made pope at Alexandria. They held, that the persons of the Trinity are not the same; that none of them exists of himself, and of his own nature; but that there is a common god or deity existing in them all, and that each is God, by a participation of this deity.

ANGELO, MICHAEL. There were five celebrated Italian painters of this name, who flourished in the 16th and 17th centuries; but the two most distinguished of them are these.—First, Michael Angelo Buonarotti, who was a most incomparable painter, sculptor, and architect, born in 1474, in the territory of Arezzi in Tuscany. He was the disciple of Dominico Ghirlandaio; and erected an academy of painting and sculpture in Florence, under the protection of Lorenzo di Medicis; which, upon the troubles of that house, was obliged to remove to Bologna. About this time he made an image of Cupid, which he carried to Rome, broke off one of its arms, and buried the image in a place he knew would soon be dug up, keeping the arm by him. It was accordingly found, and sold to Cardinal St Gregory for an antique; until Michael, to their confusion and his own credit, discovered his artifice, and confirmed it by the deficient arm which he produced: it is rather unusual for the manufacturers of antiques to be so ingenuous. His reputation was so great at Rome, that he was employed by Pope Sixtus to paint his chapel; and by the command of Pope Paul III. executed his most celebrated piece, *The Last Judgment*. He has the character of being the greatest designer that ever lived; and it is universally allowed that no painter ever understood anatomy so well. He died immensely rich at Rome, in 1564.—Secondly, Michael Angelo de Caravaggio, born at that village in Milan, in 1569. He was at first no more than a bricklayer's labourer; but he was so charmed with seeing some painters at work, that he immediately applied himself to the art; and made such progress in a few years, that he was admired as the author of a new style of painting. It was observed of Michael Angelo Buonarotti, that he was incomparable in designing, but knew little of colouring; and of Caravaggio, that he had as good a gout in colouring as he had a bad one in designing. There is one picture of his in the Dominican church at Antwerp, which Rubens used to call his master. It is said of this painter, that he was so strangely contentious, that the pencil was no sooner out of his hand but his sword was in it. He died in 1609.

ANGELO, St, a small but strong town of Italy, in the Capitanata. There are several other towns and castles of the same name in Italy, and particularly the castle of St Angelo at Rome. E. Long. 15. 56. N. Lat. 41. 43.

ANGELOS, Los, a province of Mexico, the ancient republic of Tlascala, of which a city called *Tlascala* was once the capital. That city is now reduced to an inconsiderable village, and has given place to another called *Puebla des los Angelos*, or the city of Angels. It is situated in W. Long. 103. 12. and N. Lat. 19. 13. It was formerly an Indian town; but in 1530 was entirely abandoned by the natives, on account of the cruelties of the Spaniards. A succeeding viceroy of Mexico, by a milder treatment, recalled them; and the town is now exceedingly rich and populous, so as even to vie with Mexico itself in magnificence. It is situated on the river Zacatula, in a fine valley, about 25 leagues to the eastward of Mexico. In the middle is a beautiful and spacious square, from whence run the principal streets in direct lines, which are crossed by others at right angles. One side is almost entirely occupied by the magnificent front of the cathedral; while the other three consist of piazzas, under which are the shops of tradesmen. The city is the see of a bishop, suffragan to the archbishop of Mexico, and we may form a judgment of the wealth of the place by the revenue of the cathedral and chapter, which amounts to 300,000 pieces of eight annually. It must be remembered, however, that in all popish countries the wealth of the laity by no means bears the same proportion to that of the clergy as in Britain. What contributes greatly to increase the riches of this province is, that here is situated the city of Vera Cruz, the natural centre of all the American treasures belonging to Spain. See VERA CRUZ.

Angelos || Anger.

ANGELOT, an ancient English gold coin, struck at Paris, while under subjection to the English. It was thus called from the figure of an angel supporting the scutcheon of the arms of England and France. There was another coin of the same denomination struck under Philip de Valois.

ANGELOT is also used in *Commerce* to denote a small, fat, rich sort of cheese, brought from Normandy. Skinner supposes it to have been thus called from the name of the person who first made it up in that form, and perhaps stamped it with his own name. Menage takes it to have been denominated from the resemblance it bears to the English coin called *angelot*. It is made chiefly in the Pays de Bray, whence it is also denominated *angelot de Bray*. It is commonly made in vats, either square or shaped like a heart.

ANGER, a violent passion of the mind, consisting in a propensity to take vengeance on the author of some real or supposed injury done the offended party.

Anger is either deliberative or instinctive; and the latter kind is rash and ungovernable, because it operates blindly, without affording time for deliberation or foresight. Bishop Butler very justly observes, that anger is far from being a selfish passion, since it is naturally excited by injuries offered to others as well as to ourselves; and was designed by the Author of nature not only to excite us to act vigorously in defending ourselves from evil, but to interest us in the defence or rescue of the injured and helpless, and to raise us above the fear of the proud and mighty oppressor.

Neither, therefore, is all anger sinful: hence the precept, "Be ye angry and sin not."—It becomes sinful, however, and contradicts the rule of Scripture, when it is conceived upon slight and inadequate provocations, and when it continues long. It is then contrary to the amiable spirit of charity, which "suffereth long, and is not easily provoked." Hence these other precepts, "Let every man be slow to anger;" and, "Let not the sun go down upon your wrath."

These precepts, and all reasoning indeed upon the subject, suppose the passion of anger to be within our power; and this power consists not so much in any faculty we have of appeasing our wrath at the time (for we are passive under the smart which an injury or affront occasions, and all we can then do is to prevent its breaking out into action), as in so mollifying our minds

Anger. minds by habits of just reflection, as to be less irritated by impressions of injury, and to be sooner pacified.

As reflections proper for this purpose, and which may be called the *sedatives* of anger, the following are suggested by Archdeacon Paley, in his excellent treatise of *Moral and Political Philosophy* *.—"The possibility of mistaking the motives from which the conduct that offends us proceeded; how often *our* offences have been the effect of inadvertency, when they were mistaken for malice; the inducement which prompted our adversary to act as he did, and how powerfully the same inducement has, at one time or other, operated upon ourselves; that he is suffering perhaps under a contrition, which he is ashamed, or wants opportunity, to confess; and how ungenerous it is to triumph by coldness or insult over a spirit already humbled in secret; that the returns of kindness are sweet, and that there is neither honour nor virtue nor use in resisting them—for some persons think themselves bound to cherish and keep alive their indignation, when they find it dying away of itself. We may remember that others have their passions, their prejudices, their favourite aims, their fears, their cautions, their interests, their sudden impulses, their varieties of apprehension, as well as we: we may recollect what hath sometimes passed in our own minds, when we have got on the wrong side of a quarrel, and imagine the same to be passing in our adversary's mind now; when we became sensible of our misbehaviour, what palliations we perceived in it, and expected others to perceive; how we were affected by the kindness, and felt the superiority of a generous reception and ready forgiveness; how persecution revived our spirits with our enmity, and seemed to justify the conduct in ourselves which we before blamed. Add to this, the indecency of extravagant anger; how it renders us, whilst it lasts, the scorn and sport of all about us, of which it leaves us, when it ceases, sensible and ashamed; the inconveniences and irretrievable misconduct into which our irascibility has sometimes betrayed us; the friendships it has lost us; the distresses and embarrassments in which we have been involved by it, and the sore repentance which on one account or other it always costs us.

* Book III. Part ii. chap. 7.

"But the reflection calculated above all others to allay that haughtiness of temper which is ever finding out provocations, and which renders anger so impetuous, is that which the gospel proposes; namely, that we ourselves are, or shortly shall be, suppliants for mercy and pardon at the judgment-seat of God. Imagine our secret sins all disclosed and brought to light; imagine us thus humbled and exposed; trembling under the hand of God; casting ourselves on his compassion; crying out for mercy—imagine such a creature to talk of satisfaction and revenge, refusing to be entreated, disdaining to forgive, extreme to mark and to resent what is done amiss; imagine, I say, this; and you can hardly feign to yourself an instance of more impious and unnatural arrogance."

Physicians and naturalists have recorded instances of very extraordinary effects of this passion. Borrichius cured a woman of an inveterate tertian ague, which had baffled the art of physic, by putting the patient in a furious fit of anger. Valeriola made use of the same means, with the like success, in a quartan ague. The same passion has been equally salutary to paralytic, gouty, and even dumb persons; to which last it has sometimes given the use of speech. Etmuller gives divers instances of very singular cures wrought by anger; among others, he mentions a person laid up in the gout, who being provoked by his physician, flew upon him, and was cured. It is true, the remedy is somewhat dangerous in the application, when a patient does not know how to use it with moderation. We meet with several instances of princes to whom it has proved mortal; e. g. Valentinian the first, Wenceslaus, Matthias Corvinus, king of Hungary, and others. There are also instances wherein it has produced the epilepsy, jaundice, cholera morbus, diarrhœa, &c. In fact, this passion is of such a nature, that it quickly throws the whole nervous system into preternatural commotions, by a violent stricture of the nervous and muscular parts; and surprisingly augments not only the systole of the heart and of its contiguous vessels, but also the tone of the fibrous parts in the whole body. It is also certain, that this passion, by the spasmodic stricture it produces in the parts, exerts its power principally on the stomach and intestines, which are highly nervous and membranous parts; whence the symptoms are more dangerous, in proportion to the greater consent of the stomach and intestines, with the other nervous parts, and almost with the whole body. The unhappy influence of anger likewise, on the biliary and hepatic ducts, is very surprising; since by an intense constriction of these, the liver is not only rendered scirrhous, but stones also are often generated in the gall-bladder and biliary ducts: these accidents have scarcely any other origin than an obstruction of the free motion and efflux of the bile, by means of this violent stricture. From such a stricture of these ducts likewise proceeds the jaundice, which in process of time lays a foundation for calculous concretions in the gall-bladder. Lastly, By increasing the motion of the fluid, or the spasms of the fibrous parts, by means of anger, a larger quantity of blood is propelled with an impetus to certain parts; whence it happens that they are too much distended, and the orifices of the veins distributed there opened. It is evident from experience, that anger has a great tendency to excite enormous hæmorrhages, either from the nose, the aperture of the pulmonary artery, the veins of the anus; or in women, from the uterus, especially in those previously accustomed and disposed to such evacuations.

Anger ‖ Angerona.

ANGERMANNIA, or ANGERMANLAND, a province of Sweden, bounded on the north by Lapland and Bothnia, on the east by the gulf of Bothnia, and Medelpadia, and on the west by Jempti and Herndel. It is full of rocks, mountains, and forests; and there is one very high mountain called *Scull*. It has excellent iron works, and lakes abounding with fish.

ANGERMOND, a town in the duchy of the lower Rhine, in Germany, subject to the king of Prussia. E. Long. 6. 20. N. Lat. 51. 10.

ANGERONA, in *Mythology*, the name of a Pagan deity whom the Romans prayed to for the cure of the *quinsy*, in Latin *angina*. Pliny calls her the *goddess of silence* and *calmness of mind*, who banishes all uneasiness and melancholy. She is represented with her mouth covered, to denote patience and refraining from complaints. Her statue was set up, and sacrificed to, in the temple of the goddess Volupia, to show

Angerona lia || Anghiera.

show that a patient enduring of affliction leads to pleasure.

ANGERONALIA, in antiquity, solemn feasts held by the Romans on the 21st of December, in honour of Angerona, or Angeronia, the goddess of patience and silence. Festus and Julius Modestus, quoted by Macrobius, Saturn. lib. i. cap. 10. derive the name from *angina*, "quinsy;" and suppose the goddess to have been thus denominated, because she presided over that disease. —Others suppose it formed from *angor*, "grief, pain;" to intimate that she gave relief to those afflicted therewith.—Others deduce it from *angeo*, "I press, I close," as being reputed the goddess of silence, &c.

ANGERS, a city of France, and capital of the former duchy of Anjou, now the department of the Maine and Loire. It is seated a little above the place where the Sarte and the Loire lose themselves in the Maine. This last river divides the city into two equal parts, called the High and the Low Town. There are twelve parishes in the city, and four in the suburbs, which contained 28,927 inhabitants in 1817. Besides these, there are eight chapters, and a great number of convents for both sexes. Its greatest extent is along the declivity of a hill, which reaches quite down to the river side. The castle was built by St Louis, about the middle of the 13th century. The walls, fosses, and numerous towers which yet subsist, evince its former magnificence: and its situation in the centre of the city, on a rock overhanging the river, conduces to give it an air of grandeur, though at present in decay. It was the principal residence of the kings of Sicily, as dukes of Anjou, but is now in a state of total ruin. The cathedral of Angers is a venerable structure; and although it has undergone many alterations in the course of ages since its construction, yet the architecture is singular, and deserves attention. Here lies interred with her ancestors the renowned Margaret, daughter of René king of Sicily, and queen of Henry VI. of England. She expired, after her many intrepid but ineffectual efforts to replace her husband on the throne, in the year 1482, at the castle of Dampierre in Anjou, Near the church of St Michael is the handsomest square in the city, from whence runs a street which has the name of the church. On one side of this street is the town-house; which has a fine tower, with a clock, raised upon an arch which serves for a passage into the great square. There are two large bridges, which keep up a communication between the two parts of the city; and in the lesser of these there is another square, which serves for a market. The university of Angers was founded in 1398, and the academy of belles letters in 1685. This last consists of thirty academicians. At the end of the suburb of Bresigny are the quarries of Angers, so famous for the fine slate which is got from thence. The pieces are of the thickness of a crown piece, and a foot square. All the houses in Angers are covered with this slate, which has gained it the appellation of the *Black City*. The walls with which King John of England surrounded it in 1214 remain nearly entire, and are of very great circumference. W. Long. 0. 35. N. Lat. 47. 30.

ANGHIERA, a town of Italy, in the duchy of Milan, and capital of a county of the same name. It is seated on the eastern side of the lake Maggiore, in E. Long. 8. 40. N. Lat. 45. 42.

Angina || Anglesey.

ANGINA, in *Medicine*, a violent inflammation of the throat, otherwise called *quinsy*. See MEDICINE *Index*.

Angina Pectoris. See MEDICINE *Index*.

ANGIOSPERMIA, in the Linnæan system of botany, the second order in the class didynamia. It consists of those plants of that class, whose seeds are enclosed in a pericarpium. In this order the stigma is generally obtuse. These are the *personati* of Tournefort.

ANGITIÆ LUCUS or NEMUS, (Virg.), situated on the west side of the Lacus Fucinus. The inhabitants are called *Lucenses*, by Pliny. Angitia was sister of Medea, who taught antidotes against poison and serpents, according to Sil. Italicus. But Servius on Virgil says, that the inhabitants called Medea by this name for the same reason. The town is now called *Luco*.

ANGLE, the inclination of two lines meeting one another in a point. See GEOMETRY. See also ANGLE in the SUPPLEMENT.

Angle of Incidence, in *Optics*, the angle which a ray of light makes with a perpendicular to that point of the surface of any medium on which it falls; though it is sometimes understood of the angle which it makes with the surface itself.

Angle of Refraction now generally means the angle which a ray of light, refracted by any medium, makes with a perpendicular to that point on the surface of which it was incident; but has sometimes been understood of the angle which it makes with the surface of the refracting medium itself.

ANGLER, a person who practises the art of angling, whether as a diversion or otherwise. See the article ANGLING.

ANGLER, the English name of a species of lophus. See LOPHUS, ICHTHYOLOGY *Index*.

ANGLES, an ancient German nation, originally a branch of the Suevi: who, after various migrations, settled in that part of Denmark, and duchy of Sleswick, which to this day is called *Angel*, and of which the city of Flensburgh is the capital. Here they were known, even in the time of Tacitus, by the name of *Angli*. The origin of this name is variously accounted for. According to Saxo-Grammaticus, they were called *Angli*, from one Angulus, son to Humblus king of Denmark. Widischind, a Saxon writer, will have them to be called *Angli*, from an island in the corner or angle of the sea, which they conquered. Goropius derives their name from the Saxon word *Angel* or *Engel*, signifying a fish-hook; the Angles, like the other Saxon nations, being greatly addicted to piracy, and on that account being so named by the neighbouring nations; as if, like hooks, they caught all that was in the sea. To this nation the British ambassadors are said to have applied, when soliciting succours against the Scots and Picts. The Angles, therefore, came over in greater numbers than any other Saxon nation; and accordingly had the honour of giving the name of *Anglia* to England. See ENGLAND.

ANGLESEY, ISLE OF, is the most western county of North Wales. It is 24 miles in length, 18 in breadth, and sends one member to parliament. It is separated from Caernarvonshire by a strait called *Menai*, and on every other side is surrounded by the sea.

Anglesey. It is a fertile spot, and abounds in corn, cattle, flesh, fish, and fowls.

At Port Aethwy, the most general ferry into the island, there is a great passage of cattle. It is computed that the island sends forth annually from 12,000 to 15,000 head, and multitudes of sheep and hogs. It is also computed that the remaining stock of cattle is 30,000. In 1770 upwards of 90,000 bushels of corn were exported, exclusive of wheat. The improvement in husbandry has greatly increased since the suppression of smuggling from the isle of Man: before that time every farmer was mounted on some high promontory, expecting the vessel with illicit trade; but since that period, he sets in earnest to industry and cultivation. Not but that the island was in the most remote times famous for its fertility: Mon, Mam Gymry, the Nursing mother of Wales, was a title it assumed even in the 12th century.

This island is divided into 77 parishes, of which most of the churches are situated near the shores. By an account given on the 13th of August 1563, there were 2010 households, or families, in Anglesey; allowing five to a family, the whole number of inhabitants at that period was 10,050. In 1811, the number of houses was 7183, of families 7706, and of inhabitants 37,045. Of these families 5376 were occupied in agriculture, 1453 in trade and manufactures, and 877 in other occupations. It appears then that since 1563 the number of inhabitants has nearly quadrupled. The chief town is BEAUMARIS.

In ancient times this island was called *Mon*, *Mona*, or *Moneg*. It was the great nursery of the religion of the Druids, being the residence of the grand druid, or chief pontiff, and consequently of all the learned doctors in that religion.

Many ancient monuments of druidism still remain in the island.—At Tre'r Dryw, or the habitation of the arch druid, are several mutilated remains, which have been described by Mr Rowlands. His *Bryn Gwyn*, or *Brein Gwyn*, or royal tribunal, is a circular hollow of 180 feet in diameter, surrounded by an immense agger of earth and stones, evidently brought from some other place, there not being any mark of their being taken from the spot. It has only a single entrance. This is supposed to have been the grand consistory of the druidical administration.—Not far from it was one of the *Gorseddau*, now in a manner dispersed, but which once consisted of a great copped heap of stones, on which sat aloft a druid, instructing the surrounding people *multa de Deorum immortalium vi et potestate disputare, et juventuti tradunt*: Cæs. lib. vi.—Here were also the relicks of a circle of stones, with the *cromlech* in the midst; but all extremely imperfect. Two of the stones are very large; one, which serves at present as part of the end of a house, is 12 feet 7 inches high, and 8 feet broad; and another 11 feet high, and 23 feet in girth. Some lesser stones yet remain. This circle, when complete, was one of the temples of the druids, in which their religious rites were performed. It is the conjecture of Mr Rowlands, that the whole of these remains were surrounded with a circle of oaks, and formed a deep and sacred grove: *Jam per se roborum elegunt lucos, neque ulla sacra sine ea fronde conficiunt;* (Plin. Hist. Nat. xv. 44.).—Near this is *Caer Leb*, or the moated intrenchment; of a square form, with a double rampart, and broad ditch intervening, and a lesser on the outside. Within are foundations of circular and of square buildings. This Mr Rowland supposes to have been the residence of the arch druid, and to have given the name, *Tre'r Dryw*, to the township in which it stands. At Trev Wry are several faint traces of circles of stones, and other vestiges of buildings; but all so dilapidated, or hid in weeds, as to become almost formless. *Bod-druddn*, or the habitation of the druids, *Tre'r-Beirdd*, or that of the bard, and *Bodowyr*, or that of the priests, are all of them hamlets, nearly surrounding the seat of the chief druid, composing the essential part of his suite. At the last is a thick cromlech, resting on three stones. Anglesey.

The shore near Porthamel, not far from hence, is famed for being the place where Suetonius landed, and put an end in this island to the druid reign. His infantry passed over in flat-bottomed boats, perhaps at the spot still called *Pant yr Yscraphie*, or the valley of *Skiffs*. His cavalry crossed partly by fording, partly by swimming. Of the conflict on this occasion we have the following animated description by Tacitus *: * *Annal.* xiv. 30.

"Stat pro littore diversa acies, densa armis virisque, intercursantibus fœminis in modum furiarum, veste ferali, crinibus dejectis, faces preferebant; *druidæque* circum, preces diras sublatis ad cœlum manibus fundentes. Novitate aspectus percutere militem, ut quasi hærentibus membris, immobile corpus vulneribus præberent. Dein cohortationibus ducis, et se ipse stimulantes, ne muliebre et fanaticum agmen pavescerent, inferunt signa, sternuntque obvios et igni suo involvunt. Præsidium posthac impositum vicis, excisique luci, sævi superstitionibus sacri. Nam cruore captivo adolere aras, et hominum fibris consulere deos fas habebant."—Thus Englished: "On the shore stood a motley army in close array, and well armed; with women running wildly about in black attire, with dishevelled hair, and like the furies brandishing their torches; surrounded by the druids, lifting up their hands to heaven, and pouring forth the most dreadful imprecations. The soldier stood astonished with the novelty of the sight. His limbs grew torpid, and his body remained motionless, resigned to every wound. At length, animated by their leader, and rousing one another not to be intimidated with a womanly and fanatic band, they displayed their ensigns, overthrew all who opposed them, and flung them into their own fires. After the battle, they placed garrisons in the towns, and cut down the groves consecrated to the most horrible superstitions: for the Britons held it right to sacrifice on their altars with the blood of their captives, and to consult the gods by the inspection of human entrails." There are no traces of any Roman works left in this country, Their stay was so short, that they had not time to form any thing permanent.

Near the ferry of Moel y Don appear the fine woods of Sir Nicholas Bayley, skirting the Menai for a considerable way. The wooded part of the island is on this side. It commences at Llanidan, and recals the ancient British name of Anglesey, *Ynys Dywyll*, or the *Dark Island*, on account of the deep shade of its groves: but at present it is (except in this part) entirely divested of trees; and the climate so averse to their growth, that in most parts it is with great difficulty the

Anglesey. the gentry can raise a plantation round their houses. Plas Newydd, the seat of Sir Nicholas Bayley, lies close upon the water, protected on three sides by venerable oaks and ashes. The view up and down this magnificent river-like strait is extremely fine. The shores are rocky; those on the opposite side covered with woods; and beyond soar a long range of Snowdonian Alps. Here stood a house built by Gwenllian, a descendant of Cadrod Hardd. The mansion has been improved, and altered to a castellated form by the present owner.

In the woods are some very remarkable druidical antiquities. Behind the house are to be seen two vast cromlechs. The upper stone of one is 12 feet 7 inches long, 12 broad, and four thick, supported by five tall stones. The other is but barely separated from the first; is almost a square of five feet and a half, and supported by four stones. The number of supporters to cromlechs is merely accidental, and depends on the size or form of the incumbent stone. These are the most magnificent we have, and the highest from the ground; for a middle-sized horse may easily pass under the largest. In the lands of Llugwy, indeed, there is a most stupendous one of a rhomboidal form. The greatest diagonal is $17\frac{1}{2}$ feet, the lesser 15, and the thickness three feet nine inches; but its height from the ground is only two feet: it was supported by several stones. The Welsh, who ascribe every thing stupendous to our famous British king, call it *Arthur's Quoit*. In the woods at this place are some druidical circles nearly contiguous to each other.

At a small distance from Beaumaris, on the shore, stand the remains of Llanvaes, or the Friars. It was founded by Prince Llewelyn ap Jerwerth, and, according to the general tradition of the country, over the grave of his wife Joan, daughter of King John, who died in 1237, and was interred on the spot. Here also were interred a son of a Danish king, Lord Clifford, and many barons and knights who fell in the Welsh wars. It was dedicated to St Francis, and consecrated by Howel bishop of Bangor, a prelate who died in 1240. The religious were Franciscans, or minor friars. Their church and house were destroyed, and their lands wasted, in the insurrection made soon after the death of Llewelyn, last Welsh prince, by his relation Madoc. Edward II. in consideration of their misfortunes, remitted to them the payment of the taxes due to him, which before the war were levied at the rate of 12l. 10s. These friars were strong favourers of Owen Glendwr. Henry IV. in his first march against Owen, plundered the convent, put several of the friars to the sword, and carried away the rest; but afterwards set them at liberty, made restitution to the place, but peopled it with English recluses. It possibly was again reduced to ruin; for Henry V. by patent, establishes here eight friars, but directs that only two should be Welsh. At the dissolution, Henry VIII. sold the convent and its possessions to one of his courtiers. They became in latter days the property of a family of the name of *White* (now extinct), who built here a good mansion. It of late became, by purchase, the property of Lord Bulkeley. The church is turned into a barn, and the coffin of the princess Joan now serves for a watering trough. A little farther is Castell Aber Llienawg, a small square fort, with the remains of a little round tower at each corner. In the middle stood a square tower. A fosse surrounds the whole. A hollow way is carried quite to the shore, and at its extremity is a large mound of earth designed to cover the landing. This castle was founded by Hugh Lupus earl of Chester, and Hugh the Red earl of Shrewsbury, in 1098, when they made an invasion, and committed more savage barbarities on the poor natives, especially on one Kenred a priest, than ever stained the annals of any country. Providence sent Magnus king of Norway to revenge the cruelties. His coming was to all appearance casual. He offered to land, but was opposed by the earls. Magnus stood in the prow of his ship, and calling to him a most expert bowman, they at once directed their arrows at the earl of Shrewsbury, who stood all armed on the shore. An arrow pierced his brain through one of his eyes, the only defenceless part. The victor, seeing him spring up in the agonies of death, insultingly cried out in his own language, *Leite loupe*, "Let him dance." This fort was garrisoned so lately as the time of Charles I. when it was kept for the parliament by Sir Thomas Cheadle; but was taken by Colonel Robinson in 1645. Anglesey.

Above Llandonna is a high hill, called *Bwrrd Arthur*, or Arthur's round table: the true name was probably *Din* or *Dinas Sulwy:* for a church immediately beneath bears that of *Llanvihangle Din-Sulwy*. On the top of it is a great British post surrounded by a double row of rude stones with their sharp points uppermost; and in some parts the ramparts are formed of small stones. In the area are vestiges of oval buildings; the largest is formed with two rows of flat stones set on end. These had been the temporary habitations of the possessors. It had been a place of vast strength: for, besides the artificial defence, the hill slopes steeply on all sides, and the brink next to the ramparts is mostly precipitous. It is worth while to ascend this hill for the sake of the vast prospect, and intermixture of sea, rock, and alps, most savagely great.

About two miles south of Plas Gwyn, the seat of Paul Panton, Esq. was situated Penmynnydd, once the residence of the ancestors of Owen Tudor, second husband to Catherine of France, queen dowager of Henry V.; "who beyng (as honest Halle informs us) young and lustye, folowyng more her own appetyte than frendely consaill, and regardyng more her private affection than her open honour, toke to husband privily (in 1428) a goodly gentylman, and a beautiful person, garniged with manye godly gyftes both of nature and of grace, called *Owen Teuther*, a man brought forth and come of the noble lignage and auncient lyne of Cadwalader, the last kynge of the Britonnes." The match, important in its consequences, restored the British race of princes to this kingdom: These reigned long, under the title of the House of Tudor; the mixed race having ceased on the accession of Henry VII. grandson to our illustrious countryman. The remains of the residence of the Tudors are, the door of the gateway: part of the house, and the great chimneypiece of the hall, are to be seen in the present farm-house. Some coats of arms, and dates of the building or time of repairs, are to be seen, with the initial letters of the names of the owners. The Tudors, for a considerable space before the extinction of their race, assumed the name of *Owen*. Richard

Anglesey. was the last male of the family, and was sheriff of the county in 1657. Margaret, heiress of the house, married Coningsby Williams, Esq. of Glan y gors, in this island, who possessed it during his life. It was afterwards sold to Lord Bulkeley, in whose descendant it still continues. In the church of Penmynndydd is a most magnificent monument of white alabaster, removed at the dissolution from the abbey of Llanvaes to this place; probably erected in memory of one of the House of Tudor, who had been interred there. On it is the figure of a man in complete armour, a conic helm, and mail guard down to his breast; his lady is in a thick angular hood; their feet rest on lions, and their heads are supported by angels.

On the western point of the bay is a small cape, flat at top, called *Castell Mawr*, joined to the land by a low isthmus. It is composed of limestone, which is carried to distant parts in small vessels, which lie in a small channel near the rock, and by their numbers frequently enliven the view. Roman coins have been found in this neighbourhood; but there are no vestiges of there having been any station. Beyond Castlemawr, on the shore, are vast blocks of black marble filled with shells, coralloids, and fungitæ.

At Trysclwyn mountain is the most considerable body of copper ore perhaps ever known. The part of Trysclwyn which contains it is called *Parys mountain*. Of this mountain, and the works there carried on, we have the following very curious and particular account by Mr Pennant*:—"The external aspect of the hill is extremely rude, and rises into enormous rocks of coarse white quartz. The ore is lodged in a bason, or hollow, and has on one side a small lake, on whose waters, distasteful as those of Avernus, no bird is known to alight. The whole prospect of this tract has, by the mineral operations, assumed a most savage appearance. Suffocating fumes of the burning heaps of copper arise in all parts, and extend their baneful influence for miles round. In the adjacent parts vegetation is nearly destroyed: even the mosses and lichens of the rocks have perished; and nothing seems capable of resisting the fumes but the purple melic grass, which flourishes in abundance. It is thought that the ore had been worked in a very distant period. Vestiges of the ancient operations appear in several parts, carried on by trenching, and by heating the rocks intensely, then suddenly pouring on water, so as to cause them to crack or scale; thus awkwardly supplying the use of gunpowder. Pieces of charcoal were also found, which proves that wood was made use of for that purpose. As the Britons imported all works in brass, it is certain that the Romans were the undertakers of these mines; and it is very probable that they sent the ore to Caerhen to be smelted, the place where the famous cake of copper was discovered. They might likewise have had a smelting hearth in this island; for a round cake of copper was discovered at Llanvaethlle, a few miles from this place. Its weight was fifty pounds, and it had on it a mark resembling an *L*.

* *Tour in Wales*, II. 236.

"In the year 1762, one Alexander Frazer came into Anglesey in search of mines. He visited Parys mountain; called on Sir Nicholas Bayley, and gave him so flattering an account of the prospect, as induced him to make a trial, and sink shafts. Ore was discovered; but before any quantity could be gotten, the mines were overpowered with water. In about two years after, Messrs Roe and Co. of Macclesfield applied to Sir Nicholas for a lease of Penrhyn ddu mine in Caernarvonshire; with which they were, much against their wills, compelled to take a lease of part of this mountain, and to carry on a level, and make a fair trial. The trial was accordingly made; ore was discovered; but the expences overbalanced the profits. They continued working to great loss; and at length determined to give the affair up. They gave their agent orders for that purpose: but he, as a final attempt, divided his men into ten several companies, of three or four in a partnership, and let them sink shafts in various places, about eight hundred yards eastward of a place called the *Golden Venture*, on a presumption that a spring, which issued from near the place, must come from a body of mineral. His conjecture was right; for in less than two days they met with, at the depth of seven feet from the surface, the solid mineral, which proved to be that vast body which has since been worked to such advantage. The day that this discovery was made was March 2. 1768: which has ever since been observed as a festival by the miners. Soon after this discovery, another adventure was begun by the reverend Mr Edward Hughes, owner of part of the mountain, in right of his wife Mary Lewis of Llys Dulas; so that the whole of the treasure is the property of Sir Nicholas Bayley and himself. The body of copper ore is of unknown extent. The thickness has been ascertained in some places by the driving of a level under it, several years ago, and it was found to be in some places twenty-four yards. The ore is mostly of the kind called by Cronsted, *Pyrites cupri flavo-viridescens*, and contains vast quantities of sulphur. It varies in degrees of goodness; some of it is rich, but the greater part poor in quality.

Anglesey.

"There are other species of copper ore found here. Of late a vein of the *Pyrites cupri griseus* of Cronsted, about seven yards wide, has been discovered near the west end of the mountain: some is of an iron gray, some quite black; the first contains sixteen lb. of copper per 100lb.; the last forty. An ore has been lately found, in form of loose earth, of a dark purplish colour; and the best of it has produced better than eight in twenty. Some years ago, about thirty pounds of native copper were found in driving a level through a turbery; some was in form of moss, some in very thin leaves.

"It is quarried out of the bed in vast masses; is broken into small pieces; and the most pure part is sold raw, at the rate of about 3l. to 6l. per ton, or sent to the smelting-houses of the respective companies to be melted into metal. Mr Hughes has great furnaces of his own at Ravenhead near Liverpool, and at Swansea in South Wales. An idea of the wealth of these mines may be formed, by considering that the Macclesfield Company have had at once fourteen thousand tons of ore upon bank, and Mr Hughes thirty thousand.

"The more impure ore is also broken to the size of about hens eggs; but in order to clear it from the quantity of sulphur with which it abounds, as well as other adventitious matter, it must undergo the operation of burning. For that purpose it is placed between two parallel walls of vast length: some kilns are 20, others

Anglesey. 40, and 50 yards in length; some 10, others 20, feet wide, and above four feet in height. The space between is not only filled, but the ore is piled many feet higher, in a convex form, from end to end. The whole is then covered with flat stones, closely luted with clay; and above is placed a general integument of clay, and small rubbish of the work, in order to prevent any of the fumes from evaporating. Of late, some kilns have been constructed with brick arches over the ore, which is found to be the best method of burning. Within these few years, attempts are made to preserve the sulphur from flying away; and that is done by flues made of brick, whose tops are in form of a Gothic arch, many scores of feet in length. One end of these opens into the beds of copper which are to be burnt. Those beds are set on fire by a very small quantity of coal, for all the rest is effected by its own phlogiston. The volatile part is confined to, and directed to the flues; in its course the sulphureous particles strike against their roofs, and fall to the bottom in form of the finest brimstone; which is collected and carried to adjacent houses, where it is melted into what is called in the shops *stone brimstone*.

"The beds of copper, thus piled for burning, are of vast extent. Some contain 400 tons of ore, others 2000. The first require four months to be completely burnt, the last near ten. Thus burnt, it is carried to proper places to be pressed, or washed, and made merchantable. By this process the ore is reduced to a fourth part in quantity, but considerably improved in quality: and by this means the water is strongly or richly impregnated with copper, which is dissolved by the acid quality of the sulphur; and is collected or precipitated again by iron in the above-described pits. The iron is also dissolved.

"But a far richer produce of copper is discovered from the water lodged in the bottom of the bed of ore, which is highly saturated with the precious metal. This is drawn up, either by means of whimsies or windmills, to the surface, and then distributed into numbers of rectangular pits 36 feet long, some pits more some less, 12 to 15 feet broad, and 20 inches deep. To speak in the language of the adept, Venus must make an assignation with Mars, or this solution will have no effect. In plain English, a quantity of iron must be immersed in the water. The kind of iron is of no moment; old pots, hoops, anchors, or any refuse, will suffice; but of late, for the convenience of management, the adventurers procure new plates, four feet long, one and a half broad, and three quarters of an inch thick. These they immerse into the pits. The particles of copper instantly are precipitated by the iron, and the iron is gradually dissolved into a yellow ochre. Great part of it floats off by the water, and sinks to the bottom. The plates, or the old iron (as it happens), are frequently taken out, and the copper scraped off; and this is repeated till the whole of the iron is consumed. The copper thus procured differs little from native copper, and is prized accordingly, and sold for prices from 25l. to 45l. a ton.

"This discovery is far from new: it has been practised long in the Wicklow mines in Ireland; and above a century in those of Hern-grundt in Hungary, where it is called *ziment copper*. The waters of the Hungarian mines are much more strongly impregnated with copper than those of Parys mountain. The first effects its operation in about 12 or 20 days, the last requires two months. Horse shoes, iron made in shape of hearts and other forms, are put into the foreign waters; and when perfectly transmuted, are given as presents to curious strangers. Anglesey.

"The ore is not got in the common manner of mining, but is cut out of the bed in the same manner as stone is out of a quarry. A hollow is now formed in the solid ore open to the day, and extends about 100 yards in length, about 40 yards in breadth, and 24 yards in depth. The ends are at present undermined, but supported by vast pillars and magnificent arches, all metallic; and these caverns meander far under ground. These will soon disappear, and thousands of tons of ore be gotten from both the columns and roofs. The sides of this vast hollow are mostly perpendicular, and access to the bottom is only to be had by small steps cut in the ore; and the curious visitor must trust to them and a rope, till he reaches some ladders, which will conduct him the rest of the descent. On the edges of the chasms are wooden platforms, which project far; on them are windlasses, by which the workmen are lowered to transact their business on the face of the precipice. There suspended, they work in mid air, pick a small place for a footing, cut out the ore in vast masses, and tumble it to the bottom with great noise. In such situations they form caverns, and there appear safely lodged till the rope is lowered to convey them up again. Much of the ore is blasted with gunpowder, eight tons of which are said to be annually used for the purpose.

"Nature hath been profuse in bestowing her mineral favours on this spot: for above the copper ore, and not more than three quarters of a yard beneath the common soil, is a bed of yellowish greasy clay, from one to four yards thick, containing lead ore, and yielding from 600 to 1000 pounds weight of lead from one ton; and one ton of the metal yields not less than 47 ounces of silver. Mixed with the earth, are frequently certain parts of the colour of cinnabar. Whether these are symptomatic of the sulphureous arsenical silver ores or of quicksilver, I will not pretend to decide. Something interferes with the successful smelting of this earth in the great; insomuch that it has not yet been of that profit to the adventurers which might reasonably be expected from the crucible assays of it; and they have at this time about 8000 tons on bank undisposed of. This place has been worked for lead ore in very distant times. In the bottom of the pool was found an ancient smelting hearth of grit stone, and several bits of smelted lead, of about four inches in length, two in breadth, and half an inch thick.

"These works have greatly added to the population of the island: for about 1500 persons are employed; who, with their families, are supposed to make near 8000 persons, getting their bread from these mines. The little village of Amlwch, the port of the place, is increasing fast, and the market grows considerable. At the season of the greatest work, Mr Hughes's men alone receive for many weeks 200l. in one week, and 150l. in another, merely for subsistence. The port is no more than a great chasm between two rocks, running far into land, and dry at low water; into

Anglesey, Angling.

into which sloops run, and lie secure to receive their lading."

Near Kemlyn bay is a quarry of marble, common to this place, some parts of Italy, and to Corsica, and known in the shops by the name of *Verdi di Corsica*. It colours are green, black, white, and dull purple, irregularly disposed. In different blocks one or other of the colours is frequently wanting; but among the green parts are oftener found narrow veins of a most elegant and silky white asbestos. It is a compound species of marble: part is calcareous, and may be acted on by nitric acid. The green parts partake of the nature of jasper. It is apt to be intersected by small cracks, or by asbestine veins, therefore incapable of taking a high polish. This quarry lies on the lands of Monachty, in the parish of Llan-Fair-Ynghornwy; and it is found again in the isle of Skerries, off this parish. Neither the quarry nor the asbestos are at present in use. In Rhoscolyn parish, a green amianthus, or brittle asbestos, is met with in great plenty in a green marble similar to the above; but by reason of the inflexible quality of its fibres not applicable to the same use. See ANGLESEY, SUPPLEMENT.

ANGLING, among sportsmen, the art of fishing with a rod, to which are fitted a line, hook, and bait. See *FISHING-Rod*, *FISHING-Hook*, *FISHING-Fly*.

The angler's first business is to attract the fish to the place intended for angling. The method of doing this, in standing waters, by throwing in grains, chopped worms, and the like, is well known: but the chief difficulty is in running rivers and brooks. The method, in this case, is to prepare a tin box capable of holding some hundreds of worms, bored on all sides, and full of holes of such a size as they may be just able to crawl out at; there must be a plummet fastened to this box to sink it, and a line to draw it back at pleasure; in this case it is to be thrown into the water in a proper place, above which the angler may stand under cover. The worms will slowly and gradually crawl out of this box, and the fish will be gathered about to feed on them; the baited hook is to be thrown in higher up and carried down by the stream. If this method do not bring the fish about the place in a little time, there is reason to suspect that some pike lies lurking thereabout, and deters them: in this case, it is proper to throw out a baited hook, and he will generally be taken; after this the attempt will succeed.

When the angler takes his stand, he is to shelter himself under some tree or bush, or stand so far from the brink of the water that he can only discern his float; as the fish are timorous and easily frightened away. The angling rod must be kept in a moderate state, neither too dry nor too moist: in the first case, it will be brittle; in the other, rotten. When pastes are used, it is proper to mix a little tow with them, and rub them over with honey; finally, a small anointing with butter is of great use to keep them from washing off the hook. The eyes of any fish that is taken are an excellent bait for almost any other kind of fish. The best way of angling with the fly is down the river, and not up; neither need the angler ever make above half a dozen of trials in one place, either with fly or ground bait, when he angles for trout: by that time the fish will either offer to take, or refuse the bait and not stir at all.

In a pond, the best place for the angler to take his stand is usually that where the cattle go up into water: in rivers, if breams are fished for, it should be in the deepest and most quiet places; if eels, under the banks of rivers that hang over; perch are to be expected in clean places, where the stream is swift; and chub in deep shaded holes: roach are mostly found where the perch are, and trout only in swift and clear streams. Places where there are many weeds, or old stumps of trees, harbour fish in great numbers, and they usually bite freely there; but there is danger of entangling the line, or fastening the hook to the weeds. In case of this accident, recourse is to be had to a ring of lead, of about six inches round, fastened to a small packthread: this ring is to be thrust over the rod, and let fall into the water. It will descend to the place where the hook is entangled; and then, by pulling the packthread gently, the hook will be soon disengaged, or at the worst it can only be broke off near the end of the line; whereas, when this is not employed, the rod itself is sometimes broken, or the line nearer its upper end.

Angling || Anglus.

Deep waters are best for angling in, for the fish do not love to be disturbed by wind and weather.

The openings of sluices and mill dams always bring fish up the current to seek for the food which is brought with the stream; and angling in these places is usually successful.

The best season is from April to October; for, in very cold stormy weather, the fish will not bite; the best times of the day are from three till nine in the morning, and from three in the afternoon till sunset. In an easterly wind, there is never much sport for the angler; the southerly winds are the best for his purpose, and a warm but lowering day is most of all to be chosen; a gentle wind, after a sudden shower, to disturb the water, makes a very good opportunity for the angler: the cooler the weather in the hottest months, the better; but in winter, on the contrary, the warmer the day the better. A cloudy day, after a bright moonlight night, is always a good day for sport; for the fish do not care for going after prey in the bright moonshine, and are therefore hungry the next morning.

Those who are fond of angling might save themselves some fruitless trouble, by observing when small fish in a jar take or refuse food. See FISH.

The several methods of angling for salmon, trout, carp, tench, perch, pike, dace, gudgeon, roach, flounder, &c. may be seen under the article FISHING.

ANGLO-CALVINISTS, a name given by some writers to the members of the church of England, as agreeing with the other Calvinists in most points except church government.

ANGLO-Saxon, an appellation given to the language spoken by the English Saxons; in contradistinction from the true Saxon, as well as from the modern English.

ANGLUS, THOMAS, an English priest, well known for the singularity of his opinions, and several little tracts which he wrote in the 17th century. He went by several names. Mr Baillet says his true name was *White*; but that he used to disguise it under that of *Candidus*, *Albus*, *Bianchi*, and *Richworth*; but he was most known in France by the name of *Thomas Anglus*.

Des

Anglus || Angola.

Des Cartes generally called him Mr *Vitus*. He passed some time in most countries of Europe; but his longest stay was at Rome and Paris. When he was in England, he lived a considerable time in the family of Sir Kenelm Digby; and seems to have had a great esteem for the opinions of this gentleman, as may be seen in his writings, particularly in the Preface to his Latin work concerning the Institutions of the Peripatetic Philosophy, according to the hypothesis of Sir Kenelm. He was a great advocate for the Peripatetic philosophy. He attempted even to make the principles of Aristotle subservient to the explaining the most impenetrable mysteries of religion; and with this view he engaged in the discussion of predestination, free will, and grace. Mr Baillet says, "What he wrote upon this subject resembles the ancient oracles for obscurity." In such abstruse points as we have mentioned, he was much embarrassed; and, by giving too great scope to his own thoughts, he pleased neither the Molinists nor Jansenists. He is allowed, however, to have been a man of an extensive and penetrating genius. On the 10th of June 1658, the congregation of the Index Expurgatorius at Rome condemned some treatises of Thomas Anglus. The doctors of Douay censured also 22 propositions extracted from his Sacred Institutions. He published his *Supplicatio postulativa justitiæ*, in opposition to their censure; wherein he complains that they had given him a vague undetermined censure, without taxing any particular proposition. He died some time after the restoration of Charles II. but in what year is uncertain.

ANGOL, a city of Chili in South America, now in ruins. W. Long. 72. 59. S. Lat. 37. 36.

ANGOLA, a kingdom on the western coast of Africa, lying, according to the most probable accounts, between Lat. 8. 30. and 16. 21. S. forming a coast of upwards of 480 miles; but how far it extends from west to east, has never been exactly determined. Angola Proper is bounded on the north by the river Danda, which separates it from Congo; and on the south by the Coanza, by which it is separated from Benguela. This last, however, is now included in the kingdom of Angola, having been conquered by its monarchs, though it still retains the name of a kingdom, and is included in the dimensions we have just now given. The air here is very hot and unwholesome, and the country mountainous; there being but few plains to be met with in it, except on the sea-coast, and between the huge ridges of mountains.

1 Originally a province Congo.

That part of the kingdom which we have distinguished by the name of *Angola Proper*, was subject to the kings of Congo in the year 1484, when the Portuguese first discovered the country: but how long it had been so before that time, is not known; the inhabitants being utterly destitute of chronology, and having no other way of distinguishing past events, but by saying they happened in such a king's reign. Neither, though Angola became a distinct kingdom since its discovery by the Portuguese, is it known with more certainty at what time that revolution happened; or whether the Portuguese were not concerned in assisting the viceroy of the king of Congo, who governed the province of Angola, to set up for himself.

All accounts agree, that this kingdom was founded by one *Ngola* or *Angola*, from whom it took its name. According to the tradition of the country, this Ngola was a smith, and the inventor of that trade, in which he had been instructed by the demons of the country. In consequence of this, he became exceeding rich, not in gold, silver, or shell money, which were not at that time in use, but in corn, cattle, and fruits, which were then exchanged in traffic. The country being not long after visited by a grievous famine, Ngola generously relieved his distressed countrymen, and saved the lives of some thousands. In gratitude for this generosity, he was unanimously chosen king: and hence the smith's trade is reckoned among the royal arts of Angola.

Angola.

2 Tradition concerning its becoming a distinct kingdom.

According to other accounts, which can be more depended upon, Ngola was the king of Congo's viceroy; who, having become powerful by the reduction of several of the neighbouring states, was induced to set up for himself. Dreading, nevertheless, the power of his old master, he chose to send him the usual tribute and presents annually, till he reckoned himself firmly seated on the throne, and had secured it to his descendants. His measures were greatly facilitated by the wars which the king of Congo was then engaged in with the *Giagas*, a barbarous nation in the neighbourhood. These made such a powerful inroad into his dominions that he was glad to ask asssistance from Ngola; not as a subject, but as a friend and ally. This was readily granted; and the two monarchs continued ever after sending presents and assistance to each other, and encouraging a mutual commerce between their subjects.

3 More authentic account.

Ngola lived to a great age, highly respected by his subjects, and in alliance with the king of Congo and the Portuguese, whose numerous settlements on the coast had made them become very powerful. According to the custom of the country, he had many wives and concubines. By his chief favourite he had three daughters, *Zunda Riangola*, *Tumba Riangola*, and another whose name is unknown. Towards the latter part of his life, the king's chief care was to secure the crown to the eldest of these; for which purpose he consulted his beloved queen, who encouraged him in the design with all the eloquence in her power. By her advice, he sent for his lieutenant-general, a favourite slave, whom he had created viceroy over the whole kingdom to acquaint him with his resolution. The artful minister did not fail to applaud his design, though his intention was to defraud the princess, and seize the throne for himself. He accordingly took the opportunity, one day, when that princess and the whole court were employed in sowing their lands, to spread a report that the Angolic enemies had entered the kingdom, and were destroying every thing with fire and sword. In this confusion, the treacherous viceroy conducted the three princesses to the royal palace; and acquainting Ngola with the pretended danger, urged him to betake himself to a speedy flight. The frighted monarch, unable to stir with age, desired his minister to take the most proper means for his safety: whereupon, being a stout young fellow, he takes his majesty on his back, and carries him into a neighbouring wood; where he no sooner had him in a convenient place, than he stabbed him with a dagger. This stratagem was too shallow to remain long concealed; the murderer was quickly discovered, and many of the nobles rose in arms against him; but finding his party too strong to be opposed, they were at last obliged to submit, and suffer him

4 Ngola the first king.

5 Murdered by his prime minister, who seizes the throne.

Angola.

him quietly to ascend the throne, upon his publicly declaring that he had not seized it but with a view of securing it to the princess Zunda Riangola.

To this princess the usurper palliated his conduct in the best manner he could; and she had art enough to disguise her resentment so effectually, that he never discovered the smallest occasion for jealousy. At last, his sudden death gave Zunda an opportunity of ascending the throne peaceably; when she behaved with such moderation and justice, as to gain the love and affection of all her subjects. Her jealous temper prevented her from marrying; and, by giving too much way to it, she came at last to dread as rivals the two sons of her younger sister Tumba, and to form designs against their life. To accomplish her purposes, she ordered them to be brought to court, pretending to have them educated under her own eye. This was declined for some time; but at length the queen prevailed so far as to have the eldest sent to her; whom she no sooner got in her power than she caused him to be massacred, with all his attendants; only one escaping, all covered with wounds, to carry the dreadful news to the princess and her husband.

6 Death of the usurper, who is succeeded by Zunda Riangola.

7 Murders her nephew.

On hearing of this bloody act, the afflicted parents immediately sallied forth at the head of all their vassals. They were waited for by Queen Zunda at the head of a numerous army; but no sooner did her soldiers perceive the parents of the deceased prince, than they immediately abandoned the queen to their resentment. Tumba immediately rushed upon her sister, and stabbed her to the heart; after which, she commanded her entrails to be taken out, and thrown into the hole in which her son's body had been cast. Upon this Tumba was crowned queen of Angola, and invited her husband to participate with her in the management of public affairs. This offer he was too wise to accept; and Tumba, upon his refusal, resigned the crown into the hands of her surviving son, named *Angola Chilivagni*. He proved a great and wise prince, extending his dominions by conquest, and gaining the love of his subjects by the moderation and equity of his government.

8 Is herself murdered by her sister.

9 Dambi Angola a cruel tyrant.

He was succeeded by one of his younger sons, named *Dambi Angola;* who no sooner ascended the throne, than he put all his brethren to death, lest they should unite in favour of the eldest. The rest of his reign proved conformable to such a beginning. He was a monster of cruelty, avarice, lewdness, and perfidy. Death, however, in a short time, happily delivered his subjects from this tyrant; who, notwithstanding his infamous life, was buried with the greatest magnificence; and a mount was erected over his grave, consisting, according to the custom of the country, of a prodigious number of human victims which had been sacrificed to his ghost.

10 Ngola Chilivagni, his conquests.

Dambi Angola was succeeded by Ngola Chilivagni, a warlike and cruel prince. He conquered many nations, and made the most dreadful inroads into the kingdom of Congo, along the rivers of Danda, Lucalla, Zanda, and Coanza; whose waters were often tinged with the blood of thousands whom he massacred in his incursions. Notwithstanding these butcheries, Ngola Chilivagni showed such generosity to those who readily submitted to him, that he was sure to conquer, not only wherever he came, but wherever he seemed to direct his forces. At last, as if weary of conquest, he planted a tree on the banks of the Coanza, about eight leagues from Loanda San Paulo, as a boundary to his ravages. This tree the Portuguese called *Isanda* or *Isandaura;* and afterwards erected a fortress near it.

Angola.

11 Fancies himself a god.

The same folly and insolence which took place in the breast of Alexander the Great, on account of his rapid conquests, soon puffed up the mind of this petty African tyrant. Because he had conquered and ravaged some of the neighbouring countries, and brought under his subjection a few cowardly barbarians, he first fancied himself invincible, and then that he was a god. He demanded the same adoration and respect that was paid to their other deities; and with this demand his subjects were servile enough to comply. This pretended deity however, was forced to submit to the fate of other mortals, and died without leaving a successor behind him.

On the decease of Ngola Chilivagni, the states elected Ngingha-Angola-Chilombo-Kickasanda, great nephew to Queen Tumba's husband, as his successor. He proved such a rapacious and cruel tyrant, that his subjects universally wished for his death; which, luckily for them, soon happened. He was interred with the usual pomp and solemnities, particularly that of having a whole hetacomb of human victims sacrificed upon his grave. His son Bandi Angola, who succeeded him, proved yet a greater tyrant than his father; so that he soon became intolerable to his subjects. A general revolt ensued, in which his subjects called in the cannibal Giagas to their assistance. These immediately poured in like a band of hungry dogs hastening to feed upon a carcass; and having defeated and devoured the forces of the tyrant, besieged him in an inaccessible mountain; where, not being able to come at him, they resolved to reduce him by famine. Bandi Angola applied to the king of Congo for assistance. As it was the interest of that prince to hinder the ravenous Giagas from entering into the Angolic dominions, whence they could so easily pass into his own, he did not hesitate at granting his request; and ordered a strong reinforcement of the Portuguese, of whose valour he had a high opinion, and of whom he entertained a great number at his court, to march to the assistance of the king of Angola. The command of the army was given to one of the most experienced Portuguese officers; who, depending more on the handful of Europeans he had under his command than on the Congoese, attacked the rebels, though greatly superior in number; and having utterly defeated them, restored the king of Angola to his throne.

12 Revolt against Bandi Angola.

13 Quelled by the assistance of the king of Congo and the Portuguese.

This essential piece of service so endeared the Portuguese to Bandi Angola, that he took them into his service, and even into his council. Their general became a great favourite of the king, but much more so of his daughter, who conceived a violent passion for him. Unfortunately for them both, the amour was carried on with so little precaution on her part, that the king quickly discovered it; and immediately formed a resolution of exterminating the Portuguese all at once. Such violent measures, however, could not be concerted so privately but the princess got some intelligence of it; and having apprised her lover of his danger, he immediately withdrew into Congo, taking with him as many of his countrymen as he conveniently could. The king of Congo expressed such strong resentment against Bandi

14 The king's daughter falls in love with the Portuguese general;

15 who retires to Congo.

Angola. Bandi Angola for his ingratitude, that the Portuguese general would have probably prevailed upon him to declare war against Angola, had he not been obliged to defend his own dominions against a neighbouring prince who then made an invasion. This afforded that general a fair pretence of asking leave to return home; promising to come with such reinforcements as would enable the king of Congo to revenge himself for the affront put upon him by the Angolic monarch. His real intention, however, was to give the king of Portugal an opportunity of seizing upon the kingdom of Angola.

16 ays a plan r the con- uest of ngola be- ore the ing of ortugal. On his return to Lisbon, the Portuguese general having laid his plan before the king, it was so well relished, that an armament was ordered to be fitted out, well furnished with every necessary for building fortresses, &c. and a sufficient number of men. The wind proving favourable all the way back, the Portuguese soon arrived safe at Loanda San Paulo; whence the general dispatched a messenger to acquaint the king of Congo with his arrival, and to make him some rich presents. These were no sooner gone than the admiral sailed up the Coanza; and, landing without opposition in the kingdom of Angola, set about erecting a fortress in a convenient situation, which was completed in a few days.

The king being informed of the return of the Portuguese, and of their fortifying themselves on advantageous ground, gathered together a numerous army:

17 Defeats the Angolans. but his forces, though upwards of 100,000 in number, were utterly defeated by the Portuguese; and numbers killed, and many more carried into slavery. The admiral now ravaged the whole country, putting all to fire and sword, and making himself master of every advantageous spot of ground. The king, however, had still the good luck to escape all the stratagems that were laid for him; and once more got safe to his inaccessible fortress.

All this time Bandi Angola had himself tyrannized, and allowed his favourites to tyrannize, in such a manner, that his subjects were become no less weary of his government than when they formerly revolted. Being now exasperated beyond measure at the calamitous war of which he had been the occasion, they formed a design of putting an end to his life; and in order to draw him out of his retreat, where he wallowed in all manner of debauchery, they had recourse to the following stratagem: A deputation was sent, acquainting him with the revolt of one Cuculo Cabazzo; who, at the head of a numerous band, committed the most cruel ravages. They besought his majesty, either to levy a sufficient number of troops, and march in person against him, or to allow them to arm themselves against him. The credulous king complied with this last proposal; and granted them leave to raise what force might be thought necessary. Four days after, notice was sent to the king, that his subjects had attacked the rebels, and had been repulsed with loss; but that, if his majesty would but condescend to animate them with his presence, the sight of him would inspire them with such courage, that they would assuredly prove victorious. This had the desired effect; and the king set out a few days after, without any other precaution than his own guards, to head his army, which was encamped on the banks of the Lucalla. He no sooner appeared in view than all the chief officers came out to meet him; and having under pretence of paying their respects, gradually separated him from his guards, they fell upon him and dispatched him at once. Angola.

18 Bandi Angola murdered.

Bandi Angola was succeeded by his son Ngola Bandi, whose mother had been a slave, and whose title to the crown was consequently disputable, according to the laws of the country. Of this the new king being well apprised, thought proper to begin his reign by murdering every person who had opposed his election. He began with the *Tendula*, or commander of the king's rear guard; who, by his office, is the chief of the electors, and the person who governs the kingdom during the interregnum. Him he ordered to be put to death with all his family. These were followed by the principal officers of his father's court; all his concubines, together with their parents and near relations, whom he caused to be butchered; together with his half-brother, his father's son by a favourite concubine, and then but an infant. He did not spare even the son of his sister Zingha Bandi, whom she had by one of her paramours. The interest of his sister had contributed greatly to raise this tyrant to the throne; and his ingratitude, with the murder of her son, so exasperated her, that she swore to be revenged on him in the same way.

19 Cruelty of the new king.

20 Makes war on the Portuguese, and is reduced to great distress.

The Portuguese were the next objects of his resentment. These he so much dreaded on account of their valour and policy, that he immediately declared war, resolving not to lay down his arms till he had exterminated them to the last man, or driven them totally out of his dominions. His rashness, however, cost him dear. Myriads of the Angolic poltroons were overthrown by a handful of Portuguese; and the king himself was forced to fly, first into the island of Chiconda in the river Coanza, and then into the deserts of Oacco. Here his conquerors, out of great clemency, allowed him to live among the wild beasts, without any other sustenance than what the deserts afforded. He had the misfortune also to lose his queen and two sisters Cambi and Fungi who were taken prisoners by the Portuguese, but honourably treated.

The king being informed of this, sent an embassy to treat of their ransom and an exchange of prisoners. The proposal was readily agreed to; and the princesses were sent back, laden with presents. The king, however, refused to perform his part of the agreement, and thereby plunged himself into still greater difficulties. A new Portuguese viceroy being arrived about this time, Ngola was quite at a loss how to excuse the non-performance of his part of the treaty. At last he had recourse to his exasperated sister Zingha; and having excused, as well as he could, the murder of her son, proposed to send her on a splendid embassy to the viceroy. Having consented, but without forgetting her resentment, she set out, as plenipotentiary for the king of Angola, with a magnificent retinue; was received with all the honour due to her rank, and lodged in a splendid palace prepared for her.

21 His treachery.

22 Sends his sister Zingha on an embassy.

23 Her haughty behaviour.

At the first audience Zingha had of Don John (the Portuguese viceroy), she was greatly surprised to find a stately elbow chair prepared for him to sit upon, and for herself only a rich tapestry spread on the floor, with a velvet cushion embroidered with gold, and placed over against the chair of state. Dissembling her displeasure, however,

Angola. however, she beckoned to one of the ladies of her retinue, commanded her to lay herself down on her elbows and knees upon the carpet, and sat herself upon her back during the whole time of the audience. She behaved with such address and dignity, as to gain the admiration of the whole council. A proposal was made of entering into an alliance offensive and defensive with the king of Angola, provided he acknowledged himself the vassal of the king of Portugal, and submitted to pay a yearly tribute. To this Zingha replied, that such conditions were indeed fit to be imposed upon those who had been conquered by the sword; but not upon a great and powerful monarch, who only sought their friendship and alliance: upon which the treaty was concluded on both sides, without any other conditions than the exchange of prisoners. The audience being over, Don John took notice to Zingha, as he conducted her out of the hall, that the lady who had served her as a seat, continued still in the same posture; upon which she replied, That it did not become the ambassadress of a great monarch to make use of the same chair twice, so she looked upon her as a piece of cast-off goods not worthy of further notice.

Zingha was so taken with the honours done her by the Portuguese, and so intent upon observing the order, dress, arms, &c. of their troops, that she staid at Loanda a considerable time; during which she was instructed in the Christian religion, and consented to be baptized. Don John and his spouse were her sponsors; who dismissed her soon after, with all possible honours, and highly satisfied with her reception and success. At her return, she took care to have the articles ratified by her brother; who expressed his approbation of them, and the highest obligations to her. He even went so far as to desire the viceroy to send him some proper persons to instruct him in the Christian religion, which he said he was very desirous of embracing. This request was immediately granted; and Don Denis de Fiara, a negro priest, a native of Angola, was despatched, along with an officer of distinction, to stand godfather to the king. These met at first with a gracious reception: but when they came to talk of baptism, Ngola altered his tone, and told them it was too much below his dignity to receive it from the son of one of his slaves, and sent them both back. This was cried up by the courtiers as a princely act: but Zingha represented, that it could not fail to exasperate the viceroy; and tried all possible means to dissuade him from it, but in vain. He suffered, however, his other two sisters, Cambi and Fungi, to be baptized; which was performed in 1625, with a splendour suited to their dignity.

24 Embraces the Christian religion.

25 War again declared a gainst the Portuguese.

As no experience seems to have been a sufficient antidote against the innate folly of Ngola Bandi, he soon after took it into his head to make war on the Portuguese, and invaded some of their territories. This last action proved his ruin: his troops were all cut off, and himself forced to swim for his life to a small island in the Coanza, about a mile long, and two bow-shots in breadth; whither the Portuguese pursued and surrounded him; so that he had no other chance, but either to fall into their hands, or be devoured by the wild beasts with which the place swarmed. From both these dangers he was relieved by a dose of poison, given him, as was supposed, by his sister Zingha. Before this time, however, he had taken care to send his eldest son to the country of the Giagas, and put him under the care of one of their chiefs, called *Giaga Caza*, whom he besought to take care of him, and protect him from his aunt Zingha, as he rightly imagined she would not fail of attempting his life, in order to secure herself on the throne. Angola.

26 The king poisoned.

27 Zingha Bandi crowned queen.

Zingha Bandi was crowned queen of Angola, without opposition, in 1627.—She was a very artful woman, endowed with great presence of mind, firm in her resolutions, of an intrepid courage, and a great mistress in the art of dissimulation. She inherited a large share of her brother's jealous and cruel temper, to which she would not hesitate to sacrifice her nearest relations, if they gave her the least umbrage.—To this jealousy, therefore, she resolved to sacrifice her nephew, as well knowing he had a better title to the crown than herself. She made use of the most solemn oaths to draw him out of the hands of his guardian, protesting that she had accepted of the throne with no other view than to preserve it for him. But Giaga, being well acquainted with her temper, was proof against all her oaths and fair speeches.—Zingha, finding this method ineffectual, pretended a desire of resigning the crown to her nephew, to which she said she had no other objection, than that she was afraid he was yet incapable of assuming the reins of government. She therefore desired an interview with him, though ever so short, that she might satisfy herself in this particular, and promised to detain him no longer than Giaga should think necessary. Giaga thought there could be no danger in consenting to a short interview; and therefore sent the unfortunate prince to her, attended by a magnificent retinue. The cruel queen no sooner got him in her power, than she murdered him with her own hand, and caused his body to be thrown into the Coanza, ridding herself, by that inhuman act, of a dangerous rival, as well as revenging herself on her brother, as she had sworn to do, for the murder of her son.

28 She murders her nephew.

Zingha's next scheme was to rid herself of the Portuguese, who had established themselves in such a manner as to be almost entire masters of the country. They had built fortresses on every convenient spot that suited them, especially near her principal towns, which they could level with the ground with the greatest ease. They had engrossed all her commerce, were become very wealthy, and their numbers increased daily; so that they were dreaded not only by her subjects, but by all the neighbouring nations. As Zingha was of a martial temper, she did not long hesitate. She quickly made all necessary provisions, strengthened herself by alliances with the Giagas, and other idolatrous nations, and even with the Dutch and the king of Congo. With this combined force she attacked the Portuguese so suddenly and unexpectedly, that she gained some advantages over them: and the Dutch made themselves masters of San Paulo de Loanda, and soon after of some of the best provinces in the kingdom. This happened in the year 1641; and the Portuguese did not recover these places till the year 1648, when the Dutch were entirely driven out of Angola.

29 Declares war again the Portuguese.

30 Her bad success.

Zingha's successes proved still more short-lived. Her allies the Congoese were so completely overthrown, that they were forced to sue for peace; which the Portuguese did not grant till they had gained a sufficient

Angola.

ficient number of hostages, and obliged the Congoese to deliver up to them some considerable posts, upon which they immediately erected fortresses. Zingha's troops were now defeated in every battle; and these defeats followed one another so close, that she was soon abandoned, not only by her allies, but by her own troops. She was now constrained to abandon her dominions, and retire to some of the eastern deserts, whither the Portuguese did not think it worth while to follow her.

Zingha being reduced to such distress, the Portuguese, after giving her some time to ruminate on her situation, sent her proposals of peace, upon condition that she should become tributary to the crown of Portugal. This proposal she rejected with scorn; and let them know, that however her dastardly subjects might submissively and shamefully behave towards them, their queen disdained subjection to any foreign power. On this haughty answer, the Portuguese, to mortify her still more, set up a king in her place. The person they pitched upon was named *Angola Oarij*, or *Aaru*, who was of the royal family. Before he was crowned, the Portuguese obliged him to turn Christian; and he was accordingly baptized by the name of John. The new king, however, soon died of grief, at seeing himself so hardly treated by his masters the Portuguese. They quickly set up another, named *Philip;* who bore the yoke with more patience, and lived to the year 1660.

31 efuses to come tributary to iem.

32 hey set up king.

In the mean time Zingha, exasperated at seeing herself deprived of eleven of the best provinces in her dominions, and her authority in the remaining six greatly weakened, renounced the Christian religion, and embraced all the horrid and bloody customs of the Giagas, whom she outdid even in their own barbarity. —We have already hinted the barbarity of this nation in eating human flesh. In this Zingha not only joined them, but took pleasure in devouring the raw flesh of human victims, and drinking their blood while warm both at her sacrifices and at her public meals.—She affected a martial and heroic spirit, together with an utter aversion to the male sex; but, according to the Portuguese, maintained a number of the strongest and lustiest youths, in whose embraces she gave a full scope to her inclinations, and managed matters with such secrecy that her intrigues could never be discovered. At the same time she ordered many of her own sex to be ripped up, when their incontinency was manifested by their pregnancy; and their bodies with those of the infants to be cast to wild beasts.

33 Zingha's apostasy and horrid barbarity.

But what made her most admired, as well as dreaded, by her subjects, was a notion, that she had by various stratagems inculcated upon them, of her being able to penetrate into the most secret thoughts. To keep up this apprehension, she ordered the bones of her deceased brother to be brought from the island where he was poisoned, locked up in a chest covered with coarse plates of silver, and laid on a fine carpet upon a pedestal. A number of singhillos or priests were ordered to offer sacrifices to these bones, and to keep lamps continually burning before them. To this place she herself frequently repaired, to assist at those rites, which, as she gave out, and every body believed, engaged the spirit of the deceased to inform her of every thing that was done, said, or even designed, either in the kingdom or out of it.—To procure, however, as much real intelligence as possible, she kept vast numbers of spies all over the kingdom, who constantly gave her notice of what happened in their respective circles; and this she so cunningly improved to her own ends, that her subjects looked upon her as a kind of deity from whom nothing could be concealed.

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34 Her influence over the Giagas.

By such means as these, Zingha gained such authority over the Giagas, that they were ready, at the very first indication of her will, to follow her through the most dreadful dangers, and to engage in the most desperate enterprises. She now made many strenuous and daring efforts to drive out the Portuguese; but though she had, in all probability, more valour and skill than her enemies, their fire arms gave them such an advantage, that she was always defeated with great loss. Perceiving therefore the folly of attempts of this kind, she contented herself with making continual inroads into their country, carrying off or destroying every thing that fell in her way. Though she spared neither Europeans, nor blacks, who were subjects of the mock monarchs set up by the Portuguese, yet the case of the former was peculiarly dreadful when they happened to be taken prisoners. They were either roasted by a slow fire, or had their flesh cut off in pieces, and devoured before their faces, in the manner related by Mr Bruce of the Abyssinian oxen *. In this manner she infested the Portuguese territories for 28 years, scarce ever allowing them a moment's cessation of arms. Their mock kings were often obliged to shelter themselves from her fury in an inaccessible rock called *Maopongo;* and they themselves could never hope to enjoy their dominions with any kind of peace so long as this furious queen continued alive. They in vain exhausted all their politics either to reduce her by force, or to mollify her by presents and fair offers. The one she rejected with disdain, and always found means to baffle the other. Nor would she hearken to any terms, unless they consented to resign all their conquests. The refusal of this demand was so commonly followed by some marks of her resentment, that it was with the utmost difficulty the Portuguese could prevail on any body to carry their proposals to her; and as for Zingha, she disdained to make any to them, except those of the hostile kind. The terror of her arms procured her a free passage wherever she directed her course; all the inhabitants of a province making no less haste to abandon, than she to invade it. Thus she continued to advance, till at length she was got so far as the small island of Dangii in the river Coanza. The Portuguese now found themselves under the necessity of raising an army of negroes, in order to drive her out of it. Accordingly they surrounded the island, and intrenched themselves along the banks on both sides of the river; but while they were busy at their work, Zingha attacked them with such advantage, that she killed and wounded several hundreds of the blacks, and some of the white men. Elated with this advantage, she was preparing for another attack; when she perceived, to her surprise, that the Portuguese had drawn their lines so close, and raised them to such a height, that they overlooked her whole camp, and could fire upon her naked soldiers as if they shot at a mark.—Thus great numbers of her men were cut off, particularly her chief officers. The queen, now perceiving the

35 Her terrible ravages.

* See *Abyssinia.*

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danger of her situation, amused the Portuguese with proposals of an accommodation; and having obtained a truce for three days, crossed the river in the dead of the night, and led her forces to the province of Oacco. The next morning, the Portuguese, seeing no human creature upon the island, began to apprehend some new stratagem; but, upon landing some of their troops, they perceived themselves over-reached, and deprived of the fairest opportunity they ever had of forcing her to surrender at discretion.

36 Outwits the Portuguese.

Zingha staid no longer in that province whither she had retired, than till she was assured that the Portuguese were retired from the Coanza; and then, crossing that river once more, marched directly towards the kingdom of Metamba, which had been invaded by some of the neighbouring princes. The speed with which she led her forces thither, and recruited her army with multitudes of Giagas, who were all emulous of fighting under her banner, quickly enabled her to recover some of her territories in that kingdom. Beginning now to think herself successful, she again attacked the Portuguese; but was defeated with great loss, so as to be obliged to send for fresh troops. To complete her misfortunes, she received news that the Giaga Cassangi had taken the advantage of her absence, to enter the kingdom of Metamba with a numerous army, had carried off the greatest part of the inhabitants, destroyed all the fruits of the earth, plundered the towns of all that was valuable, and set fire to the rest, leaving that kingdom in a manner desolate. To add to all this, her troops, exasperated at the loss of their wives, children, and goods, which were carried to the farthest corner of Benguela, were all on the point of revolting.

37 Her complicated misfortunes.

38 The Portuguese send an embassy to her.

Notwithstanding these disasters, Zingha behaved with such resolution and address, that the Portuguese, who, according to character, had probably instigated the Giaga against her, were so much afraid of her joining with him in alliance against them, that they despatched one Anthony Coglio, a learned priest and an excellent negociator, with Don Gaspar Borgia an eminent officer, under pretence of negociating a peace between them, first to the Giaga, and afterwards to the queen. They met with a very civil reception from the first, who told them that he was very willing to live at peace with that princess, and even to let her enjoy the kingdom of Metamba, though he was the rightful heir to it, provided she would lay down her arms. This answer encouraged the priest to try whether he could prevail on him to embrace the Christian religion; but that was declined by the Giaga in such strong terms, that the priest thought proper to desist, and set out for Zingha's camp.

39 The proposals rejected.

The ambassadors, at their first arrival, met with such a polite reception, as made them hope for success; but after she had heard their proposals, she assumed a haughty threatening tone, and told them in the conclusion of her speech, "That it did not become her dignity to lay down her arms, till she had brought the war she had begun to an honourable conclusion: that as to the Giagas, whose sect she had embraced some years before, and who had furnished her with such a prodigious number of forces to fight in her defence, her honour and interest required that she should still keep them in her service, and under her protection: and lastly, that as to herself, she remembered, indeed, that she had formerly embraced Christianity; but that it was not now a proper season to propose her returning to it, and they ought to remember that they themselves were the cause of her abandoning it."

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Borgia, perceiving that she was not to be wrought upon by religious motives, shifted the topic; and told her, that she had gained honour enough in war, and that it was now high time to think of granting peace and tranquillity to the subjects of two such powerful kingdoms, and accept of the favour and friendship of the king of Portugal, which was offered her by his viceroy. To this the queen made answer, that she was perfectly well acquainted with the valour and strength of the Portuguese, and should esteem it an honour to be allied to that monarch; but that she thought it just that their respective claims to the dominions which she justly inherited from her ancestors, and of which he had unjustly deprived her, should first of all be decided, either by the sword or by some equitable judges.

Borgia, vainly imagining that he had now obtained enough, set off immediately for Loanda San Paulo; but left the priest, on some pretence or other, to see whether, in the time of sickness, he could make any impression on the inflexible mind of Zingha, who now laboured under a lingering disease. Coglio, however, found all his arts to no purpose; and, upon the queen's recovery, she commenced the war with more fury than ever.

40 Zingha's narrow escape.

For some time hostilities were carried on with various success; Zingha being sometimes victorious and sometimes defeated. In one attempt of the latter kind, before the fortress of Massangana, she not only lost a great number of men, but had her two sisters Cambi and Fungi taken prisoners, she herself escaping with the utmost difficulty. Exasperated by this loss, she led her troops into some of the best provinces of the Portuguese, and reduced them to a mere wilderness. Still, however, she had the mortification to find her losses vastly greater than what she gained; and had now the additional misfortune of losing her sister Fungi, who was put to death by the Portuguese for treachery, and seeing her allies the Dutch totally expelled out of Angola.

41 Begins to relent;

Zingha being thus oppressed with a complication of misfortunes, and conscious of the crimes she had committed, began seriously to consider whether such a continued series of disasters was not owing to the displeasure of the God of the Christians. To this opinion she seemed to have inclined; and therefore began to treat with more lenity such Christians as fell into their hands, especially if they happened to be priests or monks. To these she now began to listen with some attention; and ordered them under severe penalties, to be treated with all possible respect; yet, without losing in the least that invincible hatred she had conceived against those who had stripped her of her dominions, or dropping her resolution never to make peace till she had recovered them.

42 but still resists the artifices of the Portuguese.

The viceroy, Don Salvador Correa, who had driven out the Dutch, being apprised of the regard shown to the clergy by Queen Zingha, thought proper to send some capuchins to her, in hopes that they might now find her more tractable. But Zingha was still proof against

Angola. against their utmost art; observing, however, that if they would consent to restore what they had unjustly taken from her, she would not only return to the Christian religion, but encourage it to the utmost of her power.

The viceroy, being now afraid that Zingha might make an alliance against him with the king of Congo, first raised a powerful army, and then acquainted that monarch, that, if he designed to prevent the total ruin of his dominions, he must immediately make reparation for all the damage he had caused to the Portuguese by his alliance with the Dutch. The fame of the Portuguese valour so intimidated the king that he submitted to a treaty almost on the viceroy's own terms; and as soon as this treaty was concluded, Don Ruy Pegado, an old experienced officer, was despatched to Zingha, offering a firm and lasting alliance with her, provided she renounced the Giagan sect, and returned to the bosom of the church. To this embassy she returned the old answer, namely, that the Portuguese themselves had been the occasion of all that had happened; as they had not only stripped her of her hereditary dominions, but dared to proclaim one of her vassals king of Angola; but, provided these dominions were restored, she would immediately embrace Christianity.

43 Their infamous conduct. All this time the furious Queen Zingha went on with her ravages, notwithstanding the viceroy kept plying her with letters for near three years. At last he had recourse to the artifice of taking advantage of the remorse for her crimes with which Zingha was sometimes affected, in order to procure the peaceable enjoyment of his own ill-gotten conquests.

It is easy to see, that had this viceroy, or the priests he employed, really intended to convert Zingha to Christianity, they ought to have so far set her an example, as at least to abandon part of the countries of which they had robbed her: but, instead of this, they impiously made use of the sacred name of our Saviour, in order to deter a poor savage African from recovering what justly belonged to her.

44 She returns to Christianity. Queen Zingha, at last, came to incline so much to return to the Christian religion, that a general murmur ran through her army. But having, by various artifices, reconciled the minds of her subjects to this event, she explained her design in a set speech; offering at the same time liberty to those who chose to abandon her on this account to go where they would; and such was their attachment to her, that even on such a sudden and important change in her resolutions, they expressed no uneasiness, but on the contrary applauded her to the highest degree.

The Portuguese, after having been harassed in a terrible manner for 28 years, and at last obliged to profane the name of their Saviour to procure a peace, began now freely to enjoy the fruits of their villany. A

45 Treaty with the Portuguese proposed. treaty was set on foot between the viceroy and Zingha; which, however, was not easily concluded. She demanded the release of her sister Cambi, whose Christian name was Donna Barbara; and the Portuguese demanded a ransom of 200 slaves or an equivalent in money. This Zingha did not well relish; and, being pressed to a compliance, threatened them with a more furious war than any they had yet experienced. Upon this the viceroy was obliged to have recourse to the usual method of sending priests to persuade her to comply through motives of religion. These hypocrites effected their purpose; and the slaves were sent, as if Christianity required the delivering up innocent people to those who had no lawful authority over them; but not being able to conclude a lasting peace about the cession of the Angolic provinces, they were forced to conclude a short truce, and sent back her sister. Angola.

This princess was received by Zingha in a very affectionate manner: and, some time after, the queen, her mind being probably weakened through the infirmities of old age, not only was thoroughly reconciled to the Portuguese, but looked upon them as her best friends. She encouraged the Christian religion; had a church built in her capital; made several laws against Paganism; and, *to encourage marriage*, she herself wedded a handsome young fellow in the 75th year of her age.

The Portuguese now imagining they would at last gain their point, proposed to her the following terms, as the basis of a lasting treaty between the two nations. 46 The Portuguese terms. 1. "That they should yield to her, *as a present*, some of the countries of which they had already robbed her. 2. That, in consideration of the said present, which should in nowise be interpreted as an investiture, the queen should pay yearly a certain acknowledgment to the king of Portugal, who should be at liberty to withdraw the said present whenever she failed of making the said acknowledgment. 3. That a free commerce should be opened between those two states, as well for slaves as for other merchandises. 4. That the queen should molest none of the lords that were feudatory to the Portuguese, whatever damages or ravages they might have committed during the late wars between them. 5. That she should restore all the Portuguese slaves that had taken refuge in her dominions. 6. That she should deliver up the Giaga Colanda, who had revolted from the Portuguese, upon condition that his crime should go unpunished."

The queen, having now a thorough view of the deep-rooted villany of those with whom she had to do, conceived such displeasure against the Portuguese, that she fell sick. During this sickness, Father Anthony, her chief confidant, and a creature of the viceroy, never left off soliciting her to make her peace with God, and to accept of the terms offered her by the Portuguese: but Zingha, though worn out with age and sickness, had still the good sense to perceive, that there was no connexion between making her peace with God and complying with such infamous terms; and therefore 47 The queen's noble answer. gave the following answer, which, under such circumstances, shows a magnanimity scarce equalled in any age or in any country. 1. "That as to her conversion, as it was neither owing to any desire of obtaining a peace, or other worldly motives, but the Divine grace by which she was recalled, she was resolved to persevere in it to her last breath. 2. That as to her going over to the Giagan sect, she had in a great measure been forced to it by the Portuguese viceroy. 3. That the king of Portugal would do a generous act in restoring some of her Angolic dominions; but it would be more so, were he to restore them all. 4. That as to her paying homage to him, neither her mind nor heart were base enough to consent to it; and that as she had refused the proposal while she lived among the Giagas, much more did she think herself

above

Angola. above it now she was a Christian queen, and owed neither tribute nor homage to any but to the Supreme Power, from whom she had received both her being and her kingdom: That, nevertheless, if she could be convinced that there was any thing in her dominions that would be acceptable to his Portuguese majesty, she would voluntarily make him a present of it; and as to the rest of the articles, such was her desire of making a firm and lasting peace with them, that she should make no difficulty of consenting to them."

This answer was not altogether satisfactory to the viceroy; but the priest, finding it impossible to make any impression upon her mind, easily prevailed upon him to consent to the following terms: 1. "That the river Lucalla should be the boundary between the dominions of the Portuguese and of Queen Zingha. 2. That neither side should henceforth give any reception to the fugitive slaves of the other, but send them back without any delay, together with the prisoners which had been taken during the last year. 3. That the queen should remain wholly free and exempt from all tribute and homage whatever, provided she agreed to the other articles."

48 Articles of the treaty.

49 The peace signed.

These terms were at last signed by the queen and viceroy in the month of April 1657, and ratified by the king of Portugal in the month of November the same year.—The only difficulty the queen had concerning this treaty was with regard to the Giaga Colanda: and the manner in which she extricated herself from it, with her subsequent behaviour, cannot fail to give us a high idea of the mental abilities of this African heroine.

50 Zingha's honourable behaviour.

The Giagan chief, weary of the Portuguese yoke, had retired from them, at the head of 1000 stout soldiers, and a much greater number of slaves, some leagues beyond the river Lucalla, and put himself under the queen's protection. This she readily granted, as he was very able to be serviceable to her in case the perfidious conduct of the Portuguese should oblige her to renew the war. She could not therefore but look upon it as unjust and dishonourable, to deliver up a brave chief who had devoted himself to her service, and whom she had taken under her special protection, to a nation with whose perfidy she was so well acquainted. To save her honour, therefore, some time before the ratification of the treaty, she sent privately for the Giaga, and acquainted him with the demand of the Portuguese; telling him, at the same time, that though she doubted not of the viceroy's keeping his word, and forgiving his offence, yet she advised him to go out of her dominions, and settle himself and his men in some country distant from the Portuguese frontiers; but forbade him, on pain of her highest displeasure, to commit the least outrage or hostility within their dominions.

The Giaga thanked her majesty, and seemed to acquiesce with her advice, but did not follow it. On the contrary, he had no sooner reached his fortress, than he set himself about fortifying it in such a manner as looked rather like defiance than defence: and, having gathered a considerable army, soon spread a general terror around him. Of this the Portuguese failed not to complain to the queen: who immediately marched against him, surprised and defeated his army; and he

51 Defeats and kills the Giaga Colanda.

himself being killed in the action, his head was cut off and sent to the Portuguese. Angola.

This was among the last memorable actions performed by this famous queen; who, now finding herself unfit for the fatigues of war, contented herself (in 1658) with dispatching an old experienced general against a neighbouring prince who had invaded her territories. He proved no less successful than herself, and quickly forced the aggressor to submit to her terms. She now gave herself up to study the best method of propagating Christianity among her subjects; and for this purpose sent a solemn embassy to Rome, to pay homage to the Pope in her name, to request a fresh supply of missionaries. To this letter she received an answer from his Holiness in 1662; and it was read in the church that same year, in the most public and solemn manner. The day appointed was the 15th of July; on which she repaired to the church at the head of a numerous retinue, and having the letter hanging about her neck in a purse made of cloth of gold. The concourse was so great, that the church could not contain one half of the people, so that none were admitted but persons of rank. The father having finished the mass, read the letter at the altar in the Portuguese language; and the secretary interpreted it in that of the country. The queen, who had stood all the while it was reading, went towards the altar, and on her knees received it from the father; and having kissed it, and sworn afresh upon the gospel to continue in obedience to the church of Rome, kissed the letter again, put it into the purse, and returned to the palace amidst the shouts and acclamations of many thousands of her subjects. On that day she gave a magnificent treat to the Portuguese resident, and to all her court, in two great porticos, and she herself vouchsafed to eat after the European manner; that is, sitting on a stately elbow chair, with a high table before her, covered with the finest linen, and with dishes, plates, knives, and forks, all of silver gilt. She bestowed some largesses upon her chief officers, released a good number of slaves, and at night appeared at the head of her ladies of honour, both she and they dressed in the Amazonian manner. They performed a kind of combat, in which the queen, though upwards of eighty years of age, behaved with all the vigour and activity of a woman of thirty.

52 Encourages Christianity.

53 Ceremonie at receiving a letter from the pope.

Her life, however, was not lengthened in proportion to her vigour and activity; for in the month of September she was seized with an inflammation in her throat; which, in December, having seized her breast and lungs, she expired on the 17th of that month, and was succeeded by her sister Barbara.

54 Zingha dies.

The deceased queen was buried with extraordinary pomp; and out of regard to her, Barbara was inaugurated a second and third time, with the greatest pomp, and the most joyful acclamations. She was a very zealous Christian, but wanted her sister's abilities, and had the misfortune of being in the decline of life, lame, and almost blind. Besides this, she had been married to a proud ill-natured husband, named Mona Zingha: who, though to her he owed all his fortune and advancement, being himself no more than the son of a slave, used her with such cruelty, even in the late queen's life, that she was obliged to take refuge in the palace, from whence he had the insolence immediately to

55 Succeeded by her sister Barbara.

56 Cruelty of her husband Mona Zingha to her.

Angola. to fetch her. This so exasperated Queen Zingha, that she had well nigh ordered him to be cut in pieces before her face; but pardoned him at the request of Father Anthony, who probably knew he was privy to some religious secrets, which he might, in case of such emergency, have disclosed. On Barbara's accession to the throne, however, he not only redoubled his cruelty to her, in hopes of getting the management of affairs entirely into his own hands, but invented accusations against Anthony himself, with a design to extirpate both him and his religion. He gave out that the late queen had been poisoned by some favourite European dishes, with which Brother Ignatio used to regale her during her last illness; and attributed his wife's lameness and blindness to some sorceries or charms used by the convent against her. He had even persuaded, or rather forced, his queen to consent that some of the singhillos or priests should be brought to counter-charm her distemper.

57 He accuses Father Anthony:

58 Who reprimands the queen.

Father Anthony, far from being intimidated at the accusations brought against him, repaired immediately to the palace; where he boldly reprimanded the queen for giving ear to these jugglers, threatening at the same time to leave her dominions, and carry off with him all the crosses and other religious utensils, from which alone they could have any benefit. The queen returned a very submissive answer; and promised to deliver up the counter-charms which she at that time had upon her, before sunset; which she accordingly did, and sent them to the convent by the hands of her secretary. This so exasperated her husband, and all the Giagan sect, that they resolved upon the destruction of all the priests and Europeans, and even the queen herself. This, however, was found improper to be attempted; and Mona Zingha was so much chagrined at his disappointment, that he retired to his own estate; giving out, that he designed to meddle no more with state affairs; but, in reality, to concert measures for engrossing the sovereignty to himself, and to deprive his wife of her life and crown.

To accomplish his purpose, he sent a messenger to her, desiring her to repair to his house, where he had something of importance to communicate; but she declining the invitation by the advice of Father Anthony, he found himself disappointed, and begged leave to retire to a neighbouring province, which was under his government. He was again disappointed, and forbid to stir out of the province of Metamba. The queen was, however, guilty of an error not long after, in sending Mona Zingha, at the head of an army, to

59 Mona Zingha revives the Giagan rites;

quell a revolt on the frontiers. On his returning victorious, he thought himself strong enough to revive the ancient Giagan rites, and therefore ordered 100 slaves to be sacrificed to the manes of the deceased queen. Though the queen was immediately apprised of his intention, and dispatched a messenger expressly commanding him to desist; yet Mona, by distributing some presents, particularly some European wines, among the counsellors, effected his purpose with impunity. He did

60 and poisons Father Anthony.

not forget to send some of this wine to Father Anthony; but to prevent suspicion, presented him only with a small quantity, to be used, as he said, at the mass; adding, that if it proved agreeable, he would supply him with a larger quantity. The unsuspecting priest drank about two glasses of it; and in about a quarter of an hour was seized with violent convulsions in his bowels, and other symptoms of being poisoned. By proper assistance, however, he recovered: yet so far was he disabled by this dose, that he was obliged to abandon his mission. Angola.

61 The queen dies.

The queen's infirmities in the mean time daily increasing, Mona Zingha was soon delivered from all further opposition on her part, by her death, which happened on the 24th of March 1666. Upon this, Mona Zingha made all possible haste to get himself elected king; and immediately renounced the Christian religion, raising a persecution at the same time against its professors. He even wrote to the Portuguese viceroy, acquainting him with his having renounced Christianity, which he had only embraced out of complaisance to his queen, and with his design to revive the Giagan rites.

62 Cruelties of Mona Zingha.

To shew that he meant to be as good as his word, he ordered all the children under six years of age, that could be found, to be sacrificed in honour of their infernal deities. He also recalled the singhillos, and heaped many favours upon them; so that they became entirely devoted to his purposes. He likewise caused many of his subjects to be privately poisoned; and then gave out, that their unaccountable deaths were owing to their having abandoned the religion of their ancestors, and embraced Christianity; which he styled the religion of a parcel of famished strangers, who, through their extreme misery, had been forced to leave their native country, and seek for a livelihood in the richest provinces of Africa.

By these and such like stratagems he almost entirely extirpated Christianity, and any appearances of civilization which had been introduced among his subjects. His career, however, was stopped by Don John the princess Barbara's first husband, from whom she had been divorced on account of his having another wife. He soon compelled the usurper to fly into an island in the Coanza; but not having the precaution to reduce him entirely, Mona Zingha found means to retrieve his affairs, and at last defeated and killed Don John himself, by which he became master of the throne without any further opposition. He was no sooner re-established, than he began to pursue his butcheries with more fury than ever; when, on a sudden, Don Francisco, the son of Don John, appeared at the head of an army in

63 He is defeated and killed.

opposition to the usurper; and in the first engagement Mona Zingha being defeated and killed, Don Francisco became sole master of the empire.

It is not known whether this prince kept to the terms of the alliance made by Queen Zingha with the Portuguese or not. These, however, have preserved their conquests, and for some time they allowed the natives to choose a king for themselves, or rather they chose him for them, as we have already noticed. These

64 Low state of the kings set up by the Portuguese.

kings enjoyed only a mere shadow of royalty; their whole grandeur consisting in being allowed to breed peacocks, and adorn themselves with their feathers, which was forbidden to their subjects under pain of perpetual slavery. The last of these kings was named Ngola Sedesio, who disliking an empty name of royalty, revolted from the Portuguese, and carried on a long war with them; but being at last defeated and killed, his head was cut off, salted, and sent to Lisbon in pickle. After this the Portuguese seem not to have thought it safe to trust their Angolic subjects even with the

Angola, Angon.

the name of a king of their own, but have vested the power entirely in their viceroy; but, as to the extent of his dominions, and how matters stand between him and that race of Angolic princes who have preserved their liberty, we are entirely in the dark.

65 Division into provinces.

When in its greatest splendour, the kingdom of Angola contained the 17 following provinces: Chessama, Sumbi, Benguela, Rimba, Sietta, High and Low Bembea, Temba, Oacco, Cabezzo, Lubolo, Loanda, Bengo, Danda, Mosiche, Higher and Lower Ilamba, Oraij, and Embacca. The provinces conquered by the Portuguese during the wars above mentioned were, Danda, Mosiche, Bengo, the Higher and Lower Ilamba, Oraij, Embacca, Benguela, Sietta, Cabezzo, Lubolo, and

66 Rivers.

Oacco.

The principal rivers are those already mentioned, viz. the Danda and Coanza. The Coanza is large, deep, and rapid. It empties itself into the Atlantic ocean about latitude 9° 20′ south, twelve leagues south of Loanda the capital of the kingdom. It is navigable for 150 miles, and abounds with variety of fish. It forms several islands, has some cataracts, and one in particular which bears its name. As for its source, and the length of ground it crosses from east to west before it comes to the Portuguese settlements, it is absolutely unknown, as well as the countries through which it runs. Its mouth, which runs between the capes Palmerino and Lego, is above a league wide; the northern shore is the deepest, and along which the vessels sail. The fall of this river into the ocean is so rapid, that the sea appears quite muddy for two or three leagues below it. Its mouth is not easily perceived from the open sea, by reason of an island quite covered with high trees which lies just before it. The two principal islands formed by this river are called *Massander* and *Motchiamia*. The one is six leagues long, and about two miles broad: it is very fertile in maize, millet, and some other grains, which are reaped at three different seasons of the year. It produces likewise vast quantities of manhioc, a root of which they make a coarse kind of meal, which serves instead of bread. Here also grow great numbers of palm and other fruit trees of various kinds. The island of Motchiamia is four or five miles long, and one in breadth, mostly plain, and producing variety of roots and herbs. It likewise abounds in cattle; and there were formerly five or six Portuguese families settled upon it, who drove a considerable trade in those commodities, and likewise in slaves.

Concerning the river Danda we know little or nothing: only, that though its mouth is not above 70 or 80 miles distant from that of the Coanza, yet their distance grows so considerably wider as you penetrate further into the inlands, as to be much above twice if not thrice that space; though how much, is not exactly known.

The manners, religion, and dress, &c. of the inhabitants, are much the same with the Congoese. See CONGO.

ANGOLA *Pea*, or *Pigeon pea*. See CYTISUS, BOTANY *Index*.

ANGON, in the ancient military art, a kind of javelin used by the French. They darted it at a considerable distance. The iron head of this weapon resembled a fleur-de-luce. It is the opinion of some writers, that the arms of France are not fleurs-de-luce, but the iron point of the angon or javelin of the ancient French.

Angon || Angoy.

ANGOR, among ancient physicians, a concentration of the natural heat: the consequence of which is a pain of the head, palpitation, and sadness.

ANGOT, a province or kingdom of Abyssinia, formerly rich and fertile, but almost ruined by the Gallas, a wandering nation in the internal parts of Africa, who dispossessed the Abyssinian monarchs of all that was worth possessing.

ANGOULESME, a city of France, the capital of the former duchy of Angoumois, now the department of Charente, and the see of a bishop. It is seated on the top of a hill, surrounded with rocks, at the foot of which runs the river Charente. The inhabitants are said to be about 8000, and have a considerable trade in paper, which they manufacture. E. Long. 0. 14. N. Lat. 45. 39.

ANGOUMOIS, formerly a province of France, now a district, bounded on the north by Poitou, on the east by Limosin and Marche, on the south by Perigord, and on the west by Saintonge. Through this province run the rivers Touvre and Charente. This last is full of excellent fish; and though it often overflows its banks, it is so far from doing any damage, that it greatly enriches the soil. The Touvre is full of trouts. The air is generally warmer than at Paris, though the country is hilly. The soil produces plenty of wheat, rye, oats, Spanish corn, saffron, grapes, and all sorts of fruits. Here are several iron mines, which yield a very good sort of iron.

ANGOURA, ANGORA, or ANGORI, a city of Asia, in Anatolia, formerly called *Ancyra*, and still full of remarkable antiquities, which are so many marks of its ancient magnificence. It is at present one of the best cities in Anatolia; its streets are full of pillars and old marbles, among which are some of porphyry and jasper. The greatest part of the pillars are smooth and cylindrical; some are channelled spirally; but the most singular are oval, with plate bands before and behind from the top to the bottom of the pedestal. The houses are now made of clay, which is sometimes intermixed with fine pieces of marble. The walls of the city are low, with very mean battlements. The masonry of the walls is intermixed with pillars, architraves, capitals, and other ancient fragments, especially that of the towers and gates. The castle of Angora has a triple enclosure; and the walls are of large pieces of white marble, and a stone much like porphyry.

The basha of Angora has about 30 purses income; and there are here about 300 janizaries, under the command of a sardar. The Turks are said to be 40,000, the Armenians 4000 or 5000, and the Greeks 600. The Armenians have seven churches, besides a monastery, and the Greeks two. They breed the finest goats in the world; and their hair, which is of a dazzling white, is almost as fine as silk, and nine inches in length: it is worked into very fine stuffs, particularly camblet. All the inhabitants are employed in this manufacture. Several large caravans pass through this city to different places. E. Long. 32. 5. N. Lat. 39. 30. See ANCYRA.

ANGOY, a kingdom of Loango in Africa, bounded

Angoy. ed on the north by Cacongo, and on the south by Congo; from the former of which it is separated by the river Cabinda, and from the latter by the river Zaire. It is but of small extent; being only a vassal province of Cacongo, till the mani or prince, who had married a Portuguese's daughter, was persuaded by his father-in-law to make himself independent. This he effected at a favourable juncture, the king of Loango having but just before revolted from the king of Congo, and the king of Cacongo from the new king of Loango. The country is full of woods and thickets; and has no towns of any note, except one called Bomangoy, situated on the north bank of the Zaire, and not far from its mouth. Its chief port is Cabinda, called also Kabenda, or Cubenda, situated on the mouth of a river of the same name, about five leagues north of Cape Palmerino, on the north side of the Zaire's mouth. The bay is very commodious for trade, or wooding and watering along the shore. It is flat and marshy in some places; but ascends gradually about three miles inland, and then forms itself into a ridge of hills. On the ascent of these is situated a town belonging to the father-in-law of the king above mentioned, where he constantly kept a stock of wood ready cut, to sell to foreign ships at an easy rate. From these wood piles, south-west along the bay, lie scattered a number of fishermen's huts, on each side a small fresh-water river which falls into the bay; and thence all the water for ships is brought in casks to the mouth of the river, which is so shallow, that even at full flood it can only be entered by a yawl carrying a cask or two. The town stands on the round point of the bay looking to the westward; and the English have a factory on the south-west of the road.

The country round the bay is mostly barren; owing chiefly to the laziness of the inhabitants, which often occasions a scarcity of provisions. The wild beasts swarm so in the woods, that they destroy all the tame kinds; so there are no cattle bred here but hogs. From the woods in this country some monkeys have been brought away which in shape and stature resembled the human species. Civet cats abound here in great plenty, and parrots may be bought for three or four ordinary knives. The coasts abound so with oysters, that the sailors quickly load their boats with them; they being found lying in great heaps like small rocks. The natives follow the occupation of fishing more than any other. They fish both in the sea and in the rivers, making use of drag nets, which have long canes fixed at equal distances, instead of corks, to show when any fish is caught. These nets are made of a peculiar kind of root, which, after being beaten, may be spun like hemp.

The dress of the inhabitants is the same with that of the Congoese. They allow polygamy, and the best beloved wife hath the command of the rest; but is no less liable to be turned out, if she proves unfaithful. The ladies of the blood-royal have the privilege of choosing their husbands out of any, even the meanest rank; and have even the power of life and death over them; as likewise over their paramours, if any of them are caught tripping: but the husbands are by no means entitled to expect the same fidelity from their royal ladies. Women of the lower rank are obliged, when they receive a stranger, to admit him for a night or two into their embraces. This obliged the missionaries, who travelled through this country, to give notice of their approach to any of their houses, that none of the female sex might enter within their doors.—Their religion consists chiefly in a variety of superstitious customs; such as powdering their public and domestic idols with the dust of a kind of red wood, on the first day of the moon, and paying a kind of worship to that planet. If, on that night, it happens to shine clear and bright, they cry out, "Thus may I renew my life as thou dost;" but if the air is cloudy, they imagine the moon hath lost her virtue, and pay her no respect. We do not hear of their offering any sacrifices to their idols; though they commonly consult them about the success of their enterprises, thefts, or such like. The king of Congo still styles himself sovereign of Angoy; but the king of this little state pays neither tribute nor homage to any foreign power. Angoy, Angra.

ANGRA, a city of Tercera, one of the Azores; the capital, not only of that island, but of all the rest, and the residence of the governor. It is seated on the south side, near the middle of the longest diameter of the island, on the edge of the sea. The harbour is the only tolerable one in the whole island, being equally secured against storms and the efforts of an enemy. It is of the form of a crescent; the extremities of which are defended by two high rocks, that run so far into the sea as to render the entrance narrow, and easily covered by the batteries on each side. From this harbour the town is said to derive its name, the word *Angra* signifying a creek, bay, or station for shipping; and this is the only convenient one among all the Azores. The opening of the port is from the east to the south-west; and, according to Frezier, it is not above four cables length in breadth, and not two of good bottom. Here ships may ride in great safety during the summer; but as soon as the winter begins, the storms are so furious, that the only safety for shipping is the putting to sea with all possible expedition. Happily, however, these storms are preceded by infallible signs, with which experience has made the inhabitants perfectly well acquainted. On these occasions the Pico, a high mountain in another of the Azores, is overcast with thick clouds, and grows exceedingly dark; but what they look upon as the most certain sign is the fluttering and chirping of flocks of birds round the city for some days before the storm begins.

The town is the see of a bishop, under the jurisdiction of the archbishop of Lisbon. It hath five parishes, a cathedral, four monasteries, as many nunneries, besides an inquisition and bishop's court, which extends its jurisdiction over all the Azores, Flores, and Corvo. It is surrounded by a wall and a dry ditch, and is defended by a castle rendered famous by the imprisonment of King Alphonso by his brother Peter in 1668. Of late the fortifications have been much neglected. Though most of the public and private buildings have a good appearance externally, they are but indifferently furnished within; but for this poverty the Portuguese excuse themselves, by saying, that too much furniture would prove inconvenient in so warm a climate.

At Angra are kept the royal magazines for anchors, cables, sails, and other stores for the royal navy, or occasionally for merchantmen in great distress. All ma-

Angrivarii || Anguinum

ritime affairs are under the inspection of an officer called *Desembergrador*, who hath subordinate officers and pilots for conducting ships into the harbour, or to proper watering places. The English, French, and Dutch, have each a consul residing here, though the commerce of any of these nations with the Azores is very inconsiderable.

ANGRIVARII, (Tacitus): a people of Germany situated between the Weser and the Ems, and eastward reaching beyond the Weser, as far as the Cherusci, on which side they raised a rampart (Tacitus); to the south, having the Tubantes on the Ems, and on the Weser where it bends to the forest Bacemis; to the west, the Ems and the confines of the Bructeri; and to the north, the territory of the Angrivarii lay between the Chamavi and Ansibarii. Ptolemy places them between the Cauchi and Suevi or Catti. Supposed now to contain a part of the county of Schaumburg, the half of the bishopric or principality of Minden to the south, the greatest part of the bishopric of Osnaburg, the north part of the country of Teclenburg, and a part of the county of Ravensburg. A trace of the name of the people still remains in the appellation *Energn*, a small town in the county of Ravensburg.

ANGUILLA, one of the West India or Caribbee islands, lying in about 18° 15′ N. Lat. It has its name from its snake-like form; and is about ten leagues in length and three in breadth. It was first discovered by the English in 1650, when it was filled with alligators and other noxious animals; but they, finding the soil fruitful, and proper for raising tobacco and corn, settled a colony on it, and imported live cattle, which have since multiplied exceedingly. But the colony not being settled under any public encouragement, each planter laboured for himself, and the island became a prey to every rapacious invader, which disheartened the inhabitants so much, that all industry was lost among them. Their chief sufferings were from a party of wild Irish, who landed here after the Revolution, and treated them worse than any of the French pirates who had attacked them before. The people of Barbadoes, and other English Caribbees, knowing the value of the soil, several of them removed to Anguilla, where they remained for many years, and even carried on a profitable trade, though without any government either civil or ecclesiastical. In 1745, their militia, though not exceeding 100 men, defended a breastwork against 1000 French who came to attack them; and at last obliged them to retire with the loss of 150 men, besides carrying off some of their arms and colours as trophies of their victory. Since that time the inhabitants have subsisted mostly by farming; though they still plant sugar, and the island is said to be capable of great improvements.

ANGUILLIFORM, an appellation given by zoologists, not only to the different species of eels, but to other animals resembling them in shape.

ANGUINA. See TRICOSANTHES.

ANGUINUM OVUM, a fabulous kind of egg, said to be produced by the saliva of a cluster of serpents, and possessed of certain magical virtues. The superstition in respect to these was very prevalent among the ancient Britons, and there still remains a strong tradition of it in Wales. The account Pliny * gives of it is as follows: Præterea est ovorum genus in magna "Galliarum fama, omissum Græcis. Angues innume-

*Lib. xix. 3.

"ri æstate convoluti, salivis faucium corporumque spu- "mis artifici complexu glomerantur; anguinum appel- "latur. Druidæ sibilis id dicunt in sublime jactari, "sagoque oportere intercipi, ne tellurem attingat; "profugere raptorem equo: serpentes enim insequi, "donec arceantur amnis alicujus interventu."—Of which the following may serve as a translation: from *Mason's Caractacus;* the person speaking, a Druid.)

Anguinum || Anhalt.

But tell me yet
From the grot of charms and spells,
Where our matron sister dwells,
Brennus, has thy holy hand
Safely brought the Druid wand,
And the potent *Adder-stone*,
Gender'd 'fore th' autumnal moon?
When, in undulating twine,
The foaming snakes prolific join;
When they hiss, and when they bear
Their wond'rous egg aloof in air:
Thence before to earth it fall,
The *Druid* in his hallow'd pall
Receives the prize,
And instant flies,
Follow'd by th' envenom'd brood,
'Till he cross the crystal flood.

This wondrous egg seems to be nothing more than a bead of glass, used by the Druids as a charm to impose on the vulgar, whom they taught to believe, that the possessor would be fortunate in all his attempts, and that it would gain the favour of the great.

Our modern Druidesses (says Mr Pennant, from whom we extract) give much the same account of the *ovum anguinum*, *glain naidr*, as the Welsh call it, or the *adder gem*, as the Roman philosopher does; but seem not to have so exalted an opinion of its powers, using it only to assist children in cutting their teeth, or to cure the chincough, or to drive away an ague.

These beads are of a very rich blue colour; some plain, others streaked. For their figure, see Plate XXXVI. fig. 22. N° 1, 2, 3.

ANGUIS, or SNAKE, in *Zoology*, a genus belonging to the order of amphibia serpentes. See OPHIOLOGY *Index*.

ANGURIA, the WATER MELON. See BOTANY *Index*.

ANGUS, a district of the county of Forfar in Scotland. It was an earldom belonging to the Douglasses, now extinct.

ANGUSTICLAVIA, in Roman antiquity, a tunica embroidered with little purple studs. It was worn by the Roman knights, as the laticlavia was by the senators.

ANHALT, a principality of Germany, in the circle of Upper Saxony, is a long narrow tract, situated for the most part betwixt the rivers Elbe and Saal, about 90 miles in length from east to west, but of unequal breadth, the greatest being on the east side, which is but 35 miles. The house of Anhalt, from whence the electors of Saxony and Brandenburg are said to derive their original, is a very ancient and honourable family. The best genealogists deduce their origin from Berenthobaldus, who made war upon the Thuringians in the sixth century: it has produced many princes who make a great figure in the German history.

Anhalt || Anjengo.

story. Joachim Ernest, who died in 1586, left five sons, who divided the principality among them. All of them having children, and being of equal authority, they unanimously agreed to submit to the eldest of the family, who has the supreme government, which is *Anhalt Dessau*. The others are, *Anhalt Bernburg*, *Anhalt Schaumburg*, *Anhalt Coethen*, and *Anhalt Zerbst*. The last house became extinct in 1793. The three houses of Dessau, Bernburg, and Coethen, have votes in the new German diet, established in 1814. The population of all the principalities in 1815, was 123,000; the revenue about 113,000l. sterling. The tax on lands is four per cent. which, rating them at 20 years purchase, is not quite one shilling in the pound. Upon an emergency the subjects are able to raise half a million dollars extraordinary. The towns in these little states are not so numerous in proportion to the extent of country as in Saxony, but better peopled. It is bounded on the south by the county of Mansfeld, on the west by the duchy of Halberstadt, on the east by the duchy of Saxony, and on the north by the duchy of Magdeburg. It abounds in corn, and is watered by the Sadle and Mulda; its principal trade is in beer.

ANHELATIO, or ANHELITUS, among physicians, a shortness of breath.

ANHINGA. See ORNITHOLOGY *Index*.

ANHOLT, an island of Denmark, in North Jutland, lying in the Categat, eight miles from the coast of Jutland, ten from Zealand, and seven from Holland. It is dangerous for seamen, for which reason there is a lighthouse.

ANIAN, a name sometimes given to the strait lying between the north-east of Asia and the north-west of America.

ANIAN is also the name of a barren sandy desert lying on the east coast of Africa. It is so excessively hot and otherwise inhospitable, that it contains but very few inhabitants, except some wandering Arabs who live in camps.

ANIELLO, or MASSANIELLO. See History of NAPLES.

ANJENGO, a small town and factory, with a fort, on the coast of Malabar, in the peninsula on this side the Ganges, belonging to the East India Company. The fort is small, but neat and strong; it is a square with four bastions, having eight guns mounted on each, carrying a ball of 18 pounds. Two of these bastions face the sea, the other two the country. Besides these, there is a line of 18 or 20 guns pointing towards the sea, of 18 and 24-pounders. About a pistol shot from the back of the fort runs a river, which, besides being a security to the factory, adds much to the agreeable situation of the place. This river has its source in some distant mountains; and, descending in a course from the north and east, it afterwards turns in several pleasing meanders so far to the west as to wash the bottom of our factory's garden, and at last winding to the south, it empties itself into the sea. Several beautiful small islands too, which are washed by its current, diversify the scenery, and greatly heighten the beauty of the prospect. This settlement supplies our East India Company with pepper; and its situation is also very convenient for giving proper intelligence to our ships touching here from Europe, or from any part of India. E. Long. 76. 1. N. Lat. 7. 0.

ANIL, in *Botany*, a synonyme of a species of indigofera. See INDIGOFERA, BOTANY *Index*.

Anil || Animal.

ANIMA, among divines and naturalists, denotes the soul or principle of life, in animals. See SOUL.

ANIMA, among chemists, denotes the volatile or spirituous parts of bodies.

ANIMA Hepatis, is a name by which some call *sal martis*, or *salt of iron*, on account of its supposed efficacy in diseases of the liver.

ANIMA Mundi, a certain pure ethereal substance or spirit, diffused, according to many of the ancient philosophers, through the mass of the world, informing, actuating, and uniting the divers parts thereof into one great, perfect, organical, and vital body or animal. Plato treats at large of the ψυχη τϖ κοσμϖ, in his *Timæus;* and is even supposed to be the author of the *dogma;* yet are interpreters much at a loss about his meaning. Aristotle, however, taking it in the common and obvious sense, strenuously opposes it. The modern Platonists explain their master's *anima mundi* by a certain universal ethereal spirit, which in the heavens exists perfectly pure, as retaining its proper nature; but on earth pervading elementary bodies, and intimately mixing with all the minute atoms thereof, it assumes somewhat of their nature, and becomes of a peculiar kind.—So the poet:

Spiritus intus alit, totosque infusa per artus
Mens agitat molem; et magno se corpore miscet.

They add, that this *anima mundi*, which more immediately resides in the celestial regions as its proper seat, moves and governs the heavens in such a manner, as that the heavens themselves first received their existence from the fecundity of the same spirit: for that this *anima*, in being the primary source of life, everywhere breathed a spirit like itself, by virtue whereof various kinds of things were framed conformable to the divine ideas.

ANIMA Saturni, a white powder obtained by pouring distilled vinegar on litharge; of considerable use in enamelling. See ENAMEL.

ANIMADVERSION, in matters of literature, is used to signify, sometimes correction, sometimes remarks upon a book, &c. and sometimes a serious consideration upon any point.

ANIMAL, in *Natural History*, an organized and living body, which is also endowed with sensation: thus, minerals are said to grow or increase, plants to grow and live, but animals alone to have sensation.

It is this property of sensation alone that can be deemed the essential characteristic of an animal; and by which the animal and vegetable kingdoms seem to be so essentially separated, that we cannot even imagine the least approximation of the one to the other. Those naturalists, indeed, who have supposed the distinction between animals and vegetables to consist in any thing else than what we have already mentioned, have found themselves greatly embarrassed; and have generally agreed, that it was extremely difficult, if not impossible, to settle the boundaries between the animal and vegetable kingdoms. But this difficulty will be easily seen to arise from their taking the characteristic marks of the animal kingdom from something that was evidently common to both. Thus Boerhaave at-

Animal. tempted to distinguish an animal from a vegetable, by the former having a mouth, which the latter has not: but here, as the mouth of an animal is only the instrument by which nourishment is conveyed to its body, it is evident that this can be no essential distinction, because vegetables also require nourishment, and have instruments proper for conveying it into their bodies; and where the end is the same, a difference in the means can never be essential. The fixing the difference in an animal's having a gula, stomach, and intestines, as is done by Dr Tyson, is as little to the purpose.

The power of moving from one place to another, hath by many been thought to constitute their difference; and indeed, in most cases, it is the obvious mark by which we distinguish an animal from a vegetable: but Lord Kames hath given several very curious instances of the locomotive power of plants; some of which, as he says, would do honour to an animal.—"Upon the slightest touch, the sensitive plant shrinks back and folds up its leaves, similar to a snail; which on the slightest touch retires within its shell. A new species of the sensitive plant hath been lately discovered. See DIONÆA. If a fly perch upon one of its flower leaves, it closes instantly, and crushes the insect to death. There is not an article in botany more admirable than a contrivance, visible in many plants, to take advantage of good weather, and to protect themselves against bad. They open and close their flowers and leaves in different circumstances; some close before sunset, some after; some open to receive rain, some close to avoid it. The petals of many flowers expand in the sun; but contract at night, or on the approach of rain. After the seeds are fecundated, the petals no longer contract. All the trefoils may serve as a barometer to the husbandman; they always contract their leaves on an impending storm. Some plants follow the sun, others turn from it. Many plants, on the sun's recess, vary the position of their leaves, which is styled the *sleep of plants*. A singular plant * was lately discovered in Bengal. Its leaves are in continual motion all day long; but when night approaches, they fall down from an erect posture to rest.

* A species of the *Hedysarum*.

"A plant has a power of directing its roots for procuring food. The red whortleberry, a low evergreen plant, grows naturally on the tops of our highest hills, among stones and gravel. This shrub was planted in an edging to a rich border, under a fruit wall. In two or three years, it overran the adjoining deep-laid gravel walk; and seemed to fly from the border, in which not a single runner appeared. An effort to come at food in a bad situation, is extremely remarkable in the following instance: Among the ruins of Newabbey, formerly a monastery in Galloway, there grows on the top of a wall a plane tree about 20 feet high. Straitened for nourishment in that barren situation, it several years ago directed roots down the side of the wall, till they reached the ground ten feet below; and now the nourishment it afforded to those roots during the time of their descending is amply repaid, having every year since that time made vigorous shoots. From the top of the wall to the surface of the earth, these roots have not thrown out a single fibre; but are now united in a single root.

"Plants, when forced from their natural position, are endowed with a power to restore themselves. A hop plant, twisting round a stick, directs its course from south to west, as the sun does. Untwist it, and tie it in the opposite direction; it dies. Leave it loose in the wrong direction: it recovers its natural direction in a single night. Twist a branch of a tree so as to invert its leaves, and fix it in that position: if left in any degree loose, it untwists itself gradually, till the leaves be restored to their natural position. What better can an animal do for its welfare? A root of a tree, meeting with a ditch in its progress, is laid open to the air. What follows? It alters its course like a rational being, dips into the ground, surrounds the ditch, rises on the opposite side to its wonted distance from the surface, and then proceeds in its original direction. Lay a wet sponge near a root laid open to the air; the root will direct its course to the sponge. Change the place of the sponge: the root varies its direction. Thrust a pole into the ground at a moderate distance from a scandent plant: the plant directs its course to the pole, lays hold of it, and rises on it to its natural height. A honeysuckle proceeds in its course, till it be too long for supporting its weight; and then strengthens itself by shooting into a spiral. If it meet with another plant of the same kind, they coalesce for mutual support; the one screwing to the right, the other to the left. If a honeysuckle twig meets with a dead branch, it screws from the right to the left. The claspers of briony shoot into a spiral, and lay hold of whatever comes in their way for support. If, after completing a spiral of three rounds, they meet with nothing, they try again by altering their course."——

Animal.

By comparing these and other instances of seeming voluntary motion in plants, with that share of life wherewith some of the inferior kinds of animals are endowed, we can scarce hesitate at ascribing the superiority to the former; that is, putting sensation out of the question. Mussels, for instance, are fixed to one place as much as plants are; nor have they any power of motion, besides that of opening and shutting their shells: and in this respect they have no superiority over the motion of the sensitive plant; nor doth their action discover more sagacity, or even so much as the roots of the plane tree mentioned by Lord Kames.

Mr Buffon, who seems to be desirous of confounding the animal and vegetable kingdoms, denies sensation to be any essential distinction. "Sensation (says he) more essentially distinguishes animals from vegetables: but sensation is a complex idea, and requires some explication. For if sensation implied no more than motion consequent upon a stroke or an impulse, the sensitive plant enjoys this power. But if, by sensation, we mean the faculty of perceiving and comparing ideas, it is uncertain whether brute animals are endowed with it. If it should be allowed to dogs, elephants, &c. whose actions seem to proceed from motives similar to those by which men are actuated, it must be denied to many species of animals, particularly to those which appear not to possess the faculty of progressive motion. If the sensation of an oyster, for example, differed only in degree from that of a dog; why do we not ascribe the same sensation to vegetables, though in a degree still inferior? This distinction, therefore, between the animal and vegetable, is neither sufficiently general nor determined.

"From

Animal. "From this investigation we are led to conclude, that there is no absolute and essential distinction between the animal and vegetable kingdoms; but that nature proceeds, by imperceptible degrees, from the most perfect to the most imperfect animal, and from that to the vegetables; and the fresh water polypus may be regarded as the last of animals and the first of plants."

It were to be wished, that philosophers would on some occasions consider, that a subject may be dark as well on account of their inability to see, as when it really affords no light. Our author boldly concludes, that there is no essential difference between a plant and an animal, because we ascribe sensation to an oyster, and none to the sensitive plant; but we ought to remember, that though we cannot perceive a distinction, it may nevertheless exist. Before Mr Buffon, therefore, had concluded in this manner, he ought to have proved that some vegetables were endowed with sensation.

It is no doubt, however, as much incumbent on those who take the contrary side of the question, to prove that vegetables are not endowed with sensation, as it was incumbent on Mr Buffon to have proved that they are. But a little attention will show us, that the difficulty here proceeds entirely from our inability to see the principle of sensation. We perceive this principle in ourselves, but no man can perceive it in another. Why then does every individual of mankind conclude that his neighbour has the same sensations with himself? It can only be from analogy. Every man perceives his neighbour formed in a manner similar to himself; he acts in a similar manner on similar occasions, &c. Just so it is with brute animals. It is no more doubtful that they have sensations, than that we have them ourselves. If a man is wounded with a knife, for instance, he expresses a sense of pain, and endeavours to avoid a repetition of the injury. Wound a dog in the same manner, he will also express a sense of pain; and, if you offer to strike him again, will endeavour to escape, before he feels the stroke. To conclude here, that the action of the dog proceeded from a principle different from that of the man, would be absurd and unphilosophical to the last degree.

We must further take notice, that there are sensations essentially distinct from one another; and in proportion as an animal is endowed with more or fewer of these different senses, it is more or less perfect as an animal; but, as long as one of them remains, it makes not the least approach to the vegetable kingdom; and, when they are all taken away, is so far from becoming a vegetable, that it is only a mass of dead matter. The senses of a perfect animal, for instance, are five in number. Take away one of them, suppose sight; he becomes then a less perfect animal, but is as unlike a vegetable as before. Suppose him next deprived of hearing: his resemblance to a vegetable would be as little as before; because a vegetable can neither feel, taste, nor smell, and we suppose him still to enjoy these three senses. Let us, lastly, suppose him endowed only with the sense of feeling, which, however, seems to include that of taste, and he is no more a vegetable than formerly, but only an imperfect animal. If this sense is then taken away, we connect him not with the vegetable kingdom, but with what Mr Buffon calls *brute matter*. It is to this kingdom, and not to the vegetable, that animals plainly approximate as they descend. Indeed, to suppose an approximation between the vegetable and animal kingdoms, is very absurd: for, at that rate, the most imperfect animal ought to be the most perfect plant; but we observe no such thing. All animals, from the highest to the lowest, are possessed of vegetable life; and that, as far as we can perceive, in an equal degree, whether the animal life is perfect or imperfect; nor doth there seem to be the smallest connexion between the highest degree of vegetation and the lowest degree of sensation. Though all animals, therefore, are possessed of vegetable life, these two seem to be as perfectly distinct and incommensurate to one another as any two things we can possibly imagine. Animal.

The power of vegetation, for instance, is as perfect in an onion or leek, as in a dog, an elephant, or a man; and yet, though you threaten a leek or an onion ever so much, it pays no regard to your words, as a dog would do; nor, though you wound it, does it avoid a second stroke. It is this principle of self-preservation in all animals, which, being the most powerful one in their nature, is generally taken, and with very good reason, as the true characteristic of animal life. This principle is undoubtedly a consequence of sensation; and as it is never observed to take place in vegetables, we have a right to say that the foundation of it, namely sensation, belongs not to them. There is no animal, which makes any motion in consequence of external impulse where danger is threatened, but what puts itself in a posture of defence; but no vegetable whatsoever does so. A muscle, when it is touched, immediately shuts its shell; and as this action puts it in a state of defence, we conclude that it proceeded from the principle of self-preservation. When the sensitive plant contracts from a touch, it is no more in a state of defence than before; for whatever would have destroyed it in its expanded state, will also do it in its contracted state. We conclude, therefore, that the motion of the sensitive plant proceeds only from a certain property called by physicians *irritability*; and which, though our bodies possess it in an eminent degree, is a characteristic neither of animal nor vegetable life, but belongs to us in common with brute matter. It is certain that an electrified silk thread shows a much greater variety of motions than any sensitive plant. If a bit of silk thread is dropt on an electrified metal plate, it immediately erects itself; spreads out the small fibres like arms; and, if not detained, will fly off. If a finger is brought near it, the thread seems greedily to catch at it. If a candle approaches, it clasps close to the plate, as if afraid of it.—Why do we not conclude that the thread in this case is really afraid of the candle? For this plain reason, That its seeming flight is not to get away from the candle, but to get towards the electrified metal; and, if allowed to remain there, will suffer itself to be burnt without offering to stir.—The sensitive plant, in like manner, after it has contracted, will suffer itself to be cut in pieces, without making the least effort to escape. The case is not so with the meanest animal. A hedgehog, when alarmed, draws its body together, and expands its prickles, thereby putting itself in a posture of defence. Throw it into water; and the same principle of self-

preservation

Animal. preservation prompts it to expand its body and swim. A snail, when touched, withdraws itself into its shell; but if a little quicklime is sprinkled upon it, so that its shell is no longer a place of safety, it is thrown into agonies, and endeavours to avail itself of its locomotive power in order to escape the danger. In mussels and oysters, indeed, we cannot observe this principle of self-preservation so strongly, as nature has deprived them of the power of progressive motion: but, as we observe them constantly to use the means which nature has given them for self-preservation, we can have no reason to think that they are destitute of that principle upon which it is founded.

But there is no need of arguments drawn from the inferior creation. We ourselves are possessed both of the animal and vegetable life, and certainly must know whether there is any connection between vegetation and sensation, or not.—We are conscious that we exist; that we hear, see, &c.: but of our vegetation we are absolutely unconscious. We feel a pleasure, for instance, in gratifying the calls of hunger and thirst; but of the process by which our aliment is formed into chyle, the chyle mixed with the blood, the circulation of that fluid, and the separation of all the humours from it, we are altogether ignorant. If we then, who are more perfect than other vegetables, are utterly insensible of our own vegetable life, why should we imagine that the less perfect vegetables are sensible of it?

To illustrate our reasoning here by an example.—The direction of the roots of the plane tree mentioned by Lord Kames, shows as much sagacity, if we are to look only to the outward action, as can be observed in any motion of the most perfect animal whatever; nevertheless, we have not the least suspicion, either that the tree saw the ground at a distance, or that it was informed of its being there by the rest of its roots. If a wound is made in the body of a man, and a loss of substance is to be repaired, the same sagacity will be observed in the arrangement of the fibres, not only as if they were animated, but they will dispose of themselves seemingly with a degree of wisdom far superior to what we have any idea of; yet this is done without our having the least knowledge either how it is done, or of its being done at all. We have therefore in ourselves a demonstration, that vegetable life acts without knowing what it does: and if vegetables are ignorant of their most sagacious actions, why should we suspect that they have a sensation, let it be ever so obscure, of any of their inferior ones, such as contracting from a touch, turning towards the sun, or advancing to meet a pole.

Thus we may easily give Mr Buffon a reason why we ascribe sensation to an oyster, and none to a vegetable; namely, because we perceive the vegetable do nothing but what is also performed in our own bodies, without our having the least sensation of it; whereas on oyster puts itself in a defensive posture on the approach of danger; and this being an action similar to our own upon a like occasion, we conclude that it proceeds from the same principle of sensation. Here it may also be observed, that though the inferior animals are deficient in the number, they are by no means so in the acuteness of their sensations; on the contrary, though a mussel or an oyster is probably endowed with no other sense than that of feeling, yet this sense is so exquisite, that it will contract upon the slightest touch, such as we would be altogether insensible of. Animal.

As to that power of contractility, or irritability, which is observed in some plants; our solids have it, when deprived both of vegetable and animal life: for a muscle, cut out of a living body, will continue to contract, if it is irritated by pricking it, after it has neither sensation nor vegetation.

A very good moral reason may also be adduced why we do not believe vegetables to be endowed with sensation.—Had they been so, we must suppose them to suffer pain when they are cut or destroyed; and, if so, what an unhappy state must they be in, who have not the least power to avoid the injuries daily offered them! In fact, the goodness of the Deity is very conspicuous in not giving to vegetables the same sensations as to animals; and, as he hath given them no means of defence, though we had not been told it by himself, we might have known that he gave them for food for animals; and, in this case, to have endowed them with sensation would have been a piece of cruelty. Though animals without number prey upon one another, yet all of them have some means of defence; from whence we may justly conclude, that their mutual destruction was not an original appointment of the Creator, but what he foresaw would happen in a course of time, and which he therefore gave every one of them some means of guarding against. It may no doubt be here objected, that the giving some means of self-defence to every animal cannot be reckoned a sufficient proof that it was not the original design of the Creator that they should be destroyed, seeing these means are not always effectual for their preservation. This objection, however, cannot be completely obviated without a solution of the question concerning the origin of evil among the works of a perfectly good Being. But whatever difficulty there may be in solving this question, it is certain, that, as some means of self-defence is given to every animal, it has been the original design of the Creator, that in all cases one species of animals should not be destroyed at the pleasure of any other species; and as no means of self-defence is given to any vegetable, it is plain that they have been destined for a prey to every species of animals that had access to them. Philosophers have insisted much on the necessity of one animal's devouring another, that there might be room sufficient for all; but this, so far from being a system worthy of the divine wisdom, seems to us to be a reflection upon it, as if the Author of nature could not have found means to preserve the life of one part of his creatures, without the destruction and misery of the rest. The sacred writings leave us at no loss to see how this carnivorous disposition came in; and, in the next world, this piece of perfection (as the sanguinary philosophers above mentioned would have it to be) seems to be left out; for there, it is said, "They shall not hurt nor destroy; the lion shall eat straw like the ox, and there shall be no more pain."

When speaking of the food of plants, we took occasion to mention a certain power totally different from that of attraction or repulsion, by which the food of a plant, after it was attracted, or otherwise brought to it, was assimilated to its substance. This power, which we there distinguish by the name of *transmutation*, belongs

Animal, Animal-Flower.

longs in a more eminent degree to animals. The alimentary substance is changed into two kinds of matter: (1.) An excrementitious one, which passes off through the intestines; and (2.) A fluid, which is the direct pabulum of the animal. Different substances, however, are not equally changeable by this process. The human stomach is not capable of acting upon any animal substance till it has lost its vital principle: the stomachs of some animals cannot act upon creatures of their own species: some have an apparatus for grinding their food after it is swallowed, &c. and there are no animals but what are subject to death by taking certain substances into their stomach. Some substances also, though they resist the action of the stomach, and pass unchanged into the system, produce no bad effects. Thus, madder will turn the bones of animals red; rhubarb will communicate its purgative nature to the milk, and its deep yellow colour to the urine.—All these changes, however, seem to belong to the vegetative part of our system: for as every one of them are performed without our knowledge of the manner how; and not only so, but while we are absolutely unconscious of their being done; we can have no reason to suppose, that the *animal* life, properly so called, is at all connected with them, any farther than as they are at present the means of preserving the creature alive, and making the connexion betwixt the principle of life and this visible creation.

The description and classing of animals make a considerable part of Natural History, known by the name of *Zoology*.

ANIMAL, used adjectively, denotes any thing belonging to, or partaking of, the nature of animals. Thus, animal actions, those that are peculiar to animals; such are sensation and muscular motion.

ANIMAL-Flower, in *Zoology*, a name given to several species of animals belonging to the genus ACTINIA of Linnæus. They have likewise been distinguished by the names of *Urtica Marina*, or *Sea-nettle*, from their supposed property of stinging; and *Sea-anemone*, from their claws or tentacles being disposed in regular circles, and tinged with a variety of bright lively colours, resembling the petals of some of our most beautiful flowers. As to one species particularly, mentioned by Abbé Dicquemarre, (Phil. Trans. for 1773, art. 37.) the purest white, carmine, and ultramarine, are said to be scarce sufficient to express their brilliancy. The bodies of some of them are hemispherical, of others cylindrical, and of others shaped like a fig. Their substance likewise differs: some are stiff and gelatinous, others fleshy and muscular; but all of them are capable of altering their figure when they extend their bodies and claws in search of food. They are found on many of the rocky coasts of the West India islands, and likewise on some parts of the coast of England.

They have only one opening, which is in the centre of the uppermost part of the animal; round this are placed rows of fleshy claws; this opening is the mouth of the animal, and is capable of great extension. The animals themselves, though exceedingly voracious, will bear long fasting. They may be preserved alive a whole year, or perhaps longer, in a vessel of sea-water, without any visible food; but, when food is presented, one of them will successively devour two mussels in their shells, or even swallow a whole crab as large as a hen's egg. In a day or two the crab-shell is voided at the mouth, perfectly cleared of all the meat. The mussel shells are likewise discharged whole, with the two shells joined together, but entirely empty, so that not the least particle of fish is to be perceived on opening them. An anemone of one species will even swallow an individual of another species; but after retaining it ten or twelve hours, will throw it up alive and uninjured. Through this opening also it produces its young ones alive, already furnished with little claws, which, as soon as they fix themselves, they begin to extend in search of food.

Animal-Flower.

One of the extremities of the sea-anemone resembles, as we have said, the outward leaves of that flower; while its limbs are not unlike the shag or inner part of it. By the other extremity it fixes itself, as by a sucker, to the rocks or stones lying in the sand; but it is not totally deprived of the power of progressive motion, as it can shift its situation, though very slowly.

A particular species of animal-flowers has been found in some of the islands ceded to Britain at the last treaty of peace with France; and the following account of them was published in the Philosophical Transactions, vol. lvii. by Mr Ellis, in a letter to Lord Hillsborough.

"This compound animal, which is of a tender fleshy substance, consists of many tubular bodies swelling gently towards the upper part, and ending like a bulb or very small onion: on the top of each is its mouth, surrounded by one or two rows of tentacles, or claws, which when contracted look like circles of beads.

"The lower part of all these bodies has a communication with a firm fleshy wrinkled tube, which sticks fast to the rocks, and sends forth other fleshy tubes, which creep along them in various directions. These are full of different sizes of these remarkable animals, which rise up irregularly in groups near to one another.

"This adhering tube, that secures them fast to the rock, or shelly bottom, is worthy of our notice. The knobs that we observe, are formed in several parts of it by its insinuating itself into the inequalities of the coral rock, or by grasping pieces of shells, part of which still remain in it, with the fleshy substance grown over them.

"This shows us the instinct of nature, that directs these animals to preserve themselves from the violence of the waves, not unlike the anchoring of mussels, by their fine silken filaments that end in suckers; or rather like the shelly basis of the serpula, or worm shell, the tree oyster, and the slipper barnacle, &c. whose bases conform to the shape of whatever substance they fix themselves to, grasping it fast with their testaceous claws, to withstand the fury of a storm.

"When we view the inside of this animal dissected lengthwise, we find like a little tube leading from the mouth to the stomach, from whence there rise eight wrinkled small guts, in a circular order, with a yellowish soft substance in them; these bend over in the form of arches towards the lower part of the bulb, from whence they may be traced downwards, to the narrow part of the upright tube, till they come to the fleshy adhering tube, where some of them may be perceived entering into a papilla, or the beginning of an animal of the like kind, most probably to convey it nourishment.

Animal-Flower.

nourishment till it is provided with claws; the remaining part of these slender guts is continued on in the fleshy tube, without doubt, for the same purpose of producing and supporting more young ones from the same common parent.

"The many longitudinal figures that we dissover lying parallel to each other, on the inside of the semi-transparent skin, are all inserted in the several claws round the animal's mouth, and are plainly the tendons of the muscles for moving and directing the claws at the will of the animal; they may be likewise traced down to the adhering tube.

"As this specimen has been preserved in spirits, the colour of the animal, when living, cannot be certainly known; it is at present of a pale yellowish brown.

"With regard to its name, it may be called *Actinia sociata*, or the *Cluster Animal flower*."

The Abbé Dicquemarre, by many curious though cruel experiments, related to the Phil. Trans. for 1773, has shown that these animals possess, in a most extraordinary degree, the power of reproduction; so that scarce any thing more is necessary to produce as many sea anemonies as we please, than to cut a single one into as many pieces. A sea anemone being cut in two by a section through the body, that part, where the limbs and mouth are placed, ate a piece of a mussel offered to it soon after the operation, and continued to feed and grow daily for three months after. The food sometimes passed through the animal; but was generally thrown up again, considerably changed, as in the perfect sea anemone. In about two months, two rows of limbs were perceived growing out of the part where the incision was made. On offering food to this new mouth, it was laid hold of and eaten; and the limbs continually increasing, the animal gradually became as perfect as those which had never been cut. In some instances, however, he found that, when one of these creatures was cut through, new limbs would be produced from the cut place, those at the mouth remaining as before: so that a monstrous animal was the consequence, having two mouths, and feeding at both ends. Having put some of them into a pan of water, set over a slow fire, he found that they lost their life at 30 degrees of Reaumur's thermometer. To avoid the imputation of cruelty in these experiments, the author argues the favourable consequences that have attended his operations on the sea anemonies which have been so fortunate as to fall into his hands; as he hath not only multiplied their existence, but also renewed their youth; which last, he adds, "is surely no small advantage."

In Hughes's Natural History of Barbadoes, an account is also given of several species of animal-flowers. They are there described as only found in a bason in one particular cave; and of the most remarkable species mentioned by him we have the following description.

"In the middle of the bason, there is a fixed stone, or rock, which is always under water. Round its sides, at different depths, seldom exceeding 18 inches, are seen, at all times of the year, issuing out of little holes, certain substances that have the appearance of fine radiated flowers, of a pale yellow, or a bright straw colour, slightly tinged with green, having a circular border of thick set petals, about the size of, and much resembling, those of a single garden marigold, except that the whole of this seeming flower is narrower at the discus, or setting-on of the leaves, than any flower of that kind.

Animal-Flower || Animal System.

"I have attempted to pluck one of these from the rock, to which they are always fixed; but never could effect it: for as soon as my fingers came within two or three inches of it, it would immediately contract, close together its yellow border, and shrink back into the hole of the rock; but if left undisturbed for about four minutes, it would come gradually in sight, expanding, though at first very cautiously, its seeming leaves, till it last it appeared in its former bloom. However, it would again recoil, with a surprising quickness when my hand came within a small distance of it. Having tried the same experiment by attempting to touch it with my cane, and a small slender rod, the effect was the same.

"Though I could not by any means contrive to take or pluck from the rock one of these animals entire; yet I once cut off (with a knife which I had held for a long time out of sight, near the mouth of a hole out of which one of these animals appeared) two of these seeming leaves. These, when out of the water, retained their shape and colour; but, being composed of a membrane-like substance, surprisingly thin, it soon shrivelled up, and decayed."

The reproductive power of the Barbadoes animal-flower is prodigious. Many people coming to see these strange creatures, and occasioning some inconvenience to a person through whose grounds they were obliged to pass, he resolved to destroy the objects of their curiosity, and, that he might do so effectually, caused all the holes out of which they appeared, to be carefully bored and drilled with an iron instrument, so that we cannot suppose but their bodies must have been entirely crushed to a pulp: nevertheless, they again appeared in a few weeks from the very same places.

Plate XXXIV. fig. 1. represents the actinia sociata, or clustered animal-flower, described by Mr Ellis, with its radical tube adhering to a rock: (a) One of the animals stretching out its claws. Fig. 2. A perpendicular dissection of one of the bodies, to show the gullet, intestines, stomach, and fibres or tendons that move the claws: (a) A young one arising out of the adhering tube. Fig. 3. The actinia aster, or animal-flower of the newly ceded islands. Fig. 4. The actinia anemone, or sea anemone from the same place. Fig. 5. The under part of the same by which it adheres to the rocks. Fig. 6. The actinia helianthus, or the sea sun-flower, from ditto. Fig. 7. The under part of the same. Fig. 8. The actinia dianthus, or sea carnation, from the rocks at Hastings in Sussex. This animal adheres by its tail, or sucker, to the upper part of the projecting rocks opposite to the town; and, when the tide is out, has the appearance of a long white fig; this is the form of it when put into a glass of sea water. It is introduced here as a new variety of this animal not yet described.

Animal Food. See Food.

Animal Oeconomy. This subject is explained under Anatomy.

Animal Magnetism. See Magnetism.

Animal Spirit. See *Nervous Fluid.*

Animal System denotes the whole class of beings endowed with animal life, otherwise called *Animal Kingdom.*

ANIMAL FLOWERS. PLATE XXXIV.

Fig. 1.

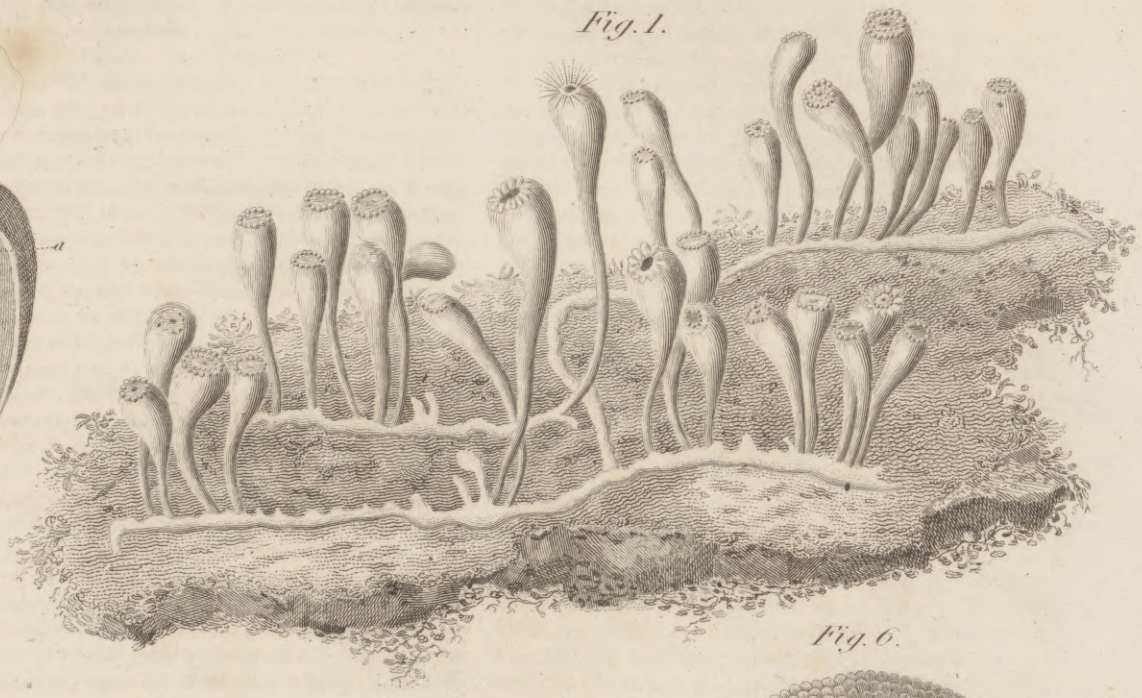

Fig. 2.

Fig. 6.

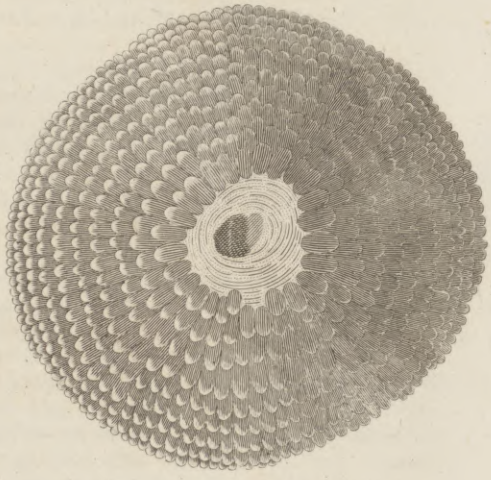

Fig. 4.

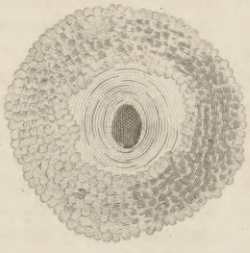

Fig. 5.

Fig. 7.

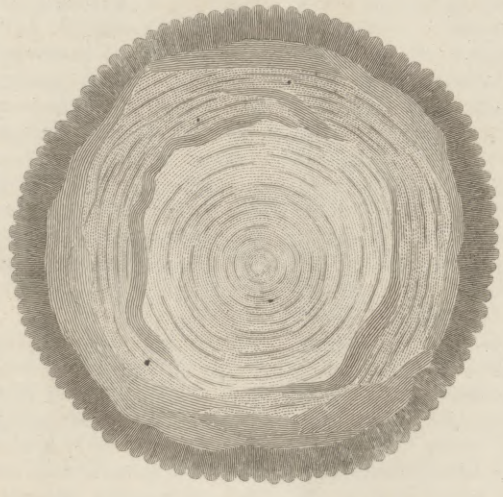

Fig. 8.

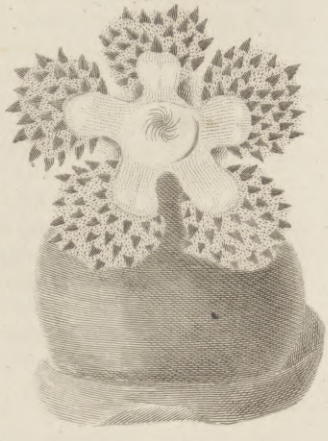

Fig. 5.

E. Mitchell fecit.

Animals, Animalcule.

Animals, the preparation of, for collections or museums. See Quadrupeds, Birds, Rfptiles.

Pairing of Animals. See Pairing.

ANIMALCULE, in general, signifies a little animal; and thus the term might be applied to every animal which is considerably inferior in size to ourselves.

1 Common acceptation of the word.

It hath been customary, however, to distinguish by the name of *animalcules* only such animals as are of a size so diminutive, that their true figure cannot be discerned without the assistance of glasses; and more especially it is applied to such as are altogether invisible to the naked eye, and cannot even be perceived to exist but by the assistance of microscopes.

By the help of magnifying glasses, we are brought into a kind of new world; and numberless animals are discovered, which from their minuteness must otherwise for ever have escaped our observation; and how many kinds of these invisibles there may be, is still unknown; as they are discerned of all sizes, from those which are barely invisible to the naked eye, to such as resist the action of the microscope, as the fixed stars do that of the telescope, and with the best magnifiers hitherto invented appear only as so many moving points.

2 Different sizes of animalcules.

The smallest living creatures our instruments can show are those that inhabit the waters: for though possibly animalcules equally minute, or perhaps more so, may fly in the air, or creep upon the earth, it is scarce possible to bring such under our examination; but water being transparent, and confining the creatures in it, we are able, by applying a drop of it to our glasses, to discover, to a certain degree of smallness, all that it contains.—Some of the most curious of these animalcules, which have been described by microscopical observers, we shall here give an account of,

3 Hair-like insect.

1. *The Hair-like Insect.* This is so called by Mr Baker on account of its shape; being extremely slender, and frequently an hundred and fifty times as long as broad. The body or middle part, which is nearly straight, appears, in some, composed of such rings as the windpipe of land animals is made up of; but in others seems rather scaled, or made up of rings that obliquely cross one another. Its two ends are hooked or bent, pretty nearly in the same degree, but in a direction opposite to one another; and as no eyes can be discerned, it is difficult to judge which is the head or tail. Its progressive * motion is very singular, being performed by turning upon one end as a centre, and describing almost a quarter of a circle with the other, as represented in the figure. Its motions are very slow, and require much patience and attention in the observer. These creatures are so small, that millions of millions of them might be contained in an inch square. When viewed singly, they are exceedingly transparent, and of a beautiful green colour; but when numbers of them are brought together, they become opaque, lose their green colour, and grow entirely black.

* Plate XXXV. Fig. 1.

4 Its extreme smallness, &c.

5 Delights in society.

Notwithstanding the extreme minuteness of these animalcules, they seem to be fond of society; for, after viewing for some time a parcel of them taken up at random, they will be seen disposing themselves in a kind of regular order†. If a multitude of them are put into a jar of water, they will form themselves in a regular body, and ascend slowly to the top, where after they have remained for some time exposed to the air, their green colour changes to a beautiful sky blue. When they are weary of this situation, they form themselves into a kind of rope, which slowly descends as low as they intend; but if they happen to be close to the side of the jar, they will descend upon it. They are so nearly of the specific gravity of water itself, that they will either remain at the bottom, float on the surface, or be suspended in the middle, according as they are originally placed, or as they themselves have a mind.

† Fig. 2.

Animalcule.

A small quantity of the matter containing these animalcules‡ having been put into a jar of water, it so happened, that one part went down immediately to the bottom, whilst the other continued floating on the top. When things had remained for some time in this condition, each of these swarms of animalcules began to grow weary of its situation, and had a mind to change its quarters. Both armies, therefore, set out at the same time, the one proceeding upwards, and the other downwards; so that, after some hours journey, they met in the middle. A desire of knowing how they would behave on this occasion, engaged the observer to watch them carefully; and to his surprise he saw the army that was marching upwards, open to the right and left, to make room for those that were descending. Thus, without confusion or intermixture, each held on its way: the army that was going up, marching in two columns to the top, and the other proceeding in one column to the bottom, as if each had been under the direction of wise leaders.

‡ Fig. 3.

6 Seems possessed of a considerable degree of sagacity.

The hair-like insect was first discovered in a ditch at Norwich, one end of which communicates with the river there, and the other end with a second ditch, into which several kennels empty themselves. The length of this ditch, when Mr Baker wrote his account of this animalcule, was at least 100 yards, and its breadth nine. The bottom, for more than a foot thick, was covered with a blackish green substance, in appearance like mud, made up for the most part of these insects; but supposing only a half or a quarter part of it to be composed of them, according to the dimensions we have given, their numbers must exceed all imagination.

7 Found in prodigious quantity.

2. *Eels in paste*, &c. When paste is allowed to stand till it becomes sour, it is then found to be the habitation of numberless animalcules, which may be discerned by the naked eye; and though their form cannot be perfectly distinguished, their motion is very perceptible, and the whole paste will seem to be animated. Fig. 4. represents one of these anguillæ magnified. The most remarkable property of these insects is, that they are viviparous. If one of them is cut through near the middle, several oval bodies of different sizes will be seen to issue forth. These are young anguillæ, each of them coiled up and enclosed in its proper membrane, which is so exquisitely fine, as scarcely to be discernible by the greatest magnifier, while it encloses the embryo animal. The largest and most forward immediately break through this covering, unfold themselves, and wriggle about in the water nimbly; others get out, uncoil, and move themselves about more slowly; and the least mature continue entirely without motion. The *uterus*, or vessel that contains all these oval bodies, is composed of many ringlets, not unlike the aspera arteria of land animals, and seems to be considerably elastic; for as soon as the animalcule is cut in two, the oval bodies are thrust out with some degree of violence, from the springing back or action of this bowel. An

8 Eels in paste viviparous.

Animalcule.

hundred and upwards of the young ones have been seen to issue from the body of one single eel, whereby the prodigious increase of them may be accounted for; as probably several such numerous generations are produced in a short time. They seem to be all prolific; and unless trial happens to be made upon one that has brought forth all its young, or when the paste has been kept for a very long time, the experiment will always succeed.—This property of these eels being viviparous renders it highly improbable that they ever become flies.

Animalcules of a similar kind are likewise found in vinegar; and, like those already described, are found to be viviparous. But it is not only in acid matters that such appearances are observed. In some fields of wheat, many grains may be observed, that appear blackish outwardly, as if scorched; but when opened are found to contain a soft white substance, which, attentively considered, appears to be nothing else than a congeries of threads or fibres lying close to each other in a parallel direction, much resembling the unripe down of some thistles on cutting open the flower heads before they begin to blow. This fibrous matter discovers not the least sign of life or motion, unless water is applied; but immediately on wetting, provided the grains of wheat have been newly gathered, the supposed fibres separate, and appear to be living creatures. Their motions at first are very languid; but gradually become more vigorous, twisting and wriggling themselves somewhat in the manner of the eels in paste, but always slower than they, and with a great deal less regularity.

9 Similar creatures found in blighted wheat.

If the grains of wheat are grown dry by keeping, and in that condition are cut open, the fibrous matter is very distinguishable; and, on putting water to it, will separate with great readiness, and seem like fine tubes or threads tapering at both ends; but not the least motion will be perceived till they have been in water for several hours, and sometimes they will never move at all. But if the same grains are steeped in water for three or four hours, or buried for some days in the earth, till they are fully saturated with moisture, and then opened with a penknife; on taking out a small portion of the white matter carefully, and spreading it thin upon a slip of glass, the animalcules will be seen bundled together, and extended longitudinally, but without motion; and though, upon the application of water, they will not revive so soon as those taken from fresh grains, whose moisture has never been exhaled; yet, after remaining an hour or two in water, they are constantly found alive and vigorous, even though the grains have been kept in a dry condition for several years. It is necessary, however, to adapt, in some measure, the time of continuing the grains in water or earth to the age and dryness of them: for if they are not opened before they are too much softened, the animalcules will be dead; and unless the husks are opened to let those creatures out after they have been steeped, they inevitably perish in them: otherwise, they will continue alive in water for many months; and, should the water dry away, may be revived again by giving them a fresh supply.

10 How discoverable.

11 Precautions necessary in making the experiment.

12 Proteus, why so called.

3. *The Proteus.* This animalcule has been dignified by Mr Baker with the name of *Proteus*, on account of its assuming a great number of different shapes, so as scarce to be known as the same animal in its various transformations; and indeed, unless it be carefully watched while passing from one shape to another, it will often become suddenly invisible, as happened more than once to Mr Baker.

Animalcule.

13 Where found.

When water, wherein any sort of vegetable has been infused, or animals preserved, has stood quietly for some days, or weeks, in any glass or other vessel, a slimy substance will be collected about the sides: some of which being taken up with the point of a penknife, placed on a slip of glass in a drop of water, and looked at through the microscope, will be found to harbour several kinds of little animals that are seldom found swimming about at large; among which the proteus is one. Its shape is better understood from the figure, than from any description that could be given. Its substance and colour seem to resemble that of a snail; and its whole shape seems to bear a considerable resemblance to that of a swan. It swims to and fro with great vivacity; but will now and then stop for a minute or two; during which time its long neck is usually employed as far as it can reach, forwards, and on every side, with a somewhat slow, but equable motion, like that of a snake, frequently extending thrice the length of its body, and seemingly in search of food.

14 Its shape, colour, &c.

There are no eyes, nor any opening in the head like a mouth to be discerned: but its actions plainly prove it to be an animal that can see; for though multitudes of different animalcules swim about in the same water, and its own progressive motion is very swift, it never strikes against any of them, but directs its course between them with a dexterity wholly unaccountable, should we suppose it destitute of sight.

15 Its transformations.

When the proteus is alarmed, it suddenly draws in its long neck, represented in fig. 5. and 6. transforming itself into the shape represented in fig. 7. when it becomes more opaque, and moves about very slowly with the large end foremost. When it has continued some time in this posture, it will often, instead of the head and neck it had formerly, put forth a new one, with a kind of wheel machinery represented fig. 8. the motions of which draw a current of water to it from a considerable distance. Having often pulled in and thrust out the short head, sometimes with and sometimes without the wheel-work, the creature, as if weary, will remain motionless for a while; then its head and long neck will be very slowly protruded, as in fig. 9. and it soon resumes its former agility. Sometimes it disposes of its neck and head, as represented in fig. 10.

16 Vorticellæ, where found.

4. *The Wheel Animal*, or *Vorticella*. This wonderful animalcule is found in rain water that has stood some days in leaden gutters, or in hollows of lead on the tops of houses; or in the slime or sediment left by such water; and perhaps may also be found in other places; but if the water standing in gutters of lead, or the sediment left behind it, has any thing of a red colour in it, one may be almost certain of finding them therein. Though it discovers no signs of life except when in the water, yet it is capable of continuing alive for many months after it is taken out of the water, and kept in a state as dry as dust. In this state it is of a globular shape, exceeds not the bigness of a grain of sand, and no signs of life appear: but being put into water, in the space of half an hour a languid motion begins, the globule turns itself about, lengthens itself by slow degrees,

Animalcule.

degrees, assumes the form of a lively maggot, and most commonly in a few minutes afterwards puts out its wheels; swimming vigorously through the water, as if in search of food; or else, fixing itself by the tail, works the wheel in such a manner as to bring its food to it.

Fig. 23. and 24. show the wheel animal in its globular form; fig. 11. and 12. in its maggot state; and fig. 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22, show the different appearances of its wheels, and also its various intermediate changes between the globular and maggot state.

17 Its wheel-work described.

The most remarkable part of this animalcule is its wheel-work. This consists of a couple of semicircular instruments, round the edges of which many little fibrillæ move themselves very briskly, sometimes with a kind of rotation, and sometimes in a trembling or vibrating manner. When in this state, it sometimes unfastens its tail, and swims along with a great deal of swiftness, seemingly in pursuit of its prey. Sometimes the wheels seem to be entire circles, armed with small teeth, like those of the balance wheel of a watch, appearing projected forwards beyond the head, and extending sidewise somewhat wider than its diameter. The teeth or cogs of these wheels seem to stand very regularly at equal distances: but the figure of them varies according to their position, the degree of their protrusion, and perhaps the will of the animal itself. They appear sometimes like minute oblong squares, rising at right angles from the periphery of a circle, like ancient battlements on a round tower; at other times, they terminate in sharp points, and altogether resemble a kind of Gothic crown. They are often seen in a kind of curved direction, all bending the same way, and seeming like so many hooks; and now and then the ends of them will be perceived to be clubbed like mallets. This figure, however, as well as the first, they assume but rarely.

As these wheels are everywhere excessively transparent, except about their circular rim or edge, where the cogs are set, it is very difficult to determine by what contrivance they are turned about, or what their real figure is, though they seem exactly to resemble wheels moving round upon an axis. It is also hardly possible to be certain whether those circular bodies in which the teeth are set, are of a flat form, or hollow and conical; but they seem rather to be of a conical figure. The difficulty of conceiving how an articulation could be contrived so as to cause a real rotation, hath caused many people imagine that there was a deception in this case: But Mr Baker assures us, that when the wheels are fully protruded, they never fail to show all the visible marks of a regular rotation; and, in some positions, the same cogs or teeth may be traced by the eye during a complete revolution.

18 Shows all the marks of a real rotation.

19 Shows great quickness of sensation.

All the actions of this creature seem to imply sagacity and quickness of sensation. At the least touch or motion in the water, they instantly draw in their wheels; and Mr Baker conjectures, that their eyes are lodged somewhere about the wheels; because, while in the maggot state, its motions are slow and blundering; but after the wheels are protruded, they are performed with great regularity, swiftness, and steadiness.

Notwithstanding the minuteness of this animalcule, the microscope generally discovers others in the same drop of water, compared with which the wheel-animal may be said to be a whale. The transparency of its body, therefore, allows its internal parts to be seen, which cannot be perceived in the minutest animalcules, on account of the smallness of their size. *a*, Is the appearance of the head; and though it is everywhere transparent, a ring or circle, more particularly remarkable for its clearness, is commonly perceived about the middle of the forehead, a little above the mouth. This, Mr Baker thinks, might justly be called the seat of the brain. Many vessels which seem to take their origin from thence are discernible in the head, wherein some transparent fluid appears continually agitated by a kind of fluctuating motion.

Animalcule.

Fig. 15.

20 Description of its internal parts.

The thorax, *b*, is joined to the head by a very short neck, *c*, and appears to be about the sixth part of the whole length of the animal. In the middle of the thorax is placed the heart, *d*, where its systole and diastole are plainly visible. It is seen through the back of the insect, shutting and opening alternately with great regularity and exactness. Its size is proportionable to the creature's bigness; and its shape, during the systole, is nearly circular, being composed seemingly of two semilunar parts, which then approach each other laterally, and form between them a roundish or horse-shoe-like figure, whose upper side is flat, and the under one convex. The diastole is performed by a seeming separation, or opening, of these two semilunar parts, whereby the transverse diameter of the heart is very much enlarged. This separation begins exactly in the middle of the lower part next the tail; and opens to such a considerable width upwards, that the two parts, when at their utmost distension, seem only joined by an arched vessel at their anterior end. The alternate motions of contraction and dilatation are performed with great strength and vigour, in pretty much the same time as the pulsation of the arteries of a man in health. The motions of the heart are communicated to all the internal parts of the thorax, and seem to extend a great deal further; for a strict examination discovers, at the same time, throughout the whole animal, contractions and dilatations going on, that are apparently correspondent thereto. These motions of the heart, however, are sometimes suspended or imperceptible for two or three minutes: after which they are renewed, and go on again with the same regularity as before. From the under part of the thorax proceeds a small transparent horn represented at *a*, fig. 11. and 12. It is never visible but when the animal turns on its back or side.

The blood or circulating fluid of the wheel-animal is so absolutely colourless, that the current of it through the vessel is undistinguishable by glasses. A sort of irregular agitation of some fluid is indeed perceived, which is perhaps a compound motion of currents running different ways, and forming such an appearance, though no single current is anywhere distinctly visible.

Immediately below the thorax is another annular division, *e*, joining upwards to the thorax and downwards to the abdomen, the entrance whereof it serves occasionally to enlarge or diminish. The abdomen, *f*, is by much the largest part of the animal, and contains the stomach and intestines. When the insect is full of food, these bowels appear opaque and of a blood-red colour, extending quite through the belly and great

Animalcule. part of the tail, and exhibiting a variety of contractions and dilatations. The belly is capable of stretching out greatly in length, or being shortened very much, and widening its diameter. It assumes many shapes, and becomes occasionally a case for all the other parts of the body.

21 Other kinds of wheel animals. Besides the above-mentioned one, there are found in the waters several other species of animals furnished with wheels, some of which appear to have a rotatory, and others a vibratory, motion. Fig. 25. represents a kind found in the ditch at Norwich, where the hair-like insect is produced. They differ from the foregoing only in having very long tails. Fig. 26, 27, and 28, represent a species of wheel animals, which are also covered with shells. The body of this species consists of three parts, in like manner as the other; only the thorax and abdomen, in this, are not separated by any gut, or intermediate vessel, but are joined immediately together. The heart is plainly perceived, having a regular systole and diastole, at *a*, as in the former species. These creatures occasionally draw themselves entirely within their shells; and the shell then appears terminated by six short spikes on one side and two on the other.

22 Manner of producing their young ones. The young ones of this species are carried in oval sacculi, or integuments, fastened externally on the lower part of their shells somewhere about the tail; these sacculi are sometimes opaque only at one end, and seemingly empty at the other; sometimes they appear opaque in the middle, with a transparency all round, as in fig. 26. When the young one is about to burst its integuments, the parent assists it greatly, by wagging its tail, and striking the oval bag, so that the young one's head becomes as it were forced into the water, though the tail cannot be so soon disengaged. In this condition the young one sets its wheel a-going, and exerts all its endeavours to free itself from its confinement. When it has got clear, it swims away, wagging its tail as the old one does, and leaving the integument adhering to the shell of the parent. The old one then uses a number of efforts to get rid of this incumbrance, striking against it with her tail, fixing the end of her tail upon it, and then darting her body forward; with several very odd motions not easily to be described. This kind of wheel animals are great tormentors of the water flea, *Pulex aquaticus arborescens* of Swammerdam; of which a figure is given from that author (Plate XXXVI.): fig. 2. shows the natural size of the flea; and fig. 1. shows it magnified, with some of the wheel animals adhering to it. These insects are often found in great numbers in the same water: and when that is the case, it is not uncommon to discover five or six of these crustaceous wheel-animals fastened by their tail to the shell or horns of the flea; causing it, seemingly, a vast deal of uneasiness: nor can they be driven away, or shaken off, by all the efforts the flea can use for that purpose.

Fig. 28. *b*.

23 Infest the Pulex Aquaticus.

24 Bell-flower animal. 5. *The Bell-flower Animal*, or *Plumed Polype*. These animalcules dwell in colonies together, from ten to fifteen (seldom falling short of the former number, or exceeding the latter), in a slimy kind of mucilaginous or gelatinous case; which, out of the water, has no determined form, appearing like a little lump of slime; but, when expanded therein, has some resemblance to the figure of a bell with its mouth upwards; and is usually about half an inch long, and a quarter of an inch in diameter. These bells, or colonies, are to be found adhering to the large leaves of duckweed, and other aquatic plants. They may be most easily discovered by letting a quantity of water, with duckweed in it, stand quietly for three or four hours in glass vessels in a window, or other place whence a strong light comes: for then, if any are about the duckweed, they will be found, on careful inspection, extending themselves out of their cases, and making an elegant appearance.

Animalcule.

25 Where discovered.

The bell, or case, which these animals inhabit, being very transparent, all the motions of its inhabitants may be discerned through it distinctly. It seems divided internally into several apartments, or rather to contain several smaller sacculi, each of which encloses one of these animals. The openings at the tops of these sacculi, are but just sufficient to admit the creature's head and a small part of its body to be thrust out beyond them, the rest remaining always in the case. It can, however, occasionally retire into its case altogether; and never fails to do so when alarmed by any sudden motion of the water, or of the vessel which contains it.

26 Motions of the whole colony. Beside the particular and separate motion which each of these creatures is able to exert within its own case, and independent of the rest; the whole colony together has a power of altering the position of the bell, or even of removing it from one place to another; and hence this bell is sometimes found standing perfectly upright, as in fig. 29. and 33. and sometimes bending the upper part downwards, as in fig. 30. As these animalcules seem not to choose to stay together in societies whose number exceeds 15, when the colony happens to increase in number, the bell may be observed to split gradually, beginning from about the middle of the upper or anterior extremity, and proceeding downwards towards the bottom, as in fig. 32. till they at last separate entirely, and become two complete colonies independent of each other, one of which sometimes removes to another part of the vessel.

27 Description of an individual. The arms of each individual of this colony are set round the head, to the number of 40, having each the figure of an Italic *f*, one of whose hooked ends is fastened to the head; and all together, when expanded, compose a figure shaped somewhat like a horse's shoe, convex on one side next the body, but gradually opening and turning outwards, so as to leave a considerable area within the outer extremities of the arms. When the arms are thus extended, the creature, by giving them a vibrating motion, can produce a current in the water, which brings the animalcules, or whatever other minute bodies are within the sphere of its action, with great velocity to its mouth, situated between the arms; where they are taken in if liked, or driven away by a contrary motion. The food is conveyed immediately from the mouth or opening between the arms, through a narrow neck, into a passage seemingly correspondent to the œsophagus in land animals; down which it passes into the stomach, where it remains for some time, and then is voided upwards, in small round pellets, through a gut whose exit is near the neck. The body consists of three divisions; in the uppermost of which are contained all the above-mentioned intestines, which are only to be discerned when the creature is full, at which time they become opaque. The other two divisions,

Animal-cule.

visions, which are probably fixed to the bell, seem to be of no other use than to give the creature a power of contraction and extension. The arms are not able to contract like those of the common polype; but when the animal retires into its case, they are brought together in a close and curious order, so as to be easily drawn in. Though their general appearance, when expanded, is that of a cup whose base and top are of a horse-shoe form, they sometimes separate into four parts, and range themselves as in fig. 36. so as to resemble four separate plumes of feathers. Though their eyes cannot be discovered, yet Mr Baker thinks they have some perception of the light: for when kept in the dark, they always remain contracted; but on being exposed to the light of the sun or of a candle, they constantly extend their arms, and show evident signs of being pleased.

28 Seem to have a perception of light.

Fig. 29. represents one complete colony or bell standing erect, with all the animals out of their kingdom, and their arms extended, exhibiting all together a very pretty appearance: *a*, represents two oval bodies, supposed by Mr Baker to be eggs.

Fig. 30. shows all the creatures withdrawn into their cells, and the end of the bell hanging downwards.

Fig. 33. shows the bell erect, with only one of the animals coming out, in order to show its connexion with the bell.

Fig. 34. shows the head and arms of a single polype closing together, and disposing themselves in order to be drawn into the bell.

Fig. 35. shows one complete animal greatly magnified, to show its several parts more distinctly; viz. *a*, the head, resembling a horse shoe; *bb*, the arms seen from one side; *c*, the narrow neck; *d*, the œsophagus; *e*, the stomach; *f*, the gut, or last intestine through which the food passes after being digested in the stomach; *g*, the anus, where the fæces are discharged in little pellets; *hi*, that part of the bell which surrounds the body of the animal, and closes upon it when it retires down.

Fig. 37. The head and arms seen in front.

29 Globe-animal.

6. *The Globe-animal.* This animalcule, represented fig. 38. seems exactly globular, having no appearance of either head, tail, or fins. It moves in all directions, forwards or backwards, up or down, either rolling over and over like a bowl, spinning horizontally like a top, or gliding along smoothly without turning itself at all. Sometimes its motions are slow, at other times very swift; and, when it pleases, it can turn round, as it were, upon an axis, very nimbly, without removing out of its place. The whole body is transparent, except where the circular black spots are shown in the figure. Some of the animals have no spots, and others from one to seven. The surface of the whole body appears, in some, as if all over dotted with points; in others, as if granulated like shagreen: but their more general appearance is, as if beset thinly round with short moveable hairs or bristles, which probably are the instruments by which their motions are performed. The animalcules may be seen by the naked eye, but appear only like moving points.

30 Pipe-animal.

7. *The Pipe-animal.* These creatures are found on the coast of Norfolk, living in small tubes or cases of sandy matter, in such multitudes as to compose a mass sometimes of three feet in length. Fig. 39. shows a piece of such a congeries broke off, where *aaaa* represent the mouths or openings of the pipes wherein the little animals make their abode. Fig. 40. shows one single pipe, with its inhabitant, separated from the rest, and magnified nine or ten times in diameter. The pipe or case *b* is made of sand, intermixed here and there with minute shells, and all cemented together by a glutinous slime, probably issuing from the animal's own body *c*, which is composed of muscular ringlets like those of a worm, capable of great extension or contraction. The inferior end or head, *d*, is exceedingly beautiful, having round it a double row of little arms disposed in a very regular order, and probably capable of extension, in order to catch its food, and bring it to its mouth. Some of these tubes are found petrified, and constitute one species of syringoides.

Animal-cule.

31 Sometimes found petrified.

32 Insects with net-like arms.

8. *An Insect with net-like arms.* The properties and shape of this little animal are very extraordinary. It is found only in cascades, where the water runs very swift. There these insects are found in clusters, standing erect on their tails; and resembling, when all together, the combs of bees at the time they are filled with their aureliæ. On being taken out of the water, they spin threads, by which they hang exactly in the same manner as the garden spider. Fig. 42. shows one of these insects magnified. Its body appears curiously turned as on a lathe; and at the tail are three sharp spines, on which it raises itself, and stands upright in the water; but the most curious apparatus is about its head, where it is furnished with two instruments like fans or nets, which serve to provide its food. These it frequently spreads out and draws in again; and when drawn up, they are folded together with the utmost nicety and exactness, so as to be indiscernible when brought close to the body. At the bottom of these fans a couple of claws are fastened to the lower part of the head, which, every time the nets are drawn in, conduct to the mouth of the animal whatever is taken in them. When the creature does not employ its nets, it thrusts out a pair of sharp horns, as in fig. 41. where the insect is shown magnified about 400 times.

Some of these creatures being kept with water in a vial, most of them died in two days; and the rest, having spun themselves transparent cases (which were fastened either to the sides of the glass, or to pieces of grass put into it), seemed to be changed into a kind of chrysalis: but, before taking this form, they appeared as in fig. 43. which shape they likewise assumed when weary with catching their food, or when lying in wait for it. None of them lived above three days; and though fresh water was given them two or three times a-day, yet, in a few hours, it would stink to a degree scarce conceivable, and that too at several yards distance, though in proportion to the water, all the included insects were not more than as 1 to 150,000. This makes it probable, that it is necessary for them to live in a rapid stream, lest they should be poisoned by the effluvia issuing from their own bodies, as no doubt they were in the vial.

33 Surprising property of spoiling water.

34 An aquatic worm.

9. *A curious aquatic worm.* This animalcule is shown, magnified, at fig. 31. It is found in ditch water; and is of various sizes, from $\frac{1}{40}$ to $\frac{1}{2}$ of an inch in length. About the head it is somewhat of a yellowish colour; but all the rest of the body is perfectly colourless and transparent, except the intestines, which are considerably

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considerably opaque, and disposed as in the figure. Along its sides are several papillæ, with long hairs growing from them: it has two black eyes, and is very nimble. But the most remarkable thing in this creature is a long horn or proboscis; which, in the large ones, may be seen

35 Its horn or proboscis.

with the naked eye, if the water is clear, and is sometimes $\frac{1}{10}$ of an inch in length: this it waves to and fro as it moves in the water, or creeps up the side of the glass; but it is not known whether it is hollow, or of what use it is to the creature itself.

36 Spermatic animals, when discovered.

10. *Spermatic Animals*, and *Animalcula Infusoria*. The discovery of living animalcules in the semen of most animals is claimed by Mr Leeuwenhoek and Mr Nicholas Hartsoeker, who both say they published it about the end of the year 1677 or beginning of 1678: but Mr Leeuwenhoek having given the most particular description of, and made by far the greatest number of experiments, concerning them, the discovery is commonly attributed to him.

37 General appearance the same in every animal.

According to this naturalist, these animalcules are found in the semen masculinum of every kind of animal: but their general appearance is very much the same, nor doth their size differ in proportion to the bulk of the animal to which they belong. The bodies of all of them seem to be of an oblong oval form, with long tapering slender tails issuing from them; and as by this shape they resemble *tadpoles*, they have been frequently called by that name; though the tails of them, in proportion to their bodies, are much longer than the tails of tadpoles are: and it is observable, that the animalcules in the semen of fishes have tails much longer and more slender than the tails of those in other animals; insomuch, that the extremity of them is not to be discerned without the best glasses, and the utmost attention. Fig. 21.

Pl. XXXII.

N° 1, 2, 3, 4, represent the spermatic animalcula of the rabbit; and N° 5, 6, 7, 8, those of a dog; according to Mr Leeuwenhoek.

38 Inconceivable number and minuteness.

The numbers of these animalcula are inconceivable. On viewing with a microscope the milt or semen masculinum of a living cod fish, innumerable multitudes of animalcules were found therein of such a diminutive size, that he supposed at least 10,000 of them capable of being contained in the bulk of a grain of sand; whence he concludes, that the milt of this single fish contained more living animalcules than there are to be found people living in the whole world. To find the comparative size of these animalcules, Mr Leeuwenhoek placed a hair of his head near them; which hair, through his microscope, appeared an inch in breadth; and he was satisfied, that at least 60 such animalcules could easily lie within that diameter; whence, their bodies being spherical, it follows, that 216,000 of them are but equal to a globe whose diameter is the breadth of a hair. He observed, that when the water wherewith he had diluted the semen of a cod fish was exhaled, the little bodies of the animalcules burst in pieces; which did not happen to those in the semen of a ram: and this he imputes to the greater firmness and consistency of the latter, as the flesh of a land animal is more compact than fish.

39 Are continually in motion.

These animalcules appear to be very vigorous, and tenacious of life: for they may be observed to move long after the animal from which they are taken is dead. They have this peculiarity also that they are continually in motion, without the least rest or intermission, provided there is fluid sufficient for them to swim about in. These animalcula are peculiar to the semen; nothing that has the least token of life being discovered, by the best glasses, either in the blood, spittle, urine, gall, or chyle. Great numbers, however, are to be found in the whitish matter that sticks between the teeth; some of which are of an oval figure, and others resemble eels.

Animalcule.

40 Animalcula infusoria.

The *Animalcula Infusoria* take their name from their being found in all kinds either of vegetable or animal infusions. Indeed there is scarcely any kind of water, unless impregnated with some mineral substance, but what will discover living creatures.—Mr Leeuwenhoek says, that at first he could discern no living creatures in rain water; but after standing some days he discovered innumerable animalcules, many thousands of times less than a grain of sand, and in proportion to a mite as a bee is to a horse.—In other rain water, which had likewise stood some time, he found the smallest sort he had ever seen; and, in a few days more, met with others eight times as big as these, and almost round. In another quantity of rain water that had been exposed like the former, he discovered a kind of animalcules with two little horns in continual motion. The space between the horns was flat, though the body was roundish, but tapering a little towards the end; where a tail appeared, four times as long as the body, and the thickness of a spider's web. He observed several hundreds of these within the space a grain of sand would occupy. If they happened on the least filament or string, they were entangled in it; and then would extend their bodies into an oblong round, and struggle hard to disengage their tails. He observed a second sort of an oval figure, and imagined the head to stand at the sharpest end. The body was flat, with several small feet moving exceeding quick, but not discernible without a great deal of attention. Sometimes they changed their shape into a perfect round, especially when the water began to dry away. He met also with a third sort, twice as long as broad, and eight times smaller than the first: yet in these he discerned little feet, whereby they moved very nimbly. He perceived likewise a fourth sort, a thousand times smaller than a louse's eye, and which exceeded all the rest in briskness; he found these turning themselves round, as it were upon a point, with the celerity of a top. And he says, there were several other sorts.

41 Mr Leeuwenhoek's account of animalcules in rain water.

42 Surprising production of these animalcules.

The production of *animalcula infusoria* is very surprising. In four hours time, an infusion of cantharides has produced animalcula less than even the tails of the spermatic animals we have already described. Neither do they seem to be subject to the fate of other animals; but, several kinds of them at least, by dividing themselves in two, to enjoy a sort of immortality. Nor do the common methods by which other animals are destroyed, seem to be effectual for destroying their vital principle. Hot mutton gravy, secured in a phial with a cork, and afterwards set among hot ashes to destroy as effectually as possible every living creature that could be supposed to exist in it, has nevertheless been found swarming with animalcules after standing a few days.

43 Mr Ellis's account of animalcules from infusion of potatoes.

In the Philosophical Transactions, vol. lix. we have the following curious account, given us by Mr Ellis, of animalcules produced from an infusion of potatoes and of hempseed.

"On

Animalcule.

"On the 25th of May 1768, Fahrenheit's thermometer 70°, I boiled a potato in the New River water till it was reduced to a mealy consistence. I put part of it, with an equal proportion of the boiling liquor, into a cylindrical glass vessel that held something less than half a wine pint, and covered it close immediately with a glass cover. At the same time, I sliced an unboiled potato; and, as near as I could judge, put the same quantity into a glass vessel of the same kind; with the same proportion of New River water not boiled; and covered it with a glass cover; and placed both vessels close to each other.

"On the 26th of May, 24 hours afterwards, I examined a small drop of each, by the first magnifier of Wilson's microscope, whose focal distance is reckoned at $\frac{1}{50}$ part of an inch; and, to my amazement, they were both full of animalcula of a linear shape, very distinguishable, moving to and fro with great celerity; so that there appeared to be more particles of animal than vegetable life in each drop.

"This experiment I have repeatedly tried, and always found it to succeed in proportion to the heat of the circumambient air; so that even in winter, if the liquors are kept properly warm, at least in two or three days, the experiment will succeed.

"What I have observed are infinitely smaller than spermatic animals, and of a very different shape; the truth of which every accurate observer will soon be convinced of, whose curiosity may lead him to compare them; and I am persuaded he will find they are no way akin.

"At present I shall pass over many other curious observations, which I have made on two years experiments, in order to proceed to the explaining a hint which I received last January from M. de Saussure of Geneva, when he was here; which is, that he found one kind of these animalcula infusoria that increase by dividing across into nearly two equal parts.

"I had often seen this appearance in various species, a year or two ago, as I found upon looking over the minutes I had taken when I made any new observation; but always supposed the animal, when in this state, to be in coition.

"Not hearing, till after M. de Saussure left this kingdom, from what infusion he had made his observation; his friend Dr de la Roche of Geneva informed me, the latter end of February last, that it was from hempseed.

44 From an infusion of hempseed.

"I immediately procured hempseed from different seedsmen in different parts of the town. Some of it I put into New River water, some into distilled water, and some I put into very hard pump water. The result was, that in proportion to the heat of the weather, or the warmth in which they were kept, there was an appearance of millions of minute animalcula in all the infusions; and, some time after, some oval ones made their appearance, as at fig. 3. *b*, *c*. These were much larger than the first, which still continued: these wriggled to and fro in an undulatory motion, turning themselves round very quick all the time that they moved forwards. I was very attentive to see these animals

45 Divide themselves into two.

divide themselves; and at last I perceived a few of the appearance of fig. 3. *a*, as it is represented by the first magnifier of Wilson's microscope; but I am so well convinced by experience that they would separate, that I did not wait to see the operation: however, as the following sketches, which I have drawn from five other species, will very fully explain this extraordinary phenomenon, there will be no difficulty in conceiving the manner of the first. See fig. 4, 5, 6, 7, 8.

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"The proportion of the number of these animals which I have observed to divide in this manner, to the rest, is scarce 1 to 50; so that it appears rather to arise from hurts received by some few animalcula among the many, than to be the natural manner in which these kinds of animals multiply; especially if we consider the infinite quantity of young ones which are visible to us through the transparent skins of their bodies, and even the young ones that are visible in those young ones while in the body of the old ones.

"But nothing more plainly shows them to be zoophytes than this circumstance, That when, by accident, the extremity of their bodies has been shrivelled for want of a supply of fresh water, the applying more fresh water has given motion to the part of the animal that was still alive: by which means, this shapeless figure has continued to live and swim to and fro all the time it was supplied with fresh water.

"I cannot finish this part of my remarks on these animals, without observing, that the excellent Linnæus has joined the *beroë* with the *volvox*, one of the animalcula infusoria. The beroë is a marine animal, found on our coast; of a gelatinous transparent nature, and of an oval or spherical form, from half an inch to an inch diameter; divided like a melon into longitudinal ribs, each of which is furnished with rows of minute fins; by means of which, this animal, like the animalcula infusoria, can swim in all directions with great swiftness. In the same manner I have seen most of those minute animals move so swift that we could not account for it, without supposing such a provision in nature, which is really true, but cannot be seen till the animals grow faint for want of water; then, if we attend, we may with good glasses plainly discover them.

46 Beroë described.

47 Method of discovering the fins of animalcules.

"I have lately found out, by mere accident, a method to make their fins appear very distinctly, especially in the larger kind of animalcula, which are common to most vegetable infusions; such as the terebella. This has a longish body, with a cavity or groove at one end, like a gimlet: by applying, then, a small stalk of the horse-shoe geranium (or geranium zonale of Linnæus), fresh broken, to a drop of water in which these animalcula are swimming, we shall find that they will become torpid instantly; contracting themselves into an oblong oval shape, with their fins extended like so many bristles all round their bodies. The fins are in length about half the diameter of the middle of their bodies. Before I discovered this expedient, I tried to kill them by different kinds of salts and spirits; but though they were destroyed by this means, their fins were so contracted, that I could not distinguish them in the least. After lying in this state of torpidity for two or three minutes, if a drop of clean water is applied to them, they will recover their shape, and swim about immediately, rendering their fins again invisible."

Fig. 3, 4, 5, 6, 7, 8, represent different species of animalcula infusoria, mentioned by Mr Ellis as belonging to the genus volvox of Linnæus.

Fig. 3. represents the volvox ovalis, or egg-shaped volvox;

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volvox; at (b) and (c) it is expressed in its natural shape; at (a) the manner in which it becomes two animals, by separating across the middle. This was found in the infusion of hempseed; but is found in other vegetable infusions, particularly that of tea seed.

Fig. 4. is the volvox torquilla, or wryneck. At (a) is represented its divided state; at (b) and (c) its natural state; this is common to most vegetable infusions, as is the following:

Fig. 5. is the volvox volutans, or the roller. At (a) the animal is separated, and becomes two distinct beings, each swimming about and providing for itself: this is often the prey of another species of this genus, especially while it is weak by this separation, not being so active for some time till it can recover itself. At (c) the animal appears to be hurt on one side; this impression in a little time is succeeded by another in the opposite side, as at (b), which soon occasions a division. At (d) is the side view, and at (e) the front view, of the natural shape of the animal.

Fig. 6. is the volvox oniscus, or wood-louse. At (a) is the natural shape of it, as it appears full of little hairs, both at the head and tail; with those at the head, it whirls the water about to draw its prey to it; the feet, which are many, are very visible, but remarkably so in a side-view at (d). At (b) it is represented beginning to divide; and at (c) the animals are ready to part: in this state, as if in exquisite pain, they swim round and round, and to and fro, with uncommon velocity, violently agitated till they get asunder. This was found in an infusion of different kinds of pine branches.

Fig. 7. is the volvox terebella, or the gimlet. This is one of the largest of the kind, and is very visible to the naked eye. It moves along swiftly, turning itself round as it swims, just as if boring its way: (a) and (b) are two views of its natural shape; (c) shows the manner of its dividing. When they are separated, the lower animal rolls very awkwardly along, till it gets a groove in the upper part: (d) represents one of them lying torpid, by means of the juice of the horse-shoe geranium, with its fins extended. This animal is found in many infusions, particularly of grass or corn.

Fig. 8. is the volvox vorax, or glutton. This animal was found in an infusion of the Tartarian pine; it varies its shape very much, contracting and extending its proboscis, turning it to and fro, in various directions, as at a, b, c, d, e. It opens its proboscis underneath the extremity, when it seizes its prey. The less active animals, that have lately been divided, such as those at fig. 3. (a), and at fig. 4. (a), serve it as food, when they come in its way: these it swallows down instantly, as it is represented at fig. 8. h and i. At (f) it is ready to divide, and at (g) it is divided; where the hinder part of the divided animal has got a proboscis or beak, to procure nourishment for itself, and soon becomes a distinct being from the fore part.

Thus we have given as full an account as our limits would admit, of the most curious kinds of animalcules that have hitherto been observed. We cannot, however, dismiss this subject, without taking notice of some of the most remarkable hypotheses which have been formed concerning their nature and origin.

Before the invention of microscopes, the doctrine of equivocal generation, both with regard to animals and plants of some kinds, was universally received: but this instrument soon convinced every intelligent person, that those plants which formerly were supposed to be produced by equivocal generation arose from seeds, and the animals, in like manner, from a male and female. But as the microscope threw light upon one part of nature, it left another involved in darkness: for the origin of the animalcula infusoria, or of the spermatic animals already mentioned, remains as yet as much unknown as that of many other kinds was when the doctrine of equivocal generation reigned in full force.

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48 Doctrine of equivocal generation exploded.

49 Supposed discovery concerning generation.

The discovery of spermatic animalcules was thought to throw some light on the mysterious affair of generation itself, and these minute creatures were imagined to be each of them individuals of the same species with the parent. Here the infinite number of these animalcules was an objection, and the difficulty remained as great as before: for, as every one of these animalcules behoved to be produced from a male and female, to explain their origin by animalcular generation in the same manner, was only explaining generation by itself.

This hypothesis, therefore, having proved unsatisfactory, others have been invented. M. Buffon, particularly, hath invented one, by which he at once annihilates the whole animalcular world; and in this he hath been followed by several very ingenious philosophers. For a particular account of this, so far as it concerns generation, we must refer to that article; but as he gives such a particular account of his having examined the human semen, that we cannot doubt of his accuracy, we shall here contrast his account with that of Mr Leeuwenhoek already mentioned.

50 M. Buffon's experiments on the human semen.

Having procured the seminal vessels of a man who died a violent death, he extracted all the liquor from them while they were still warm; and having examined a drop of it with a double microscope, it had the appearance, fig. 9. Large filaments appeared, which in some places spread out into branches, and in others intermingled with one another. These filaments clearly appeared to be agitated by an internal undulatory motion, like hollow tubes, which contained some moving substance. He saw distinctly this appearance changed for that fig. 10. Two of these filaments, which were joined longitudinally, gradually separated from each other in the middle, alternately approaching and receding, like two tense cords fixed by the ends, and drawn asunder in the middle. These filaments were composed of globules that touched one another, and resembled a chaplet of beads. After this, he observed the filament swelled in several places, and perceived small globular bodies issue from the swelled parts, which had a vibratory motion like a pendulum. These small bodies were attached to the filaments by small threads, which gradually lengthened as the bodies moved. At last, the small bodies detached themselves entirely from the filaments, drawing after them the small thread, which looked like a tail. When a drop of the seminal liquor was diluted, these small bodies moved in all directions very briskly; and had he not seen them separate themselves from the filaments, he would, he says, have thought them to be animals. The seminal matter was at first too thick, but gradually became more fluid; and, in proportion as its fluidity increased, the filaments disappeared,

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disappeared, but the small bodies became exceedingly numerous. Each of them had a long thread or tail attached to it, from which it evidently endeavoured to get free. Their progressive motion was extremely slow, during which they vibrated to the right and left, and at each vibration they had a rolling unsteady motion in a vertical direction.

At the end of two or three hours, the seminal matter becoming still more fluid, a greater number of these moving bodies appeared. They were then more free of encumbrances; their tails were shorter; their progressive motion was more direct, and their horizontal motion greatly diminished. In five or six hours, the liquor had acquired almost all the fluidity it could acquire without being decomposed. Most of the small bodies were now disengaged from their threads; their figure was oval. They moved forward with considerable quickness, and, by their irregular motions backward and forward, they had now more than ever the appearance of animals. Those that had tails adhering to them, seemed to have less vivacity than the others; and of those that had no tails, some altered more their figure and their size. In twelve hours, the liquor had deposited at the bottom of the vial a kind of ash-coloured gelatinous substance, and the fluid at top was almost as transparent as water. The little bodies being now entirely freed from their threads, moved with great agility, and some of them turned round their centres. They also often changed their figures, from oval becoming round, and often breaking into smaller ones. Their activity always increased as their size diminished. In 24 hours, the liquor had deposited a greater quantity of gelatinous matter, which, being with some difficulty diluted in water, exhibited an appearance somewhat resembling lace. In the clear semen itself only a few small bodies were now seen moving; next day, these were still farther diminished; and after this nothing was to be seen but globules, without the least appearance of motion. Most of the above-mentioned appearances are shown fig. 10, 11, 12, 13, 14, 15, 16. Fig. 17. and 18. represent an appearance of the globules in another experiment, in which they arranged themselves as troops, and passed very quickly over the field of the microscope. In this experiment they are found to proceed from a small quantity of gelatinous mucilage.

From these experiments, M. Buffon concludes, that what have been called *spermatic animals*, are not creatures really endowed with life, but something proper to compose a living creature; and he distinguishes them by the name of *organic particles*. The same individual kinds of animals he declares he has found in the fluids separated from the ovaria of females: and for the truth of this appeals to the testimony of Mr Needham, who was an eye witness of his experiments. He also brings

51 Needham's experiment on the milt of the calmar.

an additional proof of his doctrine from Mr Needham's observation on the milt of the *calmar*, a species of cuttle fish. Here the spermatic animals, at least what have the only appearance of life, are vastly larger than in any other creature, so as to be plainly visible to the naked eye. When magnified, they appear as at fig. 19. and 20. *a*. Their first appearance is at fig. 19. *a* and *b*, when they resemble springs enclosed in a transparent case. These springs were equally perfect at first as afterwards; only in time they contracted themselves, and became like a kind of screw. The head of the case is a species of valve which opens outward, and through which every thing within may be forced out. It contains, besides, another valve, *b*, a little barrel *c*, and a spongy substance *d e*. Thus the whole machine consists of an outer transparent cartilaginous case *a*, the superior extremity of which is terminated by a round head formed by the case itself, and performs the office of a valve. This external case contains a transparent tube: which includes the spring, a piston or valve, a little barrel, and spongy substance. The screw occupies the superior part of the tube and case, the piston and barrel are situated in the middle, and the spongy substance occupies the inferior part. These machines pump the liquor of the milt; the spongy substance is full of this liquor; and, before the animal spawns, the whole milt is only a congeries of these bodies which have sucked up all the liquor of it. Whenever these small machines are taken out of the body of the animal, and put in water, or exposed to the air, they begin to act, as represented in fig. 19. and 20; the spring mounts up, and is followed by the piston, the barrel, and the spongy substance which contains the liquor: and, as soon as the spring and the tube in which it is contained begin to issue out of the case, the spring plaits, and the whole internal apparatus moves, till the spring, the piston, and the barrel, have entirely escaped from the case. When this is effected, all the rest instantly follow, and the milty liquor which had been pumped in, and confined to the spongy substance, runs out through the barrel.

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Fig. 20.

According to this account, the milt of the calmar contains no animalcules; and therefore we may from analogy conclude, that the small moving bodies which are to be seen in the semen of other animals, are not really creatures endowed with life. M. Buffon extends the analogy still further: and concludes, that all the moving bodies which are to be found in the infusions either of animal or vegetable substances are of a similar nature. "To discover (says he) whether all the parts of animals, and all the seeds of plants, contained moving organic particles, I made infussions of the flesh of different animals, and of the seeds of more than 20 different species of vegetables; and after remaining some days in close glasses, I had the pleasure of seeing organic moving particles in all of them. In some they appeared sooner, in others later; some preserved their motions months, and others soon lost it. Some at first produced large moving globules resembling animals, which changed their figure, split, and became gradually smaller. Others produced only small globules, whose motions were extremely rapid; and others produced filaments, which grew longer, seemed to vegetate, and then swelled and poured forth torrents of moving globules."

52 Conclusion against the existence of animalcules.

This last observation gave rise to a new system. Baron Munchansen, perceiving that the last-mentioned moving globules, after moving for some time, began again to vegetate, concluded that they were first animals and then plants. This strange hypothesis Mr Ellis has overturned in the paper already quoted, in which he asserts that they are no other than the seeds of that genus of fungi called *mucor* or *mouldiness*, and that their motion is owing to numbers of minute animalcules attacking them for food. "Having (says he), at the request of Dr Linnæus, made several experiments

53 Baron Munchansen's theory.

54 Disproved by Mr Ellis.

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on the infusion of mushrooms in water, in order to prove the theory of Baron Munchansen, that their seeds are first animals, and then plants (which he takes notice of in his System of Nature, p. 1326, under the genus of chaos, by the name of *chaos fungorum seminum*), it appeared evidently, that the seeds were put into motion by very minute animalcules, which proceeded from the putrefaction of the mushroom: for by pecking at these seeds, which are reddish, light, round bodies, they moved them about with great agility in a variety of directions; while the little animals themselves were scarcely visible, till the food they had eaten had discovered them. The satisfaction I received from clearing up this point, led me into many other curious and interesting experiments.

"The ingenious Mr Needham supposes these little transparent ramified filaments, and jointed or coralloid bodies, which the microscope discovers to us on the surface of most animal and vegetable infusions when they become putrid, to be zoophytes, or branched animals; but to me they appear, after a careful scrutiny with the best glasses, to be of that genus of fungi called *mucor* or *mouldiness*; many of which Michelius has figured, and Linnæus has accurately described.

"Their vegetation is so amazingly quick, that they may be perceived in the microscope even to grow and feed under the eye of the observer.

Mr Needham has pointed out to us a species that is very remarkable for its parts of fructification. (See Philosophical Transactions, vol. xlv. tab. 5. fig. 3. a, A). This, he says, proceeds from an infusion of bruised wheat.

"I have seen the same species arise from the body of a dead fly, which was become putrid by lying floating for some time in a glass of water, where some flowers had been, in the month of August 1768. This species of mucor sends forth a mass of transparent filamentous roots; from whence arise hollow stems, that support little oblong oval seed vessels, with a hole on the top of each. From these I could plainly see minute globular seeds issue forth in great abundance with an elastic force, and turn about in the water as if they were animated.

"Continuing to view them with some attention, I could just discover, that the putrid water which surrounded them was full of the minutest animalcula; and that these little creatures began to attack the seeds of the mucor for food, as I have observed before in the experiment on the seeds of the larger kind of fungi or mushrooms. This new motion continued the appearance of their being alive for some time longer: but soon after, many of them arose to the surface of the water, remaining there without motion; and a succession of them afterwards coming up, they united together in little thin masses, and floated to the edge of the water, remaining there quite inactive during the time of observation.

"As this discovery cleared up many doubts which I had received from reading Mr Needham's learned dissertation, I put into the glass several other dead flies; by which means this species of mucor was propagated so plentifully, as to give me an opportunity of frequently trying the same experiment to my full satisfaction.

"Lastly, These jointed coralloid bodies, which Mr Needham calls *chaplets*, and *pearl-necklaces*, I have seen frequently very distinctly. These appear not only on an infusion of bruised wheat when it becomes putrid, but on most other bodies when they throw up a viscid scum and are in a state of putrefaction. These, then, are evidently no more than the most common mucor, the seeds of which are everywhere floating in the air; and bodies in this state afford them a natural proper soil to grow upon. Here they send downwards their fine transparent ramified roots into the moisture which they float upon; and from the upper part of the scum, their jointed coralloid branches rise full of seed into little groove-like figures. When a small portion of these branches and seeds are put into a drop of the same putrid water upon which the scum floats, many of these millions of little animalcula with which it abounds, immediately seize them as food, and turn them about with a variety of motions, as in the experiments on the seeds of the common mushrooms, either singly, or two or three seeds connected together; answering exactly to Mr Needham's description, but evidently without any motion of their own, and consequently not animated.

Animalcule.

55 M. Buffon's opinion of different kind of animalcules.

M. Buffon, however, is not content with denying life only to those beings where the signs of it are the most equivocal; but includes in the same rank of organic particles, almost every animal too small to be discovered by the naked eye, and even some of those whose motions are evidently perceptible to the eye. "Almost all microscopic animals," says he, "are of the same nature with the moving bodies in the seminal fluids and infusions of animal and vegetable substances. The eels in paste, in vinegar, &c. are all of the same nature, and derived from the same origin. There are, perhaps, as many beings that either live or vegetate, produced by a fortuitous assemblage of organic particles, as by a constant and successive generation. Some of them, as those of the calmar, are only a kind of machines, which, though exceedingly simple, are very active. Others, as the spermatic animalcules, seem to imitate the movements of animals. Others resemble vegetables in their manner of growth and extension. There are others, as those of blighted wheat, which at pleasure can be made alternately either to live or die, and it is difficult to know to what they should be compared. There are still others, and in great numbers, which are at first a kind of animals, then become a species of vegetables, and again return alternately to their vegetable state. The eels in paste have no other origin than the union of the organic particles of the most essential part of the grain. The first eels that appear are certainly not produced by other eels; but though they are not propagated themselves, they fail not to engender other living eels. By cutting them with the point of a lancet, we discover smaller eels issuing in great numbers out of their bodies. The body of this animal seems to be only a sheath or sac, containing a multitude of smaller animals, which perhaps are other sheaths of the same kind, in which the organic matter is assimilated into the form of eels."

56 His reasoning inconclusive.

Though we can by no means pretend to account for the appearance of these animalcules, yet we cannot help observing, that our ignorance of the cause of any phenomenon is no argument against its existence. Though we are not able to account in a satisfactory manner for the

Animalcule.

the origin of the native Americans, we suppose M. Buffon himself would reckon it absurd to maintain that the Spaniards on their arrival there found only *organic particles* moving about in disorder. The case is the very same with the eels in paste. They are exceedingly minute in comparison with us; but, with the solar microscope, Mr Baker has made them assume a more respectable appearance, so as to have a diameter of an inch and a half, or two inches, and a length proportionable. They swam up and down very briskly; the motion of their intestines was plainly visible; when the water dried up, they died with apparent agonies, and their mouths gaped very wide. Were we to find a creature of the size of this magnified eel, gasping in a place where water had lately been, we certainly would never conclude it to be an *organic particle*, or a fortuitous assemblage of them; but a fish. Why then should we conclude otherwise with regard to the eel while in its natural state, than that it is a little fish? In reasoning on this subject, we ought always to remember, that, however essential the distinction of bodies into great and small may appear to us, they are not so to the Deity; with whom, as Mr Baker well expresses himself, "an atom is as a world, and a world but as an atom."—Were the Deity to exert his power for a little, and give a natural philosopher a view of a quantity of paste filled with eels, from each of whose bodies the light was reflected as when it passes through a solar microscope; instead of imagining them organic particles, the paste would appear like a little mountain; he would probably look upon the whole as a monstrous assemblage of serpents, and be afraid to come near them. Whenever, therefore, we discover beings to appearance endowed with the principle of self-preservation, or whatever else we make the characteristic of animals, neither the smallness of their size, nor the impossibility of our knowing how they come there, ought to cause us doubt of their being really animated. —At the same time, it must also be remembered, that *motion* is not always a characteristic of animal life, even though the moving bodies should avoid one another, or any seeming obstacle placed in their way. We know, that inanimate bodies, when electrified, will avoid others endowed with an electricity of the same kind, and adhere to those which have the opposite one. As we are by no means acquainted with the utmost powers of electricity, but on the contrary, from what we do know of it, have all the reason in the world to conclude that it can produce effects utterly beyond our comprehension, it is impossible for us to know what share it may have in producing the motions observed in vegetable infusions, or in the semen of animals.—We may also further observe, that though in Mr Ellis's experiment of the boiled potato he took it for granted that every seed of animal life would be destroyed by the boiling water, yet even this cannot be proved; nay, on the contrary, it hath been proved by undeniable experiments, that the human body itself hath endured a heat of 240 degrees of Fahrenheit (28 degrees above that of boiling water) without injury. The eggs of these animalcula might therefore be strong enough to resist the heat hitherto used in Mr Ellis's or any other experiment.

A considerable objection to the existence of animalcules in the semen, or any other part of animal bodies, must arise from the total exclusion of air, which is found so necessary to the life of larger animals. Some instances, however, have been observed of large animals being found in such situations as they could not possibly have enjoyed the least benefit from the air for a great number of years; and in this state they have not only lived, but lived much longer than they would otherwise have done.

Animalcule.

67 Animals sometimes found living in solid bodies.

In Toulon harbour and road, are found solid hard stones, and perfectly entire; containing in different cells, secluded from all communication with the air, several living shell fish, of an exquisite taste, called *Dactyli*, i. e. Dates: to come at these fish, the stones are broken with mauls. Also, along the coast of Ancona, in the Adriatic, are stones usually weighing about 50 pounds, and sometimes even more; the outside rugged, and easily broken, but the inside so hard, as to require a strong arm and an iron maul to break them; within them, and in separate niches, are found small shell-fish, quite alive, and very palatable, called *Solenes* or *Cappe lunghe*. These facts are attested by Gassendi, Blondel, Mayol, the learned bishop of Sulturara, and more particularly by Aldrovandi a physician of Bologna. The two latter speak of it as a common fact which they themselves saw.

In the volume for 1719, of the Academy of Sciences at Paris, is the following passage:

"In the foot of an elm, of the bigness of a pretty corpulent man, three or four feet above the root, and exactly in the centre, has been found a live toad, middle sized, but lean, and filling up the whole vacant space: no sooner was a passage opened, by splitting the wood, than it scuttled away very hastily: a more firm and sound elm never grew; so that the toad cannot be supposed to have got into it. The egg whence it was formed, must, by some very singular accident, have been lodged in the tree at its first growth. There the creature had lived without air, feeding on the substance of the tree, and growing only as the tree grew. This is attested by Mr Hubert, professor of philosophy at Caen."

The volume for the year 1731 has a similar observation, expressed in these words:

"In 1719, we gave an account of a fact, which, though improbable, is well attested; that a toad had been found living and growing in the stem of a middling elm, without any way for the creature to come out or to have got in. M. Seigne, of Nantes, lays before the academy a fact just of the very same nature, except that instead of an elm, it was an oak, and larger than the elm, which still heightens the wonder. He judges, by the time requisite for the growth of the oak, that the toad must have subsisted in it, without air, or any adventitious aliment, during 80 or 100 years. M. Seigne seems to have known nothing of the fact in 1719."

With the two foregoing may be classed a narrative of Ambrose Parée, chief surgeon to Henry III. king of France, who, being a very sensible writer, relates the following fact, of which he was an eye-witness.

"Being (says he) at my seat, near the village of Meudon, and overlooking a quarryman whom I had set to break some very large and hard stones; in the middle of one we found a huge toad, full of life, and without any visible aperture by which it could get

Animalcule, Animated.

there. I began to wonder how it received birth, had grown, and lived; but the labourer told me, it was not the first time he had met with a toad, and the like creatures, within huge blocks of stone, and no visible opening or fissure."

Observations of living toads, found in very hard and entire stones, occur in several authors, particularly Baptist Fulgosa doge of Genoa, the famous physicians Agricola and Horstius, and Lord Verulam; others give very specious accounts of snakes, frogs, crabs, and lobsters, being found alive, enclosed within blocks of marble, rocks, and large stones.

An instance similar to these, of the truth of which we have no reason to doubt, was observed in this country in the year 1773, where a large toad was found in the middle of a piece of coal having not the least visible crack or fissure.

58 The subject still obscure.

Upon the whole, therefore, though philosophers are not yet able to discover how these minute creatures are produced; yet, that there really are animals much smaller than what we can discern with our naked eye, seems to be indisputable. The subject, however, is still evidently obscure, and will no doubt require the utmost attention of philosophers, as well as further improvements in the construction of microscopes, fully to investigate it.

Animalcula are said to be the cause of various disorders. The itch, from several experiments, is affirmed to be a disorder arising from the irritations of a species of animalcula found in the pustules of that ailment; whence the communication of it by contact from one to another is easily conceived, as also the reason of the cure being effected by cutaneous applications. On this foundation some have attributed the smallpox and measles, and infectious diseases; others the epilepsy, &c. to animalcules. Langius goes farther, and pretends to reduce all diseases in general to the same principle. A late writer at Paris, who assumed the title of an English physician, has done more. He not only accounts for all diseases, but for the operation of all medicines, from the hypothesis of animalcules. He has peculiar animalcules for every disease; scorbutic animalcules, podagrical animalcules, variolous animalcules, &c. all at his service. *Journ. des Sçav.* tom. lxxxii. p. 535, &c.

But as most discoveries in natural philosophy have laid a foundation for the warm imaginations of some men to form visionary theories, to the great prejudice of real knowledge; so those relating to animalcula have been drawn in, however improperly, to support the most whimsical and chimerical systems.

Animalcules, Invisible.—Naturalists suppose another species or order of invisible animalcules, viz. such as escape the cognizance even of the best microscopes, and give many probable conjectures in relation to them. Reason and analogy give some support to the existence of infinite imperceptible animalcules. The naked eye, say some, takes in from the elephant to the mite; but there commences a new order reserved only for the microscope, which comprehends all these from the mite to those 27 millions of times smaller; and this order cannot be yet said to be exhausted, if the microscope be not arrived at its last perfection. See further on this subject the article Microscope.

ANIMATED, or Animate, in a general sense, denotes something endowed with animal life. It also imports a thing to be impregnated with vermine or animalcules. Animated || Anjou.

Animated Horse-Hairs. See *Horse-Hairs.*

ANIMATION signifies the informing an animal body with a soul.—The different hypotheses of physicians and philosophers, concerning the time of animation, have had their influence on the penal laws made against artificial abortions: it having been made capital to procure miscarriage in the one state, while in the other it was only deemed a venial crime. The emperor Charles V. by a constitution published in 1532, put the matter on another footing; instead of the distinction of an animated and unanimated fœtus, he introduced that of a vital and non-vital fœtus, as a thing of more obvious and easy decision, and not depending on any system either of creation, traduction, or infusion. Accordingly a fœtus is said, in a legal sense, to be animated, when it is perceived to stir in the womb; which usually happens about the middle of the term of gestation.

ANIME, in *Heraldry*, a term used when the eyes of a rapacious creature are borne of a different tincture from the creature itself.

Anime, a resin exsuding from the trunk of a large American tree, called by Piso *jetaiba*, by the Indians *courbaril*, (a species of Hymenæa). This resin is of a transparent amber colour, a light agreeable smell, and little or no taste. It dissolves entirely, but not very readily, in rectified spirit of wine; the impurities, which are often in large quantity, remaining behind. The Brazilians are said to employ anime in fumigations for pains and aches proceeding from a cold cause: with us, it is rarely, if ever, made use of for any medicinal purposes.

ANIMETTA, among ecclesiastical writers, denotes the cloth wherewith the cup of the eucharist is covered.

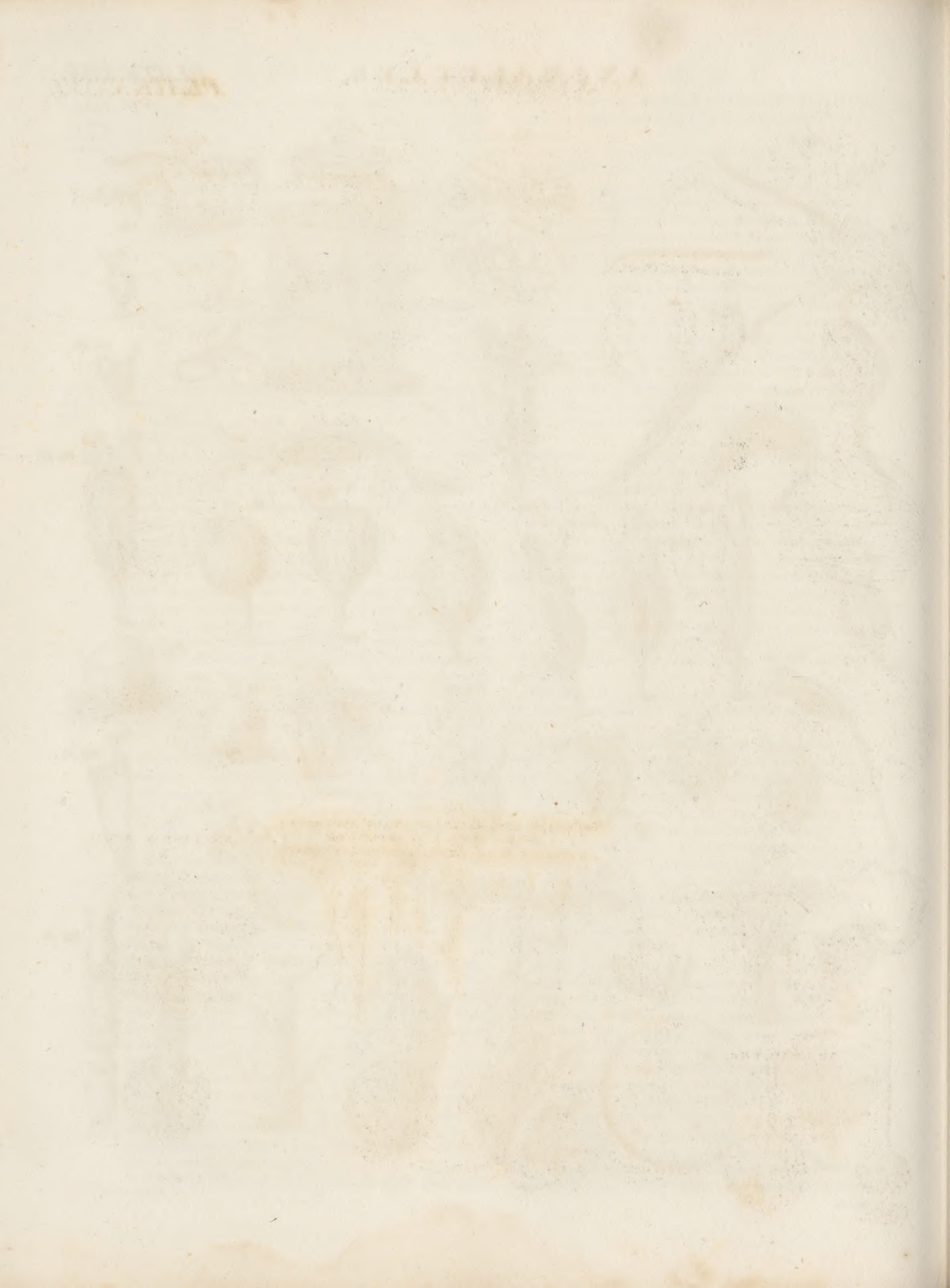
ANINGA, in commerce, a root which grows in the Antilles islands, and is pretty much like the China plant. It is used by sugar bakers for refining the sugar.

ANJOU, a province and duchy of France before the revolution, bounded on the east by Touraine, on the south by Poictou, on the west by Bretagne, and on the north by Maine. It is now included under the departments of the Mayne and Loire, and the Sarte and Mayenne. It is 70 miles in length, and in breadth 60. Through this province run five navigable rivers: the Loire, which divides it into two parts; the Vienne, the Toue, the Mayenne, and the Sarte.

The air is temperate, and the country agreeably diversified with hills and meadows. There are 33 forests of oak trees mixed with beech. The country produces white wine, wheat, barley, rye, oats, pease, beans, flax, hemp, walnuts, and some chesnuts. In Lower Anjou they make cyder. There are fruit trees of all kinds, and pasture proper for horses. The greatest riches of the province consist in cows, oxen, and sheep. There are several coal and iron mines; and yet there are but two forges in the whole province. There are quarries of marble and of slate; as well as quarries of white stone, proper for building, on the side of the river Loire. Here are also several saltpetre works and some glass-houses. The remarkable towns, besides

ANIMALCULES. PLATE XXXV.

Roffe Sculp.



ANIMALCULES.

PLATE XXXVI.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

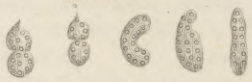


Fig. 6.

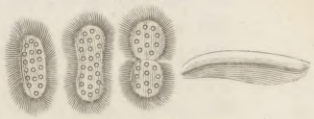


Fig. 7.

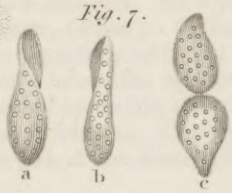


Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

Fig. 17.

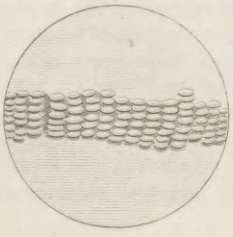


Fig. 18.

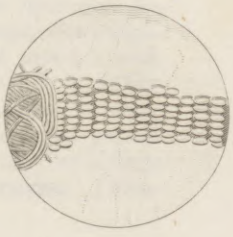


Fig. 19.

Fig. 21.

SPERMATIC ANIMALCULA *of the Dog* | SPERMATIC ANIMALCULA *of the Rabbit*

ACCORDING TO THE FIRST EDITION OF LEWENHOCK.

Fig. 22.

ANGUINUM OVUM.

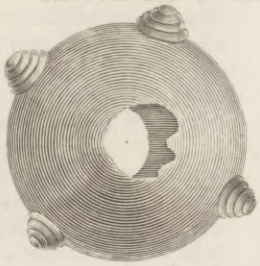


Fig. 23.

ARÆOMETER.

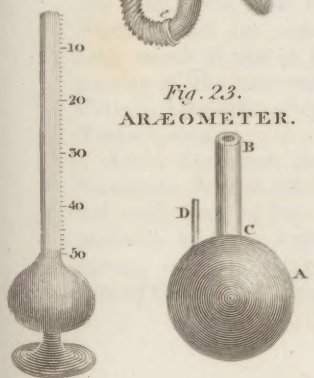
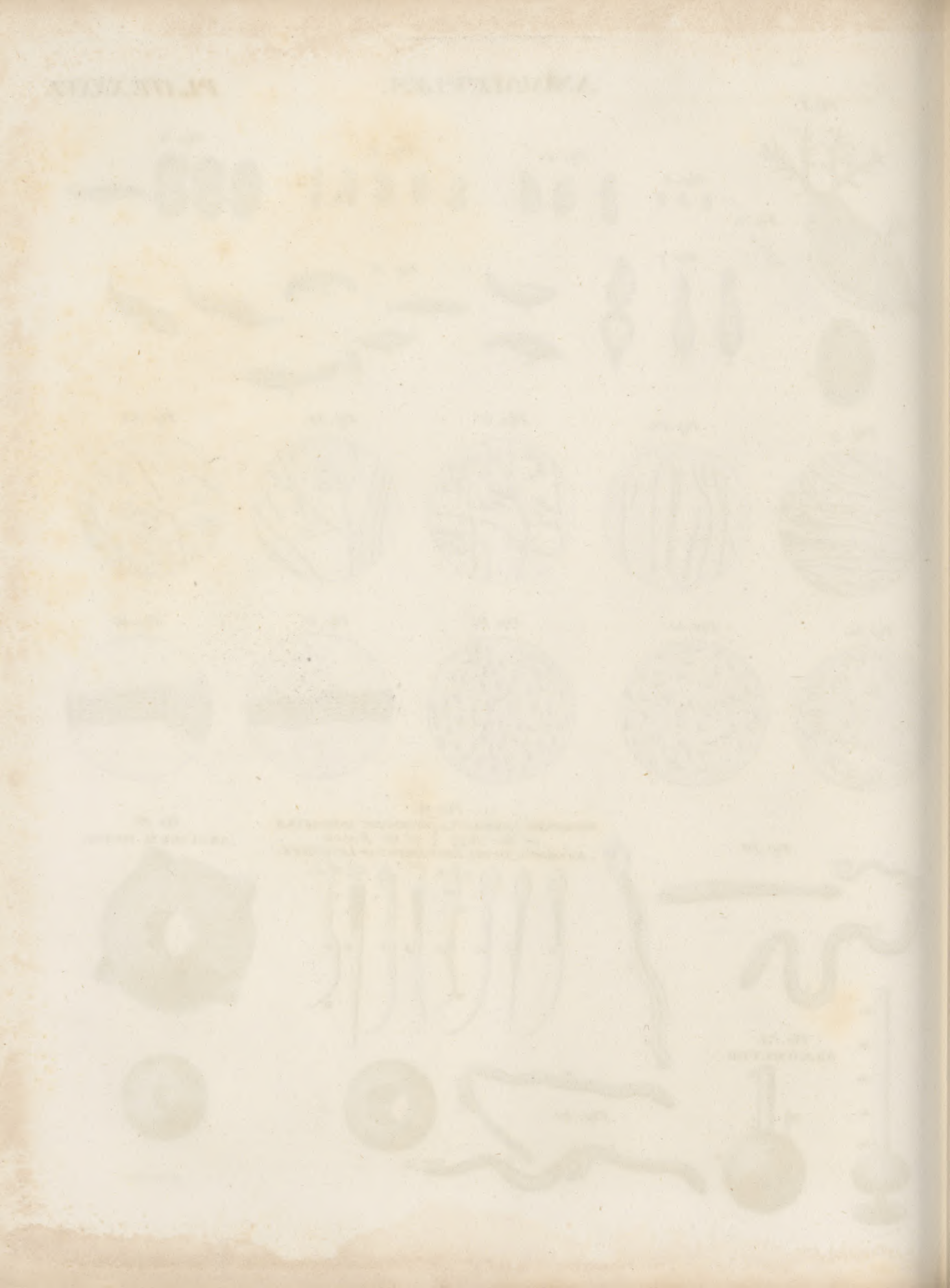


Fig. 20.

Reff. Sculpt. Edint.



Anjou || Anna.

besides Angers the capital, are Saumur, Brisac, Pons de Cea, La Fleche, and Beaufort.

ANIO, (Cicero, Horace, Priscian); ANIEN, (Statius); now *il Teverone:* a river of Italy, which falls into the Tiber, three miles to the north of Rome, not far from Antemnæ. It rises in a mountain near Treba, (Pliny); and running through the country of the Æquiculi or Æqui, it afterwards separated the Latins from the Sabines; but nearer its mouth, or confluence, it had the Sabines on each side. It forms three beautiful lakes in its course, (Pliny). In the territories of Tibur it falls from a great height, and there forms a very rapid cataract; hence the epithet *præceps*, and hence the steam caused by its fall, (Horace). *Anienus* is the epithet formed from it, (Virgil, Propertius). *Anienus* is also the god of the river, (Propertius, Statius.)

ANISUM, or ANISE. See PIMPINELLA, BOTANY *Index*.

ANKER, a liquid measure at Amsterdam. It contains about 32 gallons English measure.

ANKLE, in *Anatomy*, the joint which connects the foot to the leg.—We have an account of the menses being regularly evacuated at an ulcer of the ankle, *Edin. Med. Obs.* vol. iii. art. 29.

ANN, or ANNAT, in *Scots Law*, is half a years stipend, which the law gives to the executors of ministers of the church of Scotland, over and above what was due to the minister himself for his incumbency.

ANNA, one of the three principalities into which Arabia Deserta is divided.

ANNA, one of the chief cities of the above principality, and formerly a famed mart-town, is situated in Lat. 33. 57. and E. Long. 42. 10. on the river Euphrates, in a fruitful and pleasant soil. It has two streets, which are divided by the river. That on the Mesopotamia side is about two miles long, but thinly peopled, and by none but tradesmen; that on the opposite side is about six miles in length, and it is there that the principal inhabitants of the city dwell. Every house has some ground belonging to it; and these grounds are loaded with noble fruit trees, as lemons, oranges, citrons, quinces, figs, dates, pomegranates, olives, all very large and in great plenty. Some of the flat grounds are sown with corn and other grain, which yield likewise a considerable crop. This city is the common rendezvous of all the robbers that infest the country, and from which they disperse themselves into all parts of the desert. Here they meet to consult; here they hold their grand council, and deliberate where to rob next with success. It is with great difficulty that the Turkish aga, and the janizaries who are kept here, can levy the tribute imposed by the Turks on all the commodities carried through this city, which is one of the great thoroughfares for the passing of the caravans that go to and from Aleppo, Tripoli, Damascus, Bagdad, and some other parts of the Turkish empire.

ANNA *Comnena*, daughter of the emperor Alexius Comnenus I. was not less distinguished by her elevated rank than by her mental qualifications. Her superiority of mind began early to display itself. Despising and neglecting the effeminacy and voluptuousness of the court in which she was educated, she directed her attention to literary pursuits. Indulging her favourite studies, she solicited the acquaintance of the more eminent philosophers of that period.

Anna || Annals.

But the pursuits of literature did not induce her entirely to abandon society; she gave her hand to Nicephorus Bryennius, a young nobleman of a respectable family. This accomplished woman was, however, actuated with unjustifiable ambition; and, during the last illness of her father, she united with the empress Irene, in attempting to prevail upon that monarch to disinherit his own son, and give the crown to her husband. The affection and virtue of the father prevailed over female address and intrigue. But the ambition of Comnena was not diminished; for she entered into a conspiracy to depose her brother; and when her husband displayed a timidity and hesitation in this unjust enterprise, she exclaimed, that "Nature had mistaken their sexes, for he ought to have been the woman."

Either through the vigilance of her brother, or the timidity of her husband, the treasonable plot was discovered, and Anna punished with the confiscation of all her property. But generosity has an opportunity of displaying its real nature when an enemy is vanquished; thus was the generosity of her brother displayed on the present occasion, by returning all her property. Ashamed, however, of her base conduct, she retired from court, and never more possessed any influence there. Disappointed ambition took shelter among the walks of literature, and she employed herself in her solitude in writing the history of her father's reign. This production of her pen is still extant, and composes a part of the collection of the Byzantine historians. The stores of rhetoric are ransacked to embellish this work, and every effort made to enrich it with science; but the general complexion of it is rather like an apology, than an impartial narrative. It must, however, be acknowledged, that she is not more partial than many other Latin historians, and that her history contains many valuable facts and observations. (*Gen. Biog.*).

ANNABON. See ANNOBON.

ANNALE, in the church of Rome, a term applied to the masses celebrated for the dead during a whole year.

ANNALIS CLAVUS, the nail which the prætor, consul, or dictator, drove into the wall of Jupiter's temple annually upon the ides of September, to show the number of years. But this custom was superseded by reckoning years by consulships. The ceremony was sometimes performed to avert the plague, &c.

ANNALS, in matters of literature, a species of history, which relate events in the chronological order wherein they happened. They differ from perfect history in this, that annals are but a bare relation of what passes every year, as a journal is of what passes every day; whereas history relates not only the transactions themselves, but also the causes, motives, and springs of actions. Annals require nothing but brevity; history demands ornament.—Cicero informs us of the origin of annals. To preserve the memory of events, the *Pontifex Maximus*, says he, wrote what passed each year, and exposed it on tables in his own house, where every one was at liberty to read: this they called *annales*

Annals, Annan.

annales maximi; and hence the writers who imitated this simple method of narrating facts were called *annalists.*

ANNAN, the capital of Annandale, a division of Dumfrieshire in Scotland; a small town, containing 2500 inhabitants, and situated on a river of the same name, in W. Long. 3. 10. N. Lat. 54. 56. This place, which is a royal borough, has some trade in wine, and exports annually between 20 and 30,000 Winchester bushels (10 and 15,000 bolls) of corn. Vessels of about 250 tons can come within half a mile of the town; and of 60, as high as the bridge; which consists of five arches, defended by a gateway. A fabric for carding and spinning of cotton has lately been erected, and the town begins to increase. Here was formerly a castle; which was built by the Bruces, after they became lords of Annandale. Upon the death of David II. the son of King Robert, in 1371, this castle (Lochmaben), and the lordship of Annandale, came to Thomas Randolph earl of Murray, and went with his sister Agnes to the Dunbars, earls of March: after their forfeiture it went to the Douglasses, who also lost it by the same fate; and then having come to Alexander duke of Albany, he, for rebelling against his brother King James III. and plundering the fair of Lochmaben in 1484, was also forfeit. Since which time it continued in the hands of the king, and became the great key of the west border.

The stewarty or district of Annandale, of which Lochmaben castle was the chief fortalice, is a fertile vale, 24 miles long, and about 14 miles broad. From its vicinity to England, and the continual incursions and predatory wars of the borderers, the greatest part of it was uncultivated and common; but since the beginning of the present century, or rather within the last thirty years, all these wastes and commons have been divided and brought into culture, and the country has assumed a new appearance; which may be ascribed not only to the division of the commons, but likewise to the improvement made in the roads, and particularly in the great western road from Edinburgh to London by Moffat, Gratney, and Carlisle, running through this vale, and carried on by some gentlemen of the country, after they had obtained an act of parliament for levying a toll to defray the expence of making and keeping it in repair.

Annandale formed a part of the Roman province of Valentia; and Severus's wall ending here, it abounds with Roman stations and antiquities. The camps at Birrens in Middlebie, and on the hill of Burnswark, are still entire, and their form is preserved; and the traces and remains of a military road are now visible in different parts of the country. The ruins of the house or castle of Auchincass, in the neighbourhood of Moffat, once the seat of that potent baron, Thomas Randolph, earl of Murray, lord of Annandale, and regent of Scotland in the minority of David II. covers above an acre of ground, and even now conveys an idea of the plan and strength of the building. The ancient castle of Comlongan, formerly belonging to the Murrays, earls of Annandale, and now to Lord Stormont, is still in a tolerable state of preservation; but except this castle and that of Hoddam, most of the other old fortalices and towers are now taken down, or in ruins.

Annandale is a marquisate belonging to the Johnstones, and the chief of the name.

Annan Annano.

ANNAND, WILLIAM, dean of Edinburgh in Scotland, the son of William Annand minister of Ayr, was born at Ayr in 1633. Five years after, his father was obliged to quit Scotland with his family, on account of their loyalty to the king, and adherence to the episcopal government established by law in that country. In 1651, young Annand was admitted a scholar in University college in Oxford; and though he was put under the care of a presbyterian tutor, yet he took all occasions to be present at the sermons preached by the loyal divines in and near Oxford. In 1656, being then bachelor of arts, he received holy orders from the hands of Dr Thomas Fulwar, bishop of Ardfert or Kerry in Ireland, and was appointed preacher at Weston on the Green near Bicester in Oxfordshire, where he met with great encouragement from Sir Francis Norris, lord of that manor. After he had taken the degree of master of arts, he was presented to the vicarage of Leighton-Buzzard in Bedfordshire; where he distinguished himself by his edifying manner of preaching, till 1662, when he went into Scotland, in quality of chaplain to John earl of Middleton, the king's high commissioner to the church of that kingdom. In the latter end of the year 1663, he was instituted to the Tolbooth church at Edinburgh, and from thence was removed some years after to the Tron church of that city, which is likewise a prebend. In April 1676, he was nominated by the king to the deanery of Edinburgh; and in 1685, he commenced doctor of divinity in the university of St. Andrew's. He wrote, 1. *Fides Catholica;* or, The Doctrine of the Catholic Church, in eighteen grand Ordinances, referring to the word, sacraments, and prayer, in purity, number, and nature, catholically maintained, and publicly taught, against heretics of all sorts. Lond. 1671-2, 4to. 2. Solutions of many proper and profitable questions, suitable to the nature of each Ordinance, &c. printed with the Fides Catholica. 3. *Panem Quotidianem;* or, A short Discourse, tending to prove the legality, decency, and expediency, of set forms of prayers in the Churches of Christ, with a particular Defence of the Book of Common Prayer of the Church of England. Lond. 1661, 4to. 4. *Pater Noster,* Our Father; or, The Lord's Prayer explained, the sense thereof, and duties therein, from Scripture, History, and the Fathers, methodically cleared, and succinctly opened. Lond. 1670, 8vo. 5. *Mysterium Pietatis;* or, The Mystery of Godliness, &c. Lond. 1672, 8vo. 6. *Doxologia;* or, Glory to the Father, the Church's Hymn, reduced to glorifying the Trinity. Lond. 1672, 8vo. 7. *Dualitas;* or, A twofold subject displayed and opened, conducible to godliness and peace in order: First, *Lex loquens,* the honour and dignity of magistracy, with the duties thereupon, &c.; Secondly, *Duorum Unitas;* or, The agreement of magistracy and ministry, at the election of the honourable magistrates at Edinburgh and opening of the Diocesan Synod of the Reverend Clergy there. Edin. 1674, 4to. Dr Annand died the 13th of June 1689, and was honourably interred in the Grey-Friars church in Edinburgh.

ANNANO, a strong fort of Italy, in the duchy of Milan.

Anjou || Anne.

Milan. It has been twice taken by the French; but was restored to the duke of Savoy in 1706. It is seated on the river Tanaro, in E. Long. 8. 30. N. Lat. 44. 40.

ANNAPOLIS, the chief town in Maryland, in North America; it stands upon a sort of peninsula on the west side of the Chesapeake, and is a small town, but well built. It contained 2000 inhabitants in 1810. It was once known by the name of *Severn*. It received its present name in 1694, when it was made a port town, and the residence of a collector and naval officer. W. Long. 76. 10. N. Lat. 38. 25.

ANNAPOLIS ROYAL, a town of Nova Scotia, is seated on the bay of Fundy; and, though a mean place, was formerly the capital of the province. It has one of the finest harbours in America, capable of containing 1000 vessels at anchor in the utmost security. The place is also protected by a fort and garrison. At the bottom of the harbour is a point of land, which divides two rivers; and on each side there are pleasant meadows, which in spring and autumn are covered with all sorts of fresh-water fowl. There is a trade carried on by the Indians with furs, which they exchange for European goods. W. Long. 65. 22. N. Lat. 45. 10.

ANNATES, among ecclesiastical writers, a year's income of a spiritual living.

These were, in ancient times, given to the pope through all Christendom, upon the decease of any bishop, abbot, or parish clerk, and were paid by his successor. At the Reformation they were taken from the pope, and vested in the king; and, finally, Queen Anne restored them to the church, by appropriating them to the augmentation of poor livings.

ANNE, queen of Great Britain, second daughter of King James II. by his first wife, Anne Hyde, was born in 1664. In 1683, she married George, prince of Denmark, by whom she had several children, but none of them arrived at the age of maturity. On the death of King William, she ascended the throne, A. D. 1702, and her reign comprehends one of the most illustrious periods of English history. Possessed, however, of a very feeble character, which did not permit her to act for herself, this period is the reign of her counsellors, and favourites; and she exhibited no decided inclination which could influence state affairs, except a strong desire for tory principles, both in church and state. In the commencement of her reign, being entirely governed by the duchess of Marlborough, she was induced to follow out the premeditated designs of her predecessors with respect to Louis XIV. king of France, and for many years repeated success attended her armies with glory. These were at length, after a fruitless protraction of hostilities, terminated by the peace of Utrecht, in 1713. This peace was chiefly owing to the acquired influence of a female favourite of the opposite party. By an act of the legislature in the year 1706, the union of the English and Scottish nations was formed, which event contributed more than the former towards the prosperity of the kingdom. Yet these successful events prevented not the contention of parties which prevailed during the greatest part of her reign. And about the close of it, when this spirit was just on the eve of breaking into a flame, the queen manifested an ardent desire, that the exiled part of her family should succeed to the throne, and so conduced towards the superiority of the tories, as that they were inclined to push to the utmost extremity their plans, with respect to the government both of the church and state. The death of Queen Anne in August 1714, of a dropsy, in the fiftieth year of her age, and thirteenth of her reign, was therefore equally to the disappointment of the one, and to the triumph of the other. In her private station she supported the character of an amiable woman, and not devoid of understanding, although her indolence and yielding temper prevented her from exerting it. She was generally well beloved by her subjects, whose prejudices coincided with her own, and the title of the *Good Queen Anne* best expresses their sentiments. Although her own dispositions and accomplishments had no share in the honour, yet this age was rendered a sort of Augustan age of British literature, on account of the several eminent writers who flourished under her reign (*Gen. Biog.*).

Anne.

ANNE Boleyn, queen of Henry VIII. king of England, daughter of Sir Thomas Boleyn, a noblemen of a powerful family, and numerous alliances. The daughter of the duke of Norfolk was her mother, and during the reign of the former king her father had been honoured with several embassies. Mary the king's sister, who married Lewis XII. king of France, carried over this lady with her at an early age, where she imbibed the freedom, the vivacity, and the openness of manners of that nation. After the death of Lewis, that queen returned to England, and Anne continued to attend her royal mistress. Having some time after left her service, she was introduced into the family of the duchess of Alençon. In addition to all her acquired accomplishments, she possessed the greatest personal elegance, and was highly famed in that age.

History does not explicitly mention whether or not it was on her account, but upon her return to England the king expressed his scruples concerning his union with Catharine of Arragon. Enamoured, however, of Anne, he expressed his attachment to her; but she was possessed of too much virtue and policy, to confer any improper favours. This prudent and virtuous restraint only increased the passion of Henry; and placing her at court, he distinguished her by many marks of royal favour. The impetuous king at length came to the resolution to divorce his queen, to make way for his favourite Anne. In this instance, the injury done to that queen proved the cause of the final separation of England from the dominion of the pope. Various delays and difficulties occurring to the divorce, Henry privately married Anne during the month of November 1532, and in April following he publicly declared her queen of England. The famous Queen Elizabeth was the first fruits of this marriage, who was born the September following. For some time she enjoyed a considerable share of the royal favour, and she made use of that influence in subduing the haughty prelate Wolsey, and widening the breach between the king and the pope. But this favour was not of long continuance; for the king, every varying in his temper, and disappointed at her being brought to bed of a dead male child, imbibed a new passion for Jane Seymour; and troubled at the evil inclinations of the Catholics, he allowed the jealousy of conjugal affection to enter his bosom, which her thoughtless demeanour tended in

Anne, Annealing.

a great measure to realize. The king's jealousy still increasing, she was accused of adultery with several of the household officers, and even with her own brother, Lord Rochfort. She was accordingly tried on a charge of high treason, and although proof was very scanty, yet she was condemned to be beheaded; which sentence was executed in May 1536. Her behaviour on that occasion was a singular mixture of firmness and unusual levity. She avowed being guilty of many excesses, yet to the last resolutely denied any serious guilt. Although her character has been greatly depreciated by several authors, yet a letter written by her to the king after condemnation, gives a much higher idea of her character than these partial accounts would endeavour to convey.

The important part which she and her daughter acted in the Reformation has drawn upon her memory many malignant and vicious stories, by those of the Catholic party, who were likewise induced to this by the expectation of being conductive to the injury of Protestantism, by stigmatizing the various characters and motives of its promoters. These various accounts are, however, for the most part refuted by facts universally known, or have no evidence or probability by which they may be supported. Respecting her innocence of the charge on which she lost her life, it is a matter of uncertainty, yet it appears to be less certain that she was guilty than that her husband was a bloody and capricious tyrant. (*Gen. Biog.*).

St Anne's Day, a festival of the Christian church, celebrated by the Latins on the 26th of July, but by the Greeks on the 9th of December. It is kept in honour of Anne or Anna, mother of the Virgin Mary.

ANNEALING, by the workmen called *nealing*, is particularly used in making glass: it consists in placing the bottles, &c. whilst hot, in a kind of oven or furnace, where they are suffered to cool gradually: they would otherwise be too brittle for use.—Metals are rendered hard and brittle by hammering: they are therefore made red hot, in order to recover their malleability; and this is called *nealing*.

The difference between unannealed and annealed glass, with respect to brittleness, is very remarkable. When an unannealed glass vessel is broken, it often flies into a small powder, with a violence seemingly very unproportioned to the stroke it has received. In general, it is in greater danger of breaking from a very slight stroke than from one of some considerable force. One of those vessels will often resist the effects of a pistol bullet dropped into it from the height of two or three feet; yet a grain of sand falling into it will make it burst into small fragments. This takes place sometimes immediately on dropping the sand into it: but often the vessel will stand for several minutes after, seemingly secure; and then, without any new injury, it will fly to pieces. If the vessel be very thin, it does not break in this manner, but seems to possess all the properties of annealed glass.

The same phenomena are still more strikingly seen in glass drops or tears. They are globular at one end, and taper to a small tail at the other. They are the drops which fall from the melted mass of glass on the rods on which the bottles are made. They drop into the tubs of water which are used in the work; the greater part of them burst immediately in the water. When those that remain entire are examined, they discover all the properties of unannealed glass in the highest degree. They will bear a smart stroke on the thick end without breaking; but if the small tail be broken, they burst into small powder with a loud explosion. They appear to burst with more violence, and the powder is smaller, in an exhausted receiver than in the open air. When they are annealed, they lose these properties.

Annealing.

Glass is one of those bodies which increase in bulk when passing from a fluid to a solid state. When it is allowed to crystallize regularly, the particles are so arranged, that it has a fibrous texture: it is elastic, and susceptible of long-continued vibrations; but when a mass of melted glass is suddenly exposed to the cold, the surface crystallizes, and forms a solid shell round the interior fluid parts: this prevents them from expanding when they become solid. They, therefore, have not the opportunity of a regular crystallization; but are compressed together with little mutual cohesion: On the contrary, they press outward to occupy more space, but are prevented by the external crust. In consequence of the effort of expansion in the internal parts, the greater number of glass drops burst in cooling; and those which remain entire are not regularly crystallized. A smart stroke upon them communicates a vibration to the whole mass, which is nearly synchronous in every part: and therefore the effort of expansion has little more effect than if the body were at rest; but the small tail and the surface only are regularly crystallized. If the tail be broken, this communicates a vibration along the crystallized surface, without reaching the internal parts. By this they are allowed some expansion; and overcoming the cohesion of the thin outer shell, they burst it, and are dispersed in powder.

In an unannealed glass vessel, the same thing takes place. Sometimes the vibration may continue for a considerable time before the internal parts overcome the resistance. If the vessel be very thin, the regular crystallization extends through the whole thickness; or at least the quantity of compressed matter in the middle is so inconsiderable as to be incapable of bursting the external plate.

By the process of annealing, the glass is kept for some time in a state approaching to fluidity; the heat increases the bulk of the crystallized part, and renders it so soft, that the internal parts have the opportunity of expanding and forming a regular crystallization.

A similar process is now used for rendering kettles and other vessels of cast iron less brittle: of it the same explanation may be given. The greater number of metals diminish in bulk when they pass from a fluid to a solid state; iron, on the contrary, expands.

When cast iron is broken, it has the appearance of being composed of grains: forged or bar iron appears to consist of plates. Forged iron has long been procured, by placing a mass of cast iron under large hammers, and making it undergo violent and repeated compression. A process is now used for converting cast iron into forged, by heat alone. The cast iron is placed in an air furnace, and kept for several hours in a degree of heat, by which it is brought near to a fluid state. It is then allowed to cool gradually, and is found to be converted into forged iron. This process

is

Annealing. is conducted under a patent; although, if Reaumur's experiments upon cast iron be consulted, it will appear not to be a new discovery.

By these experiments, it is ascertained, that if cast iron be exposed for any length of time to a heat considerably below its melting point, the texture and properties are not changed: but if it be kept in a heat near the melting point, the surface soon becomes lamellated like forged iron; and the lamellated structure extends farther into the mass in proportion to the length of time in which it is exposed to that degree of heat. When it is continued for a sufficient time, and then allowed to cool gradually, it is found to possess the lamellated structure throughout.

Cast iron, then, is brittle, because it has not had the opportunity of crystallizing regularly. When it is exposed to cold while fluid, the surface becoming solid, prevents the inner parts from expanding and arranging themselves into regular crystals. When cast iron is brought near to the melting point, and continued for a sufficient length of time in that degree of heat, the particles have the opportunity of arranging themselves into that form of crystals by which forged iron is distinguished, and by which it possesses cohesion and all its properties.

There appears, therefore, to be no other essential difference between forged and cast iron, except what arises from the crystallization. Cast iron is indeed often not sufficiently purified from other substances which are mixed with the calx. It appears also to contain a considerable quantity of calx unreduced; for during the process for converting it into forged iron, by heat alone, a pale flame arises from the metal till near the end of the process. This is owing to fixed air which the heat forces off from the calx. The expulsion of this air reduces the calx, and therefore frees the metal from that injurious mixture.

That this explanation of the annealing of iron is probable, appears also from the well-known fact of forged iron being incomparably more difficult of fusion than cast iron. A piece of forged iron requires a very violent heat to melt it; but when it is reduced to a small powder, it melts in a much lower degree of heat. Iron diminishes in bulk when it passes into a fluid state, while most other metals increase in volume. The expansion which heat occasions in bringing them to their melting point, will be favourable to their fluidity, by gradually bringing the particles to the same state of separation in which they are when the mass is fluid; but the expansion of iron by heat removes it farther from that state, and keeps it in the state which is favourable to the continuance of it in a crystallized form. It will not melt till the heat expand it so much that the cohesion of crystallization be overcome. When it is reduced to a minute powder before it be exposed to the heat, it melts sooner. The crystals having been destroyed, that cohesion has no effect in preventing it from passing into a state of fluidity.

Upon the same principles may be explained the almost peculiar property of welding possessed by iron, and the conversion of forged iron into steel.

But perhaps they may also be applied to platina, a metal which has lately gained much attention. It possesses some of the properties of iron. It is still more difficult of fusion than that metal. It is susceptible of being welded. The natural grains of it can scarcely be melted in the focus of the most powerful burning glass; but when it is dissolved in aqua regia, and precipitated by potash, it has been melted in small globules by the blowpipe. When precipitated by muriate of ammoniac, it has been melted in a considerable mass in the heat of a furnace; but is said to be brittle. Annealing ‖ Annesley.

Many attempts have been made to procure a mass of it in a malleable state, but without success. It is said that the process is now discovered by a chemist in Spain. The treatment of the metal is probably very simple. Perhaps it only consists in precipitating it in a minute powder from aqua regia, exposing it to a strong heat which melts it, and keeping it for some time in a state nearly fluid, that it may, like iron, crystallize regularly: by this it will possess all its metallic properties. See ANNEALING, SUPPLEMENT.

ANNECY, a city of Savoy, seated between Chamberry and Geneva, on the banks of a lake of the same name, from whence run several brooks, which flow through the town, and uniting at length, form a river. There are piazzas in most of the streets of the town, which serve to shelter the inhabitants from rain. It has several collegiate and parish churches, as well as convents for men and women. The lake is about nine miles long and four broad. E. Long. 6. 12. N. Lat. 45. 53.

ANNESLEY, ARTHUR, earl of Anglesey, and lord privy seal in the reign of King Charles II. was the son of Sir Francis Annesley, Baronet, Lord Mount-Norris, and Viscount Valentia, in Ireland; and was born at Dublin on the 10th of July 1614. He was for some time at the university of Oxford, and afterwards studied the law at Lincoln's Inn. He had a considerable share in the public transactions of the last century; for in the beginning of the civil war he sat in the parliament held at Oxford; but afterwards became reconciled to the opposite party, and was sent commissioner to Ulster, to oppose the designs of the rebel Owen Roe O'Neal. He engaged in several other affairs with great success. He was president of the council of state after the death of Oliver, and was principally concerned in bringing about the Restoration; soon after which, King Charles II. raised him to the dignity of a baron, by the title of Lord Annesley, of Newport-Pagnel, Bucks; and a short time after he was made earl of Anglesey. During that reign he was employed in some very important affairs, was made treasurer of the navy, and afterwards lord privy seal. In October 1680, his lordship was charged by one Dangerfield, in an information delivered upon oath, at the bar of the house of commons, with endeavouring to stifle evidence in relation to the Popish plot, and to promote the belief of a Presbyterian one. The uneasiness he received from this attack did not prevent his speaking his opinion freely of those matters in the house of lords, particularly in regard to the Popish plot. About the same time he answered the Lord Castlehaven's Memoirs, in which that nobleman endeavoured to paint the Irish rebellion in the lightest colours; and a sharp dispute was raised, which ended in the seal's being taken from him. He was a person of great abilities, had uncommon learning, and was well acquainted with the constitution and laws of England. He wrote, besides his Animadversions on Castlehaven's

Annesley || Annihilation.

Memoirs, 1. The Privileges of the House of Lords and Commons stated. 2. A Discourse on the House of Lords. 3. Memoirs. 4. The History of the Troubles in Ireland, from the rebellion in 1611 till the Restoration. 5. Truth unveiled, in behalf of the Church of England;—and some other works. He died in April, 1686, in the 73d year of his age; and was succeeded by his son James.

ANNEXATION, in *Law*, a term used to imply the uniting of lands or rents to the crown.

ANNIHILATION, the act of reducing any created being into nothing.

Christians, Heathens, Jews, Siamese, Persians, divines, philosophers, &c. have their peculiar systems, sentiments, conjectures, not to say dreams, concerning annihilation; and we find great disputes among them about the reality, the possibility, the means, measures, prevention, ends, &c. of annihilation.

The first notions of the production of a thing from, or reduction of it to, nothing, Dr Burnet shows, arose from the Christian theology; the words *creation* and *annihilation*, in the sense now given to them, having been equally unknown to the Hebrews, the Greeks, and the Latins.

The ancient philosophers in effect denied all annihilation as well as creation, resolving all the changes in the world into new modifications, without supposing the production of any thing new, or destruction of the old. By daily experience, they saw compounds dissolved; and that in their dissolution nothing perished but their union or connexion of parts: when in death the body and soul were separated, the man they held was gone, but that the spirit remained in its original the great soul of the world, and the body in its earth from whence it came; these were again wrought by nature into new compositions, and entered new states of being which had no relation to the former.

The Persian bramins hold, that after a certain period of time, consisting of 71 joogs, God not only annihilates the whole universe, but every thing else, angels, souls, spirits, and all, by which he returns to the same state he was in before the creation; but that, having breathed a while, he goes to work again, and a new creation arises, to subsist 71 joogs more, and then to be annihilated in its turn. Thus they hold there have been almost an infinite number of worlds: but how many joogs are elapsed since the last creation, they cannot certainly tell; only in an almanack written in the Shanscrit language in 1670, the world is said to be then 3,892,771 years old from the last creation.

The Siamese heaven is exactly the hell of some Socinians and other Christian writers; who, shocked with the horrible prospect of eternal torments, have taken refuge in the system of annihilation. This system seems countenanced by Scripture; for that the words *death*, *destruction*, and *perishing*, whereby the punishment of the wicked is most frequently expressed in Scripture, do most properly import annihilation and an utter end of being. To this Tillotson answers, that these words, as well as those corresponding to them in other languages, are often used, both in Scripture and other writings, to signify a state of great misery and suffering, without the utter extinction of the miserable. Thus God is often said in Scripture to bring *destruction* on a nation, when he sends judgment upon them, but without exterminating or making an end of them. So, in other languages, it is frequent, by *perishing*, to express a person's being made miserable; as in that known passage in Tiberius's letter to the Roman senate: *Ita me dii, deæque omnes, pejus perdant, quam hodie perire me sentio.* As to the word *death*, a state of misery which is as bad, or worse than death, may properly enough be called by that name; and thus the punishment of wicked men after the day of judgment is in the book of Revelation frequently called the *second death.* Annihilation.

Some Christian writers allow a long time of the most terrible torments of sinners; and after that suppose that there shall be an utter end of their being. Of this opinion Irenæus appears to have been; who, according to M. du Pin, taught that the souls, at least of the wicked, would not subsist eternally; but that, after having undergone their torments for a certain period, they would at last cease to be at all. But Tillemont, Petit, Didier, and others, endeavour to defend Irenæus from this imputation, as being too favourable to the wicked.

It has been much disputed among divines, whether, at the consummation of all things, this *earth* is to be annihilated, or only purified, and fitted for the habitation of some new order of beings. Gerard in his Common Places, and Hakewil in his Apology, contend earnestly for a total abolition or annihilation. Ray, Calmet, and others, think the system of renovation or restitution more probable, and more consonant to Scripture, reason, and antiquity. The fathers who have treated on the question are divided; some holding that the universe shall not be annihilated, but only its external face changed; others asserting, that the substance of it shall be destroyed.

How widely have the sentiments of mankind differed as to the possibility and impossibility of annihilation! According to some, nothing so difficult; it requires the infinite power of the Creator to effect it: some go further, and seem to put it out of the power of God himself. According to others nothing so easy: Existence is a state of violence; all things are continually endeavouring to return to their primitive nothing; it requires no power at all; it will do itself; nay, what is more, it requires an infinite power to prevent it.

Many authors consider preservation as a continual reproduction of a thing, which, subsisting no longer of itself, would every moment return into nothing. Gassendi on the contrary asserts, that the world may indeed be annihilated by the same power which first created it, but that to continue it there is no occasion for any power of preservation.

Some divines, of which number the learned Bishop King seems to be, hold annihilation for the greatest of all evils, worse than even the utmost torments of hell flames; whilst others, with some of the eastern philosophers, acknowledge annihilation for the ultimate pitch of happiness human nature is capable of; that sovereign good, that absolute beatitude, so long vainly sought for by the philosophers, is found here. No wonder it had been so long concealed; for who would have thought of looking for the *summum bonum*, where others have placed the sum of misery?

The said prelate proposes it as a question, Whether suffering eternal torments be a greater evil than not existing? He thinks it highly probable, that the damned

Annihilation || Annobon.

will be such fools, that feeling their own misery in the most exquisite degree, they will rather applaud their own conduct, and choose to be, and to be what they are, rather than not to be at all; fond of their condition, however wretched, like people enraged, they will persist in their former sentiments without opening their eyes to their folly, and persevere by way of indignation and revenge. Mr Bayle refutes him on this head; but might, one would think, have saved himself the trouble.

The Talapoins hold it the supreme degree of happiness to have the soul totally annihilated, and freed from the burden and slavery of transmigrations. They speak of three Talapoins, who, after a great number of transmigrations, became gods; and when arrived at this state, procured this further reward of their merit, to be annihilated. The ultimate reward of the highest perfection man can arrive at is *neiurepan*, or annihilation; which at length is granted to those who are perfectly pure and good, after their souls have wandered many thousand years through various bodies.

ANNI NUBILES, in *Law*, denotes the marriageable age of a woman, viz. after she has arrived at twelve.

ANNIVERSARY, the annual return of any remarkable day. Anniversary days, in old times, more particularly denoted those days in which an office was yearly performed for the souls of the deceased, or the martyrdom of the saints was yearly celebrated in the church.

ANNOBON, a small island of Africa, on the coast of Loango, belonging to the Portuguese. It lies in E. Long. 5. 10. S. Lat. 1. 50. and receives its name from being discovered on New-year's-day. According to Pyrard, it is about five or six French leagues in compass; but Baudrand says, it is ten leagues round. Here are two high mountains, the tops of which being continually covered with clouds, occasion frequent rains. On the south-east of the island are two rocks; one of which is low, and upon a level with the surface of the sea; the other higher and larger, but both dangerous in the night to shipping; but between them the channel is deep and clear. These rocks are inhabited by vast numbers of birds, so tame, that the sailors frequently catch them with their hands. On the same side of the island is a convenient watering place at the foot of a rivulet, which tumbles from the mountains down to a valley covered with orange and citron trees, &c. and affording a pleasant and refreshing shade; but the road on the north-west side is difficult and dangerous, though most frequented by ships who have no intention of touching upon the continent. In either place it is difficult to take in a sufficient quantity of water, on account of the violent breaking of the sea, and a stone intrenchment erected by the negroes, from which they annoy all strangers that attempt to land. The true road for shipping lies on the north-east side, where they may anchor in seven, ten, thirteen, or sixteen fathoms, on a fine sand close to the land, opposite to the village where the negroes have thrown up their intrenchments.

The climate is wholesome, and the air clear and serene for the greatest part of the year. Every part of the island is watered by pleasant brooks and fresh water springs, which, however, at the new and full moons, or in all high tides, acquire a brackishness. The banks of every rivulet are covered with palms, whence the inhabitants extract their wine by incision. Here are a number of fertile valleys, which produce Turkey corn, rice, millet, yams, potatoes, &c. and afford pasture for abundance of oxen, sheep, goats, &c. Poultry and fish also abound here: but the only mercantile production is cotton, which is esteemed equal in quality to any produced in India, though the quantity is small. Annobon || Annual.

In the year 1605, the Dutch admiral Matelief found 200 negroes, and two Portuguese, on Annobon, most of them able to bear arms, expert in the use of them, and trained up in military discipline. La Croix says, it has a town opposite to the road that contains above 100 houses, the whole surrounded by a parapet. Most of their dwellings are cane huts. In the whole island there is not a single house built of stone, and only two of wood, which belong to the Portuguese. All the inhabitants are meanly clothed; the women go bareheaded, and have also the upper part of the body naked, modesty being defended by a piece of linen wrapt under their stomach, and falling down in the form of a petticoat, or wide apron, to the knees. As to the men, they wear only a linen girdle round the loins, with a small flap before. The women carry their children on their backs, and suckle them over the shoulder. All the inhabitants are subject to the Portuguese governor, who is the chief person in the island; at the same time that the negroes have their own chief subordinate to him. They are all rigid Catholics, having either been compelled or persuaded by the arguments of the Portuguese to embrace that faith; and, like all other converts, they are bigotted in proportion to the novelty of the belief, and their ignorance of the true tenets.

ANNO DOMINI, i. e. the year of our Lord; the computation of time from our Saviour's incarnation.

ANNOMINATION, in *Rhetoric*, the same with what is otherwise called *paronomasia*. See PARONOMASIA.

ANNONA, in Roman antiquity, denotes provision for a year of all sorts, as of flesh, wine, &c. but especially of corn. Annona is likewise the allowance of oil, salt, bread, flesh, corn, wine, hay, and straw, which was annually provided by the contractors for the maintenance of an army.

ANNONA, the *Custard Apple*. See BOTANY *Index*.

ANNONÆ PRÆFECTUS, in antiquity, an extraordinary magistrate, whose business it was to prevent a scarcity of provisions, and to regulate the weight and fineness of bread.

ANNONAY, a small town of France, in the department of Ardeche, formerly Upper Vivarais, seated on the river Deunre. E. Long. 4. 52. N. Lat. 45. 15.

ANNOT, a small city on the mountains of Provence in France. E. Long. 7. 0. N. Lat. 44. 4.

ANNOTATION, in matters of literature, a brief commentary, or remark, upon a book or writing, in order to clear up some passage, or draw some conclusion from it.

ANNOTTA. See ANOTTA.

ANNUAL, in a general sense, an appellation given to whatever returns every year, or is always performed within that space of time.

ANNUAL Motion of the Earth. See ASTRONOMY.

ANNUAL Leaves, are such leaves as come up afresh in the spring, and perish in winter. These stand opposed to *Evergreens*.

Annual || Annuity.

ANNUAL Plants, called also simply *annuals*, are such as only live their year, i. e. come up in the spring and die again in the autumn; and accordingly are to be recruited every year.

ANNUALRENT is used, in *Scots Law*, to denote a yearly profit due by a debtor in a sum of mony to a creditor for the use of it.

Right of ANNUALRENT, in *Scots Law*, the original method of burdening lands with a yearly payment for the loan of money, before the taking of interest for money was allowed by statute.

ANNUEL OF NORWAY, of which mention is made in the acts of parliament of King James III. was an annual payment of a hundred merks sterling, which the kings of Scotland were obliged to pay to the kings of Norway, in satisfaction for some pretensions which the latter had to the Scottish kingdom, by virtue of a conveyance made thereof by Malcom Kenmore, who usurped the crown after his brother's decease. This annuel was first established in 1266: in consideration whereof the Norwegians renounced all title to the succession to the isles of Scotland. It was paid till the year 1468, when the annuel, with all its arrears, was renounced in the contract of marriage between King James III. and Margaret daughter of Christian I. king of Norway, Denmark, and Sweden.

ANNUITY, a sum of money, payable yearly, half-yearly, or quarterly, to continue a certain number of years, for ever, or for life.

An annuity is said to be in arrear, when it continues unpaid after it falls due. And an annuity is said to be in reversion, when the purchaser, upon paying the price, does not immediately enter upon possession; the annuity not commencing till some time after.

Interest on annuities may be computed either in the way of simple or compound interest. But compound interest being found most equitable, both for buyer and seller, the computation by simple interest is universally disused.

I. *Annuities for a certain time.*

PROBLEM 1. Annuity, rate, and time, given; to find the amount, or sum of yearly payments, and interest.

RULE. Make 1 the first term of a geometrical series, and the amount of 1l. for a year the common ratio; continue this series to as many terms as there are years in the question, and the sum of this series is the amount of 1l. annuity for the given years; which, multiplied by the given annuity, will produce the amount sought.

EXAMPLE. An annuity of 40l. payable yearly, is forborn and unpaid till the end of 5 years: What will then be due, reckoning compound interest at 5 per cent. on all the payments then in arrear?

1 5 5 4 5

1 : 1.05 : 1.1025 : 1.157625 : 1.21550625? whose sum is 5.52563125l.; and $5.25563125 \times 40 = 221.02525 = 221$l. 0s. 6d. the amount sought.

The amount may also be found thus: Multiply the given annuity by the amount of 1l. for a year; to the product add the given annuity, and the sum is the amount in two years; which multiply by the amount of 1l. for a year; to the product add the given annuity, and the sum is the amount in 3 years, &c. The former question wrought in this manner follows: Annuity.

40 am. in 1 year.	126.1 am. in 3 years.
1.05	1.05
42.00	132.405
40	40
82 am. in 2 years.	172.405 am. in 4 years.
1.05	1.05
86.10	181.02525
40	40
126.1 am. in 3 years.	221.02525 am. in 5 years.

If the given time be years and quarters, find the amount for the whole years, as above: then find the amount of 1l. for the given quarters; by which multiply the amount for the whole years; and to the product add such a part of the annuity as the given quarters are of a year.

If the given annuity be payable half yearly, or quarterly, find the amount of 1l. for half a year or a quarter; by which find the amount for the several half-years or quarters, in the same manner as the amount for the several years is found above.

PROB. 2. Annuity, rate, and time given: to find the present worth, or sum of money that will purchase the annuity.

RULE. Find the amount of the given annuity by the former problem; and then, by compound interest, find the present worth of this amount, as the sum due at the end of the given time.

EXAMP. What is the present worth of an annuity of 40l. to continue 5 years, discounting at 5 per cent. compound interest?

By the former problem, the amount of the given annuity for 5 years, at 5 per cent. is 221.02525; and by compound interest, the amount of 1l. for 5 years, at 5 per cent. is 1.276281562 5.

And, 1.276281562 5)221.02525000(173.179= 173l. 3s. 7d. the present worth sought.

The present worth may be also found thus: By compound interest, find the present worth of each year by itself, and the sum of these is the present worth sought. The former example done in this way follows:

1.276281562 5)40.000000000	(31.3410
1.21550625)40.0000000	(32.9080
1.157625)40.00000	(34.5535
1.1025)40.000	(36.2811
1.05)40.0	(38.0952
Present worth	173.1788

If the annuity to be purchased be in reversion, find first the present worth of the annuity, as commencing immediately, by any of the methods taught above; and then, by compound interest, find the present worth of that present worth, rebating for the time in reversion; and this last present worth is the answer.

EXAMP.

Annuity. EXAMP. What is the present worth of a yearly pension or rent of 75l. to continue 4 years, but not to commence till three years hence, discounting at 5 per cent.?

.05 : 1 : : 75 : 1500
1.05×1.05×1.05×1.05=1.21550625
1.21550625)1500.00000(1234.05371
1500
1234.05371

265.94629, present worth of the annuity, if it was to commence immediately.

1.05×1.05×1.05=1.157625 *L. s. d.*
1.157625)265.94629(229.7344=229 1 8¾

PROB. 3. Present worth, rate, and time given; to find the annuity.

RULE. By the preceding problem, find the present worth of 1l. annuity for the rate and time given; and then say, As the present worth thus found to 1l. annuity, so the present worth given to its annuity; that is, divide the given present worth by that of 1l. annuity.

EXAMP. What annuity, to continue 5 years, will 173l. 3s. 7d. purchase, allowing compound interest at 5 per cent.?

.05 : 1 : : 1 : 20l.
1.05×1.05×1.05×1.05×1.05=1.276281562 5
1.276281562 5)20.00000000(15.6705
20
15.6705

4.3295 present worth of 1l. annuity.
4.329)173.179(40l. annuity. *Ans.*

II. *Annuities for ever, or freehold Estates.*

In freehold estates, commonly called *annuities in fee-simple*, the things chiefly to be considered are, 1. The annuity or yearly rent. 2. The price or present worth. 3. The rate of interest. The questions that usually occur on this head will fall under one or other of the following problems.

PROB. 1. Annuity and rate of interest given, to find the price.

As the rate of 1l. to 1l. so the rent to the price.

EXAMP. The yearly rent of a small estate is 40l.: What is it worth in ready money, computing interest at 3½ per cent.?

As .035 : 1 : : 40 : 1142.857142=*L.*1142 17 1⅕.

PROB. 2. Price and rate of interest given, to find the rent or annuity.

As 1l. to its rate, so the price to the rent.

EXAMP. A gentleman purchases an estate for 4000l. and has 4½ per cent for his money: Required the rent.

As 1 : .045 : : 4000 : 1 : 180l. rent sought.

PROB. 3. Price and rent given, to find the rate of interest.

As the price to the rent, so 1 to the rate.

EXAMP. An estate of 180l. yearly rent is bought for 4000l.: What rate of interest has the purchaser for his money?

As 4000 : 180l. : : 1 : .045 rate sought. Annuity.

PROB. 4. The rate of interest given, to find how many years purchase an estate is worth.

Divide 1 by the rate, and the quot is the number of years purchase the estate is worth.

EXAMP. A gentleman is willing to purchase an estate, provided he can have 2½ per cent. for his money: How many years purchase may he offer?

.025)1.000(40 years purchase. *Ans.*

PROB. 5. The number of years purchase, at which an estate is bought or sold, given; to find the rate of interest.

Divide 1 by the number of years purchase, and the quot is the rate of interest.

EXAMP. A gentleman gives 40 years purchase for an estate: What interest has he for his money?

40)1.000(.025 rate sought.

The computations hitherto are all performed by a single division or multiplication, and it will scarcely be perceived that the operations are conducted by the rules of compound interest; but when a reversion occurs, recourse must be had to tables of annuities on compound interest.

PROB. 6. The rate of interest, and the rent of a freehold estate in reversion, given; to find the present worth or value of the reversion.

By Prob. 1. find the price or present worth of the estate, as if possession was to commence presently; and then, by the Tables, find the present value of the given annuity, or rent, for the years prior to the commencement; subtract this value from the former value, and the remainder is the value of the reversion.

EXAMP. A has the possession of an estate of 130l. per annum, to continue 20 years; B has the reversion of the same estate, from that time for ever: What is the value of the estate, what the value of the 20 years possession, and what the value of the reversion, reckoning compound interest at six per cent.?

By Prob. 1. .06)130.00(2166.6666 value of the estate.
By Tables 1491.0896 val. of the possession.

675.5770 val. of the reversion.

PROB. 7. The price or value of a reversion, the time prior to the commencement, and rate of interest, given, to find the annuity or rent.

By the Tables, find the amount of the price of the reversion for the years prior to the commencement; and then by Prob. 3. find the annuity which that amount will purchase.

EXAMP. The reversion of a freehold estate, to commence 20 years hence, is bought for 675.577l. compound interest being allowed at 6 per cent.: Required the annuity or rent?

By the Tables the amount of 675.577l. for 20 years, at 6 per cent. is } *L* 2166 6

By Prob. 2. 2166.6×.06=130.0 rent sought.

III. *Life Annuities.*

The value of annuities for life is determined from observations made on the bills of mortality. Dr. Halley, Mr.

Annuity. Mr Simpson, and Mons. de Moivre, are gentlemen of distinguished merit in calculations of this kind.

Dr Halley had recourse to the bills of mortality at Breslaw, the capital of Silesia, as a proper standard for the other parts of Europe, being a place pretty central, at a distance from the sea, and not much crowded with traffickers or foreigners. He pitches upon 1000 persons all born in one year, and observes how many of these were alive every year, from their birth to the extinction of the last, and consequently how many died each year, as in the first of the following Tables; which is well adapted to Europe in general. But in the city of London there is observed to be a greater disparity in the births and burials than in any other place, owing probably to the vast resort of people thither, in the way of commerce, from all parts of the known world. Mr Simpson, therefore, in order to have a table particularly suited to this populous city, pitches upon 1280 persons all born in the same year, and records the number remaining alive each year till none were in life.

It may not be improper, however, to observe, that however perfect tables of this sort may be in themselves, and however well adapted to any particular climate, yet the conclusions deduced from them must always be uncertain, being nothing more than probabilities, or conjectures drawn from the usual period of human life. And the practice of buying and selling annuities on lives, by rules founded on such principles, may be justly considered as a sort of lottery or chance work, in which the parties concerned must often be deceived. But as estimates and computations of this kind are now become fashionable, we shall subjoin some brief account of such as appear most material.

Dr Halley's Table on the Bills of Mortality at Breslaw.

Age.	*Pers. liv.*	*Age.*	*Pers. liv.*	*Age.*	*Pers. liv.*	*Age.*	*Pers. liv.*
1	1000	24	573	47	377	70	142
2	855	25	567	48	367	71	131
3	798	26	560	49	357	72	120
4	760	27	553	50	346	73	109
5	732	28	546	51	335	74	98
6	710	29	539	52	324	75	88
7	692	30	531	53	313	76	78
8	680	31	523	54	302	77	68
9	670	32	515	55	292	78	58
10	661	33	507	56	282	79	49
11	653	34	499	57	272	80	41
12	646	35	490	58	262	81	34
13	640	36	481	59	252	82	28
14	634	37	472	60	242	83	23
15	628	38	463	61	232	84	20
16	622	39	454	62	222	85	15
17	616	40	445	63	212	86	11
18	610	41	436	64	202	87	8
19	604	42	427	65	192	88	5
20	598	43	417	66	182	89	3
21	592	44	407	67	172	90	1
22	586	45	397	68	162	91	0
23	579	46	387	69	152		

Annuity.

Mr Simpson's Table on the Bills of Mortality at London.

Age.	*Pers. liv.*	*Age.*	*Pers. liv.*	*Age.*	*Pers. liv.*	*Age.*	*Pers. liv.*
0	1280	24	434	48	220	72	59
1	870	25	426	49	212	73	54
2	700	26	418	50	204	74	49
3	635	27	410	51	196	75	45
4	600	28	402	52	188	76	41
5	580	29	394	53	180	77	38
6	564	30	385	54	172	78	35
7	551	31	376	55	165	79	32
8	541	32	367	56	158	80	29
9	532	33	358	57	151	81	26
10	524	34	349	58	144	82	23
11	517	35	340	59	137	83	20
12	510	36	331	60	130	84	17
13	504	37	332	61	123	85	14
14	498	38	313	62	117	86	12
15	492	39	304	63	111	87	10
16	486	40	294	64	105	88	8
17	480	41	284	65	99	89	6
18	474	42	274	66	93	90	5
19	468	43	264	67	87	91	4
20	462	44	255	68	81	92	3
21	455	45	246	69	75	93	2
22	448	46	237	70	69	94	1
23	441	47	228	71	65	95	0

From the preceding Tables the probability of the continuance or extinction of human life is estimated as follows.

1. The probability that a person of a given age shall live a certain number of years, is measured by the proportion which the number of persons living at the proposed age has to the difference between the said number and the number of persons living at the given age.

Thus, if it be demanded, what chance a person of 40 years has to live seven years longer? from 445, the number of persons living at 40 years of age in Dr Halley's table, subtract 377, the number of persons living at 47 years of age, and the remainder 68 is the number of persons that died during these seven years; and the probability or chance that the person in the question shall live these 7 years is as 377 to 68, or nearly as $5\frac{1}{2}$ to 1. But, by Mr Simpson's table, the chance is something less than that of 4 to 1.

2. If the year to which a person of a given age has an equal chance of arriving before he dies, be required, it may be found thus: Find half the number of persons living at the given age in the tables, and in the column of age you have the year required.

Thus, if the question be put with respect to a person of 30 years of age, the number of that age in Dr Halley's table is 531, the half whereof is 265, which is found in the table between 57 and 58 years; so that a person of 30 years has an equal chance of living between 27 and 28 years longer.

3. By the tables, the premium of insurance upon lives may in some measure be regulated.

Thus,

Annuity. Thus, the chance that a person of 25 years has to live another year, is, by Dr Halley's table, as 80 to 1; but the chance that a person of 50 years has to live a year longer is only 30 to 1; and, consequently, the premium for insuring the former ought to be to the premium for insuring the latter for one year, as 30 to 80, or as 3 to 8.

PROB. I. To find the value of an annuity of 1l. for the life of a single person of any given age.

Mons. de Moivre, by observing the decrease of the probabilities of life, as exhibited in the table, composed an algebraic theorem or canon, for computing the value of any annuity for life; which canon we here lay down by way of

RULE. Find the complement of life; and, by the tables, find the value of 1l. annuity for the years denoted by the said complement; multiply this value by the amount of 1l. for a year, and divide the product by the complement of life; then subtract the quot from 1; divide the remainder by the interest of 1l. for a year; and this last quot will be the value of the annuity sought, or, in other words, the number of years purchase the annuity is worth.

EXAMP. What is the worth of an annuity of 1l. for an age of 50 years, interest at 5 per cent.?

86
50 age given.
—
36 complement of life.

By the tables, the value is 16.5468
Amount of 1l. for a year, 1.05

827340
165468

Complement of life, 36)17.374140(.482615
From unity, viz. 1.000000
Subtract .482615

Interest of 1l. .05).517385(10.3477 value sought.

By the preceding problem is constructed the following table.

The value of 1l. annuity for a single life.

Age.	3 per c.	3½ per c.	4 per c.	4½ per c.	5 per c.	6 per c.
9=10	19.87	18.27	16.88	15.67	14.60	12.80
8=11	19.74	18.16	16.79	15.59	14.53	12.75
7=12	19.60	18.05	16.64	15.51	14.47	12.70
13	19.47	17.94	16.60	15.43	14.41	12.65
6=14	19.33	17.82	16.50	15.35	14.34	12.60
15	19.19	17.71	16.41	15.27	14.27	12.55
16	19 05	17.59	16.31	15.19	14.20	12.50
5=17	18 90	17.49	16.21	15.10	14.12	12.45
18	18.76	17.33	16.10	15.01	14.05	12.40
19	18.61	17.21	15.99	14.92	13.97	12.35
4=20	18.46	17.09	15.89	14.83	13.89	12.30
21	18.30	16.96	15.78	14.73	13.81	12.20
22	18.15	16.83	15.67	14.64	13.72	12.15
23	17.99	16.69	15.55	14.54	13.64	12.10
3=24	17.83	16.56	15.43	14.44	13.55	12.00
25	17.66	15.42	15.31	14.34	13.46	11.95

Annuity.

The value of 1l. annuity for a single life.

Age.	3 per c.	3½ per c.	4 per c.	4½ per c.	5 per c.	6 per c.
26	17.50	16.28	15.19	14.23	13.37	11.90
27	17.33	16.13	15.04	14.12	13.28	11.80
28	17.16	15.98	14.94	14.02	13.18	11.75
29	16.98	15.83	14.81	13.90	13.09	11.65
30	16.80	15.68	14.68	13.79	12.99	11.60
2=31	16.62	15.53	14.54	13.67	12.88	11.50
32	16.44	15.37	14.41	13.55	12.78	11.40
33	16.25	15.21	14.27	13.43	12.67	11.35
34	16.06	15.05	14.12	13.30	12.56	11.25
35	15.86	14.89	13.98	13.17	12.45	11.15
36	15.67	14.71	13.82	13.04	12.33	11.05
37	15.46	14.52	13.67	12.90	12.21	11.00
38	15.29	14.34	13.52	12.77	12.09	10.90
1=39	15.05	14.16	13.36	12.63	11.96	10.80
40	14.84	13.98	13.20	12.48	11.83	10.70
41	14.63	13.79	13.02	12.33	11.70	10.55
42	14.41	13.59	12.85	12.18	11.57	10.45
43	14.19	13.40	12.68	12.02	11.43	10.35
44	13.96	13.20	12.50	11.87	11.29	10.25
45	13.73	12.99	12.32	11.70	11.14	10.10
46	13.49	12.78	12.13	11.54	10.99	10.00
47	13.25	12.56	11.94	11.37	10.84	9.85
48	13.01	12.36	11.74	11.19	10.68	9.75
49	12.76	12.14	11.54	11.00	10.51	9.60
50	12.51	11.92	11.34	10.82	10.35	9.45
51	12.26	11.69	11.13	10.64	10.17	9.30
52	12.00	11.45	10.92	10.44	9.99	9.20
53	11.73	11.20	10.70	10.24	9.82	9.00
54	11.46	10.95	10.47	10.04	9.63	8.85
55	11.18	10.69	10.24	9.82	9.44	8.70
56	10.90	10.44	10.01	9.61	9.24	8.55
57	10.61	10.18	9.77	9.39	9.04	8.35
58	10.32	9.91	9.52	9.16	8.83	8.20
59	10.03	9.64	9.27	8.93	8.61	8.00
60	9.73	9.36	9.01	8.69	8.39	7.80
61	9.42	9.08	8.75	8.44	8.16	7.60
62	9.11	8.79	8.48	8.19	7.93	7.40
63	8.79	8.49	8.20	7.94	7.68	7.20
64	8.46	8.19	7.92	7.67	7.43	6.95
65	8.13	7.88	7.63	7.39	7.18	6.75
66	7.79	7.56	7.33	7.12	6.91	6.50
67	7.45	7.24	7.02	6.83	6.64	6.25
63	7.10	6.91	6.75	6.54	6.36	6.00
69	6.75	6.57	6.39	6.23	6.07	5.75
70	6.38	6.22	6.06	5.92	5.77	5.50
71	6.01	5.87	5.72	5.59	5.47	5.20
72	5.63	5.51	5.38	5.26	5.15	4.90
73	5.25	5.14	5.02	4.92	4.82	4.60
74	4.85	4.77	4.66	4.57	4.49	4.30
75	4.45	4.38	4.29	4.22	4.14	4.00

The

Annuity.

The value of 1l. annuity for a single life.

Age.	3 *per c.*	3½ *perc.*	4 *per c.*	4½ *perc.*	5 *per c.*	6 *per c.*
76	4.05	3.98	3.91	3.84	3.78	3.65
77	3.63	3.57	3.52	3.47	3.41	3.30
78	3.21	3.16	3.11	3.07	3.03	2.95
79	2.78	2.74	2.74	2.67	2.64	2.55
80	2.34	2.31	2.31	2.26	2.23	2.15

The above table shows the value of an annuity of one pound for a single life, at all the current rates of interest; and is esteemed the best table of this kind extant, and preferable to any other of a different construction. But yet those who sell annuities have generally one and a half or two years more value, than specified in the table, from purchasers whose age is 20 years or upwards.

Annuities of this sort are commonly bought or sold at so many years purchase: and the value assigned in the table may be so reckoned. Thus the value of an annuity of one pound for an age of 50 years, at 3 per cent. interest, is 12.51; that is, 12l. 10s. or twelve and a half years purchase. The marginal figures on the left of the column of age serve to shorten the table, and signify, that the value of an annuity for the age denoted by them is the same with the value of an annuity for the age denoted by the numbers before which they stand. Thus the value of an annuity for the age of 9 and 10 years is the same; and the value of an annuity for the age of 6 and 14, for the age of 3 and 24, &c. is the same. The further use of the table will appear in the questions and problems following.

QUEST. 1. A person of 50 years would purchase an annuity for life of 200l.: What ready money ought he to pay, reckoning interest at 4½ per cent.?

	L.
By the table the value of 1l. is	10.8
Multiply by	200
Value to be paid in ready money,	2164.00 *Ans.*

QUEST. 2. A young merchant marries a widow lady of 40 years of age, with a jointure of 300l. a-year, and wants to dispose of the jointure for ready money: What sum ought he to receive, reckoning interest at 3½ per cent.?

	L.
By the table, the value of 1l. is	13.98
	400
Value to be received in ready money,	4194.00 *Ans.*

PROB. 2. To find the value of any annuity for the joint continuance of two lives; one life failing, the annuity to cease.

Here there are two cases, according as the ages of the two persons are equal or unequal.

1. If the two persons be of the same age, work by the following

RULE. Take the value of any one of the lives from the table; multiply this value by the interest of 1l. for a year; subtract the product from 2; divide the foresaid value by the remainder; and the quot will be the value of 1l. annuity, or the number of years purchase sought. Annuity.

EXAMP. What is the value of 100l. annuity for the joint lives of two persons, of the age of 30 years each, reckoning interest at 4 per cent.?

By the table, one life of years is -	14.68
Multiply by -	.04
Subtract the product -	5872
From - -	2.0000
Remains - -	1.4128

And 1.4128)14.68(10.39 value of 1l. annuity.
And 10.39 × 100 = 1039 the value sought.

2. If the two persons are of different ages, work as directed in the following

RULE. Take the values of the two lives from the table; multiply them into one another, calling the result the first product; then multiply the said first product by the interest of 1l. for a year, calling the result the second product; add the values of the two lives, and from their sum subtract the second product; divide the first product by the remainder, and the quot will be the value of 1l. annuity, or the number of years purchase sought.

EXAMP. What is the value of 70l. annuity for the joint lives of two persons, whereof one is 40 and the other 50 years of age, reckoning interest at 5 per cent.?

By the table, the value of 40 years is -	11.83
And the value of 50 years is - -	10.35
First product,	122.4405
Multiply by	.05
Second product,	6.122025
Sum of the two lives, - - -	22.180000
Second product deduct, - -	6.122025
Remainder, -	16.057975

And 16.057975)122.4405(7.62 value of 1l. annuity.
70

533.40 value sought.

PROB. 3. To find the value of an annuity upon the longest of two lives; that is, to continue so long as either of the persons is in life.

RULE. From the sum of the values of the single lives subtract the value of the joint lives, and the remainder will be the value sought.

EXAMP. What is the value of an annuity of 1l. upon the longest of two lives, the one person being 30, and the other 40 years of age, interest at 4 per cent.?

By the table, 30 years is - -	14.68
40 years is - -	13.20
	27.88
Value of their joint lives, by Prob. 2. Case 2. is	9.62
Value sought, - - -	18.26

If

Annuities. If the annuity be any other than 1l. multiply the answer found as above by the given annuity.

If the two persons be of equal age, find the value of their joint lives by Case 1. of Prob. 2.

PROB. 4. To find the value of the next presentation to a living.

RULE. From the value of the successor's life subtract the joint value of his and the incumbent's life, and the remainder will be the value of 1l. annuity; which, multiplied by the yearly income, will give the sum to be paid for the next presentation.

EXAMP. A enjoys a living of 100l. per annum, and B would purchase the said living for his life after A's death: The question is, What he ought to pay for it, reckoning interest at 5 per cent. A being 60, and B 25 years of age?

	L.
By the table, B's life is - -	13.46
Joint value of both lives, by Prob. 2. is	6.97
The value of 1l. annuity, - -	6.49
Multiply by - -	100
Value of next presentation, -	649.00

The value of a direct presentation is the same as that of any other annuity for life, and is found for 1l. by the table; which being multiplied by the yearly income, gives the value sought.

PROB. 5. To find the value of a reversion for ever, after two successive lives; or to find the value of a living after the death of the present incumbent and his successor.

RULE. By Prob. 3. find the value of the longest of the two lives, and subtract that value from the value of the perpetuity, and the remainder will be the value sought.

EXAMP. A, aged 50, enjoys an estate or living of 100l. per annum; B, aged 30, is entitled to his lifetime of the same estate after A's death; and it is proposed to sell the estate just now, with the burden of A and B's lives on it: What is the reversion worth, reckoning interest at 4 per cent.?

	L.
By the table, A's life of 50 is -	11.34
B's life of 30 is -	14.68
Sum,	26.02
Value of their joint lives found by Prob. 2. Case 2. is -.	8.60
Value of the longest life, -	17.42 sub.
From the value of the perpetuity,	25.00
Remains the value of 1l. reversion,	7.58
Multiply by	100
Value of the reversion, - -	758.00

PROB. 6. To find the value of the joint continuance of three lives, one life failing, the annuity to cease.

RULE. Find the single values of the three lives from the table; multiply these single values continually, calling the result the product of the three lives; multiply that product by the interest of 1l. and that product again by 2, calling the result the double product; then, from the sum of the several products of the lives, taken two and two, subtract the double product; divide the product of the three lives by the remainder, and the quot will be the value of the three joint lives. Annuities.

EXAMP. A is 18 years of age, B 34, and C 56; What is the value of their joint lives, reckoning interest at 4 per cent.?

By the table, the value of A's life is 16.1, of B's 14.12, and of C's 10.01.

16.1 × 14.12 × 10.01 = 2275.6, product of the three lives.

.04

91.024

2

182.048, double product.

Product of A and B, 16.1 × 14.12 × 227.33

A and C, 16.1 × 10.01 = 161.16

B and C, 14.12 × 10.00 = 141.34

Sum of all, two and two, -	529.83
Double product subtract, -	182.048
Remainder, -	347.782

And 347.782)2275.600(6.54 value sought.

PROB. 7. To find the value of an annuity upon the longest of three lives.

RULE. From the sum of the values of the three single lives taken from the table, subtract the sum of all the joint lives, taken two and two as found by Prob. 2. and to the remainder add the value of the three joint lives, as found by Prob. 6. and that sum will be the value of the longest life sought.

EXAMP. A is 18 years of age, B 34, and C 56: What is the value of the longest of these three lives, interest at 4 per cent.?

By the table, the single value of A's life is	16.1
single value of B's life is	14.12
single value of C's life is	10.01
Sum of the single values,	40.23
By Prob. 2. the joint value of A and B is	10.76
joint value of A and C is	8.19
joint value of B and C is	7.65
Sum of the joint lives,	26.60
Remainder, -	13.63
By Prob. 6. the value of the 3 joint lives is	6.54
Value of the longest of the 3 lives, -	20.17

Other problems might be added, but these adduced are sufficient for most purposes. The reader probably may wish that the reason of the rules, which, it must be owned, are intricate, had been assigned: but this could not be done without entering deeper into the subject than was practicable in this place. See CHANCES. See also ANNUITIES, SUPPLEMENT.

Annuities. *Annuities, Borrowing upon;* one of the methods employed by government for raising supplies.

Of this there are two methods; that of borrowing upon annuities for terms of years, and that of borrowing upon annuities for lives.

During the reigns of King William and Queen Anne, large sums were frequently borrowed upon annuities for terms of years, which were sometimes longer and sometimes shorter. In 1693, an act was passed for borrowing one million upon an annuity of 14 per cent. or of 140,000l. a year for 16 years. In 1691, an act was passed for borrowing a million upon annuities for lives, upon terms which in the present times would appear very advantageous. But the subscription was not filled up. In the following year the deficiency was made good by borrowing upon annuities for lives at 14 per cent. or at a little more than seven years purchase. In 1695, the persons who had purchased those annuities were allowed to exchange them for others of 96 years, upon paying into the exchequer 63 pounds in the hundred; that is, the difference between 14 per cent. for life, and 14 per cent. for 96 years, was sold for 63 pounds, or for four and a half years purchase. Such was the supposed instability of government, that even these terms procured few purchasers. In the reign of Queen Anne, money was upon different occasions borrowed both upon annuities for lives and upon annuities for terms of 32, of 89, of 98, and of 99 years. In 1719, the proprietors of the annuities for 32 years were induced to accept in lieu of them South Sea stock to the amount of eleven and a half years purchase of the annuities, together with an additional quantity of stock equal to the arrears which happened then to be due upon them. In 1720, the greater part of the other annuities for terms of years both long and short were subscribed into the same fund. The long annuities at that time amounted to 666,821l. 8s. $3\frac{1}{2}$d. a-year. On the 5th of January 1775, the remainder of them, or what was not subscribed at that time, amounted only to 136,453l. 12s. 8d.

During the two wars which began in 1739, and in 1755, little money was borrowed either upon annuities for terms of years, or upon those for lives. An annuity for 98 or 99 years, however, is worth nearly as much money as a perpetuity, and should, therefore, one might think, be a fund for borrowing nearly as much. But those who, in order to make family settlements, and to provide for remote futurity, buy into the public stocks, would not care to purchase into one of which the value was continually diminishing; and such people make a very considerable proportion both of the proprietors and purchasers of stock. An annuity for a long term of years, therefore, though its intrinsic value may be very nearly the same with that of a perpetual annuity, will not find nearly the same number of purchasers. The subscribers to a new loan, who mean generally to sell their subscription as soon as possible, prefer greatly a perpetual annuity redeemable by parliament, to an irredeemable annuity for a long term of years of only equal amount. The value of the former may be supposed always the same, or very nearly the same; and it makes, therefore, a more convenient transferable stock than the latter.

During the two last-mentioned wars, annuities, either for terms of years or for lives, were seldom granted but as premiums to the subscribers to a new loan, over and above the redeemable annuity to interest upon the credit of which the loan was supposed to be made. They were granted, not as the proper fund upon which the money was borrowed; but as an additional encouragement to the lender. Annuities.

Annuities for lives have occasionally been granted in two different ways; either upon separate lives, or upon lots of lives, which in French are called *Tontines*, from the name of their inventor. When annuities are granted upon separate lives, the death of every individual annuitant disburdens the public revenue so far as it was affected by his annuity. When annuities are granted upon tontines, the liberation of the public revenue does not commence till the death of all the annuitants comprehended in one lot, which may sometimes consist of twenty or thirty persons, of whom the survivors succeed to the annuities of all those who die before them; the last survivor succeeding to the annuities of the whole lot. Upon the same revenue more money can always be raised by tontines than by annuities for separate lives. An annuity, with a right of survivorship, is really worth more than an equal annuity for a separate life; and from the confidence which every man naturally has in his own good fortune, the principle upon which is founded the success of all lotteries, such an annuity generally sells for something more than it is worth. In countries where it is usual for government to raise money by granting annuities, tontines are upon this account generally preferred to annuities for separate lives. The expedient which will raise most money, is almost always preferred to that which is likely to bring about in the speediest manner the liberation of the public revenue.

In France a much greater proportion of the public debts consists in annuities for lives than in England. According to a memoir presented by the parliament of Bourdeaux to the king in 1764, the whole public debt of France is estimated at twenty-four hundred millions of livres; of which the capital, for which annuities for lives had been granted, is supposed to amount to three hundred millions, the eighth part of the whole public debt. The annuities themselves are computed to amount to thirty millions a-year, the fourth part of one hundred and twenty millions, the supposed interest of that whole debt. It is not the different degrees of anxiety in the two governments of France and England for the liberation of the public revenue, which occasions this difference in their respective mode of borrowing; it arises altogether from the different views and interests of the lenders.

In Britain, the seat of government being in the greatest mercantile city in the world, the merchants are generally the people who advance money to government. By advancing it they do not mean to diminish, but on the contrary, to increase their mercantile capitals; and unless they expected to sell with some profit their share in the subscription for a new loan, they never would subscribe. But if by advancing their money they were to purchase, instead of perpetual annuities, annuities for lives only, whether their own or those of other people, they would not always be so likely to sell them with a profit. Annuities upon their own lives they would always sell with loss; because no man will give for an annuity upon the life

Annuities || Annunciada.

life of another whose age and state are nearly the same with his own, the same price which he would give for one upon his own. An annuity upon the life of a third person, indeed, is no doubt, of equal value to the buyer and the seller; but its real value begins to diminish from the moment it is granted, and continues to do so more and more as long as it subsists. It can never, therefore, make so convenient a transferable stock as a perpetual annuity, of which the real value may be supposed always the same, or very nearly the same.

In France, before the revolution, the seat of government not being in a great mercantile city, merchants did not make so great a proportion of the people who advance money to government. The people concerned in the finances, the farmers general, the receivers of the taxes which were not in farm, the court bankers, &c. made the greater part of those who advance their money in all public exigencies. Such people were commonly men of mean birth, but of great wealth, and frequently of great pride. They were too proud to marry their equals, and women of quality disdained to marry them. They frequently resolved, therefore, to live bachelors; and having neither any families of their own, nor much regard for those of their relations, whom they were not always very fond of acknowledging, they desired only to live in splendour during their own time, and were not unwilling that their fortune should end with themselves. The number of rich people, besides, who were either averse to marry, or whose condition of life rendered it either improper or inconvenient for them to do so, was much greater in France than in England. To such people, who had little or no care for posterity, nothing could be more convenient than to exchange their capital for a revenue, which is to last just as long, and no longer, than they wish it to do.

ANNUITY OF TEINDS, in *Scots Law*, a certain proportion of the teinds of erected benefices formerly payable to the crown, but now gone into disuse.

ANNULAR, in a general sense, something in the form of, or resembling a ring. It is also a peculiar denomination of the fourth finger, commonly called the *ring finger*.

ANNULET, in *Architecture*, a small square member in the Doric capital, under the quarter round.

ANNULET is also a narrow flat moulding, which is common to divers places of the columns, as in the bases, capitals, &c. It is the same member which Vitruvius calls a *fillet;* Palladio, a *listil* or *cincture;* Scamozzi, and Mr Brown, a *supercilium*, *list*, *tinea*, *eyebrow*, *square*, *rabbit*. See ARCHITECTURE.

ANNULET, a little circle, born as a charge in coats of arms, as also added to them as a *difference*. Among the Romans it represented liberty and nobility. It also denotes strength and eternity, by reason of its circular form.

ANNULOSA, a type, or great division of the animal kingdom, comprehending five classes; see SUPPLEMENT.

ANNULLING, a term sometimes used for cancelling or making void a deed, sentence, or the like.

ANNUNCIADA, ANNUNTIADA, or ANNUNCIATA, an order of knighthood in Savoy, first instituted by Amadeus I. in the year 1409: their collar was of 15 links, interwoven one with another, in form of a true lover's knot: and the motto, F. E. R. T. signifying, *Fortitudo ejus Rhodum tenuit*. Amadeus VIII. gave the name *Annunciada* to this order, which was formerly known by that of *the knot of love;* changing at the same time the image of St Maurice patron of Savoy, which hung at the collar, for that of the Virgin Mary; and instead of the motto above mentioned, substituting the words of the angel's salutation.

Annunciada || Anolympiades.

ANNUNCIADA is also the title of several religious orders, instituted at different times, and at different places, in honour of the annunciation. See the next article.

ANNUNCIATION, the tidings brought by the angel Gabriel to the Virgin Mary of the incarnation of Christ.

ANNUNCIATION is also a festival, kept by the church on the 25th of March, in commemoration of these tidings. This festival appears to be of very great antiquity. There is mention made of it in a sermon which goes under the name of *Athanasius*. Others carry it up to the time of Gregory Thaumaturgus, because there is a sermon likewise attributed to him upon the same subject. But the best critics reject both these writings as spurious. However, it is certain, this festival was observed before the time of the council of Trullo, in which there is a canon forbidding the celebration of all festivals in Lent, excepting the Lord's day, and the feast of the annunciation: so that we may date its original from the seventh century.

In the Romish church, on this feast, the pope performs the ceremony of marrying or cloistering a certain number of maidens, who are presented to him in the church, clothed in white serge, and muffled up from head to foot: An officer stands by, with purses containing notes of 50 crowns for those who make choice of marriage, and notes of a hundred for those who choose to veil.

ANNUNCIATION, is likewise a title given by the Jews to a part of the ceremony of the passover.

ANNUNCIATOR, the name of an officer in the church of Constantinople. It was his business to inform the people of the festivals that were to be celebrated.

ANODYNE, from α privative, and οδυνω, *doleo;* or α neg. and ωδυνη, *pain*), a term applied to medicines which ease pain, and procure sleep. They are divided into three sorts, viz. 1. Paregorics, or such as assuage pain. 2. Hypnotics, or such as relieve by procuring sleep. 3. Narcotics, or such as ease the patient by stupifying him.

Opiates and narcotics destroy sensation. Some hypnotics and paregorics, as nitre, camphor, &c. procure ease and sleep by removing the offending cause. Camphor is said to be the best anodyne in nervous cases and at the decline of fevers. The doses of these medicines are generally regulated by the pulse.

ANOINTERS, a religious sect in some parts of England, so called from the ceremony they used of anointing all persons before they admitted them into their church. They founded their opinion of anointing upon the fifth of James, ver. 14. and 15.

ANOLYMPIADES, in antiquity, a name given by the Elians to those Olympic games which had been celebrated under the direction of the Pisæans and Arcadians. The Elians claimed the sole right of managing the Olympic games, in which they sometimes

Anolympiades || Anomœans.

met with competitors. The hundred and fourth Olympiad was celebrated by order of the Arcadians, by whom the Elians were at that time reduced very low; this, as well as those managed by the inhabitants of Pisa, they called ανολυμπιαδας, that is, "unlawful Olympiads;" and left them out of their annals, wherein the names of their victors and other occurrences were registered.

ANOMALISTICAL YEAR, in *Astronomy*, the time that the earth takes to pass through her orbit: it is also called the *Periodical Year*. The space of time belonging to this year is greater than the tropical year, on account of the precession of the equinoxes. See ASTRONOMY.

ANOMALOUS, a term applied to whatever is irregular, or deviates from the rule observed by other things of the like nature.

ANOMALOUS Verbs, in *Grammar*, such as are not conjugated conformably to the paradigm of their conjugation. They are found in all languages. In Latin, the verb *lego* is the paradigm of the third conjugation; and runs thus, *lego, legis, legit:* by the same rule it should be *fero, feris, ferit;* but we say, *fero, fers, fert: fero*, then, is an anomalous verb. In English the irregularity relates often to the preter tense and passive participle; for example, *give*, were it formed according to rule, would make *gived* in the preter tense and passive participle; whereas, in the former, it makes *gave*, and in the latter *given*.

ANOMALY, in *Astronomy*, an irregularity in the motion of the planets, whereby they deviate from the aphelion or apogee.

ANOMIA, in *Zoology*, a genus of insects belonging to the order of vermes testacea. Their shell is bivalve, and the valves are unequal. One valve is perforated near the hinge; affixed by that perforation to some other body. There are 25 species of the anomia: of which only two are natives of the British seas, viz. 1. The ephippium, with the habit of an oyster; the one side convex, the other flat, perforated; adherent to other bodies, often to oyster shells, by a strong tendinous ligature; colour of the inside perlaceous. Size, near two inches diameter. 2. The sqnammula, with shells resembling the scales of fish; very delicate, and silvery; much flatted, perforated; very small. Adheres to oysters, crabs, lobsters, and shells. This species of the genus are commonly called *Beaked Cockles*. No name has been given to the fish that inhabits it; for the recent shells of this kind are so very rare, that there is scarcely one to be found perfect. They are perhaps, as well as that which has given its form to the *cornu ammonis*, inhabitants of the deepest parts of the ocean; consequently it must be some extraordinary agitation of that great body of water that can bring them at all to our knowledge in their recent state. See CONCHOLOGY *Index*.

The fossil species of the *Anomia* genus are uncommonly numerous in this island, in our chalk pits and limestone quarries; and in Gloucestershire they are as common on the ploughed lands as pebbles on other places.

ANOMOEANS, in ecclesiastical history, the name by which the pure Arians were called in the fourth century, in contradistinction to the Semi-Arians. The word is formed from the Greek ανομοιος, *different, dissimilar:* For the pure Arians asserted, that the Son was of a nature different from, and in nothing like, that of the Father: whereas the Semi-Arians acknowledged a likeness of nature in the Son; at the same time that they denied, with the pure Arians, the consubstantiality of the Word. The Semi-Arians condemned the Anomœans in the council of Seleucia; and the Anomœans in their turn condemned the Semi-Arians in the councils of Constantinople and Antioch, erasing the word ομοιος, *like*, out of the Formula of Rimini and that of Constantinople.

Anomœans || Anorexia.

ANOMORHOMBOIDIA, in *Natural History*, the name of a genus of spars; the word is derived from the Greek ανωμαλης, *irregular*, and ρομβοιδης, a *rhomboidal* figure. The bodies of this genus are pellucid crystalline spars of no determinate or regular external form, but always breaking into regularly rhomboidal masses; easily fissile, and composed of plates running both horizontally and perpendicularly through the masses, but cleaving more readily and evenly in a horizontal, than in a perpendicular direction; the plates being ever composed of irregular arrangements of rhomboidal concretions. Of this genus there are five known species. 1. A white, bright, and shattery one; found in great quantities in the lead mines of Derbyshire, Yorkshire, and Wales. 2. A milk-white, opaque, and shattery one, found in some parts of France, and very plentifully in Germany, and sometimes in Wales and Scotland, and in the hills of Yorkshire. 3. A hard, dull, and snow-white one, found in some of the mines in Derbyshire, and in many of our northern counties. 4. A hard, gray, and pellucid one, found in the lead mines of Yorkshire, and very common in Germany. And, 5. A pellucid and colourless one; this is found in the lead mines of Derbyshire and Yorkshire. All these in some degree have the double refraction of the Iceland crystal. See *ICELAND Crystal*.

ANONIS. See ONONIS, BOTANY *Index*.

ANONYMOUS, something that is nameless, or of which the name is concealed. It is a term usually applied to books which do not express the author's name, or to authors whose names are unknown.

ANONYMOUS, in commerce. Parnerships in trade in France are styled anonymous, when they are not carried on under any particular name, but wherein each of the partners trades visibly on his own account, and in his own name; after which all the partners give one another an account of their profit or loss in trade. These sorts of partnerships are concealed, and known only to the parties themselves.

ANONYMOUS Partnerships in Trade, are also in France, such, wherein persons of fortune and quality deposite sums of money, in order to share of the profits and loss. To this end those who furnish the capital have no trouble in carrying on the trade, nor do their names appear to be any way interested therein.

ANONYMOUS, in *Law*. The sending anonymous letters demanding money, &c. is felony by the Black Act, 9 Geo. I. cap. xxii.

ANOREXIA, ANOREXY, (from α negative, and ορεξις, *appetite*): a want of appetite, or a loathing of food. The disorder is either original or symptomatic. When it is original, its causes are bad diet, too free drinking, voraciousness, &c.: In which cases, a vomit or two of ipecacuanha may be taken; and temperance, a light but cordial nourishing diet, and daily exercise

persisted

Anorexia, Anossi.

persisted in, will generally effect a recovery. But it is more frequently a symptom of some other disorder; and then the cure depends on the removal of the original one.

ANOSSI, a province of the island of Madagascar, lying between Lat. 23. 18. and 26. 0. S. It is watered by many rivers, most of which run into the *Franchere*, *Ramevatte*, or *Immour*, the spring of which is in a mountain called *Manghage*, and discharges itself into the sea in Lat. 25. 18. S. The mouth of this river is often stopped, and the course to the sea interrupted, unless kept open by the overflowings of great rains and high tides. The water runs salt one league above the mouth, particularly in a free communication with the sea. A lake, called *Ambou*, is formed at the mouth, half a league wide, with depth sufficient for any ship if the mouth of the river was kept open. Next in bigness to the Franchere, is the Manghasia, which springs from a mountain called *Siliva*, and empties itself into the sea, where large ships may ride at anchor. Crocodiles breed in these and all the other rivers of the island.

Between the two rivers above mentioned lies Cape St Romain, half a mile distant from the mouth of the Franchere, and which runs from the north-west six or seven leagues into the sea. When the cape is passed the coast forms a great bay, in the shape of a cross, which extends to the mouth of a river called *Dian Panouge* or *Pitorah*. In the middle of this bay the land runs out, and almost forms a peninsula called *Tholangare*. Fort Dauphin lies to the north of this peninsula, and Port Dauphin over against it. This province has several other peninsulas and small islands belonging to it. The country is beautiful; abounds in fruit trees; is fertile in pastures for cattle; and, if carefully cultivated, would produce all the necessaries of life. It is surrounded by high mountains, which are covered with woods and shrubs; but, about four miles distant from Fort Dauphin, the adjacent hills are quite destitute of verdure. The French often dug in this neighbourhood, expecting to meet with mines of gold and silver, particularly in one mountain where several springs flow near each other and empty themselves into a neighbouring river. In this river they found several stones and heaps intermixed with yellow clay, with a great quantity of black and white spangles shining like silver, which they carefully pounded and washed, but without effect. About 60 yards above these springs the grass, and every sort of vegetable, appears half dried and yellow, from a metalline sulphur, which gives that aspect; but the top of the mountain is covered with a fresh and beautiful verdure. It is said that the Portuguese found gold at the foot of this mountain on the north side, but that the place they had dug was filled up by the chiefs of the country after the Portuguese had been driven out.

The province of Anossi is inhabited by three different sorts of whites, and four sorts of negroes. The whites are distinguished by the names of *Rohandrians*, *Anacandrians*, and *Ondzatsi*. The whites are distinguished from the negroes by the general names of *Raferamini* or *Rahimini;* and the Rohandrians are distinguished above the other whites. When they proceed to an election of a sovereign, whom they call *Ompiandrian*, or *Dian Bahouache*, he is chosen from the Rohandrian race. Next to him the others hold the rank of princes, and are honoured as such by all the rest of the subjects. The Anacandrians are descendants of the chiefs, but who have degenerated, and are accounted the bastards of princes, or those who are descended from a Rohandrian and any inferior white or black woman. These are likewise called by the name of *Ontempassemaca*, or people from the sandy parts of Mecca, from whence, they say, came the Rohandrians. Both the Rohandrians and Anacandrians wear long hair, which hangs down in curls; and enjoy the privilege of killing beasts. The Ondzatsi, or lowest class of whites, are descended from the bastards of the Anacandrians. These are all fishermen, and are allowed to kill no land animal except a chicken. Anossi.

The four classes of negroes are named *Voadziri*, *Lohavohits*, *Ontsoa* and *Ondeves*. The Voadziri, the most powerful and the richest, are masters of several villages; and descended from the original lords of the country. They enjoy the privilege of killing beasts, when at a distance from the whites, and no Rohandrian or Anacandrian in the village. The Lohavohits are descendants from the Voadziri, and also lords; but with this difference, that the one commands a whole district, and the jurisdiction of the others extends only to their own village and family. They are also permitted to kill those beasts they intend to eat, when at a distance from the whites. The Ontsoa are next to the Lohavohits, and are their near relations. The Ondeves are the lowest of all, being originally slaves by father and mother. The Voadziri, Lohavohits, and Ontsoa, enjoy the privilege of submitting themselves, on the death of their lord or king, to any chief they please. In return for such homage, the new lord makes them a present, in consequence of which he becomes heir to all their possessions. Hence the lower classes both of whites and blacks, when death approaches, are under the greatest concern and anguish of mind, well knowing that their lords will not fail to deprive their children of every thing they possess. The Ondeves have not the same liberty with the others; but, in times of famine, the chiefs are obliged to supply them with necessaries; which if they fail to do, they have the liberty of submitting themselves to new masters. The inhabitants of this province have no temples, and very little appearance of religion; only they keep up a custom of immolating beasts upon particular occasions, as in sickness, planting yams or rice, on assemblies, &c. They offer the first born beast to the devil and to God, naming the devil first, in this manner, *Dianbilis Aminhanhabare*, or "Lord Devil and God."—There are several towns on the river Franchere; and near this river the Portuguese had a fort built upon a steep rock, and several buildings below, with enclosures, which furnished all sorts of necessaries for their subsistence; but they were all massacred by the natives.

This province seems originally to have been inhabited by negroes. The whites or Raferamini settled in it about 200 years ago, and conquered the negroes. But they themselves were conquered by the French, though under the government of a king whom they honoured as a god. In 1642, Captain Rivault obtained permission to establish a colony in this part of the island; and accordingly he took possession of it in the name of the king of France, in the month of September, that same year.

Anossi, Anotta.

year. The French landed 200 men, well armed, and provided with store of ammunition and other necessaries for building a fort, which they immediately set about; but no sooner did the natives observe their intention, than they used their utmost art to prevent their design from taking effect. This created a war, in which the French were victors; and, the natives becoming in time much better reconciled to them, they intermarried, and lived up and down in several towns at some distance from one another, not above five or six in a place. This tranquillity lasted for some years; but at last the natives, growing jealous, resolved to free themselves from a foreign yoke; and accordingly formed a conspiracy to cut off all the French in one day; which they soon after effected, not leaving a single person alive. In 1644 the above-mentioned Fort Dauphin was erected in Lat. 25. 6. S. Many buildings were erected, behind the fort, adjoining to the governor's house, with great enclosures that produced every sort of fruit and kitchen herb. In 1656 it was accidentally destroyed by fire; but was soon after repaired, and still continues, notwithstanding the catastrophe above mentioned, and its garrison carries on frequent wars with the natives.

ANOTTA, or ARNOTTA, in dyeing, an elegant red colour, formed from the pellicles or pulp of the seeds of the BIXA, a tree common in South America. It is also called *Terra Orleana*, and *Roucou*.

The manner of making anotta is as follows: The red seeds, cleared from the pods, are steeped in water for seven or eight days, or longer, till the liquor begins to ferment; then strongly stirred, stamped with wooden paddles and beaters, to promote the separation of the red skins; this process is repeated several times, till the seeds are left white. The liquor, passed through close cane sieves, is pretty thick, of a deep red colour, and a very ill smell; in boiling, it throws up its colouring matter to the surface in form of scum, which is afterwards boiled down by itself to a due consistence, and made up while soft into balls. The anotta commonly met with among us, is moderately hard and dry, of a brown colour on the outside, and a dull red within. It is difficultly acted upon by water, and tinges the liquor only of a pale brownish yellow colour. It very readily dissolves in rectified spirit of wine; and communicates a high orange or yellowish red. Hence it is used as an ingredient in varnishes, for giving more or less of an orange cast to the simple yellows. Alkaline salts render it perfectly soluble in boiling water, without altering its colour. Wool or silk boiled in the solution acquires a deep, but not a very durable, orange dye. Its colour is not changed by alum or by acids, any more than by alkalies: but when imbibed in cloth, it is discharged by soap, and destroyed by exposure to the air. It is said to be an antidote to the poisonous juice of manioc or cassava.—Labat informs us, that the Indians prepare anotta greatly superior to that which is brought to us, of a bright shining red colour, almost equal to carmine: that, for this purpose, instead of steeping and fermenting the seeds in water, they rub them with the hand, previously dipped in oil, till the pellicles come off, and are reduced into a clear paste; which is scraped off from the hands with a knife, and laid on a clean leaf in the shade to dry. De Laet, in his notes on Margrave's Natural History of Brazil, mentions also two kinds of anotta; one of a permanent crimson colour, used as a fucus or paint for the face; and another which gives a colour inclining more to that of saffron. This last, which is our anotta, he supposes to be a mixture of the first sort with certain resinous matters, and with the juice of the root of the tree. The wax or pulp in which the seeds are enclosed is a cool agreeable rich cordial, and has been long in use among the Indians and Spaniards in America, who still mix it with their chocolate, both to heighten the flavour and raise the colour. It is said to be a successful remedy in bloody fluxes. The roots have much the same properties with the wax.

Anotta || Ansarians

ANOUT, a small island in the Schagerrack, or that part of the sea of Denmark which has Norway on the north, Jutland on the west, and the isle of Zeeland on the south. It lies in 13. 0. E. Long. and 56. 36. N. Lat.

ANQUETIL, LEWIS PETER, a French historian. See SUPPLEMENT.

ANQUETIL DU PERRON, A. H. an eminent French oriental scholar. See SUPPLEMENT.

ANSÆ, in *Astronomy*, implies the parts of Saturn's ring projecting beyond the disk of the planet.—The word is Latin, and properly signifies *handles;* these parts of the ring appearing like handles to the body of the planet.

ANSARIANS, a people of Syria, so called in the country, but styled in De l'Isle's maps *Ensarians*, and in those of D'Anville, *Nassaris*. The territory occupied by these Ansaria is that chain of mountains which extends from Antakia to the rivulet called *Nahr-el-Kabir*, or the Great River. The history of their origin, though little known, is yet instructive. The following account is from the *Bibliotheque Orientale* of Assemani, a writer who has drawn his materials from the best authorities.

"In the year of the Greeks, 1202 (A. D, 891), there lived at the village of Nasar, in the environs of Koufa, an old man, who, from his fastings, his continual prayers, and his poverty, passed for a saint. Several of the common people declaring themselves his partizans, he selected from among them twelve disciples to propagate his doctrine. But the commandant of the place, alarmed at his proceedings, seized the old man, and confined him in prison. In this reverse of fortune, his situation excited the pity of a girl who was slave to the gaoler, and she determined to give him his liberty. An opportunity soon offered to effect her design. One day when the gaoler was gone to bed intoxicated, and in a profound sleep, she gently took the keys from under his pillow, and after opening the door to the old man, returned them to their place unperceived by her master: the next day when the gaoler went to visit his prisoner, he was extremely astonished at finding he had made his escape, and the more so since he could perceive no marks of violence. He therefore judiciously concluded he had been delivered by an angel, and eagerly spread the report, to avoid the reprehension he merited: the old man, on the other hand, asserted the same thing to his disciples, and preached his doctrines with more earnestness than ever. He even wrote a book, in which, among other things, he says, 'I such a one, of the village of Nasar, have seen Christ who is the word of God, who is Ahmad, son of Mohammed, son of Hanafa, of the race of Ali;

who

Ansarians || Anselm.

who also is Gabriel: and he said to me, Thou art he who readeth (with understanding); thou art the man who speaketh truth; thou art the camel which preserveth the faithful from wrath; thou art the beast which carrieth their burden; thou art the (Holy) Spirit, and John, the son of Zachary. Go, and preach to men that they make four genuflections in praying; two before the rising of the sun, and two before his setting, turning their faces towards Jerusalem: and let them say, three times, God Almighty! God Most High! God Most Great! Let them observe only the second and third festival; let them fast but two days annually; let them not wash the prepuce, nor drink beer, but as much wine as they think proper; and lastly, let them abstain from the flesh of carnivorous animals.' This old man passing into Syria, propagated his opinions among the lower orders of the country people, numbers of whom believed in him: And after a few years he went away, and nobody ever knew what became of him."

Such was the origin of these Ansarians, who are, for the most part, inhabitants of the mountains before mentioned.

The Ansaria are divided into several tribes or sects; among which are distinguished the Shamsia, or adorers of the sun; the Kelbia, or worshippers of the dog; and the Kadmousia, who are said to pay a particular homage to that part in women which corresponds to the priapus.

Many of the Ansaria believe in the metempsychosis; others reject the immortality of the soul; and in general, in that civil and religious anarchy, that ignorance and rudeness which prevail among them, these peasants adopt what opinions they think proper, following the sect they like best, and frequently attaching themselves to none.

Their country is divided into three principal districts, farmed by the chiefs called *Mokaddamim*. Their tribute is paid to the pacha of Tripoli, from whom they annually receive their title. Their mountains are in general not so steep as those of Lebanon, and consequently are better adapted to cultivation; but they are also more exposed to the Turks; and hence, doubtless, it happens, that with greater plenty of corn, tobacco, wines, and olives, they are more thinly inhabited than those of their neighbours the MARONITES and the DRUSES.

ANSE, an ancient town of France, in the Lyonois, ten miles north of Lyons. Long. 6. 55. N. Lat. 45. 55.

ANSELM, archbishop of Canterbury, in the reigns of William Rufus and Henry I. He was born in the year 1033, at Aost, a town in Savoy at the foot of the Alps. He became a monk in the abbey of Bec in Normandy; of which he was afterwards chosen prior, and then abbot. In the year 1092, he was invited over to England by Hugh earl of Chester; and in the year following was prevailed on, as we are told, with great difficulty, to accept the archbishopric of Canterbury. He enjoined celibacy on the clergy; for which he was banished by King Rufus, but recalled by Henry at his coming to the crown. He refused to consecrate such bishops as were invested by the king, according to Pope Urban's decree; flatly denying it to be the king's prerogative: for this he was outed again; till, the pope and king agreeing, he was recalled in 1107. In short, from the day of his consecration to that of his death, he was continually employed in fighting the prerogative of the church against that of the crown; and for that purpose spent much of his time in travelling backwards and forwards between England and Rome, for the advice and direction of his holiness. At the council of Bari, in the kingdom of Naples, the pope being puzzled by the arguments of the Greeks against the Holy Ghost's proceeding from the Father, be called upon Anselm, who was present, and he discussed their objections with great applause. Priests call him a resolute saint; to other people he appears to have been an obstinate and insolent priest. He wrought many miracles, if we believe the author of his life, both before and after his death, which happened at Canterbury, in the 76th year of his age, anno 1109. He was canonized in the reign of Henry VII. Anselm, though we may disregard him as a saint, deserves to be remembered as one of the principal revivers of literature, after three centuries of profound ignorance.

Anselm || Ansibarii.

His works have been printed in different years, and at different places, viz. Nuremb. 1491. Paris 1544 and 1549. Venice 1549. Cologne 1573 and 1612. Lyons 1630. But the best is that of Father Gerberon, printed at Paris 1675. It is divided into three parts; the first contains dogmatical tracts, and is entitled *Monologia;* the second contains practical and devotional tracts; the third part consists of letters, in four books.

ANSER, the trivial name of a species of anas. See ANAS, ORNITHOLOGY *Index*.

ANSER, in *Astronomy*, a small star, of the fifth or sixth magnitude, in the milky way, between the swan and eagle, first brought into order by Hevelius.

ANSERES, the name which Linnæus gives to his third order of birds. See ORNITHOLOGY *Index*.

ANSIBARII, or ANSIVARII, an ancient people of Germany, situated somewhere in the neighbourhood of the Chauci. All we know of their history is, that, in the reign of the emperor Nero, they were driven from their own possessions by the Chauci. Being then in a forlorn condition, they took possession of some uninhabited lands, which had been used as pasture for the horses of the Roman soldiers. They were led by one Boiocalus, a man of great valour, and of known fidelity to the Romans. He remonstrated to the Romans, who objected to their taking possession of these lands, That the territory in dispute was large; and requested, that it might be allowed to an unhappy people driven from their own habitations: that, at the same time, wide tracts might be retained for the horses and cattle of the soldiers to graze in; that it was inconsistent with humanity to famish men in order to feed beasts, &c.: and at last, lifting up his eyes to heaven, he asked the celestial luminaries how they could behold a desolate soil, and if they would not more justly let loose the sea to swallow up usurpers, who had engrossed the whole earth? To this the Roman commander, Avitus, replied, That the weakest must submit to the strongest; and that since the gods, to whom they had appealed, had left the sovereign judgment to the Romans, they were resolved to suffer no other judges than themselves. To Boiocalus himself, however, he privately offered lands as a reward for his long attachment to the Romans; but this offer the brave German rejected, as a price for betraying

Ansibarii. Ansiko, Anson.

betraying his people: adding, "A place to live in we may want, but a place to die in we cannot." The Ansibarii now invited the neighbouring nations to join them against the Romans; but they, dreading the power of that nation, refused to give them any assistance; upon which they applied to the neighbouring nations, begging leave to settle in their territories; but being everywhere driven out as enemies and intruders, these unhappy people were reduced to wander up and down till every one of them perished.

ANSIKO, a kingdom of Africa, bounded on the west by the river Umbre which runs into the Zaire, the kingdom of Wangua, and the Amboes who border on Loango; on the north, by some deserts of Nubia; and on the south, by Songo and Sonda, provinces of Congo. Here are great numbers of wild beasts, as lions, rhinoceroses, &c. and many copper mines. The king of Ansiko, or the great Macoco, commands 13 kingdoms, and is esteemed the most powerful monarch in Africa. The inhabitants of Angola have a tradition, that this is the proper country of the Giagas, who came originally from Sierra Leona, and overran, like a torrent, the whole coast as far as Benguela; that, being weakened by numerous battles, and unable to force the defiles in order to return to Sierra Leona, they arrived on the borders of Monomotapa, where being defeated, they were forced to remain in the provinces of Ansiko. Be this as it will, the Ansikans yield not in the least to the Giagas in fierceness and barbarity. They are so accustomed to the eating of human flesh, that it is asserted they have markets where it is publicly sold, and that there are no other graves for the dead than the bellies of the living. They try the courage of their prisoners of war by shooting at them as at marks, directing their arrows above or around their heads; and whoever discovers the least signs of fear, is immediately devoured without remedy. Those who appear intrepid and resolute, have their noses and ears bored, and two fore teeth of the upper jaw drawn. They are then improved in barbarity, by accustoming them to the most horrid cruelties.

The Ansikans are neat, well proportioned, and strong; wandering about from place to place, without either sowing or reaping. They are dreaded for their extreme brutality, and never traded with by the Europeans. Their language is barbarous, and difficult to be learned, even by the inhabitants of Congo. The most distinguished among them wear red and black caps of Portuguese velvet; the lower ranks go naked from the waist upwards; and, to preserve their health, anoint their bodies with a composition of pounded white sandal wood and palm oil. Their arms are battle axes, and small but very strong bows, adorned with serpents skins. Their strings are made of supple and tender shoots of trees, that will not break, and their arrows of hard and light wood. These people, who kill birds flying, shoot with such surprising swiftness, that they can discharge 28 arrows from the bow before the first falls to the ground. With equal dexterity they manage their battle axes; one end of which is sharpened and cuts like a wedge, and the other flattened like a mallet, with a handle set between, about half the length of the iron, rounded at the end like an apple, and covered with the skin of a serpent.—The current money in this country is the zimbis or shell, which is fished for, and passes among several African nations.—They worship the sun as their chief deity; whom they represent by the figure of a man, and the moon by that of a woman. They have also an infinite number of inferior deities, each individual having a particular idol whom he addresses on certain occasions.

ANSLO, a sea port town of Norway, in the province of Aggerhuys, with a bishop's see. The supreme court of justice is held here for Norway. It is seated on a bay of the same name. E. Long. 10. 14. N. Lat. 50. 24.

ANSON, GEORGE, a gentleman whose merit and good fortune, as a naval commander, exalted him to the rank of nobility. He was the son of William Anson, Esq. of Huckborough, in Staffordshire; and, showing an early inclination for the sea, received a suitable education. The first command he enjoyed was that of the Weasel sloop, in 1722; but the most memorable action of his life, and the foundation of his future good fortune, took place on his receiving the command of five ships, a sloop, and two victuallers, equipped to annoy the Spaniards in the South seas, and to co-operate with Admiral Vernon across the isthmus of Darien; an expedition the principal object of which failed by the unaccountable delay in fitting him out. He sailed, however, in Sept. 1740; doubled Cape Horn in a dangerous season; lost most of his men by the scurvy; and with only one remaining ship, the Centurion, crossed the great Pacific ocean. If no considerable national advantage resulted from this voyage, Commodore Anson made his own fortune, and enriched his surviving companions, by the capture of a rich galleon on her passage from Acapulco to Manilla; with which he returned home round the Cape of Good Hope. If he was lucky in meeting this galleon, he was no less fortunate in escaping a French fleet then cruising in the Channel, by sailing through it during a fog. He arrived at Spithead in June 1744. In a short time after his return, he was appointed rear-admiral of the blue, and one of the lords of the admiralty. In April 1745, he was made rear-admiral of the white, and the following year vice-admiral of the blue; at which time he was chosen to represent the borough of Heydon in parliament. In 1747, being on board the Prince George of 90 guns, in company with Admiral Warren, and 12 other ships, he intercepted, off Cape Finisterre, a powerful fleet, bound from France to the East and West Indies; when, by his valour and conduct, he again enriched himself and his officers, and at the same time strengthened the British navy, by taking six men of war and four East Indiamen, not one of them escaping. The French admiral, M. Jonquiere, on presenting his sword to the conqueror, said, *Monsieur, vous avez vaincu l'Invincible, et la Gloire vous suit:* "Sir, you have conquered the Invincible, and Glory follows you;" pointing to the ships, named the *Invincible* and the *Glory*, he had taken. For his signal services, his late majesty created him baron of Soberton in Hants. The same year he was appointed vice-admiral of the red; and, on the death of Sir John Norris, was made vice-admiral of England. In 1748 he was made admiral of the blue: he was afterwards appointed first lord of the admiralty, and was at length made admiral and commander in chief of his majesty's fleet; in which rank

Anson || Ant-eggs.

rank he continued, with a very short interval, until his death; and the last service he performed was to convey Queen Charlotte to England. He died in June 1762. No performance ever met with a more favourable reception, than the account of Anson's Voyage round the World. Though it is printed under the name of his chaplain, it was composed under his lordship's own inspection, and from the materials he himself furnished, by Mr Benjamin Robins.

ANSPACH, MARQUISATE OF, a small territory of Franconia, in Germany, bounded on the north by the bishoprics of Wartsburg and Bamberg, which last likewise lies to the west; by the earldoms of Holach and Oeting, with the bishopric of Aichstet, on the south; and the palatinate of Bavaria and the territory of Nuremberg on the east. The country is fruitful, and interspersed with woods, which render it agreeable for hunting. Besides the city Anspach, which is the capital, the chief towns are Kreglin, Swasbach, and Kreilsheim. Since 1806 it belongs to Bavaria.

ANSPACH is a small but pretty town, very well built, and has several churches. It is walled round, but has no other fortifications. In the palace there is a remarkable cabinet of curiosities. It is seated on a river of the same name. E. Long. 10. 42. N. Lat. 49. 14.

ANSPESSADES, in the French armies, a kind of inferior officer in the foot, below the corporals, but above the common sentinels. There are usually four or five of them in a company.

ANSTRUTHER, EASTER and WESTER, two royal boroughs of Scotland, situated on the south-east coast of Fife, containing about 1300 inhabitants in 1811. W. Long. 2. 45. N. Lat. 56. 12.

ANT, in *Zoology*. See FORMICA and TERMES. See also the article ANT in the SUPPLEMENT.

ANT-Bear, or *Ant-eater*, in *Zoology*. See MYRMECOPHAGA.

ANT-eggs, a name popularly given to a kind of little white balls found in the banks or nests of ants, ordinarily supposed to be the ova of this insect.

Late naturalists have observed that these are not properly the ants eggs, but the young brood themselves in their first state; they are so many little vermiculi wrapped up in a film or skin, composed of a sort of silk, which they spin out of themselves as silk worms and caterpillars do. At first they are hardly observed to stir; but, after a few days continuance, they exhibit a feeble motion of flexion and extension; and begin to look yellowish and hairy, shaped like small maggots, in which shape they grow up till they are almost as large as ants. When they pass their metamorphosis, and appear in their proper shape, they have a small black speck on them close to the anus of the enclosed ant, which M. Leeuwenhoek probably enough imagines to be the fæces voided by it. Dr Edward King opened several of these vulgarly reputed eggs; in some of which he found only a maggot in the circumstances above described; while in another the maggot had begun to put on the shape of an ant about the head, having two little yellow specks, where the eyes were to be. In others, a further progress was observed, the included maggots being furnished with every thing to complete the shape of an ant, but wholly transparent, the eyes only excepted, which were as black as bugles. Lastly, in others he took out very perfect and complete ants, which immediately crept about among the rest. These supposed ants eggs are brought up every morning in summer near the top of the bank, where they are lodged all the warm part of the day, within reach of the sun's influence. At night, or if it be cool, or like to rain, they carry them down to a greater depth; so that you may dig a foot deep e'er you come at them. The true ants eggs are the white substance, which, upon opening their banks, appears to the eye like the scatterings of fine white sugar, or salt, but very soft and tender. Examined by a microscope, it is found to consist of several pure white appearances, in distinct membranes, all figured like the lesser sort of bird's eggs, and as clear as a fish's bladder. The same substance is found in the bodies of the ants themselves. On this spawn, when emitted, they lie in multitudes, to brood, till in some time it is turned into little vermicules as small as mites, commonly called *ants eggs*.

Ant eggs || Anta.

ANT-Hills, are little hillocks of earth, which the ants throw up for their habitation and the breeding of their young. They are a very great mischief to dry pastures, not only by wasting so much land as they cover, but by hindering the scythe in mowing the grass, and yielding a poor hungry food pernicious to cattle. The manner of destroying them is to cut them into four parts from the top, and then dig into them so deep as to take out the core below, so that, when the turf is laid down again, it may lie somewhat lower than the level of the rest of the land: by this means it will be wetter than the rest of the land, and this will prevent the ants from returning to the same place, which otherwise they would certainly do. The earth that is taken out must be scattered to as great a distance every way as may be, otherwise they will collect it together, and make another hill just by. The proper time for doing this is winter; and if the places be left open, the frost and rains of that time of the year will destroy the rest: but in this case care must be taken that they are covered up early enough in the spring, otherwise they will be less fertile in grass than the other places. In Hertfordshire they use a particular kind of spade for this purpose. It is very sharp, and formed at the top into the shape of a crescent, so that the whole edge makes up more than three-fourths of a circle; this cuts in every part, and does the business very quickly and effectually. Others use the same instruments that they do for mole-hills. Human dung is a better remedy than all these, as is proved by experiment; for it will kill great numbers of them, and drive all the rest away, if only a small quantity of it be put into their hills.

ACID of ANTS, an acid produced by distilling millions of these insects, either without addition, or with water. It resembles vinegar in many respects; but differs from it in forming crystals with magnesia, iron, and zinc. Its attractions are not yet determined, but are supposed to coincide with those of vinegar.

ANTA, in the *Ancient Architecture*, a square pilaster, placed at the corners of buildings.

ANTA, or *Ante*, a small kingdom on the Gold coast of Africa, extending about ten leagues in length.—The country is covered with large trees, among which stand a number of fine villages. The soil is exceedingly rich, and the face of the country beautiful. The

Anta ‖ Antæus.

air is also much more salubrious than in other places of the Gold coast; it being observed by all writers, that the number of deaths here bears no proportion to that on any other part on the coasts of Guinea. This country contains the following villages, which deserve a particular description on account of the commerce they drive; viz. *Bourtrey*, *Tokorari*, *Sukoada*, and *Sama*; for which, see those articles.—Formerly Anta was potent and populous, inhabited by a bold and rapacious people, who greatly annoyed the Europeans by their frequent incursions; but by continual wars with their neighbours they are now greatly enfeebled, and the country in a manner depopulated. The spirit of the few remaining inhabitants is fled: they are desponding, dispirited and abject, seeking protection from the Dutch and other Europeans who have forts on this coast, and looking upon them as their best friends.

ANTACIDS, in *Pharmacy*, an appellation given to all medicines proper to correct acid or sour humours.

Under the class of Antacids come, 1. Absorbents: as chalk, coral, sea-shells, hæmatites, and steel filings. 2. Obtundents; as oils and fats. 3. Immutants; as lixivious salts and soaps.

ANTÆUS, in fabulous history, a giant of Libya, son of Neptune and Terra. Designing to build a temple to his father, of men's skulls, he slew all he met; but Hercules fighting him, and perceiving the assistance he received from his mother, (for by a touch of the earth he refreshed himself when weary), lifted him up from the ground and squeezed him to death.

Antæus was king of Mauritania; and from several circumstances, with which we are supplied by various authors, it appears extremely probable that he was the same person with Atlas: they were both of them the sons of Neptune, who reigned over Mauritania, Numidia, and a great part of Libya; as may be naturally inferred from his having such particular marks of distinction conferred upon him by the inhabitants of those regions. They both ruled with absolute power over a great part of Africa, particularly Tingitana. Hercules defeated and slew Antæus in the same war wherein he took the Libyan world from Atlas: both Atlas and Antæus invaded Egypt, and contended with Hercules in the wars with the gods, and were both vanquished by him. Antæus, as well as Atlas, was famed for his knowledge in the celestial sciences: from whence we may fairly conclude them to have been the same king of Mauritania.

Antæus, in his wars with Hercules, who commanded an army of Egyptians and Ethiopians, behaved with great bravery and resolution. Receiving large reinforcements of Libyan troops, he cut off vast numbers of Hercules's men; but that celebrated commander having at last intercepted a strong body of Mauritanian or Libyan forces sent to the relief of Antæus, gave him a total overthrow, wherein both he and the best part of his forces were put to the sword. This decisive action put Hercules in possession of Libya and Mauritania, and consequently of all the riches in those kingdoms; hence arose the fable that Hercules finding Antæus, a giant of an enormous size, with whom he was engaged in single combat, to receive fresh strength as often as he touched his mother earth when thrown upon her, at last lifted him up in the air and squeezed him to death. Hence likewise may be deduced the fable, intimating, that Hercules took Atlas's globe upon his own shoulders, overcame the dragon that guarded the orchards of the Hesperides, and made himself master of all the golden fruit. The golden apples, so frequently mentioned by the old mythologists, were the treasures that fell into Hercules's hands upon Antæus's defeat, the Greeks giving the Oriental word מלא *riches*, the signification annexed to their own term, μηλα, *apples*. After the most diligent and impartial examination of all the different hypotheses of historians and chronologers, relating to Atlas and Antæus, we find none so little clogged with difficulties as that of Sir Isaac Newton. According to that illustrious author, Ammon, the father of Sesac, was the first king of Libya, or that vast tract extending from the borders of Egypt to the Atlantic ocean; the conquest of which country was effected by Sesac in his father's lifetime. Neptune afterwards excited the Libyans to a rebellion against Sesac; slew him, and then invaded Egypt under the command of Atlas or Antæus, the son of Neptune, Sesac's brother and admiral. Not long after, Hercules, the general of Thebais and Ethiopia for the gods or great men of Egypt, reduced a second time the whole continent of Libya, having overthrown and slain Antæus near a town in Thebais, from that event called Antæa or Antæopolis: this, we say, is the notion advanced by Sir Isaac Newton, who endesvours to prove, that the first reduction of Libya by Sesac happened a little above a thousand years before the birth of Christ, as the last by Hercules did some few years after.

Antæus ‖ Antavar

ANTAGONIST, denotes an adversary, especially in speaking of combats and games.

Antagonist Muscles, in *Anatomy*, those which have opposite functions; as flexors and extensors, abductors, and addnctors, &c.

ANTANACLASIS, in *Rhetoric*, a figure which repeats the same word, but in a different sense; as *dum vivimus vivamus*.

ANTAGOGUE, in *Rhetoric*, a figure by which, when the accusation of the adversary is unanswerable, we load him with the same or other crimes.

ANTANDROS, in *Ancient Geography*, a town of Mysia, on the sea-coast, at the foot of Mount Alexandria, a part of Mount Ida, (Strabo, Ptolemy): it was a town of the Leleges, (Strabo); anciently called *Edonis*, then *Cimmeris*, (Pliny, Stephanus). It takes its name from Antandros, a general of the Æolians: it is now called *S. Dimitri*.

ANTAPHRODISIACS, in *Pharmacy*, medicines proper to diminish the semen, and consequently extinguish or lessen all desires of venery.

ANTARCTIC, in a general sense, denotes something opposite to the northern or arctic pole. Hence antarctic circle is one of the lesser circles of the sphere, and distant only 23° 30′ from the south pole, which is likewise called antarctic for the same reason.

ANTARES, in *Astronomy*, the name of a star of the first magnitude, called also the scorpion's heart. Its longitute is 60° 13′ 14″ of Sagittarius; and its latitude 43° 51′ 26″ south.

ANTAVARE, a province of the island of Madagascar, lying about 21° 30′ S. Lat. and bounded by the

Antavare || Antecursores.

the province and cape of Manousi. The greatest part of it is watered by the river Mananzari, whose source is in the red mountains of Ambohitsmene.

ANTE, in *Heraldry*, denotes that the pieces are let into one another in such a form as there is expressed; for instance, by dove tails, round, swallow tails, or the like.

ANTEAMBULONES, in Roman antiquity, servants who went before persons of distinction to clear the way before them. They used this formula, *Date locum domino meo*, i. e. "Make room or way for my master."

ANTECEDENT, in general, something that goes before another, either in order of time or place.

ANTECEDENT, in *Grammar*, the words to which a relative refers.

ANTECEDENT, in *Logic*, is the first of the two propositions in an enthymeme.

ANTECEDENT, in *Mathematics*, is the first of two terms of a ratio, or that which is compared with the other.

ANTECEDENCE, in *Astronomy*, an apparent motion of a planet towards the west, or contrary to the order of the signs.

ANTECESSOR, one that goes before. It was an appellation given to those who excelled in any science. Justinian applied it particularly to professors of civil law; and, in the universities of France, the teachers of law take the title *antecessors* in all their theses.

ANTECURSORES, in the Roman armies, a party of horse detached before, partly to get intelligence, provisions, &c. and partly to choose a proper place to encamp in. These were otherwise called *antecessores*, and by the Greeks *prodromi*.

Antedate || Antediluvians.

ANTEDATE, among lawyers, a spurious or false date prior to the true date of a bond, bill, or the like.

ANTEDILUVIAN, in a general sense, implies something that existed before the flood.

Antediluvian World; the earth as it existed before the flood. See EARTH.

ANTEDILUVIANS, a general name for all mankind who lived before the flood, and so includes the whole of the human race from Adam to Noah and his family.

1 Chronology of the first ages.

As Moses has not set down the particular time of any transaction before the flood, except only the years of the father's age wherein the several descendants of Adam in the line of Seth were begotten, and the length of their several lives; it has been the business of chronologers to endeavour to fix the years of the lives and deaths of those patriarchs, and the distance of time from the creation to the deluge. In this there could be little difficulty, were there no varieties in the several copies we now have of Moses's writings; which are, the Hebrew, the Samaritan, and the Greek version of the Septuagint; but as these differ very considerably from one another, learned men are much divided in their opinion concerning the chronology of the first ages of the world; some preferring one copy, and some another.

That the reader may the better judge of the variations in the three copies in this period, they are exhibited in the following table, with the addition of those of Josephus as corrected by Dr Wells and Mr Whiston.

A Table of the Years of the Antediluvian Patriarchs.

	Their ages at their sons birth.				Years they lived after their sons birth.			Length of their lives.		
	Heb.	Sam.	Sept.	Jos.	Heb.	Sam.	Sept.	Heb.	Sam.	Sept.
Adam,	130	130	230	130	800	800	700	930	930	930
Seth,	105	105	205	105	807	807	707	912	912	912
Enos,	90	90	190	90	815	815	715	905	905	905
Cainan,	70	70	170	70	840	840	740	910	910	910
Mahalaleel,	65	65	165	65	830	830	730	895	895	895
Jared,	162	62	162	62	800	785	800	962	847	962
Enoch,	65	65	165	65	300	300	200	365	365	365
Methuselah,	187	67	167	187	782	653	802	969	720	969
Lamech,	182	53	188	182	595	600	565	777	653	753
Noah was aged, at the flood,	600	600	600	600						
To the Flood,	1657	1307	2262	1556						

To this Table it will be necessary, in order to explain the consequences of these variations, to add separate chronological tables, showing in what year of his contemporaries the birth and death of each patriarch happened, according to the computation of each of the said three copies.

Antedi-luvians.

A Chronological TABLE *of the Years of the Patriarchs, according to the Computation of the Hebrew.*

	Years of the world.	Years of Seth.	Years of Enos.	Years of Cainan.	Years of Mahalaleel.	Years of Jared.	Years of Enoch.	Years of Methuselah.	Years of Lamech.	Years of Noah.
Adam created, -	1									
Seth born, -	130									
Enos born, -	235	105								
Cainan born, -	325	195	90							
Mahalaleel born,	395	265	160	70						
Jared born, -	460	330	225	135	65					
Enoch born, -	622	492	387	297	227	162				
Methuselah born,	687	557	452	362	292	227	65			
Lamech born,	874	744	639	549	479	414	252	187		
Adam dies, -	930	800	695	605	535	470	308	243	56	
Enoch translated,	987	857	752	662	592	527	365	300	113	
Seth dies, -	1042	912	807	717	647	582		355	168	
Noah born, -	1056		821	731	661	596		369	182	
Enos dies, -	1140		905	817	745	680		453	266	84
Cainan dies, -	1235			910	840	775		548	361	179
Mahalaleel dies,	1290				895	830		603	416	234
Jared dies, -	1422					962		735	548	366
Japhet born, -	1556							869	682	500
Shem born, -	1558							871	684	502
Lamech dies,	1651							964	777	595
Methuselah dies,	1656				The Flood,			969		600

A Chronological TABLE *of the Years of the Patriarchs, according to the Computation of the Septuagint.*

	Years of the world.	Years of Seth.	Years of Enos.	Years of Cainan.	Years of Mahalaleel.	Years of Jared.	Years of Enoch.	Years of Methuselah.	Years of Lamech.	Years of Noah.
Adam created, -	1									
Seth born, -	230									
Enos born, -	435	205								
Cainan born, -	625	395	190							
Mahalaleel born,	795	565	360	170						
Adam dies, -	930	700	495	305	135					
Jared born, -	960	730	525	335	165					
Enoch born, -	1122	892	687	467	327	162				
Seth dies, -	1142	912	707	517	347	182	165			
Methuselah born,	1387		852	662	492	327	218	187		
Enos dies, -	1340		905	715	545	380	352	200		
Lamech born,	1474			849	679	514	365	248	61	
Enoch translated,	1487			862	692	527		375	188	
Cainan dies, -	1535			910	740	575		403	216	28
Noah born, -	1662				867	702		635	448	260
Mahalaleel dies,	1690				895	730		875	688	500
Jared dies, -	1922					962		877	690	502
Japhet born, -	2162							940	753	565
Shem born, -	2164							969		594
Lamech dies,	2227									600
Methuselah dies,	2256									
The Flood, -	2262									

A

Antediluvians.

A Chronological TABLE *of the Years of the Patriarchs, according to the Computation of the Samaritan Pentateuch.*

Antediluvians.

	Years of the world.	Years of Seth.	Years of Enos.	Years of Cainan.	Years of Mahalaleel.	Years of Jared.	Years of Enoch.	Years of Methuselah.	Years of Lamech.	Years of Noah.
Adam created, -	1									
Seth born, -	130									
Enos born, -	235	105								
Cainan born, -	325	195	90							
Mahalaleel born,	395	265	160	70						
Jared born, -	460	330	225	135	65					
Enoch born, -	522	392	287	197	127	62				
Methuselah born,	587	457	352	262	192	127	65			
Lamech born,	654	524	419	329	259	194	132	67		
Noah born, -	707	577	472	382	312	247	185	120	53	
Enoch translated,	887	757	652	562	497	427	365	300	233	180
Adam dies, -	930	800	695	605	535	470		343	276	323
Seth dies, -	1042	912	807	717	647	582		462	388	335
Enos dies, -	1140		905	815	745	680		553	486	433
Japhet born, -	1207			882	812	747		620	553	500
Shem born, -	1209			884	814	749		622	555	502
Cainan dies, -	1235			910	840	775		648	581	528
Mahalaleel dies,	1290				895	830		703	636	583
Jared, Methuselah, and Lamech, die,	1307		The Flood,			847		720	653	600

To the varieties exhibited in the two last tables, others might be added, by admitting the various readings of some numbers in the Samaritan and Septuagint: for as to the Hebrew copies, there is here a constant agreement among them.

The manuscript from which the Samaritan Pentateuch was published, agrees exactly with the Samaritan numbers given by Eusebius. But St Jerome tells us, that in his time, there were some Samaritan copies which make Methuselah 187 years old at the birth of Lamech, and Lamech 182 at the birth of Noah, just as the Hebrew does. Now if these numbers be approved as the true original numbers, the interval from the creation to the flood will be 1556 years; differing from the Hebrew computation but 100 years in the age of Jared at the birth of Enoch; and if this last be allowed to be a mistake of the transcriber, by his dropping a number, and writing 62 instead of 162, as has been suspected, the Samaritan will be perfectly reconciled with the Hebrew, and all difference between them vanish.

Scaliger, on the authority of an old Samaritan chronicle, having at the end a table of the years of the patriarchs to the time of Moses, would correct two of the Samaritan numbers in Eusebius; viz. instead of 65, the age of Mahalaleel when he begat Jared, he thinks it should be 75; and instead of 67, the age of Methuselah when he begat Lamech, he would have it 77. By which alterations he reckons 20 years more to the flood than Eusebius and the manuscript; that is, 1327. But, as he acknowledges the table, whereon he grounds these corrections, contains some great absurdities, it seems unreasonable to oppose it to the joint authority of Eusebius and the Samaritan manuscript.

As to the Septuagint, in the common editions of that version, the age of Methuselah at the birth of Lamech is 167; and consequently the sum of this period, according to them, is no more than 2242. But, in this case, Methuselah will outlive the flood 14 years; and we may well wonder, with Eusebius, where he was preserved. To obviate this objection, we are told, that, in some copies, Methuselah is said to have lived but 782 (not 802) years after the birth of Lamech, and no more than 949 in all. But the Alexandrian manuscript entirely takes away the difficulty, by giving the same number in this place with the Hebrew.

Pezron is of opinion, that the age of Lamech, at the birth of Noah, should be but 182, as it is both in the Hebrew and in Josephus, supposing, with St Austin, that the present number is the error of the scribe who first copied the original Septuagint manuscript in Ptolemy's library. So that he computes 2256 years to the flood. And, if this correction be admitted, and one more mentioned also by St Austin, viz. that Lamech lived 595 years after the birth of Noah, and not 565, as in the present copies, there will then remain no other difference between the Septuagint and the Hebrew than 600 years added to the ages of the six patriarchs when they begat their sons, and Methuselah will, conformably to the Hebrew and Samaritan, die in the year of the flood.

Having premised this chronological view, we shall proceed to the history of the antediluvian patriarchs.

Of Adam in Paradise.

Of the great progenitor we are told, that "the Lord God took the man and put him into the garden." These words plainly indicate, that Adam was not created within the precincts of Paradise; and it is afterwards said, upon his being turned out of the garden, "He

Antedilu-vians.

was sent to till the ground whence he was taken."—As to the situation of this garden, concerning which there has been so much learned but uncertain inquiry, see the article PARADISE.

Adam was doubtless created in the prime of his life, with all his powers and faculties in the highest degree of strength and vigour. His body would be graceful, and well proportioned; while his countenance was comely, and glowed with all the lustre of youthful innocence. The poet thus describes our first parents:

> Adam the goodliest man, of men since born
> His sons; the fairest of her daughters Eve.
> ———for in their looks divine
> The image of their glorious Maker shone. MILTON.

Many have entertained an opinion (as mentioned under the article ADAM), that our first parent was created an adept in knowledge and in science, a consummate philosopher, and an accomplished divine. But the very reverse of this must be true, providing we give credit to the account which Moses gives of him. If Adam was created with intuitive knowledge, for what end was he endowed with the senses of a man, through which ideas might be conveyed to his mind, and make him capable of such improvements as arise from experience and observation? And if he originally possessed such a fund of valuable knowledge, why had he such an ardent thirst for an unwarrantable portion of more, and for the sake of this additional pittance forfeited his happiness and life? Besides, if Adam was at first all light and knowledge, and was soon after reduced to a state of ignorance and error, this transition would make a retrograde in the system of nature, quite dissimilar to that uniformity which obtains thoughout the whole of the divine government and economy. Moses introduces our first parents into life in the most natural manner, as having capacities to acquire knowledge, senses to receive impressions from objects round them, and a sufficient degree of reason to form a judgement of the things perceived: yet all these faculties can only be considered as so many instruments, by the exercise of which they might be enabled to discharge the duties of their future life.

Smellie's Translation, vol. iii. p. 50. &c. (the passage here abridged).

The following portrait of our first progenitor when he first came into life, drawn by the inimitable pencil of Buffon, is extremely beautiful, while it is dissonant from no part of the Mosaic history. "Let us suppose a man in the same situation with him who first received existence; a man whose organs were perfectly formed, but who was equally new to himself, and to every object which surrounded him. Were he to give a history of his thoughts, and of the manner in which he received impressions, he might give some such information as this. I remember the moment when my existence commenced. It was a moment replete with joy, with amazement and anxiety. I neither knew what I was, where I was, nor whence I came. I opened my eyes. But what an amazing increase of sensation! The light, the celestial vault, the verdure of the earth, the transparency of the waters, gave animation to my spirits, and conveyed pleasures which exceed the powers of expression. At first I believed that all these objects existed within me, and formed a part of myself. When, turning mine eyes to the sun, his splendour overpowered me. I voluntarily shut out the light, and felt a small degree of pain. During this moment of darkness, I imagined that I had lost the greatest part of my being. I was then roused with a variety of sounds. The singing of birds and the murmuring breezes formed a concert, which excited most sweet and enchanting emotions. I listened, and was convinced that these harmonious sounds existed within me.—I made a step forwards; and afterwards renewing my motion, I walked with my face turned towards the heavens; till I struck against a palm tree, and felt some degree of pain. Seized with terror, I ventured to lay my hand upon the object, and perceived it to be a being distinct from myself, because it did not, like touching my own body, give me a double sensation. I resolved then to feel every object I saw, and had a strong desire to touch the sun; but stretching out my hands to embrace the heavens, they met without any intermediate object. All objects appeared to me equally near; and it was not till after many trials that I learned to use my eye as a guide to my hand. At last the train of my ideas was interrupted, and I lost the consciousness of my existence. My sleep was profound; but having no mode of measuring time, I knew nothing of its duration. When I awakened, I was astonished to find by my side another form, perfectly similar to my own. I conceived it to be another self; and instead of losing by my sleep, I imagined myself to be double. I ventured to lay my hand upon this new being. With rapture and astonishment I perceived that it was not myself, but something much more glorious and desirable."

Antedilu-vians.

This philosophical detail coincides with the opinion that, excepting what portions of knowledge Adam might acquire by the exercise of his senses, his Maker taught him every thing that was necessary for his comfort and subsistence. But before the Almighty gave any instructions to our first parents, we must suppose he inspired them with the knowledge of the meaning of every word which they heard him speak; otherwise it would have been impossible that he could have had any such communication with them. The words which they heard and were made to understand, being imprinted upon their memories, would serve as the foundation of a language, which they would afterwards increase and enlarge as new objects began to multiply, and hence give rise to new terms and definitions.

One of the first lessons taught to Adam by his infallible Director, would be the necessity of food for the support of his life. Accordingly Moses informs us, that for this purpose a grant was made him to eat of every tree of the garden, excepting one. At the same time it was made known to him, in what manner he was to repair the decays of nature, namely, by eating of *the tree of life*. Then, in order to qualify him for social intercourse, he was ordered to exercise his faculty of speech, by giving names to different creatures. The author of the book of Ecclesiasticus says of our first parents, "They received the use of the five operations of the Lord; and in the sixth he imparted to them understanding; and in the seventh, speech to interpret the cogitations thereof." The meaning cannot be, that he gave them every word they were to pronounce, more than every idea which their senses were to convey to their understanding. Our talents, and

Antediluvians.

and the exercise of them, may be both said to be given us of God; but whatever capacities we receive from him, it is supposed that we ourselves must improve them, before we can attain to any acquirements whatever. Although Adam had heard and understood the words of God, yet Moses does not give the least hint that he ever attempted to speak before this time. For if he had, as some imagine, innate knowledge and proper terms for every thing presented to him, what occasion was there to bring animals before him to see what names he would impose upon them? Some writers have endeavoured to turn into ridicule the whole of this transaction, and have asked, how could all creatures upon earth appear at one time before Adam? not only one, but many days would have elapsed before he could give each a name. But this objection arises from not understanding the words of Moses. What our translators render, to see what he would call THEM, is in the original, to see what name he would call IT. "And whatsoever Adam called IT, (viz. the living creature), that was the name of IT." The meaning seems to be no more than this: God brought a few creatures to Adam, to make him try to name them; and whatever he called any of them, that continued to be its name. And no doubt he would denominate every animal before him, from its external appearance, from its size, its colour, or its voice: And in process of time, he would give names to all those creatures which Providence brought within his view, or with which he became afterwards acquainted.

The next thing in which God instructed Adam, though probably in a trance or vision, was his near relation to Eve, as being a part of his own body. This piece of knowledge was imparted to him, in order to cement the greater love and affection between the two during the remaining period of their lives.

These, according to Moses, are all the transactions in which our first parents were interested during their abode in paradise, till they lost their innocence, and forfeited the enjoyments of their happy situation. And nothing can be more evident, than that the instructions which they received bespoke the infantile state of their minds; though there is no doubt but further and higher dispensations of knowledge would have been communicated to them, as they became able to bear them, and had their minds matured by experience and reflection.

3 How long our first parents retained their innocence.

How long our first parents retained their innocence, we are nowhere told. Many assert that they fell on the very first day of their creation. But Moses mentions so many transactions on that day, as must have engrossed the whole of their attention, and prevented them from falling into such temptations as arise from indolence and want of reflection. Besides, if, in such circumstances as they were placed, they could not refrain from an open violation of the Divine law for the space of one day, it would bespeak a deceitfulness of heart in them greater than in most of their posterity. It is somewhat singular, that many of the great trials recorded in sacred writing were limited to 40 days; which in prophetic style is sometimes equivalent to 40 years. This appears from the history of Moses, of Elijah, of Nineveh, and of the Jewish nation after the death of Christ. And, what is very remarkable, he, of whom Adam was a type, was tempted 40 days in the wilderness. Agreeable to this part of the Divine economy, perhaps the trial of our first parents lasted so long. However, that they remained for a considerable time in the garden, appears highly probable from this consideration, that their indulgent Creator, who had manifested his tender concern for them while innocent, and extended his mercy to them when fallen, would never have turned them out of paradise, and sent them into an uncultivated world, before they had acquired the arts of living, and were capable of providing against the vicissitudes of their future lot. The particulars of this memorable transaction are considered under the article FALL.

Antediluvians.

Moses gives us no farther account of Adam's life after leaving the garden, but that he begat some children, and died at such an age. Yet we have no reason to doubt, but the venerable patriarch ever after led a life of penitence, and of the strictest piety. The various communications which he had enjoyed with his Maker in paradise, and which were probably renewed to him after his fall, could not fail to make the deepest impressions upon his mind. The gracious respite he had met with, from the execution of the sentence denounced against him, would make him cautious of offending for the time to come; lest the next violation of the Divine authority should put an end to his existence. The *cherubim and flaming sword*, or the devouring flame, on the *east of Eden* (which might continue burning all his life) would be to him what the vestiges of the ark were to Noah and his sons, an awful memorial of the danger of incurring the Divine displeasure. Besides, his worldly comforts being in a great measure withdrawn, his mind would be naturally disposed for relishing those pleasures which flow from piety and religion.

4 Of their progeny.

The first thing which we hear of Adam in his new situation was, that *he knew Eve his wife, and she conceived and bare Cain.* Afterwards, we are told, she bare Abel. When the brothers were grown up, they betook themselves to distinct employments; the former to husbandry, and the latter to the keeping of sheep. Their inward dispositions were still more different; Cain being wicked and avaricious, but Abel just and virtuous.

In process of time they brought their respective offerings to God; Cain of the fruit of the ground, and Abel of the firstlings of his flock: but they met with very different success; for God accepted the offering of Abel, but Cain's he did not accept; the consequences of which are related under the articles ABEL and CAIN.

Soon after the murder of Abel, his loss was made up to his parents in another son they had, whom Eve named *Seth*, that is "appointed;" because he was appointed instead of Abel whom Cain slew.

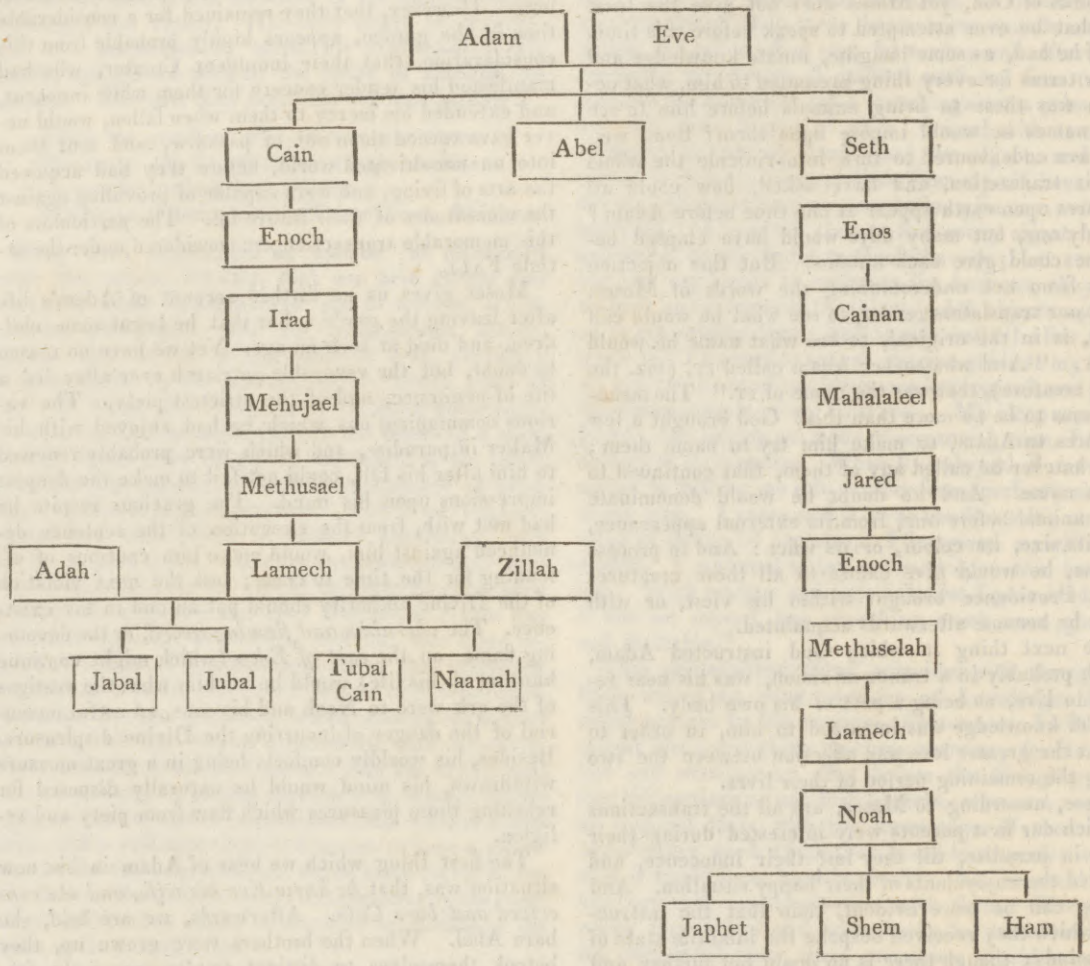
As the whole progeny of Adam, of whom we have any mention in Scripture, were the descendants of Cain and Seth, it may be proper to give the following

Genealogical

Antediluvians.

Antediluvians.

Genealogical TABLE *of the* ANTEDILUVIANS.



5 Of the line of Cain.

The sacred historian, confining himself chiefly to the line of Seth, from whence Noah was descended, has acquainted us with very few particulars relating to that of Cain: nor can we thus form any conjectures how long he or any of his descendants lived. All we know is, that Lamech, the fifth in descent from him, married two wives, Adah and Zillah, the first known instance of polygamy; that by the former he had two sons, Jabal, who was the first that dwelt in tents, and fed cattle, and Jubal, the inventor of music; and by the other, a son named Tubal-Cain, who found out the art of forging and working metals. Zillah likewise brought him a daughter named Naamah, supposed to have invented spinning and weaving: and we are told that, on some occasion or other, Lamech made a speech to his wives, the explication of which has greatly puzzled the interpreters. See LAMECH.

6 The line of Seth.

Moses proceeds to tell us, that Seth had a son born to him called *Enos*, and that *then began men to call upon the name of the Lord.* Commentators give us three different senses of these words. Some think the words should be rendered, *Then men profaned in calling on the name of the Lord;* and that even Enos arrogated to himself a power as if he had been a god. But this sense seems harsh and unnatural. There is nothing more unlikely, than that Adam's grandchildren, who lived under his own eye, would so soon shake off parental authority, and apostatize from the belief and worship of the one true God. Others think, that though men had hitherto worshipped God in private, yet they now instituted public assemblies, met in larger societies for solemn and social worship, and introduced liturgies and forms for more effectually paying their homage to the Almighty. This indeed is a very natural comment from those who place religion in modes and set forms of worship. But it is scarcely credible, that Adam and his family had never met together to worship God till now, when we are told that Cain and Abel, and probably both their families along with them, brought their offerings to the Lord; this they no doubt did every Sabbath day. Others, therefore, put a more consistent interpretation upon the words, namely,

Miln's Physico-Theol. Lectures, p. 142, &c.

Antediluvians. namely, that *men now called themselves by the name of the Lord.* The meaning of which is, that about this period, the family of Seth, who adhered to God and his worship, began to give themselves a denomination, expressive of their relation and regards to him. They distinguished themselves from the irreligious family of Cain, and assumed the title of the *sons* or *children* of God: which designation was afterwards applied to them by Moses; it was even used after the flood, and adopted by the writers of the New Testament.

Of the three next descendants of Seth, Cainan, Mahalaleel, and Jared, and of Methuselah and Lamech, the grandfather and father of Noah, Moses has recorded no more than their several ages. The oriental authors commend them, as they do Seth and Enos, for their piety, and the salutary injunctions they left behind them, forbidding their children all intercourse with the race of cursed Cain.

Enoch the son of Jared, and father of Methuselah, was a person of most extraordinary piety, *walking with God*, as the Scripture expresses it, for at least the last three hundred years of his life; as a reward for which exemplary behaviour in so corrupt an age, he was taken up by God into heaven, without tasting death. See ENOCH.

7 Corruption of the human race. Moses afterwards informs us, *When men began to multiply*, i. e. when the earth was filled with inhabitants, and tribes formerly living remote began to approach nearer to one another, *Daughters were born unto them:* meaning in greater abundance than formerly; which seems to hint, that at this period there were considerably more females than males born into the world. Some think that Moses, being now about to mention the wickedness of the Antediluvians, introduces the posterity of Cain as being the chief cause of their corruption; and that he styles them *men* and *daughters of men*, because they were sensual and earthly; in which sense the word *men* is sometimes used in the Scriptures.

The sons of God saw the daughters of men that they were fair; and they took them wives of all that they chose. These words have given rise to many absurd and ridiculous comments both of Jews and Christians. There are two meanings affixed to them, which may be mentioned as the most probable. Whenever the name of God is added to any thing, it not only denotes God's being the efficient cause, but it heightens and increases its usual meaning. For which reason any thing that is excellent in its kind, or uncommonly lofty and magnificent, was by the Jews said to be of God, or of the Lord. Thus the angels are called the *sons of God.* And Adam being created with a nobler image than any other creature, is said to be made in the *image of God.* The cedars of Lebanon are called the *cedars of the Lord;* and great mountains, the *mountains of God.* Therefore by the *sons of God* in this place are meant men of great opulence, power, and authority. And by way of contrast, the historian introduces those of poor and mean circumstances in life, and calls them the *daughters of men.* The words thus explained, are not an unlikely description of that dissolute age. The great and mighty in this world are commonly most addicted to sensual gratifications, because they have so many incentives to inflame their passions, and so few restraints to curb them; and, instead of using their power to punish and discountenance vice, are too often the greatest examples and promoters of lasciviousness and debauchery. Thus, these *sons of God*, these great men, when they happened to meet with the daughters of their inferiors, gazed upon them as fit objects to gratify their lust; and from among these they *took to themselves*, in a forcible manner, *wives*, or (as it may be rendered) *concubines, of all that they chose*, whether married or unmarried, without ever asking their consent. No wonder, then, that the earth should be *filled with violence*, when the highest rank of men were above the restraint of law, of reason, and religion, and not only oppressed the poor, but with impunity treated them and their children in such a base and cruel manner. Antediluvians.

But there are other writers who cannot relish the above opinion; because they think it a harsh and unnatural construction, to call great and powerful persons the *sons of God*, and all mean and plebeian women the *daughters of men.* Besides, the text does not say, that the *sons of God* offered any violence to these inferior women; but that they saw that they were *fair*, and made choice of them for wives. And wherein is the heinousness of the offence, if men of a superior rank marry their inferiors, especially when an excess of beauty apologizes for their choice? Or why should a few unequal matches be reckoned among the causes of bringing upon the world an universal destruction? For these reasons many are of opinion, that the descendants of Seth, who were styled the *sons of God* on account of their near relation to him, saw the *daughters of men*, i. e. the impious progeny of Cain, and by intermarriages became associated with them; and surrendering to those enchantresses their hearts and their freedom, they surrendered at the same time their virtue and their religion. From this union proceeded effects similar to what has happened ever since. When a pure society mixes with a profane, the better principles of the one become soon tainted by the evil practices of the other; which verifies the old adage, *Evil communication corrupts good manners.* Thus it appears, that the great source of universal degeneracy was owing to the posterity of Seth mingling with the progeny of Cain, in opposition to what their pious fathers had strictly charged them. *Milt.* p. 265.

It is afterwards said, *There were giants in the earth in those days: and also after that, when the sons of God came in unto the daughters of men, and they bare children to them, the same became mighty men, which were of old men of renown.* Translators are not agreed about the meaning of the word *giants.* Some render the word, *violent and cruel men;* others, men who *fall upon* and *rush forward*, as a robber does upon his prey: the meaning then is, that they were not more remarkable for their strength and stature, than for their violence and cruelty. In Luther's German translation of the Bible, this word is rendered *tyrants.* It is generally agreed, that in the first ages of the world, men were of a gigantic stature; though Moses does not mention them as giants till after the union of the families of Seth and Cain, when men used their superiority in bodily strength for the purposes of gratifying their unhallowed passions.

At this period of the world, and long after, political power and bodily strength went hand and hand together.

Antediluvian.

gether. Whoever was able to encounter and kill a fierce and dangerous wild beast, and clear the country of noxious animals, or who was able in the day of battle to destroy most of his enemies, was looked up to by the rest of his companions as the fittest to be their leader and commander. Thus Nimrod, from being a *mighty hunter*, became a great king, and, grasping at power, was never satisfied till every obstacle to his ambition was removed. And it appears from history, that all his successors have pretty nearly trodden in the same path. These *giants* then, or *sons of God*, might be the chief warriors, who formed themselves into chosen bands, and living among a cowardly and effeminate people, had no curb to their cruelty and lust. From them might spring an illegitimate race, resembling their fathers in body and mind, who, when they grew up, having no inheritance, would be turned loose upon the world, and follow no other employment but theft, rapine, and plunder. Thus they became *mighty men* and *men of renown, and procured themselves a name:* but this was owing to the mischief they did, and the feats of savage cruelty which they performed.

8 God's forbearance.

Mankind running thus headlong into all manner of vice, were admonished to repent; and God, out of his great mercy, was pleased to grant them a convenient time for that purpose; no less than 120 years, during which space, but no longer, he declared his Spirit should "strive with man," or endeavour to awaken and reclaim them from their wicked course of life.

Amidst this general corruption, one man, however, was found to be just and perfect in his generation, walking with God. This extraordinary person was Noah, the son of Lamech; who, not thinking it sufficient to be righteous himself, unless he did his utmost to turn others likewise to righteousness by admonition as well as

9 Preaching of Noah.

example, became a preacher to the abandoned race among which he lived, employing both his counsel and authority to bring them to a reformation of their manners, and to restore the true religion among them. But all he could do was to no purpose; for they continued incorrigibly obstinate; so that at length (as Josephus tells us), finding himself and family in imminent danger of some violence in return for his good will, he departed from among them, with his wife and children.

10 Mankind incorrigible.

On his departure, it is probable they fell into greater disorders than before; having now none to controul, or even to trouble them with unwelcome advice. Moses assures us, that the wickedness of man was great in the earth, and that every imagination of the thoughts of his heart was continually evil; and that "the earth was corrupt and filled with violence, all flesh having corrupted his way upon the earth." These words leave no room to inquire into the particular crimes of the Antediluvian world, which seems to have been overrun with a complication of all manner of debauchery and wickedness, and above all with violence and injustice towards one another.

11 The whole world destroyed by a flood except Noah and his family.

Things being in this state, God, as the sacred historian pathetically expresses it, "repented that he had made man on earth, and it grieved him at his heart." And the time of forbearance being elapsed, he passed the sentence of their utter destruction by a flood of waters; a sentence which likewise included the beasts of the earth, and every creeping thing, and the fowls of the air. But Noah found grace in the eyes of the Lord;" who had before acquainted him with his design of bringing a deluge on the earth, and directed him to make an ark, or vessel, of a certain form and size, capable of containing not only himself and family, but such numbers of animals of all sorts as would be sufficient to preserve the several species, and again replenish the earth, together with all necessary provisions for them. All these injunctions Noah performed; and, by God's peculiar favour and providence, he and those that were with him survived this tremendous calamity. See the article DELUGE.

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12 Traditional history of the Antediluvians.

As to any further transactions before the flood, we are left entirely in the dark by the sacred historian. The Jews and eastern nations, however, have made ample mends for the silence of Moses, by the abundance of their traditions. The only part of these, which can be connected in any thing like history, is what follows.——After the death of Adam, Seth, with his family, separated themselves from the profligate race of Cain, and chose for their habitation the mountain where Adam was buried, the Cainites remaining below, in the plain where Abel was killed; and, according to our historians, this mountain was so high, that the inhabitants could hear the angels singing the praises of God, and even join them in that service. Here they lived in great purity and sanctity of manners. Their constant employment was praising God, from which they had few or no avocations; for their only food was the fruit of the trees which grew on the mountain, so that they had no occasion to undergo any servile labours, nor the trouble of sowing and gathering in their harvest. They were utter strangers to envy, injustice, or deceit. Their only oath was, "By the blood of Abel;" and they every day went up to the top of the mountain to worship God, and to visit the body of Adam, as a mean of procuring the Divine blessing. Here, by contemplation of the heavenly bodies, they laid the foundations of the science of astronomy; and lest their inventions should be forgotten, or lost before they were publicly known, understanding, from a prediction of Adam's, that there would be a general destruction of all things, once by fire, and once by water, they built two pillars, one of brick, and the other of stone, that if the brick one happened to be overthrown by the flood or otherwise destroyed, that of stone might remain. This last, Josephus says, was to be seen in his time in the land of Syriad, (thought to be in Upper Egypt).

The descendants of Seth continued in the practice of virtue till the 40th year of Jared, when an hundred of them hearing the noise of the music and the riotous mirth of the Cainites, agreed to go down to them from the holy mountain. On their arrival in the plain, they were immediately captivated by the beauty of the women, who were naked, and with whom they defiled themselves; and this is what is meant by the intermarriage of the sons of God with the daughters of men, mentioned by Moses. The example of these apostate sons of Seth was soon followed by others; and from time to time great numbers continued to descend from the mountain, who in like manner took wives from the abandoned race of Cain. From these marriages sprung the giants (who, however, according to Moses,

Antediluvians. Moses, existed before); and these being as remarkable for their impiety as for their strength of body, tyrannized in a cruel manner, and polluted the earth with wickedness of every kind. This defection became at last so universal, that none were left in the holy mountain, except Noah, his wife, his three sons, and their wives.

13 Profane history. *Berosus's Babylonian Antiquities.* Berosus, a Chaldean historian, who flourished in the time of Alexander the Great, enumerates ten kings who reigned in Chaldea before the flood; of whom the first, called *Alorus*, is supposed to be Adam, and Xisuthrus, the last, to be Noah.—This Alorus declared that he held his kingdom by divine right, and that God himself had appointed him to be the pastor of the people. According to our historian, in the first year of the world, there appeared out of the Red sea, at a place near the confines of Babylonia, a certain *irrational* animal called *Oannes*. He had his whole body like that of a fish; but beneath his fish's head grew another of a different sort (probably a human one). He had also feet like a man, which proceeded from his fish's tail, and a human voice, the picture of him being preserved ever after. This animal conversed with mankind in the day time, without eating any thing: he delivered to them the knowledge of letters, sciences, and various arts: he taught them to dwell together in cities, to erect temples, to introduce laws, and instructed them in geometry: he likewise showed them how to gather seeds and fruits, and imparted to them whatever was necessary and convenient for a civilized life; but after this time there was nothing excellent invented. When the sun set, Oannes retired into the sea, and continued there all night. He not only delivered his instructions by word of mouth, but, as our author assures us, wrote of the origin of things, and of political economy. This, or a similar animal, is also mentioned by other authors.

Of Alasporus, the second king, nothing remarkable is related. His successor, Amelon, or Amillarus, was of a city called *Pantabibla*. In his time another animal resembling the former appeared, 260 years after the beginning of this monarchy. Amelon was succeeded by Metalarus; and he by Daonus, all of whom were of the same city. In the time of the latter four animals of a double form, half man and half fish, made their appearance. Their names were *Euedocus*, *Eneugamus*, *Encubulus* and *Anementas*. Under the next prince, who was likewise of Pantabibla, appeared another animal of the same kind, whose name was *Odacon*. All these explained more particularly what had been concisely delivered by Oannes.

In the reign of the tenth king, Xisuthrus, happened the great deluge, of which our author gives the following account: Cronus, or Saturn, appeared to Xisuthrus in a dream, and warned him, that on the fifteenth of the month Dæsius mankind would be destroyed by a flood, and therefore commanded him to write down the original, intermediate state, and end of all things, and bury the writings under ground in Sippara, the city of the sun; that he should also build a ship, and go into it with his relations and dearest friends, having first furnished it with provisions, and taken into it fowls and four-footed beasts; and that, when he had provided every thing, and was asked whither he was sailing, he should answer, *To the gods, to pray for happiness to mankind.* Xisuthrus did not disobey; but built a vessel, whose length was five furlongs, and breadth two furlongs. He put on board all he was directed; and went into it with his wife, children, and friends. The flood being come, and soon ceasing, Xisuthrus let out certain birds, which finding no food, nor place to rest upon, returned again to the ship. Xisuthrus, after some days, let out the birds again; but they returned to the ship, having their feet daubed with mud: but, when they were let go the third time, they came no more to the ship, whereby Xisuthrus understood that the earth appeared again; and thereupon he made an opening between the planks of the ship, and seeing that it rested on a certain mountain, he came out with his wife, and his daughter, and his pilot: and having worshipped the earth, and raised an altar, and sacrificed to the gods, he and those who went out with him disappeared. They who were left behind in the ship, finding that Xisuthrus and the persons that accompanied him did not return, went out themselves to seek for him, calling him aloud by his name; but Xisuthrus was no more seen by them: only a voice came out of the air, which enjoined them, as their duty was, to be religious; and informed them, that on account of his own piety he was gone to dwell with the gods, and that his wife and daughter and pilot were partakers of the same honour. It also directed them to return to Babylon, and that, as the fates had ordained, they should take the writings from Sippara, and communicate them to mankind; and told them, that the place where they were was the country of Armenia. When they had heard this, they offered sacrifice to the gods, and unanimously went to Babylon; and when they came thither, they dug up the writings at Sippara, built many cities, raised temples, and rebuilt Babylon. Antediluvians

14 Antediluvian kings of Egypt. The Egyptians, who would give place to no nation in point of antiquity, have also a series of kings, who, as is pretended, reigned in Egypt before the flood: and to be even with the Chaldeans, began their account the very same year that theirs does according to Berosus.

There was an ancient chronicle extant among the Egyptians, not many centuries ago, which contained 30 dynasties of princes who ruled in that country, by a series of 113 generations, through an immense space of 36,525 years, during which Egypt was successively governed by three different races; of whom the first were the Auritæ, the second the Mestræi, and the third the Egyptians.

But this extravagant number of years Manetho (to whose remains we must chiefly have recourse for the ancient Egyptian history) has not adopted; however, in other respects, he is supposed to have been led into errors in chronology by this old chronicle, which yet seems to have been a composition since Manetho's time.

15 Sanchoniatho's Phœnician history. The account given by Berosus is manifestly taken from the writings of Moses; but we have another account of the first ages of mankind, in which no mention is made of the flood at all. This is contained in some fragments of a Phœnician author called *Sanchoniatho*, who is by some said to have been contemporary with Gideon, by others to have lived in the days of King David; while some boldly assert there never was such

Antediluvians. such a person, and that the whole is a fiction of Philo Biblius, in opposition to the books of Josephus, written against Apion. To gratify the reader's curiosity, however, we have subjoined an account of the first ten generations mentioned by him, which are supposed by the compilers of the Universal History to correspond to the generations mentioned by Moses before the flood.

Sanchoniatho having delivered his cosmogony, or generation of the other parts of the world, begins his history of mankind with the production of the first pair of mortals, whom Philo, his translator, calls *Protogonus* and *Æon;* the latter of whom found out the food which was gathered from trees.

Their issue were called *Genus* and *Genea*, and dwelt in Phœnicia: but when the great droughts came, they stretched forth their hands to heaven towards the sun; for him they thought the only God and Lord of heaven, calling him *Beelsamen*, which in Phœnician is *Lord of heaven*, and in Greek *Zeus*.

Afterwards from Genus, the son of Protogonus and Æon, other mortal issue was begotten, whose names were *Phos*, *Phur*, and *Phlox;* that is, *Light*, *Fire*, and *Flame*. These found out the way of germinating fire, by the rubbing of pieces of wood against each other, and taught men the use thereof. They begat sons of vast bulk and height, whose names were given to the mountains on which they seized: so from them were named Mount *Cassius*, *Libanus*, *Antilibanus*, and *Brathys*.

Of these last were begotten Memrumus and Hypsuranius; but they were so named by their mothers, the women of those times, who without shame lay with any man they could light upon. Hypsuranius inhabited Tyre, and he invented the making of huts of reeds and rushes and the papyrus. He also fell into enmity with his brother Usous, who first invented a covering for his body out of the skins of the wild beasts which he could catch. And when violent tempests of winds and rains came, the boughs in Tyre, being rubbed against each other, took fire, and burnt the wood there. And Usous, having taken a tree, and broke off its boughs, was so bold as to venture upon it into the sea. He also consecrated two rude stones, or pillars, to fire and wind; and he worshipped them, and poured out to them the blood of such wild beasts as had been caught in hunting. But when these were dead, those that remained consecrated to them stumps of wood and pillars, worshipping them, and kept anniversary feasts unto them.

Many years after this generation came Agreus and Halicus, the inventors of the arts of hunting and fishing, from whom huntsmen and fishermen are named.

Of these were begotten two brothers, the inventors of iron and of the forging thereof: one of these, called *Chrysor*, the same with Hephestus, or Vulcan, exercised himself in words and charms and divinations: found out the hook, bait, and fishing-line, and boats slightly built; and was the first of all men that sailed. Wherefore he also was worshipped after his death for a god: and they called him *Zeus Michius*, or Jupiter the engineer; and some say his brother invented the way of making walls of brick.

Afterwards from this generation came two brothers; one of whom was called *Technites*, or the Artist; the other *Geinus Autochthon*, [the home-born man of the earth]. These found out to mingle stubble, or small twigs, with the brick earth, and to dry them in the sun, and so made tyling. Antediluvians.

By these were begotten others; of which one was called *Agrus* [Field]; and the other *Agrouerus*, or *Agrotes* [Husbandman], who had a statue much worshipped, and a temple carried about by one or more yoke of oxen, in Phœnicia; and among those of Byblus he is eminently called the *greatest of the gods*. These found out how to make courts about men's houses, and fences, and caves or cellars. Husbandmen, and such as use dogs in hunting, derive from these; and they are also called *Aletæ* and *Titans*.

Of these were begotten Amynus and Magus, who showed men to constitute villages and flocks.

In these men's age there was one Eliun, which imports in Greek *Hypsistus* [the most high] and his wife was named *Beruth*, who dwelt about Byblus: and by him was begot one Epigerus, or Autochthon, whom they afterwards called *Uranus* [heaven]; so that from him that element which is over us, by reason of its excellent beauty, is called *heaven;* and he had a sister of the same parents called *Ge* [the earth]; and by reason of her beauty the earth had her name given to it.

Hypsistus, the father of these, dying in fight with wild beasts, was consecrated, and his children offered sacrifices and libations to him.—But Uranus taking the kingdom of his father, married his sister Ge, and had by her four sons; Ilus, who is called *Cronus*, [or Saturn]; Betylus; Dagon, who is Siton, or the god of corn; and Atlas: but by other wives Uranus had much issue.

As to the customs, policy, and other general circumstances of the Antediluvians, we can only form conjectures.

The only thing we know as to their religious rites is, that they offered sacrifices, and that very early, both of the fruits of the earth and of animals; but whether the blood and flesh of the animals, or only their milk and wool, were offered, is a disputed point.— 16

Arts, &c. of the Antediluvians.

Of their arts and sciences, we have not much more to say. The Antediluvians seem to have spent their time rather in luxury and wantonness, to which the abundant fertility of the first earth invited them, than in discoveries or improvements, which probably they stood much less in need of than their successors. The art of working metals was found out by the last generation of Cain's line; and music, which they might be supposed to practise for their pleasure, was not brought to any perfection, if invented, before the same generation. Some authors have supposed astronomy to have been cultivated by the Antediluvians, though this is probably owing to a mistake of Josephus: but it is to be presumed, the progress they made therein, or in any other science, was not extraordinary; it being even very doubtful whether letters were so much as known before the flood. See ALPHABET.

As to their politics and civil constitutions, we have not so much as any circumstances whereon to build conjecture. It is probable, the patriarchal form of government, which certainly was the first, was set aside when tyranny and oppression began to take place, and much sooner among the race of Cain than that of Seth. It seems also that their communities were but few, and consisted

Antediluvians.

consisted of vastly larger numbers of people than any formed since the flood: or rather, it is a question, whether, after the union of the two great families of Seth and Cain, there were any distinction of civil societies, or diversity of regular governments, at all. It is more likely, that all mankind then made but one great nation, though living in a kind of anarchy, divided into several disorderly associations; which, as it was almost the natural consequence of their having, in all probability, but one common language, so it was a circumstance which greatly contributed to that general corruption which otherwise perhaps could not have so universally overspread the Antediluvian world. And for this reason chiefly, as it seems, so soon as the posterity of Noah were sufficiently increased, a plurality of tongues was miraculously introduced, in order to divide them into distinct societies, and thereby prevent any such total depravation for the future. See *Confusion of Tongues*.

Of the condition of the Antediluvians, Mr Whitehurst, in his *Inquiry into the original state and formation of the earth**, has given us the following picture: "Under a mild and serene sky, and when the spontaneous productions of the earth were more than sufficient for the calls of nature, without art or labour, mankind had no need of any other protection from the inclemency of the seasons, nor of barns for winter's store, than the benevolent Author of nature had plentifully provided for them. Consequently, in a state of nature like this, there was no temptation to acts of violence, injustice, fraud, &c.; every one having plenty and enough, each equally partook of the numerous blessings thus amply provided for him. Power and property being equally diffused, men lived together in perfect peace and harmony, without law, and without fear; therefore it may be truly said of the Antediluvians, that they slept away their time in sweet repose on the ever-verdant turf. Such apparently was the state of nature in the first ages of the world, or from the creation to the first convulsion in nature, whereby the world was not only universally deluged, but reduced to a heap of ruins." But our ingenious author, whose *Inquiry* is not professedly repugnant to revelation, seems here to have lost himself in a pleasing reverie. At least he has forgot to inform us, For what purpose, under such circumstances, he supposes the deluge to have been sent upon the earth; and, How we are to understand the account given by Moses, who represents the Antediluvians, not as an innocent race, quietly reposing on the ever-verdant turf, but as a corrupt generation, by whom "the earth was filled with violence."

* P. 282, 283.

17 Of the longevity of the Antediluvians.

One of the most extraordinary circumstances which occurs in the Antediluvian history, is the vast length of human lives in those first ages, in comparison with our own. Few persons now arrive at eighty or an hundred years; whereas, before the flood, they frequently lived to near a thousand: a disproportion almost incredible, though supported by the joint testimonies of sacred and profane writers. Some, to reconcile the matter with probability, have imagined that the ages of those first men might possibly be computed, not by solar years, but months; an expedient which reduces the length of their lives rather to a shorter period than our own. But for this there is not the least foundation; besides the many absurdities that would thence follow, such as their begetting children at about six years of age, as some of them in that case must have done, and the contracting of the whole interval between the creation and the deluge to considerably less than two hundred years, even according to the larger computation of the Septuagint. Antediluvians.

Again: Josephus, the Jewish historian, and some Christian divines, are of opinion, that before the flood, and some time after, mankind in general did not live to such a remarkable age, but only a few beloved of God, such as the patriarchs mentioned by Moses. They reason in this manner: Though the historian records the names of some men, whose longevity was singular, yet that is no proof that the rest of mankind attained to the same period of life, more than that every man was then of a gigantic stature, because he says, *in those days there were giants upon the earth*. Besides, had the whole of the Antediluvians lived so very long, and increased in numbers in proportion to their age, before the flood of Noah, the earth could not have contained its inhabitants, even supposing no part of it had been sea. And had animals lived as long, and multiplied in the same manner as they have done afterwards, they would have consumed the whole produce of the globe, and the stronger would have extinguished many species of the weaker. Hence they conclude, that for wise and good ends, God extended only the lives of the patriarchs, and a few beside, to such an extraordinary length.

But most writers maintain the longevity of mankind in general in the early world, not only upon the authority of sacred, but likewise of profane history. And for such a constitution, the moral reasons are abundantly obvious. When the earth was wholly unpeopled, except by one pair, it was necessary to endow men with a stronger frame, and to allow them a longer continuance upon earth for peopling it with inhabitants. In the infant state of every mechanical art, relating to tillage, building, clothing, &c. it would require many years experience to invent proper tools and instruments to ease men of their labour, and by multiplied essays and experiments to bring their inventions to any degree of maturity and perfection. Every part of their work must have been exceedingly arduous from such a penury and coarseness of tools, and must have required longer time and more strength of body than afterwards, when mechanical knowledge was introduced into the world. If parents at this period had not continued long with their children, to have taught them the arts of providing for themselves, and have defended them from the attacks of wild beasts, and from other injuries to which they were exposed, many families would have been totally extinguished. But one of the best and most valuable ends which longevity would answer was, the transmitting of knowledge, particularly of religious knowledge, to mankind. And thus, before writing was invented, or any such easy and durable mode of conveyance was found out, a very few men served for many generations to instruct their posterity, who would not be at a loss to consult living and authentic records. 18 Moral reasons for this longevity.

The natural causes of this longevity are variously assigned. Some have imputed it to the sobriety of the Antediluvians, and the simplicity of their diet; alleging that they had none of those provocations to gluttony, which 19 Natural causes of it.

Antediluvians. which wit and vice have since invented. Temperance might undoubtedly have some effect, but not possibly to such a degree. There have been many temperate and abstemious persons in later ages, who yet seldom have exceeded the usual period.—Others have thought that the long lives of those inhabitants of the old world proceeded from the strength of their stamina, or first principles of their bodily constitutions: which might, indeed, be a concurrent, but not the sole and adequate cause of their longevity; for Shem, who was born before the deluge, and had all the virtue of the antediluvian constitution, fell three hundred years short of the age of his forefathers, because the greatest part of his life was passed after the flood.—Others have imputed the longevity of the Antediluvians to the excellency of their fruits, and some peculiar virtue in the herbs and plants of those days. But to this supposition it has been objected, that as the earth was cursed immediately after the fall, its productions we may suppose gradually decreased in their virtue and goodness till the flood; and yet we do not see the length of men's lives decrease considerably, if at all, during that interval. Waving this objection, as the import of the curse is variously interpreted, it appears certain that the productions of the earth were at first, and probably continued till after the deluge, of a different nature, from what they were in future times. Buffon supposes this difference may have continued gradually to diminish for many ages subsequent to that catastrophe. The surface of the globe (according to his theory) was in the first ages of the world less solid and compact; because, gravity having acted only for a short time, terrestrial bodies had not acquired their present density and consistence. The produce of the earth, therefore, must have been analogous to its condition. The surface being more loose and moist, its productions would of course be more ductile and capable of extension. Their growth, therefore, and even that of the human body, would require a longer time of being completed. The softness and ductility of the bones, muscles, &c. would probably remain for a longer period, because every species of food was more soft and sueculent. Hence the full expansion of the human body, or when it was capable of generating, must have required 120 or 130 years; and the duration of life would be in proportion to the time of growth, as is uniformly the case at present: For if we suppose the age of puberty, among the first races of men, to have been 130 years, as they now arrive at that age in 14 years, the age of the Antediluvians will be in exact proportion to that of the present race; since by multiplying these two numbers by seven, for example, the age of the present race will be 98, and that of the Antediluvians will be 910. The period of man's existence, therefore, may have gradually diminished in proportion as the surface of the earth acquired more solidity by the constant action of gravity: and it is probable that the period from the creation, to the days of David, was sufficient to give the earth all the density it was capable of receiving from the influence of gravitation; and consequently that the surface of the earth has ever since remained in the same state, and that the terms of growth in the productions of the earth, as well as the duration of life, have been invariably fixed from that period.

It has been further supposed, that a principal cause of the longevity under consideration was the wholesome constitution of the Antediluvian air, which, after the deluge, became corrupted and unwholesome, breaking, by degrees, the pristine crasis of the body, and shortening men's lives, in a very few ages, to near the present standard. Antediluvians.

The temperature of the air and seasons before that catastrophe are upon very probable grounds supposed to have been constantly uniform and mild: the burning heats of summer and the severities of winter's cold were not then come forth, but spring and autumn reigned perpetually together: And indeed, the circumstance above all others most conducive to the prolongation of human life in the postdiluvian world, appears to be an equal and benign temperature of climate (see the article LONGEVITY); whence it seems reasonable to infer, that the same cause might have produced the same effect in the Antediluvian world.

29 Whether any flesh might be eaten before the flood.

Whether flesh was permitted to be eaten before the deluge, is a question which has been much debated. By the permission expressly given to Noah, for that purpose, after the flood, and God's assigning vegetables only for food to man, as well as beast, at the creation, one would imagine it was not lawful before: yet others have supposed, that it was included in the general grant of power and dominion given to Adam by God over the animal creation; and the distinction of beasts into clean and unclean, which was well known before the flood, is insisted on as a strong argument on this side.

But in answer to this it has been observed that, if so, it does not appear what occasion there was to renew this grant after the flood, and to add, "Every moving thing that liveth shall be food for you, even as the green herb have I given you all things." This surely implies that the green herb and fruits of the trees were all that was granted to man at first; but now, over and above that, was added the grant of animal food; for in a deed of gift, all is specified that is given or granted, and whatever is not expressly mentioned is excluded, or not given. Here man's food is appointed and specified; what is not expressly mentioned is therefore reserved and not granted. Besides, his grant or appointment of man's food respected not Adam only, but all his posterity, till an additional grant was made.

To the animals no further grant was made than at first; but to man another was made immediately after his fall and expulsion from Paradise, implied in these words: "In the sweat of thy face shalt thou eat bread, till thou return unto the ground." This was in truth a punishment for his transgression, as well as a grant of other food, but yet what was now become necessary to him. Paradise no doubt was planted with the most excellent fruits, sufficient to have sustained his life in health and vigour in his innocent state; but after his transgression, being thrust out from that happy abode, and having then only the fruits of the common earth to feed on; which were not so nutritious as those of Paradise, he stood in need of something else to sustain life; and therefore bread produced by culture and other preparations for his food was now added, which before was not necessary, and thence called the *staff of life*. This seems a plain reason why bread was added after he came to live on the common earth; though

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though perhaps another reason also for that addition may be given from the change that happened in man's body after his fall. Bread being now become the staff of life, Cain, the first man born, became a tiller of the ground, or an husbandman; as the next in birth, Abel, became a keeper or feeder of sheep.

As to the distinction between clean and unclean, this solely respected animals offered in sacrifice in the Antediluvian world; as is evident from hence, that Noah, upon his coming out of the ark, "took of every clean beast and of every clean fowl, and offered burnt offerings unto the Lord;" and that upon the grant of animal food to him and his posterity, which was posterior in time to the sacrifice, there is not the least mention of any distinction between clean and unclean with respect to food, but the very contrary, since the grant runneth: "Every moving thing that liveth shall be meat for you, even as the green herb have I given you all things." That distinction of clean and unclean as to food, came in with the law of Moses, and was different from that of sacrifices, there being several creatures clean for food which were not to be offered in sacrifice.

But another objection here occurs. What occasion was there for keeping sheep, when none of them could be eaten? In answer to this it has been observed, that sheep and other animals might at this period be of great use to men besides yielding them food. Their flocks, no doubt, consisted of such creatures as were of the domestic kind, and such as by the divine law were pronounced clean and fit for being offered in sacrifice; therefore numbers would be kept for this very purpose. Their skins, besides serving men as garments, might answer many other valuable intentions. Vestments of hair and wool soon succeeded the ruder coverings of skins; consequently great profit would be derived from such animals as could be shorn, especially in countries where the inhabitants led a pastoral life and dwelt in tents. And we afterwards find that Abel's sacrifice was of this kind. They might use several of these animals, as they still do in some parts of the world, for bearing of burdens and drawing of carriages: for we may take it for granted that the first inventions for easing men of labour, would be of the simplest kind, and such as came easiest to hand. But keeping flocks of sheep, goats, and such like, would be of great utility, by affording quantities of milk, which is found to be the most nourishing diet both to the young and the old; and their carcases, though not used as food, might answer some useful purposes perhaps in manuring the soil.

21 Increase of mankind before the flood.

The Antediluvian world was, in all probability, stocked with a much greater number of inhabitants than the present earth either actually does, or perhaps is capable of containing or supplying. This seems naturally to follow from the great length of their lives, which exceeding the present standard of life in the proportion, at least, of ten to one, the Antediluvians must accordingly in any long space of time double themselves, at least in about the tenth part of the time in which mankind do now double themselves. It has been supposed that they began to beget children as early, and left off as late, in proportion, as men do now; and that the several children of the same father succeeded as quickly one after another as they usually do at this day: and as many generations, which are but successive with us, were contemporary before the flood, the number of people living on the earth at once would be by that means sufficiently increased to answer any defect which might arise from other circumstances not considered. So that, if we make a computation on these principles, we shall find, that there was a considerable number of people in the world at the death of Abel, though their father Adam was not then 130 years old; and that the number of mankind before the deluge would easily amount to above one hundred thousand millions (even according to the Samaritan chronology), that is, to twenty times as many as our present earth has, in all probability, now upon it, or can well be supposed capable of maintaining in its present constitution.

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The following table, made upon the above-mentioned principles by Mr Whiston, shows at least what a number of people might have been in the Antediluvian world.

Number of mankind.	Year of the world.	Year of doubling.	Series.
4	2	2	1
8	6	4	2
16	12	6	3
32	20	8	4
64	30	10	5
128	42	12	6
256	56	14	7
512	72	16	8
1024	90	18	9
2048	110	20	10
4096	132	22	11
8192	156	24	12
16,384	182	26	13
32,768	210	28	14
65,536	240	30	15
131,072	272	32	16
262,144	306	34	17
524,288	342	36	18
1,048,576	380	38	19
2,097,152	420	40	20
4,194,304	462	42	21
8,388,608	506	44	22
16,777,216	552	46	23
33,554,432	600	48	24
67,108,864	650	50	25
134,217,728	702	52	26
268,435,456	756	54	27
536,870,912	812	56	28
1,073,741,824	870	58	29
2,147,483,648	930	60	30
4,294,967,296	992	62	31
8,589,934,592	1056	64	32
17,179,869,184	1122	66	33
34,359,738,368	1190	68	34
68,719,476,736	1260	70	35
137,438,953,472	1332	72	36
274,877,906,944	1406	74	37
549,755,813,888	1482	76	38

But

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But according to a later * writer upon the subject, the above table, though the numbers there may be thought sufficient for the peopling of the earth, we could by no means depend upon, for several reasons; particularly,

* *Cockburn upon the Deluge.*

22 Objection to Mr Whiston's table.

1. It is laid down there as a foundation, that the Antediluvians would double themselves every 40 years; as indeed they would, and in less time, after there came to be 100 marriages. Now, had the author observed this regular progression in his computation, by adding forty years to every former period of the age of the world, the amount, instead of two millions of millions, &c. would have been above five millions of millions at the year 1656, the age of the world at the deluge, according to the Hebrew numbers, which he contends for. What would the sum then have been, had we carried on the computation for 600 years more, according to the Septuagint?

2. He supposes the period of doubling must have been much shorter in the earliest ages, and much longer in the later, contrary to reason and fact. For mankind being sprung from one pair only, the increase at first must have been very slow, but come on very fast when a considerable number were married. His table therefore is made not regularly, but according to fancy, by unequal starts or chasms at great intervals in the latter part, where it should have been most regular; it would seem with no other view than to raise such a number, upon the whole, as might be thought sufficient to people the earth.

3. In that calculation the two material points, the time of nursing and the age of puberty, are quite overlooked, by which all compntations of the numbers in the Antediluvian world must be regulated. What unavoidable mistakes this omission must occasion, will be seen by examining the first ten numbers of the said table.

Years of the world and intervals of doubling.	Number of increase according to the intervals.	
1	2	Adam and Eve.
2	4	Cain and Abel.
6	8	
12	16	
20	32	
30	64	
42	128	
56	256	
72	512	
90	1024	
110	2048	

On this table it may be observed, 1. That though there were but two persons created at first, this computation makes four persons in the second year of the world. This could not possibly be, except Cain had been born within 12 months after the creation, which is highly improbable, and Abel in the second year, yet far more improbable; and in that case Eve could not have suckled Cain.

Cockburn, p. 108.

2. In the sixth year of the world we have eight persons, that is, six children of Eve's in six years. "But (our author adds) what shall Eve do with six infants in six years? Where could she find so many wet nurses for them? Or would the mother of all living deny her children that nourishment which the Creator had appointed for their first food, the milk in her breasts? Do they consider that there was but one woman in the world to do for herself, her husband, and her children, what belongs to women to do? We should surely have more respect and compassion for the mother of all mankind, than to lay such an intolerable burden upon her, whose sorrow for her own deception, and thereby ruining both herself and her husband, must have been very great for many years. In punishment of which, though God had said *he would greatly multiply her sorrow and conception*, the meaning was not, that she should have a child every year, which could not be, because the nature of that food and nourishment appointed by himself for her children would not permit it. Nor yet when he commanded them to *increase and multiply and replenish the earth*, could the command be obeyed in such a manner as was contrary to the order of nature and providence. But the method intended to answer the design of the command was to prolong their lives to above 800 and 900 years, and their prolific powers for 340 and 360 years of that term of life, that by slow and sure and long continuance of increase they might people the earth in due time."

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3. The same exception lies to all the following periods of doubling, where the number far exceeds what it could possibly be in fact; but we shall pass them over, and come to the last of them in the year 110, in which the number of mankind is made 2048. Now in the year 110, not one of Adam's children was married, because not yet come to the age of puberty. In that year of the world there could be no more than 18 or 20 persons, at single births, besides Adam and Eve. It is a great mistake therefore to imagine, that the periods of doubling were much shorter in the earlier times than in the latter; the contrary of which is evident to reason.

According to our author, two errors have been fallen into in treating of this point; namely, 1. That in the first ages of the world, both before and after the Flood, men began to propagate their kind as early as they commonly do at present. 2. That the children of the same father succeeded one after another as fast as they do now, that is, that the women brought forth children every year. The first of these errors he confutes, by shewing that the several periods or stages of man's life bear a just proportion to one another, and to the whole term of life; and that the period of puberty or maturity has not been the same at all times, but is according to the length or brevity of life in the different ages of the world, according to that remark of St Augustine, *Tanto serior fuit proportione pubertas, quanto vitæ totius major annositas.* Moses, he observes, gives the age of the world from the creation to the deluge, and from that period to his own time, chiefly by generations. A generation is the interval of years between the births of father and son. This the Latins call *ætas*, and the Greeks γενεα. Now, a generation, or the interval of years between father and son, has not been, neither possibly could be, the same in all ages from the beginning, as Vossius justly observes; but has varied greatly according to the length or brevity of man's life in the several periods of the world. Since the ordinary term of man's life has been reduced to 70 and 80 years, the time of puberty is in proportion to this brevity of life, and reckoned at 20 or 21, which is the fourth part of a life of fourscore. The several

Id. p. 81.

23 Of the ag of puberty among th Antediluvians.

stages

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stages of human life are infancy, childhood, youth, manhood, full age, declension, old or decrepit age; all which commonly bear a proportion to the whole term of life. Now the bounds and limits of these several stages cannot be precisely the same in all, but vary in respect of the disposition of men's bodies, their course of life, and also the places and ages in which they live. In the Antediluvian world then, when men lived to upwards of 800 and 900 years, can it be thought that they passed through the several stages of life in as short time as men do now, who seldom exceed 80, and not one in ten arrives at that age? But if the Antediluvians arrived at puberty or manhood as soon as men do now, then would the several stages of human life have been lost or confounded, and men would have started from childhood to manhood at once, without any due or regular intervals, contrary to the order of nature: But if, according to the present economy of nature, man is but a youth at 20, which is a fourth part of our term of life, we may reasonably conclude, there would be a suitable proportion of years in a much longer term of life, since nature is constant and uniform in her operations. And though in so long a life as the Antediluvians enjoyed, the time of puberty might be a fifth or sixth part of their term of life, yet would they be but youths at 150 or 160; which bears much the same proportion to the whole of their life as 20 is to that of ours.

The other is an error, he thinks, which could never have been fallen into, had it been considered that every mother suckled her own children in those early days: and indeed where could she have found another to have done it for her?

Taking it for granted, then, that it was an universal custom for women to suckle their children as well before as after the flood, the next question is, for how long time they continued nurses? He shows various instances, that when man's life was reduced to 130 or 140 years, the ordinary time of nursing was two years; he thence infers, that for three or four generations after the flood, when men lived to about 400 years, the time would be so much longer in proportion, and would not be less than three or four years; and consequently, that before the flood, when life was protracted to 800 or 900 years, it would be still longer, in proportion to their longevity; so that five years might be the ordinary time of nursing in the old world; and therefore that we cannot reckon less than six years between the births. For man's life being prolonged to so many hundred years at first for the more speedy peopling of the earth, he came by slow degrees to mature age, there being a long time required to rear up a body that was to last near 1000 years. The intervals, therefore, of infancy, childhood, youth, and mature age, were so much longer in proportion to ours as the difference is between our term of life and theirs: and 150 or 160 years, with respect to their longevity, was no more in proportion than 20 is to the brevity of our life. As the Antediluvians therefore were so very long in growing up to mature age, he concludes, that the time of nursing could not be shorter than five years, and that the distance between the births in a regular way must be set at six years.

24 Of the time allotted for nursing in those early days.

25 Distance between the births.

Upon the whole, he thinks it evident that there could be no such speedy increase of mankind at the beginning as is imagined; that the time of nursing above specified was no more than necessary for that strength of constitution which was to last for 800 and 900 years; and that women who were to continue bearing children for 340 or 360 years of their life, should have them but slowly and at the distance of several years, that their strength might hold out, and that they might not be overburdened with too many cares at once; and therefore when Eve's first child was six years old, it was time enough for her to have another, and so on, though possibly sometimes twins.

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26 Cockburn's calculation of the increase of mankind.

These points being discussed, he proceeds, 1. To compute what number upon the whole might be born into the world from the creation to near the time of the deluge; and then, 2. To state the needful deductions for deaths and other deficiencies.

I. 1. How long the parents of mankind continued in paradise, we know not; though longer perhaps than is commonly imagined. We shall even suppose two or three years, in which time there was no child born, nor any attempt towards it. We shall allow them two or three years more to lament their fall, and the miserable estate their want of faith and disobedience had brought them to, from a most happy condition; and suppose Cain to be born six years after the creation (in which supposition few, probably, will be apt to think us too hasty), and Abel again six years after him, and so every sixth year Eve to have had a child, the first seven, eight, or nine whereof probably were all males (the males being longer in coming to maturity than the females); and this distance between the births will also be thought a sufficient allowance. At this rate of increase Adam would have in 100 years 16 children, in 200 years 32, and in 400 years 64 children; when we will suppose Eve to have left off child-bearing. Nor need the number of Adam's children be thought too great, when there are instances in those later ages, and this short period of man's life, of those who have had 40 children at single births by two successive wives, and of many others who have had 20, 25, and 30, by one wife; though in such cases it is not to be supposed that the women suckled their children.

2. Though it is reasonable to think that the Antediluvians, notwithstanding their longevity, came to mature age at 150; yet, as we are not sure that they all married so soon as they were ripe for marriage, and that the earliest in the genealogies is born in the 162d year of his father, who might probably be a first born, our author does not suppose Cain, Abel, or any of the succeeding children or grandchildren of Adam to have married till they were 160, but to have had children from 161 or 162 till they were of the age of 500, at the fore-named distance or interval between the births; though Noah we know had three sons after he was 500, at the due intervals. And to all the Antediluvians we may allow, without fear of exceeding, 50 or 54 children in general, according to the course of nature, and the longevity of those first ages of the world.

3. Let us next inquire in what number of years the men of that world might double themselves, notwithstanding the long intervals between the births. The increase indeed will be found very small for the first 300 or 400 years, as they were late in coming to maturity; but the succeeding ages will swell the account exceedingly.

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exceedingly. Let us suppose at present (what shall be proved afterwards) that in the year of the world 500, there were 200 persons only, male and female, of full age to marry, the men at 160, the women at 120 or thereabout. The first or second year after the marriage will probably produce 100 births from 100 couple, and every sixth year after 100 more. At this slow progression the 200 married persons will, in 19 or 20 years, be increased to 600: so that the number of mankind would be trebled in 20 years, after there came 100 pair to be married. And in this manner they would increase and multiply every 20 years, or in that space treble themselves.

It may perhaps be objected, that though it appears that such an increase might be at first from the first 100 marriages, yet they could not continue thus to multiply at such periods; because, according to the rule we have laid down, none of the issue of these 100 first marriages could increase the number of mankind till the men had attained the age of 160. It is true they could not: but then it must be remembered, that the first 100 pair are still adding every sixth year 100 more to the number of mankind, even till after the 400 born in the first 20 years are married, and begin a new stock for increase; so that when there came to be some hundred couples married, the increase and multiplication would come on very fast, and in 1000 years mankind would be prodigiously increased.

But though there be nothing in this supposition contrary to reason, viz. That after the year of the world 500, they might treble themselves in 20 years; yet we will not reckon upon so short an interval, but will allow a much longer time even to their doubling themselves, and shall exhibit two tables of doubling; the first at the interval of 50 years (much too long indeed), the other at the interval of 40 years, and both beginning at the year 500, when there could not be fewer (whatever more there might be) than 100 married or marriageable persons descended from Adam and Eve.

Years of the World.	Number of Mankind.
500	200
550	400
600	800
650	1,600
700	3,200
750	6,400
800	12,800
850	25,600
900	51,200
950	102,400
1000	204,400
1050	409,600
1100	819,200
1150	1,638,400
1200	3,276,800
1250	6,553,500
1300	13,107,200
1350	26,214,400
1400	52,428,800
1450	104,857,600
1500	209,715,200
1550	419,430,400
1600	838,860,800
1650	1,677,721,600
1700	3,335,443,200
1750	6,710,886,500
1800	13,421,772,800
1850	26,843,545,600
1900	53,687,091,200
1950	107,374,182,400
2000	214,748,364,800
2050	429,496,729,600

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This table is calculated at the long interval of 50 years, that it may appear that even by under-rating the number of mankind, there would be so many millions born into the world before the deluge came, that they would be obliged to spread themselves over the face of the earth, though but one half of the sum total of 429,496 millions had been alive at the time of the deluge; but as the interval here allowed may appear to be too long for the time of doubling, the second is calculated at the interval of 40 years, which comes nearer to the truth of the case, though even this may exceed the time of doubling.

Years of the World.	Number of Mankind.
500	200
540	400
580	800
620	1,600
660	3,200
700	6,400
740	12,800
780	25,600
820	51,200
860	102,400
900	204,800
940	409,600
980	819,200
1020	1,638,400
1060	3,276,800
1100	6,553,600
1140	13,107,200
1180	26,214,400
1220	52,428,800
1260	104,857,600
1300	209,715,200
1340	419,430,400
1380	838,860,800
1420	1,677,721,600
1460	3,355,443,200
1500	6,710,886,400
1540	13,421,772,800
1580	26,843,545,600
1620	53,687,091,200
1660	107,374,182,400
1700	214,748,304,800
1740	429,496,729,600
1780	858,993,459,200
1820	1,717,986,918,400
1860	3,435,973,836,800
1900	6,871,947,673,600
1940	13,743,895,347,200
1980	27,487,790,634,400
2020	54,975,581,388,800

The first table is brought down no lower than to the year 2050, and the second to the year 2020, though

Antediluvians. though there remain by the first 206, and by the second 236 years to the flood: the reason is, that in those last 200 years of the world, mankind would not increase in any measure equal to what they had done in the preceding years (though regularly the increase should have been much greater); because that violence was then great in the earth, and thousands, yea millions, might have been cut off by untimely deaths; for which cause the world's destruction was determined 120 years before the flood came.

27 Objection answered. II. But now against this immense number of mankind that might in a regular and ordinary way have been born into the world between the creation and the deluge in 2056 years, it will no doubt be objected by some (as it has been done to far less numbers), that all such calculations are mere guess work, the product of fruitful imaginations.

But it should be considered, that in calculations of this nature some regular order or method must be observed: and though, according to the course of nature such an increase and multiplication of mankind there might have been periodically, especially at the beginning, when the command was *to increase and multiply and replenish the earth;* yet we will not suppose that all things went on thus regularly, without difference or interruption. We do not know what extraordinary obstructions or interruptions there might be to such a regular increase. Though every married pair might by the course of nature have had such a number of children as has been mentioned, yet the Divine Providence might order it otherwise in manifold instances, and it might possibly be in the old world, as it has been since the flood, viz. that some marriages have produced many children, others few, and some none at all. Allowing, therefore, for all such obstructions and deficiencies, and likewise for all casualties and accidents (to which men might be liable in that world as well as in the present), in as ample a manner as can be desired, let the former number be reduced to one half, viz. to 27,487,790,694,400, that is, 27 billions, or millions of millions, four hundred and eighty-seven thousand seven hundred and ninety millions, six hundred and ninety-four thousand and four hundred. And this we shall now suppose to be the whole number of those who were born into the world before the deluge. But from this sum is to be subtracted the number of those who died before that time.

Of those in the genealogies from Adam by Seth, Enoch was translated at the age of 365, Lamech the father of Noah died just before the flood at 753, Mahalaleel at 895. Adam and the other five patriarchs lived to about 900. Before the year 900, therefore, we may suppose there were no deaths except that of Abel, who was slain, a young man, but that all born within that period were alive altogether. But in the tenth century death began to reign, and Adam and Eve, we may presume, were the first over whom death had power in a natural way, as their disobedience was the cause of it. The children also born of them in the first hundred years would also die in this 10th century, those born in the second hundred would die in the 11th, those born in the third century would die in the 12th, and so on. But though we are far from thinking that after the beginning of the 10th century (till which time few or none died), the deaths would be equal to the births; yet as we have made large concessions all along, we shall do the same in this case, and suppose them upon the whole to have been equal, especially since we cannot precisely say how long that violence or bloodshed, which was their crying sin, came to prevail; and therefore will reduce the last sum mentioned to one half again, to allow for the deaths and prevailing violence, and suppose the total number of mankind alive upon earth at the time of the deluge to have been no more than 13,743,895,347,200, that is, 13 billions or millions of millions, seven hundred and forty-three thousand eight hundred and ninety-five millions, three hundred and forty-seven thousand and two hundred; a number vastly exceeding that of the present inhabitants of the whole earth. Antedi'uvians.

28 Probability of the above calculation. Notwithstanding the very large allowances and abatements made to reduce the number of mankind, yet even the last reduction to 13 billions or millions of millions, &c. seems so vastly great, that it will hardly be thought possible that such a number of men could ever be at one time upon the earth. Now, though we pretend to no certainty in this point (which made it the more requisite to allow largely for deaths and deficiencies), yet the calculation we have given must appear highly probable, since it is founded upon grounds certain and undeniable: for instance,

1. It cannot be denied but that the Antediluvians were come to the age of puberty and marriage at 160 years, when we find a son born in 162. Nor,

2. Can it be said, that they could not have children at the age of 500, when we have an instance of one that had three sons at due distances after that age. Neither,

3. Can it be alleged that we have not allowed a due distance or interval between the births, viz. six years, when most will be of opinion that it could not be so long. Nor yet,

4. Can it be judged that we have made the period of doubling far too short, when we had before showed that after 100 marriages consummated, they would treble themselves in half the time we have taken for their doubling. Nor,

5. Will any one make a doubt, but that there might be 200 persons of mature age for marriage in the year of the world 500, the men at 160, the women younger. Nevertheles, as this is the foundation of our calculation, we shall now show that there was at least such a number of persons marriageable at that age of the world.

It may be observed, that as we take 160 for the years of maturity and marriage, according to that period all married or marriageable in the year 500 must have been born in or before the year 340; the males at least, though the females, coming sooner to maturity, might some of them be born later or after the year 380. Now, according to this stated period of marriage,

1. In or before the year 340, Adam might have had 54 children, males and females, or 27 pair married or fit for marriage.

2. Cain, whom we suppose to be but six years younger than Adam (which by the by is more than others allow), and to have married in the year 166, might have in the year 340, 28 children, or 14 pair fit for marriage, which added to the former, makes 41 pair.

Antediluvians || Antenati.

3. Abel, married six years later, that is, in the year 172, and whom we shall suppose slain in the year 225 or 226, could in that case have no more than eight or nine children, or four pair, which with the former make 45 pair.

4. Adam's third son, married in the year 178, will afford us in the year 340, 26 children, or 13 pair, which increase the number of marrigeable persons to 58 pair.

5. A fourth son of Adam's, married in the year 184, will give us in the year 340, 25 children, or 12 pair; which makes the number of pairs 70.

6. A fifth son of Adam's, married in the year 190, might in the year 340 have 24 children, or 12 pair again, which increase the former number to 82 pair.

7. A sixth son of Adam's, married in the year 196, would have in the year 340, 22 children, or 11 pair; which added to the former make up 93 pair.

8. A seventh son of Adam's, married in the year 202, will, in the year 340, give us 20 children, or 10 pair: which makes in the whole 103 pair, already three pair more than we reckoned upon. I need therefore go no farther or to the eighth or ninth son; but the following eight or nine births I may reasonably take to have been daughters, and married to the brothers that preceded them.

Here are now no more than 14 children of Adam's married, who have given us the 100 pair we have reckoned upon, and three over. We might yet have 13 pair to bring into the account, all born before the year 340, and marriageable in the year 500, which would very much increase the number of mankind. And by this the reader may perceive that we have been far from building on uncertain or precarious foundations, since we have omitted 13 pair more, which we might have taken into the account. And if it be considered that the command given to Adam was to increase and multiply and replenish the earth, no doubt can be made, but that his own and his children's marriages were fruitful in the procreation of children, that the earth might be inhabited.

ANTEGO. See ANTIGUA.

ANTEJURAMENTUM, by our ancestors called *juramentum calumniæ*, an oath which anciently both accuser and accused were to take before any trial or purgation.—The accuser was to swear that he would prosecute the criminal; and the accused to make oath, on the day he was to undergo the ordeal, that he was innocent of the crime charged against him.

ANTELOPE, in *Zoology*. See CAPRA.

ANTELUCAN, in ecclesiastical writers, is applied to things done in the night or before day. We find frequent mention of the antelucan assemblies (*Cœtus antelucani*) of the ancient Christians, in times of persecution, for religious worship.

ANTEMURALE, in the ancient military art, denotes much the same with what the moderns call an *out-work*.

ANTENATI, in modern English history, is chiefly understood of the subjects of Scotland, born before King James the First's accession to the English crown, and alive after it. In relation to these, those who were born after the accession were denominated *Postnati*. The antenati were considered as aliens in England, whereas the postnati claimed the privilege of natural subjects.

Antenati || Antestature.

ANTENCLEMA, in *Oratory*, is where the whole defence of the person accused turns on criminating the accuser. Such is the defence of Orestes, or the oration for Milo: *Occisus est, sed latro. Exsectus, sed raptor.*

ANTENICENE, in ecclesiastical writers, denotes a thing or person prior to the first council of Nice. We say the Antenicene faith, Antenicene creeds, Antenicene fathers.

ANTENNÆ, in the history of insects, slender bodies with which nature has furnished the heads of these creatures, being the same with what in English are called *horns* or *feelers*. See ENTOMOLOGY *Index*.

ANTENOR, a Trojan prince, came into Italy, expelled the Enganians on the river Po, and built the city of Padua, where his tomb is said to be still extant.

ANTEPAGMENTA, in the *Ancient Architecture*, the jambs of a door. They are also ornaments, or garnishings, in carved work, of men, animals, &c. made either of wood or stone, and set on the architrave.

ANTEPENULTIMA, in *Grammar*, the third syllable of a word from the end, or the last syllable but two.

ANTEPILANI, in the Roman armies, a name given to the hastati and principes, because they marched next before the triarii, who were called *pilani*.

ANTEPILEPTICS, among physicians, medicines esteemed good in the epilepsy.

ANTEPOSITION, a grammatical figure, whereby a word, which by the ordinary rules of syntax ought to follow another, comes before it. As when, in the Latin, the adjective is put before the substantive, the verb before the nominative case, &c.

ANTEPREDICAMENTS, among logicians, certain preliminary questions which illustrate the doctrine of predicaments and categories.

ANTEQUIERA, a handsome town of Spain, in the kingdom of Granada, divided into two parts, the upper and lower. The upper is seated on a hill, and has a castle: the lower stands in a fertile plain, and is watered with a great number of brooks. There is a large quantity of salt in the mountain; and five miles from the town, a spring famous for the cure of the gravel. W. Long. 4. 40. N. Lat. 36. 51.

ANTERIOR, denotes something placed before another, either with respect to time or place.

ANTEROS, in *Mythology*, one of the two Cupids who were the chief of the number. They are placed at the foot of the Venus of Medicis; this is represented with a heavy and sullen look, agreeably to the poetical description of him, as the cause of love's ceasing. The other was called Eros.

ANTESIGNANI, in the Roman armies, soldiers placed before the standards, in order to defend them, according to Lipsius; but Cæsar and Livy mention the antesignani as the first line, or first body, of heavy-armed troops. The velites, who used to skirmish before the army, were likewise called *antesignani*.

ANTESTATURE, in *Fortification*, a small retrenchment

Antestature || Anthesteria.

trenchment made of palisadoes, or sacks of earth, with a view to dispute with an enemy the remainder of a piece of ground.

ANTESTARI, in Roman antiquity, signifies to bear witness against any one who refused to make his appearance in the Roman courts of judicature, on the day appointed, and according to the tenor of his bail. The plaintiff, finding the defendant after such a breach of his engagement, was allowed to carry him into court by force, having first asked any of the persons present to bear witness. The person asked to bear witness in this case, expressed his consent by turning his right ear, which was instantly taken hold of by the plaintiff, and this was to answer the end of a subpœna. The ear was touched upon this occasion, says Pliny, as being the seat of memory, and therefore the ceremony was a sort of caution to the party to remember his engagement.

ANTHELION. See CORONA and PARHELION.

ANTHELIX, in *Anatomy*, the inward protuberance of the external ear, being a semicircle within, and almost parallel to the helix. See ANATOMY.

ANTHELMINTICS, among physicians, medicines proper to destroy worms.

ANTHEM, a church song performed in cathedral service by choristers, who sung alternately. It was used to denote both psalms and hymns, when performed in this manner. But, at present, anthem is used in a more confined sense, being applied to certain passages taken out of the Scriptures, and adapted to a particular solemnity. Anthems were first introduced in the reformed service of the English church, in the beginning of the reign of Queen Elizabeth.

ANTHEMIS, CHAMOMILE. See BOTANY *Index*.

ANTHERA, in *Botany*, that part of the stamen which is fixed on the top of the filamentum, within the corolla: it contains the pollen or fine dust, which, when mature, it emits for the impregnation of the plant, according to Linnæus. The APEX of Ray, Tournef. and Rivin.; *Capsula staminis*, of Malpighi.

ANTHERICUM, SPIDER-WORT. See BOTANY *Index*.

ANTHESPHORIA, in antiquity, a Sicilian festival instituted in honour of Proserpine. The word is derived from the Greek ανθος, *flower*, and φερω, *I carry*; because that goddess was forced away by Pluto when she was gathering flowers in the fields. Yet Festus does not ascribe the feast to Proserpine; but says it was thus called by reason ears of corn were carried on this day to the temples.—Anthesphoria seems to be the same thing with the *florisertum* of the Latins, and answers to the harvest-home among us.

ANTHESTERIA, in antiquity, was a feast celebrated by the Athenians in honour of Bacchus. The most natural derivation of the word is from the Greek ανθος (*flos*), a flower, it being the custom at this feast to offer garlands of flowers to Bacchus.

The anthesteria lasted three days, the 11th, 12th, and 13th of the month; each of which had a name suited to the proper office of the day. The first day of the feast was called πιθοιγια, i. e. *opening of the vessels*, because on this day they tapped the vessels, and tasted the wine. The second day they called χοες, *congii*, the name of a measure containing the weight of 10 pounds; on this they drank the wine prepared the day before. The third day they called χυτροι, *kettles*: on this day they boiled all sorts of pulse in kettles; which however they were not allowed to taste, as being offered to Mercury. Anthesteria || Anthony.

ANTHESTERION, in ancient chronology, the sixth month of the Athenian year. It contained 29 days; and answered to the latter part of our November and beginning of December. The Macedonians called it *dæsion* or *desion*. It had its name from the festival anthesteria kept in it.

ANTHISTIRIA. See BOTANY *Index*.

ANTHOCEROS, or HORN-FLOWER. See BOTANY *Index*.

ANTHOLOGION, the title of the service book used in the Greek church. It is divided into 12 months, containing the offices sung throughout the year, on the festivals of our Saviour, the Virgin, and other remarkable saints.

ANTHOLOGY, a discourse of flowers, or of beautiful passages from any authors.—It is also the name given to a collection of epigrams taken from several Greek poets.

ANTHOLYZA, MAD-FLOWER. See BOTANY *Index*.

ANTHONY, SAINT, was born in Egypt in 251, and inherited a large fortune, which he distributed among his neighbours and the poor, retired into solitude, founded a religious order, built many monasteries, and died anno 356. Many ridiculous stories are told of his conflicts with the devil, and of his miracles. There are seven epistles extant attributed to him.

St Anthony is sometimes represented with a fire by his side, signifying that he relieves persons from the inflammation called after his name; but always accompanied by a hog, on account of his having been a swineherd, and curing all disorders in that animal. To do him the greater honour, the Romanists in several places keep at common charges a hog denominated *St Anthony's hog*, for which they have great veneration. Some will have St Anthony's picture on the walls of their houses, hoping by that to be preserved from the plague; and the Italians, who do not know the true signification of the fire painted at the side of their saint, concluding that he preserves houses from being burnt, invoke him on such occasions. Both painters and poets have made very free with this saint and his followers: the former by the many ludicrous pictures of his temptation; and the latter, by divers epigrams on his disciples or friars: one of which is the following, printed in Stephen's World of Wonders:

Once fedd'st thou, Anthony, an herd of swine,
And now an herd of monks thou feedest still.
For wit and gut alike both charges bin;
Both loven filth alike; both like to fill
Their greedy paunch alike: nor was that kind
More beastly, sottish, swinish, than this last.
All else agrees: one fault I only find,
Thou feedest not thy monks with oaken mast.

ANTHONY, or *Knights of St ANTHONY*, a military order, instituted by Albert duke of Bavaria, Holland, and Zealand, when he designed to make war against the Turks in 1382. The knights wore a collar of gold

Anthony ‖ Anthropolatria.

gold made in form of a hermit's girdle, from which hung a stick cut like a crutch, with a little bell, as they are represented in St Anthony's pictures.

St ANTHONY also gives the denomination to an order of religious founded in France about the year 1095, to take care of those afflicted with St Anthony's fire; (see the next article).—It is said, that, in some places, these monks assume to themselves a power of giving, as well as removing, the *ignis sacer*, or erysipelas; a power which stands them in great stead for keeping the poor people in subjection, and extorting alms. To avoid the menaces of these monks, the country people present them every year with a fat hog a piece. Some prelates endeavoured to persuade Pope Paul III. to abolish the order; *quæstuarios istos sancti Anthonii, qui decipiunt rusticos et simplices, eosque innumeris superstitionibus implicent, de medio tollendos esse.* But they subsist, notwithstanding, to this day, in several places.

St ANTHONY'S *Fire*, a name properly given to the erysipelas. Apparently it took this denomination, as those afflicted with it made their peculiar application to St Anthony of Padua for a cure. It is known, that anciently particular diseases had their peculiar saints: thus, in the ophthalmia, persons had recourse to St Lucia; in the toothach, to St Apollonia; in the hydrophobia, to St Hubert, &c.

ANTHORA, the trivial name of a species of aconitum. See ACONITUM, BOTANY *Index*.

ANTHORISMUS, in *Rhetoric*, denotes a contrary description or definition of a thing from that given by the adverse party.—Thus, if the plaintiff urge, that to take any thing away from another without his knowledge or consent, is a theft; this is called ὅρος, or definition. If the defendant reply, that to take a thing away from another without his knowledge or consent, provided it be done with design to return it to him again, is not theft; this is an Ανθορισμος.

ANTHOSPERMUM, the AMBER TREE. See BOTANY *Index*.

ANTHOXANTHUM, or VERNAL GRASS. See BOTANY *Index*.

ANTHRACIS, ANTHRACIAS, or ANTHRACITIS, names promiscuously used by ancient naturalists for very different fossils, viz. the carbuncle, hæmatites, and a kind of asteria. See CARBUNCLE, &c.

ANTHRACOCIS, in *Medicine*, a corrosive scaly ulcer either in the bulb of the eye or the eyelids.

ANTHRAX, a Greek term, literally signifying a burning coal, used by the ancients to denote a gem, as well as a disease, more generally known by the name of *carbuncle*.

ANTHRAX is sometimes also used for lithanthrax or pit coal.

ANTHROPOGLOTTUS, among zoologists, an appellation given to such animals as have tongues resembling that of mankind, particularly to the parrot kind.

ANTHROPOGRAPHY, denotes the description of the human body, its parts, structure, &c. See ANATOMY.

ANTHROPOLATRÆ, in church history, an appellation given to the Nestorians, on account of their worshipping Christ, notwithstanding that they believed him to be a mere man.

ANTHROPOLATRIA, the paying divine honours to a man; supposed to be the most ancient kind of idolatry. Anthropolatria, Anthropolites.

ANTHROPOLITES, a term denoting petrifactions of the human body, as those of quadrupeds are called *zoolites*.

It has been doubted whether any real human petrifactions ever occur, and whether those which have been supposed such were not mere *lusus naturæ*. But the generality of naturalists best versed in this branch assure us of real anthropolites being sometimes found. And indeed, as it is universally admitted that the zoolites are frequently seen, what negative argument therefore can be brought against the existence of the others? Are not the component parts of the human body nearly similar to those of the brute creation? Consequently, correspondent matter may be subject to, and acquire, the like accidental changes, wherever the same power or causes concur to act upon either object. If the former are not so common, it may be accounted for, in some measure, by reflecting that human bodies are generally deposited in select and appropriate places; whereas the bones of animals are deposited everywhere, and falling into various beds of earth, at a greater or less depth, there is more probability of their encountering the petrifying agent. Could we credit some authors who have treated on this subject, they will tell us of entire bodies and skeletons that were found petrified. One in particular, discovered at Aix in Provence, anno 1583, in a rocky cliff, the cerebrum whereof, when struck against a piece of steel, produced sparks, the bones being at the same time friable. The reports of Happel and Kircher are too absurd for belief. Van Helmont's strange relations, together with those of Jean à Costa, must also be rejected as fabulous. Scheuhzer has published an engraved figure, which he calls the *Antediluvian man:* how far it is authentic, it would be rash to say. It is, however, asserted by many respectable writers on natural history, that whole skeletons petrified have been brought to light from certain old mines, which remained closed up and disused for several centuries. These indeed are acknowledged to be very rare. Yet it is a known fact, that detached parts (*osteolithi*) are sometimes found, especially in situations where either the water, the soil, or both, have been observed to possess a strong petrescent quality. The human vertebræ, fragments or portions of the tibia, and even the whole cranium itself, have been seen in an absolute state of petrifaction. Some of these are said to appear vitriolated or mineralized. As to the petrified bones of pretended giants, they are more probably real zoolites, the bones of the larger animals. All these bones are found in various states, and under different appearances. Some are only indurated; others calcined, vitriolated, or mineralized; some, again, are simply incrusted; whilst others have been proved completely petrified. Notwithstanding what is here advanced, it may be granted that a positive *lusus naturæ*, in some hands, is repeatedly mistaken for a real petrifaction. They are, however, distinguishable at all times by an experienced naturalist; particularly by the two following rules: First, We may determine that fossil a *lusus naturæ*, which, on a strict examination, is observed to deviate in any material degree from the true *res analogica existens*. Secondly, By the same parity of reasoning, these fossil

shells

Anthropolites || Anthropophagi.

shells are to be esteemed certain petrifications, and genuine Antediluvian *reliquiæ*, in which, on a comparison with their *analogues*, collected from the sea, there appears an exact conformity in size and figure. This comparative observation will hold good for all fossils; that is, such as present themselves either under the animal or vegetable form. It is nevertheless worthy of notice, that all testaceous fossils are not petrified; since some kinds of them have been found in beds of sand, which retained their original perfect shape and quality, but at the same time they proved very brittle, indeed scarcely bearing the most gentle touch. Shells of this description are always dissoluble by acids, in contradistinction to the petrified or calcareous fossil shells, whose property it is to resist the action of such like *menstrua*. See further the article PETRIFACTION.

ANTHROPOLOGY, a discourse upon human nature.

ANTHROPOLOGY, among divines, denotes that manner of expression, by which the inspired writers attribute human parts and passions to God.

ANTHROPOMANCY, a species of divination, performed by inspecting the entrails of a human creature.

ANTHROPOMORPHA, a term formerly given to the primates of that class of animals which have the greatest resemblance to the human kind.

ANTHROPOMORPHISM, among ecclesiastical writers, denotes the heresy or error of the Anthropomorphites. See the next article.

ANTHROPOMORPHITES, in *Church History*, a sect of ancient heretics, who, taking every thing spoken of God in Scripture in a literal sense, particularly that passage of Genesis in which it is said, *God made man after his own image*, maintained that God had a human shape. They are likewise called *Audeans*, from Audeus their leader.

ANTHROPOMORPHOUS, something that bears the figure or resemblance of a man. Naturalists give instances of anthropomorphous plants, anthropomorphous minerals, &c. These generally come under the class of what they call *lusus naturæ*, or monsters.

ANTHROPOPATHY, a figure or expression by which some passion is ascribed to God, which properly belongs only to man.

ANTHROPOPHAGI, (of ανθρωπος, a *man*, and φαγω, to *eat*, MEN-EATERS). That there have been, in almost all ages of the world, nations who have followed this barbarous practice, we have abundance of testimonies.

The Cyclops, the Lestrygons, and Scylla, are all represented in Homer, as *Anthropophagi*, or man-eaters; and the female phantoms, Circe, and the Sirens, first bewitched with a show of pleasure, and then destroyed. This, like the other parts of Homer's poetry, had a foundation in the manners of the times preceding his own. It was still, in many places, the age spoken of by Orpheus.

When men devour'd each other like the beasts,
Gorging on human flesh.——

According to Herodotus, among the Essedonian Scythians, when a man's father died, the neighbours brought several beasts, which they killed, mixed up their flesh with that of the deceased, and made a feast. Among the Massagetæ when any person grew old, they killed him and ate his flesh; but if he died of sickness, they buried him, esteeming him unhappy. The same author also assures us, that several nations in the Indies killed all their old people and their sick, to feed on their flesh: he adds, that persons in health were sometimes accused of being sick, to afford a pretence for devouring them. According to Sextus Empiricus, the first laws that were made, were for the preventing of this barbarous practice, which the Greek writers represent as universal before the time of Orpheus. Anthropophagi.

Of the practice of anthropophagy in later times, we have the testimonies of all the Romish missionaries who have visited the internal parts of Africa, and even some parts of Asia. Herrera speaks of great markets in China, furnished wholly with human flesh, for the better sort of people. Marcus Paulus speaks of the like in his time, in the kingdom of Concha towards Quinsay, and the island of Zapengit; others, of the great Java; Barbosa, of the kingdom of Siam and island of Sumatra; others, of the islands in the gulf of Bengal, of the country of the Samogitians, &c.

The philosophers Diogenes, Chrysippus, and Zeno, followed by the whole sect of Stoics, affirmed, that there was nothing unnatural in the eating of human flesh; and that it was very reasonable to use dead bodies for food, rather than to give them a prey to worms and putrefaction. In order to make the trial, however, whether there was any real repugnancy in nature to the feeding of an animal with the flesh of its own species, Leonardus Floroventius fed a hog with hog's flesh, and a dog with dog's flesh; upon which he found the bristles of the hog to fall off, and the dog to become full of ulcers.

When America was discovered, this practice was found to be almost universal, insomuch that several authors have supposed it to be occasioned through a want of other food, or through the indolence of the people to seek for it; though others ascribe its origin to a spirit of revenge.

It appears pretty certain from Dr Hawkesworth's account of the Voyages to the South seas, that the inhabitants of the island of New Zealand, a country unfurnished with the necessaries of life, eat the bodies of their enemies. It appears also to be very probable, that both the wars and anthropophagy of these savages, take their rise and owe their continuance to irresistible necessity, and the dreadful alternative of destroying each other by violence, or of perishing by hunger. See vol. iii. p. 447. et seq. and vol. ii. p. 389, &c.

Mr Marsden also informs us, that this horrible custom is practised by the Battas, a people in the island of Sumatra. "They do not eat human flesh (says he) as a means of satisfying the cravings of nature, owing to a deficiency of other food; nor is it sought after as a gluttonous delicacy, as it would seem among the New Zealanders. The Battas eat it as a species of ceremony; as a mode of showing their detestation of crimes, by an ignominious punishment; and as a horrid indication of revenge and insult to their unfortunate enemies. The objects of this barbarous repast are the prisoners taken in war, and offenders convicted and condemned for capital crimes. Persons of the former

Anthropophagi, Anthropophagia.

former description may be ransomed or exchanged, for which they often wait a considerable time; and the latter suffer only when their friends cannot redeem them by the customary fine of twenty beenchangs, or eighty dollars. These are tried by the people of the tribe where the fact was committed, but cannot be executed till their own particular raja or chief has been acquainted with the sentence; who, when he acknowledges the justice of the intended punishment, sends a cloth to cover the delinquent's head, together with a large dish of salt and lemons. The unhappy object, whether prisoner of war or malefactor, is then tied to a stake: the people assembled throw their lances at him from a certain distance; and when mortally wounded, they run up to him, as if in a transport of passion; cut pieces from the body with their knives; dip them in the dish of salt and lemon juice; slightly broil them over a fire prepared for the purpose; and swallow the morsels with a degree of savage enthusiasm. Sometimes (I presume according to the degree of their animosity and resentment) the whole is devoured; and instances have been known, where, with barbarity still aggravated, they tear the flesh from the carcass with their mouths. To such a depth of depravity may man be plunged, when neither religion nor philosophy enlighten his steps! All that can be said in extenuation of the horror of this diabolical ceremony is, that no view appears to be entertained of torturing the sufferers; of increasing or lengthening out the pangs of death: the whole fury is directed against the corpse, warm indeed with the remains of life, but past the sensation of pain. I have found a difference of opinion in regard to their eating the bodies of their enemies slain in battle. Some persons long resident there, and acquainted with their proceedings, assert that it is not customary; but as one or two particular instances have been given by other people, it is just to conclude, that it sometimes takes place, though not generally. It was supposed to be with this intent, that Raja Neabin maintained a long conflict for the body of Mr Nairne, a most respectable gentleman and valuable servant of the India Company, who fell in an attack upon the campong of that chief, in the year 1775."

It may be said, that whether the dead body of an enemy be eaten or buried, is a matter perfectly indifferent. But whatever the practice of eating human flesh may be in itself, it certainly is relatively, and in its consequences, most pernicious. It manifestly tends to eradicate a principle, which is the chief security of human life, and more frequently restrains the hand of the murderer, than the sense of duty or the dread of punishment. Even if this horrid practice originates from hunger, still it must be perpetuated from revenge. Death must lose much of its horror among those who are accustomed to eat the dead; and where there is little horror at the sight of death, there must be less repugnance to murder. See some further observations on this subject, equally just and ingenious, by Dr Hawkesworth, *ut supra*.

ANTHROPOPHAGIA, the act or habit of eating human flesh. This is pretended by some to be the effect of a disease, which leads people affected with it to eat every thing alike. Some choose only to consider it as a species of PICA. The annals of Milan furnish an extraordinary instance of anthropophagy. A Milanese woman named Elizabeth, from a depraved appetite, like what women with child, and those whose menses are obstructed, frequently experience, had an invincible inclination to human flesh, of which she made provision by enticing children into her house, where she killed and salted them: a discovery of which having been made, she was broken on the wheel and burnt in 1519.

Anthropophagia || Antichris

ANTHROPOSCOPIA, from ανθρωπος, and σκοπεω, *I consider*, the art of judging or discovering a man's character, disposition, passions, and inclinations, from the lineaments of his body. In which sense, anthroposcopia seems of somewhat greater extent than physiognomy or metoposcopy. Otto has published an Anthroposcopia, *sive judicium hominis de homine ex lineamentis externis*.

ANTHROPOTHYSIA, the inhuman practice of offering human sacrifices. See SACRIFICE.

ANTHUS, in *Ornithology*, a synonyme of a species of loxia. See LOXIA, ORNITHOLOGY *Index*.

ANTHYLLIS, KIDNEY-VETCH. See BOTANY *Index*.

ANTHYPOPHORA, in *Rhetoric*, a figure of speech; being the counterpart of an hypophora. See HYPOPHORA.

ANTI, a Greek preposition, which enters into the composition of several words, both Latin, French, and English, in different senses. Sometimes it signifies *before*, as an antichamber; and sometimes *opposite* or *contrary*, as in the names of these medicines, anti-scorbutic, anti-venereal.

ANTI, in matters of literature, is a title given to divers pieces written by way of answer to others, whose names are usually annexed to the anti. See the *Anti* of M. Baillet; and the *Anti-Baillet* of M. Menage: there are also *Anti-Menagiani*, &c. Cæsar the dictator wrote two books by way of answer to what had been objected to him by Cato, which he called *Anti-Catones;* these are mentioned by Juvenal, Cicero, &c. Vives assures us, he had seen Cæsar's *Anti-Catones* in an ancient library.

ANTIBACCHIUS, in ancient poetry, a foot consisting of three syllables, the two first long, and the last one short; such is the word āmbīrĕ.

ANTIBES, a sea port town of France, in the department of Var, with a strong castle. Its territory produces excellent fruit; and the town stands opposite to Nice, in the Mediterranean. E. Long. 7. 9. N. Lat. 43. 42.

ANTICHAMBER, an outer chamber for strangers to wait in, till the person to be spoken with is at leisure.

ANTICHORUS, in *Botany*. See BOTANY *Index*.

ANTICHRIST, among ecclesiastical writers, denotes a great adversary of Christianity, who is to appear upon the earth towards the end of the world.

We have demonstrations, disputations, and proofs, in great order and number, both that the pope is, and that he is not, Antichrist.

F. Calmet is very large in describing the father and mother of Antichrist, his tribe and pedigree, his wars and conquests, his achievements against Gog, Magog, &c.

Some place his capital at Constantinople, others at Jerusalem, others at Moscow, and some few at London; but the generality at Rome, though these last are divided

Antichrist. vided. Grotius and some others suppose Rome Pagan to have been the seat of Antichrist: most of the Lutheran and reformed doctors contend earnestly for Rome Christian under the papal hierarchy. In fact, the point having been maturely debated at the council of Gap, held in 1603, a resolution was taken thereupon, to insert an article in the Confession of Faith, whereby the pope is formally declared to be Antichrist.—Pope Clement VIII. was stung to the quick with this decision; and even King Henry IV. of France was not a little mortified, to be thus declared, as he said, an imp of Antichrist.

M. le Clerc holds, that the rebel Jews and their leader Simon, whose history is given by Josephus, are to be reputed as the true Antichrist. Lightfoot and Vanderhart rather apply this character to the Jewish Sanhedrim. Hippolitus and others held that the devil himself was the true Antichrist; that he was to be incarnate, and make his appearance in human shape before the consummation of all things. Others among the ancients held that Antichrist was to be born of a virgin by some prolific power imparted to her by the devil. A modern writer * of the female sex, whom many hold for a saint, has improved on this sentiment; maintaining that Antichrist is to be begotten by the devil on the body of a witch by means of the semen of a man caught in the commission of a certain crime, and conveyed, &c.

* Bayle's Dictionary, voce *Bourignon.*

Hunnius and some others, to secure Antichrist to the pope (notwithstanding that this latter seemed excluded by not being of the tribe of Dan), have broke in upon the unity of Antichrist, and assert that there is to be both an eastern and a western Antichrist.

Father Malvenda, a Jesuit, hath published a large work entitled *Antichristo*, in which this subject is amply discussed. It consists of thirteen books. In the first he relates all the opinions of the fathers with regard to Antichrist. In the second, he speaks of the times when he shall appear; and shows, that all the fathers who supposed Antichrist to be near at hand, judged the world was near its period. In the third, he discourses of his origin and nation; and shows that he is to be a Jew of the tribe of Dan: this he founds on the authority of the fathers; on the passage in Genesis xlix. 17. *Dan shall be a serpent by the way*, &c.; on that of Jeremiah viii. 16. where it is said, *The armies of Dan shall devour the earth*; and on Rev. vii. where St John, enumerating all the tribes of Israel, makes no mention of that of Dan. In the fourth and fifth books he treats of the signs of Antichrist. In the sixth, of his reign and wars. In the seventh, of his vices. In the eighth, of his doctrine and miracles. In the ninth, of his persecutions: and in the rest, of the coming of Enoch and Elias, the conversion of the Jews, the reign of Jesus Christ, and the death of Antichrist, after he has reigned three years and a half. See also *Lowman on the Revelation.*

How endless are conjectures! Some of the Jews, we are told, actually took Cromwell for the Christ; while some others have laboured to prove him Antichrist himself. Pfaffius assures us he saw a folio book in the Bodleian library, written on purpose to demonstrate this latter position.

Upon the whole, the Antichrist mentioned by the apostle John, 1 Ep. ii. 18. and more particularly described in the book of Revelation, seems evidently to be the same with the *Man of Sin*, &c. characterized by St Paul in his Second Epistle to the Thessalonians, ch. ii. And the entire description literally applies to the excesses of papal power. Had the right of private judgment, says an excellent writer, been always adopted and maintained, Antichrist could never have been; and when that sacred right comes to be universally asserted, and men follow the voice of their own reason and consciences, Antichrist can be no more. Antichrist ‖ Antieyra.

ANTICHRISTIANISM, a state or quality in persons or principles, which denominates them antichristian, or opposite to the kingdom of Christ.

M. Jurieu takes the idea of the unity of the church to have been the source of *Antichristianism*. Had not mankind been infatuated with this, they would never have stood in such awe of the anathemas of Rome. It is on this the popes erected their monarchical power.

ANTICHRISTIANS, properly denote the followers or worshippers of Antichrist.

ANTICHRISTIANS are more particularly understood of those who set up or believe a false Christ or Messiah.

ANTICHTHONES, in *Ancient Geography*, an appellation given to the inhabitants of opposite hemispheres.

ANTICOR, or ANTICOEUR, among *Farriers*, an inflammation in a horse's throat, being the same with the quinsy in mankind. See FARRIERY.

ANTICOSTE, a barren island lying in the mouth of the river St Lawrence, in North America. W. Long. 64. 16. N. Lat. 49. 40.

ANTICYRA, in *Ancient Geography*, a town in Phocis, on the Corinthian bay, opposite to Cirrha, lying to the west on the same bay. The Phoceans seizing the temple of Apollo at Delphi, a war, called *the sacred*, commenced, and lasted ten years; when Philip, father of Alexander the Great, avenged the god by destroying many of the cities of the pillagers. Anticyra was one of the number. It was again taken and subverted by Attilius a Roman general in the war with the Macedonians. It afterwards became famous for its hellebore. That drug was the root of a plant, the chief produce of the rocky mountains above the city, and of two kinds, the black, which had a purgative quality, and the white, which was an emetic. Sick persons resorted to Anticyra to take the medicine, which was prepared there by a peculiar and very excellent recipe: Hence the adage, *Naviget Anticyram*, (Horace). By the port in the second century was a temple of Neptune, not large, built with selected stones, and the inside white-washed: the statue of brass. The agora or market-place was adorned with images of the same metal; and above it was a well with a spring, sheltered from the sun by a roof supported by columns. A little higher was a monument formed with such stones as occurred, and designed, it was said, for the sons of Iphitus. One of these, Schedius, was killed by Hector, while fighting for the body of Patroclus, but his bones were transported to Anticyra; where his brother died after his return from Troy. About two stadia or a quarter of a mile distant was a high rock, a portion of the mountain, on which a temple of Diana stood; the image bigger than a large woman, and made

Anticyra || Antigonea.

by Praxiteles. The walls and other edifices at Anticyra were probably erected, like the temple of Neptune, with stones or pebbles. The site is now called *Asprospitia*, or *The White Houses;* and some traces of the buildings from which it was so named remain. The port is landlocked, and frequented by vessels for corn. Some paces up from the sea is a fountain.

ANTIDESMA, Chinese Laurel. See Botany *Index*.

ANTIDICOMARIANITES, ancient heretics who pretended that the Holy Virgin did not preserve a perpetual virginity, but that she had several children by Joseph after our Saviour's birth. Their opinion was grounded on some expressions of our Saviour, wherein he mentions his brothers and his sisters; and of St Matthew, where he says, that Joseph knew not Mary till she had brought forth her first-born son. The Antidicomarianites were the disciples of Helvidius and Jovinian, who appeared in Rome toward the close of the fourth century.

ANTIDORON, in *Ecclesiastical Writers*, a name given by the Greeks to the consecrated bread, out of which the middle part, marked with the cross, wherein the consecration resides, being taken away by the priest, the remainder is distributed after mass to the poor. On the sides of the antidoron are impressed the words *Jesus Christus vicit*. The word is formed from δωρον, *donum*, "a gift," as being given away *loco muneris*, or in charity. The antidoron is also called *panis præsanctificatus*. Some supposed the antidoron to be distributed in lieu of the sacrament, to such as were prevented from attending in person at the celebration; and thence derive the origin of the word, the eucharist being denominated *doron*, "gift," by way of eminence.

ANTIDOSIS, in antiquity, denotes an exchange of estates, practised by the Greeks on certain occasions with peculiar ceremonies, and first instituted by Solon.

When a person was nominated to an office, the expence of which he was not able to support, he had recourse to the antidosis: that is, he was to seek some other citizen of better substance than himself, who was free from this, and other offices; in which case the former was excused. In case the person thus substituted denied himself to be the richest, they were to exchange estates, after this manner; the doors of their houses were close shut up and sealed, that nothing might be conveyed away: then both took an oath to make a faithful discovery of all their effects, except what lay in the silver mines, which by the laws was excused from all imposts: accordingly, within three days, a full discovery and exchange of estates was made.

ANTIDOTE, among physicians, a remedy taken to prevent, or to cure, the effects of poison, &c.

ANTIENT. See Ancient.

ANTIGONEA, or Antigonia, in *Ancient Geography*, a town of Bithynia, so called from Antigonus, the son of Philip, and afterwards called *Nicæa* (Strabo, Stephanus). Another of Epirus, to the north of the Montes Ceraunii, opposite to the city of Oricum (Polybius, Ptolemy). A third of Arcadia, namely *Mantinea*, so called in honour of King Antigonus, (Plutarch, Pausanias). A fourth in Macedonia, in the territory of Mygdonia (Pliny, Ptolemy). A fifth in the territory of Chalcidice, in Macedonia, on the east side of the Sinus Thermaicus (Livy). A sixth of Syria, built by Antigonus, not far from Antioch, on the Orontes (Stephanus); but soon after destroyed by Seleucus, who removed the inhabitants to Seleucia, a town built by him (Diodorus Siculus). A seventh of Troas, called Alexandria in Pliny's time. Antigonea Antigonus

ANTIGONUS I. one of the captains of Alexander the Great, was the son of Philip a Macedonian nobleman. After Alexander's death, a division of the provinces taking place, Pamphylia, Lycia, and Phrygia Major fell to his share. But Perdiccas, well acquainted with his ambitious spirit and great abilities, determined to divest him of his government, and laid plans for his life, by bringing various accusations against him. Antigonus, aware of the danger, retired with his son Demetrius into Greece, where he obtained the favour and protection of Antipater; and in a short time Perdiccas dying, a new division taking place, he was invested not only with the government of the former provinces, but also with that of Lycaonia. He was likewise entrusted with the command of the Macedonian household troops, and upon Eumenes being declared a public enemy, he received orders to prosecute the war against him with the utmost vigour. On the commencement of this war, Eumenes suffered a total overthrow, and was obliged to retire with only 600 brave followers to a castle situated on an inaccessible rock, where he might rest in safety from all the assaults of Antigonus. In the interval, his friends assembling a new army for his relief, were routed by Antigonus, who now began to exhibit the great projects of his ambition. Polysperchon succeeding to the tutorship of the young king of Macedon after Antipater's death, Antigonus resolved to set himself up as lord of all Asia. On account of the great power of Eumenes, he greatly desired to gain him over to his interest; but that faithful commander effecting his escape from the fortress where he was closely blockaded, raised an army, and was appointed the royal general in Asia. The governors in Upper Asia co-operating with him, he succeeded in several engagements against Antigonus, but was at last delivered up to him through treachery, and put to death. Upon this, the governors of Upper Asia yielded to Antigonus. Those whom he suspected, he either sacrificed to his resentment or displaced them from their offices. Then seizing upon all the treasures at Susa, he directed his march towards Babylon, of which city Seleucus was governor. Seleucus fled to Ptolemy, and entered into a league with him, together with Lysimachus and Cassander, with the intention of giving a check to the exorbitant power of Antigonus, who, notwithstanding this, made a successful attempt upon the provinces of Syria and Phenicia. Yet these provinces were soon after recovered by Ptolemy, who defeated his son Demetrius, while he himself was employed in repelling Cassander, who had made rapid progress in Lesser Asia. They were again taken by Antigonus, and he being flushed with his success, planned an expedition against the Nabathæan Arabs, dwelling in the deserts adjacent to Judea; but on the first enterprise against the town of Petra, his general Athenæus, with almost all his troops, was cut to pieces by the Arabs. Antigonus then sent his son against them, who returned after forcing them to reasonable terms. Demetrius then

Antigonus. then expelled Seleucus from Babylon, and success attending his arms wherever he went, the confederates were obliged to make a treaty with Antigonus, in which it was stipulated, that he should remain in possession of all Asia, but that the Greek cities should continue in possession of their liberty. This agreement was soon violated, under the pretence that garrisons had been placed in some of these cities by Antigonus. At first Ptolemy made a successful descent in Lesser Asia and on several of the islands of the Archipelago; but he was at length defeated by the successful arms of Demetrius in a sea-fight, who also took the island of Cyprus, with many prisoners. On this victory Antigonus was so elated that he assumed the title of king, and bestowed the same upon his son; and from that time, B. C. 306, his reign in Asia, and that of Ptolemy in Egypt, and of the other captains of Alexander in their respective governments, properly commence.

Irritated at the hostile conduct of Ptolemy, Antigonus prepared a numerous army and a formidable fleet, and having taken the command of the army, he gave the command of the fleet to Demetrius, and hastened to attack him in his own dominions. After enduring the severest hardships, they met in the vicinity of Mount Cassius; but Ptolemy acted with such valour and address that Demetrius could gain no advantage over him; and after several fruitless attempts, he abandoned the undertaking. He next attempted the reduction of Rhodes, but meeting with obstinate resistance, he was obliged to make a treaty upon the best terms that he could, having been called to join Antigonus against Cassander, who at this time had formed a confederacy with Seleucus and Lysimachus. When Demetrius united his forces with those of Antigonus, they advanced to Phrygia, and having met the enemy at Ipsus, a decisive battle was fought, in which Antigonus fell, in the 84th year of his age, B. C. 301.

Ardent in his passions, Antigonus frequently used improper means for their gratification; but as a soldier he was sagacious, active, brave, and fortunate. An insatiable ambition, however, the general passion of great men, proved a strong stimulus to all his actions; but with these blemishes better qualities were blended in his character. The violence and temerity of youth were tempered by the clemency and moderation of advanced life, and he endeavoured to conciliate the affections of those whom force had subjected to his power. In matters of private concern he was strictly just; for when his brother wished him to listen to a cause in private where he was concerned, he exclaimed, "No, my dear brother, I will hear it in the open court of justice, because I mean to do justice." When flattered with the title of god, he replied, "My chamberlain well knows the contrary;" and similar philosophical sentiments would frequently drop from his lips. He apologized for the rigour of his taxes by saying, "Alexander reaped Asia, but I only glean it." He shone with peculiar lustre in domestic retirement. Notwithstanding the strong ambition of his son Demetrius, he continued in perfect harmony both with him and all his family. The son had a full share of the authority of the father; and one day saluting his son upon his return from hunting in the presence of some ambassadors, he desired them to tell their masters upon what terms he lived with his son. (*Gen. Biog.*).

ANTIGONUS *Gonatus*, son of Demetrius Poliorcetes, was the grandson of the former Antigonus. His character was eminently distinguished by humanity and mildness of disposition. When he besieged Thebes under the command of his father, he strongly remonstrated against the loss of so many lives for such an insignificant object. Filial affection was so powerful in his mind, that when his father was taken prisoner by Seleucus, he generously offered himself in his stead, and being rejected, he wore deep mourning, and refrained from all festivals and amusements during his father's imprisonment. Informed of his death, all the floods of sorrow burst from his tender heart, and sailing with a fleet to meet his ashes, he received them with all the demonstrations of filial sensibility and dutiful respect. By the death of his father he became master of all the European dominions of Demetrius, together with the kingdom of Macedon and various other cities in Greece. The Gauls invading his country, he defeated and expelled them, but was soon after routed by Pyrrhus king of Epirus. Some time after, however, Pyrrhus was slain at Argos; and when his head was brought him by his son, he expressed the highest displeasure, and throwing his robe over it, he gave orders to search for his body, and to inter the same with all funeral honours. With singular kindness, also, he treated Helenus, the son of that unfortunate king, who fell into his hands by the fortune of war. Antigonus || Antigua.

In the evening of his reign, he so cultivated the arts of peace, and so conciliated the minds of his subjects, that he secured their affections both to himself and his descendants. The taking of the citadel of Corinth by intrigue was the meanest action of his reign, but he improved that event in maintaining the freedom of the small states of Greece, and in increasing his own dominions. The Achæans, and Aratus their famous chief, vigorously opposed his measures, and at length recovered Corinth; but Antigonus was so inclined to peace, that notwithstanding this event, he pursued his wonted plan, and left his kingdom in peace about the 80th year of his life, and the 44th of his reign, B. C. 243; and Demetrius II. his son, next ascended the throne. (*Gen. Biog.*).

ANTIGRAPHUS, in antiquity, an officer of Athens, who kept a counterpart of the apodecti, or chief treasurer's accounts, to prevent mistakes, and keep them from being falsified.

ANTIGRAPHUS is also used, in middle-age writers, for a secretary or chancellor. He is thus called, according to the old glossarists, on account of his writing answers to the letters sent to his master. The antigraphus is sometimes also called *archigraphus;* and his dignity *antigraphia* or *archigraphia*.

ANTIGRAPHUS is also used in Isidorus for one of the notes of sentences which is placed with a dot to denote diversity of sense in the translations.

ANTIGRAPHUS is also applied in ecclesiastical writers to an abbreviator of the papal letters. In which sense the word is used by Pope Gregory the Great in his register. Of late days the office of antigraphus consists in making minutes of bulls from the petitions agreed to by his holiness, and renewing the bulls after engrossing.

ANTIGUA, one of the Antilles or Caribbee islands, situated 20 leagues east of St Christopher's, in

Antigua ‖ Antilibanus.

W. Long. 61. 45. and N. Lat. 17. 6. It is about 50 miles in circumference, and is reckoned the largest of all the British leeward islands.

This island having no rivers, and but few springs, or such as are brackish, the inhabitants are obliged to preserve the rain water in cisterns. The air here is not so wholesome as in the neighbouring islands, and it is more subject to hurricanes; but it has excellent harbours, particularly English Harbour, which is capable of receiving the largest man of war in the navy. Here is also a dock yard, supplied with all stores and conveniences for repairing and careening ships. The principal trade, however, is carried on in the harbour of St John's, the capital, situated in the north-west part of the island, and which has water sufficiently deep for merchant vessels. The island contains 59,838 acres of land, of which about 34,000 are appropriated to the growth of sugar, including those which are annexed as pasture grounds. The other staples are cotton, wool, and tobacco.

This island was first attempted to be settled by Sir Thomas Warner, about the same time with St Christopher's and Nevis: but no establishment then took place. It was afterwards granted by Charles II. to Lord Willoughby, then governor of Barbadoes, who settled a colony upon it in the space of a few years. In a short time, but by what means is not evident, it became again the public property. It raises at present about 16,000 hogsheads of sugar, which was at first of a very bad quality, unfit for the English market; but the planters have greatly improved their staple since, and it is now as good as in any of the other islands. It has continued unmolested in all the late wars with France. It is divided into five parishes, St John's Town, Falmouth, Porham, Bridge Town, and St Peter's. According to returns in 1817 the number of white inhabitants was 2102, exclusive of troops, of free people of colour 1747, of free blacks 438, and of slaves 31,452. The slaves had increased 1170 since 1807, when the slave trade was abolished.

ANTIGUGLER, is a crooked tube of metal, so bent as easily to be introduced into the necks of bottles, and used in decanting liquors, without disturbing them. For this purpose the bottle should be a little inclined, and about half a spoonful of the liquor poured out, so as to admit an equal quantity of air; let one end of the bent tube be stopped with the finger, whilst the other is thrust into the body of the liquor near to the bubble of air already admitted. When the finger is taken off, the bottle will have vent, and the liquor will run out steadily and undisturbed.

ANTIHECTICS, in *Pharmacy*, medicines good in hectical disorders.

ANTIHECTICUM POTERII, the name of a medicine formerly much celebrated, but now laid aside in common practice.

ANTILIBANUS, in *Ancient Geography*, a mountain of Cœlosyria, which bounds it on the south, running parallel with Libanus: they both begin a little above the sea, Libanus near Tripolis, Antilibanus at Sidon: and both terminate near the mountains of Arabia, which run to the north of Damascus, and the mountains of Traconitis, and there end in other mountains, (Strabo). The Scripture, making no distinction between Libanus and Antilibanus, calls them by the common name *Lebanon*.

ANTILLES, the French name for the CARIBBEE islands. Antilles ‖ Antimetabole.

ANTILOGARITHM, the complement of the logarithm of a sine, tangent, or secant; or the difference of that logarithm from the logarithm of 90 degrees.

ANTILOGY, in matters of literature, an inconsistency between two or more passages of the same book.

ANTILOPE. See CAPRA.

ANTIMENSIUM, a kind of consecrated table-cloth, occasionally used in the Greek church, in places where there is no proper altar. F. Goar observes, that in regard the Greeks had but few consecrated churches, and that consecrated altars are not things easy to be removed, that church has, for many ages, made use of certain consecrated stuffs or linens, called *antimensia*, to serve the purposes thereof.

ANTIMENSIUM, in the Greek church, answers to the *altare portabile*, or portable altar in the Latin church. They are both only of late invention, though Habertus would have them as old as St Basil. But Durant and Bona do not pretend to find them in any author before the time of Bede and Charlemagne.

Antimensia is also applied to other tables, used in offices of religion, besides those whereon the eucharist is administered: such, e. g. are those whereon the host is exposed, &c. The origin of the antimensia is described by Meursius: when the bishop had consecrated a church, the cloth which had been spread on the ground and over the communion table, was torn in pieces, and distributed among the priests, who carried each a fragment away, to serve to cover the tables in their churches and chapels. Not that it was necessary that such cloths should be laid on all tables; but only on those which either were not consecrated, or at least whose consecration was doubted of.

ANTIMERIA, in *Grammar*, a figure whereby one part of speech is used for another: e. g. *velle suam cuique est*, for *voluntas sua cuique est*; also *populus lātè rex*, for *populus lātè regnans*.

ANTIMERIA, in a more restrained sense, is a figure where the noun is repeated instead of the pronoun. The antimeria is frequent in the Hebrew, and is sometimes retained in our version of the Old Testament accordingly: e. g. *Hear my voice, ye wives of Lamech*, for *my wives*, Gen. iv. 23.

ANTIMETABOLE, in *Rhetoric*, a figure which sets two things in opposition to each other. The word is Greek, compounded of ἀντὶ *against*, and μεταβολὴ from μεταβαλλω, I *shift* or *transfer*, i. e. shifting, or setting two things over-against each other. This figure is twice exemplified in an apophthegm of Musonius; which, on account of its excellence, is called *aureum monitum*, the golden maxim or precept.

Αν τι πραξης καλον μετα πονε, ομεν πονος οιχεται, το δε καλον μενει.

Αν τι ποιησης αισχρον μετα ηδονης, το μεν ηδυ οιχεται, το δε αισχρον μενει.

In English thus:

"Allowing the performance of an honourable action to be attended with labour; the labour is soon over, but the honour immortal: whereas, should even pleasure wait on the commission of what is dishonourable, the pleasure is soon gone, but the dishonour eternal."

ANTIMETATHESIS,

Antimetathesis ‖ Antimony.

ANTIMETATHESIS, in *Rhetoric*, is the inversion of the parts or members of an antithesis. Such is that of Cicero in Verrem, lib. iv. cap. 52. "Compare this peace with that war; the arrival of this governor with the victory of that general; his profligate troops with the invincible army of the other; the luxury of the former with the temperance of the latter: you will say, that Syracuse was founded by him who took it; and taken by him, who held it when founded."

ANTIMONARCHICAL, an appellation given to whatever opposes monarchical government.

ANTIMONIALS, in *Medicine*, preparations of antimony. See PHARMACY.

ANTIMONY, a blackish mineral substance, staining the hands, full of long, shining, needle-like striæ, hard, brittle, and considerably heavy. It is found in different parts of Europe, as Bohemia, Saxony, Transylvania, Hungary, France, and England; commonly in mines by itself, intermixed with earth and stony matters. Sometimes it is blended with the richer ores of silver, and renders the extraction of that metal difficult by volatilizing a part of the silver, or, in the language of the miners, *robbing the ore*. See METALLURGY, for the different operations.

Antimony is the *stibium* of the ancients; by the Greeks called στιμμι. The reason of its modern denomination, *antimony*, is usually referred to Basil Valentine, a German monk; who, as the tradition relates, having thrown some of it to the hogs, observed, that after purging them violently, they immediately grew fat upon it. This made him think, that by giving his fellow monks a like dose, they would be the better for it. The experiment, however, succeeded so ill, that they all died of it: and the medicine thenceforward was called *antimony*, q. d. *anti-monk*.

Uses. Antimony at first was of service only in the composition of paint. Scripture describes it to us as a sort of paint, with which the women blackened their eyebrows. Jezebel, understanding that Jehu was to enter Samaria, painted her eyes with antimony; or, according to the Hebrew, "put her eyes in antimony." As large black eyes were thought the finest, they of both sexes, who were careful of their beauty, rubbed their eyes, eyelids, and round their eyes, with a needle dipped in a box of paint made of antimony, with a design of blackening them.—At this day, the women of Syria, Arabia, and Babylonia, anoint and blacken themselves about the eyes; and both men and women put black upon their eyes in the desert, to preserve them from the heat of the sun and the piercing of its rays. M. Darvieux tells us, that the Arabian women border their eyes with a black colour made of tutty, which the Arabians call *rebel*. They draw a line of this kind of blacking without the corner of their eyes, to make them appear larger. Isaiah, in his enumeration of the several ornaments belonging to the daughters of Sion, has not forgot the needles which they made use of in painting their eyes and eyelids. Nor has this practice escaped the lash of Juvenal:

> *Ille supercilium madida fuligine tinctum*
> *Obliqua producit acu, pingitque trementes*
> *Attollens oculos.*

Ezekiel, discovering the irregularities of the Jewish nation under the idea of a debauched woman, says, that she bathed and perfumed herself, and that she anointed her eyes with antimony. Job shows sufficiently how much antimony was in esteem, by calling one of his daughters a vessel of antimony, or a box to put paint in, *cornu stibii*. The author of the book of Enoch says, that before the deluge the angel Azlcel taught young women the art of painting themselves. Antimony.

Tertullian and St Cyprian have declaimed very warmly against this custom of painting the eyes and eyebrows, which was much practised in Africa even by the men: *Inunge oculos tuos non stibio diaboli, sed collyrio Christi*, says St Cyprian. Pliny, speaking of the Roman ladies, says, that they painted their very eyes: *Tanta est decoris affectatio, ut tingantur oculi quoque*. Sardanapalus painted his eyes and eyebrows. Josephus reproaches the seditious with the same, who assumed the name of zealots, and made themselves masters of the temple of Jerusalem.

The modern uses of antimony are very numerous and important. It is a common ingredient in specula or burning concaves, serving to give the composition a finer texture. It makes a part in bell metal, and renders the sound more clear. It is mingled with tin, to make it more hard, white, and sounding; and with lead, in the casting of printers letters, to render them more smooth and firm. It is also a general help in the melting of metals, and especially in casting of cannon-balls. It is likewise made use of for purifying and heightening the colour of gold. See CHEMISTRY *Index*.

For a long time this mineral was esteemed poisonous. In 1566, its use was prohibited in France by an edict of parliament; and in 1609, one Besnier was expelled the faculty for having given it. The edict was repealed in 1650; antimony having a few years before been received into the number of purgatives. In 1668, a new edict came forth, forbidding its use by any but doctors of the faculty. It is now universally allowed, that pure antimony in its crude state has no noxious quality, and that though many of its preparations are most virulently emetic and cathartic, yet, by a slight alteration or addition, they lose their virulence, and become mild in their operation.

The virtues of antimony in the diseases of animals are greatly extolled. Pigs that have the measles are at all times recovered by it, which proves it a great purifier of the blood. Horses who have running heels that cannot be cured by the common methods used by the farriers, will generally be cured by this medicine in a little time. The manner of using it is this: Mix one drachm with every feeding of oats which the horse has in a morning. It is best put together in one place, buried under a few oats; and the horse's head being withheld a little, and then let go just against that place, he will take it all in at a mouthful. Some horses do not dislike it: others obstinately refuse it, but to these it may be easily given in balls. The virtues of this drug in fattening cattle have been thought imaginary, but experiment proves it to be a real truth. A horse that is lean and scabby, and not to be fatted by any other means, will become fat on taking a dose of antimony every morning for two months together. A boar fed for brawn, and having an ounce of antimony

Antimony || Antioch.

mony given him every morning, will become fat a fortnight sooner than others put into the stye at the same time, and fed in the same manner, but without the antimony.

ANTINOE. See ENFINE.

ANTINOEIA, in antiquity, annual sacrifices, and quinquennial games, in memory of Antinous the Bithynian. They were instituted at the command of Adrian, the Roman emperor, at Mantinea, in Arcadia, where Antinous was honoured with a temple and divine worship.

ANTINOMIANS, in ecclesiastical history, certain heretics who maintain the law of no use or obligation under the gospel-dispensation, or who hold doctrines that clearly supersede the necessity of good works and a virtuous life. The Antinomians took their origin from John Agricola about the year 1538; who taught that the law is no ways necessary under the gospel; that good works do not promote our salvation, nor ill ones hinder it; that repentance is not to be preached from the decalogue, but only from the gospel.

This sect sprung up in England during the protectorate of Oliver Cromwell, and extended their system of libertinism much farther than Agricola the disciple of Luther. Some of their teachers expressly maintained, that as the elect cannot fall from grace, nor forfeit the Divine favour, the wicked actions they commit are not really sinful, nor are to be considered as instances of their violation of the divine law; and that consequently they have no occasion either to confess their sins, or to break them off by repentance. According to them, it is one of the essential and distinctive characters of the elect, that they cannot do any thing which is either displeasing to God or prohibited by the law.—Luther, Rutherford, Schlusselburg, Sedgwick, Gataker, Witsius, Bull, Williams, &c. have written refutations; Crisp, Richardson, Saltmarsh, &c. defences, of the Antinomians; Wigandus, a comparison between ancient and modern Antinomians.

The doctrine of Agricola was in itself obscure, and perhaps represented worse than it really was by Luther, who wrote with acrimony against him, and first styled him and his followers *Antinomians*. Agricola stood on his own defence, and complained that opinions were imputed to him which he did not hold. Nicholas Amsdorf fell under the same odious name and imputation, and seems to have been treated more unfairly than even Agricola himself. It is rather hard to charge upon a man all the opinions that may be inferred from things that have hastily dropped from him, when he himself disavows such inferences.

ANTINOUS, the favourite of Adrian, was born at Bithynus in Bithynia. His beauty engaged the heart of Adrian in such a manner, that there never was a more boundless and extravagant passion than that of this emperor towards this youth. After his death, the emperor ordered divine honours to be paid him; and he also erected a city of his name. See ENFINE.

ANTIOCH, a city of Syria, in Asia, situated on the river Orontes, in E. Long. 36. 5. N. Lat. 36. 10. It was built by Seleucus Nicator, founder of the Syro-Macedonian empire, who made it his capital. It stood on the above-mentioned river, about 20 miles from the place where it empties itself into the Mediterranean; being equally distant from Constantinople and Alexandria in Egypt, that is, about 700 miles from each. Seleucus called it *Antioch*, from his father's name, according to some; or from that of his son, according to others. He built 16 other cities bearing the same name; of which one, situated in Pisidia, is probably that where the name of *Christians* was first given to the followers of Jesus Christ. But that situated on the Orontes by far eclipsed, not only all the others of this name, but all the cities built by Seleucus. Antigonus, not long before, had founded a city in that neighbourhood, which from his own name he had called *Antigonia*, and designed it for the capital of his empire: but it was razed to the ground by Seleucus, who employed the materials in building his metropolis, and also transplanted the inhabitants thither. Antioch.

The city of Antioch was afterwards known by the name of *Tetrapolis*, being divided as it were into four cities, each of them being surrounded with its proper wall, besides a common one which enclosed them all. The first of these cities was built by Seleucus Nicator, as already mentioned; the second by those who flocked thither on its being made the capital of the Syro-Macedonian empire; the third by Seleucus Callinicus; and the fourth by Antiochus Epiphanes.—About four or five miles distant, stood a place called *Daphne*, which was nevertheless reckoned a suburb of Antioch. Here Seleucus planted a grove, and in the middle of it built a temple which he consecrated to Apollo and Diana, making the whole an asylum. To this place the inhabitants of Antioch resorted for their pleasures and diversions; whereby it became at last so infamous, that "to live after the manner of Daphne" was used as a proverb to express the most voluptuous and dissolute way of living. Here Lucius Verus, the colleague of M. Aurelius, chose to take up his residence, instead of marching against the Parthians; while his general Cassius forbade by proclamation any of his soldiers to enter or even go near the place. In short, so remarkable was Daphne of old, that the metropolis itself was distinguished by it, and called *Antioch near Daphne*.

Though Antioch continued to be, as Pliny calls it, the queen of the East, for near 1600 years; yet scarce any city mentioned in history hath undergone such calamities, both from the attacks of its enemies, and its being naturally subject to earthquakes. The first disaster mentioned in history which befel the Antiochians happened about 145 years before Christ. Being at that time very much disaffected to the person and government of Demetrius their king, they were continually raising tumults and seditions; insomuch that he found himself at last obliged to solicit assistance from the Jews; and was furnished by Jonathan, one of the Maccabees, with 3000 men; by which reinforcement, believing himself sufficiently strong to reduce the mutineers by force, he ordered them immediately to deliver up their arms. This unexpected order caused a great uproar in the city. The inhabitants ran to arms, and invested the king's palace, to the number of 120,000, with a design to put him to death. All the Jews hastened to his relief, fell upon the rebels, killed 100,000 of them, and set fire to the city. On the destruction of the Syrian empire by the Romans, Antioch submitted to them as well as the other cities of that kingdom, and continued for a long time under their dominion. About the year 115, in the reign of the

Antioch. the emperor Trajan, it was almost entirely ruined by one of the most dreadful earthquakes mentioned in history. Trajan himself happened to be there at that time, being returned from an expedition against the Parthians; so that the city was then full of troops, and strangers come from all quarters either out of curiosity or upon business and embassies: the calamity was by this means felt almost in every province of the Roman empire. The earthquake was preceded by violent claps of thunder, unusual winds, and a dreadful noise under ground. The shock was so terrible, that great numbers of houses were overturned, and others tossed to and fro like a ship at sea. Those who happened to be in their houses were for the most part buried under their ruins: those who were walking in the streets or in the squares, were, by the violence of the shock, dashed against each other, and most of them either killed or dangerously wounded. This earthquake continued, with some small intermission, for many days and nights; so that vast numbers perished. The most violent shock, according to the Acts of St Ignatius, was on a Sunday, December 23. By this Trajan was much hurt, but escaped through a window. Dion Cassius pretends, that he was taken out of the window by one who exceeded the human size in tallness. The same historian adds, that Mount Lison, which stood at a small distance from the city, bowed its head and threatened to fall down upon it: that other mountains fell; that new rivers appeared, and others that had flowed before forsook their course and vanished. When the earthquake ceased, a woman was heard crying under the ruins; which being immediately removed, she was found with a living child in her arms. Search was made for others; but none was found alive, except one child which continued sucking its dead mother.

No doubt, Trajan, who was an eye-witness of this terrible calamity, would contribute largely towards the re-establishment of Antioch in its ancient splendour. Its good fortune, however, did not continue long; for in 155, it was almost entirely burnt by accidental fire; when it was again restored by Antoninus Pius. In 176 or 177, the inhabitants having sided with Cassius, the above-mentioned Roman general, who had revolted from M. Aurelius, that emperor published a severe edict against them, deprived them of all their privileges, suppressed their public assemblies, and took from them the shows and spectacles to which they were greatly addicted: but his anger being soon appeased, he restored them to their former condition, and even condescended to visit their city. In 194, having sided with Niger against Severus, the latter deprived them of all their privileges, and subjected Antioch as a mere village to Laodicea; but, however, pardoned them the next year, at the entreaties of his eldest son, then a child.

When the power of the Roman empire began to decline, Antioch became the bone of contention between them and the eastern nations; and, accordingly, on the breaking out of a Persian war, it was almost always sure to suffer. In 242, it was taken and plundered by Sapor; and, though he was defeated by Gordian, it underwent the same misfortune in the time of Valerian, about 18 years after; and after the defeat and captivity of Valerian, being taken by the Persian monarch a third time, he not only plundered it, but levelled all the public buildings with the ground. The Persians, however, being soon driven out, this unfortunate city continued free from any remarkable calamity till about the time of the division of the Roman empire by Constantine in 331. It was then afflicted with so grievous a famine, that a bushel of wheat was sold for 400 pieces of silver. During this grievous distress, Constantine sent to the bishop 30,000 bushels of corn; besides an incredible quantity of all kinds of provisions, to be distributed among the ecclesiastics, widows, orphans, &c. In the year 347, Constantine II. caused a harbour to be made at Seleucia, for the conveniency of Antioch. This was effected at an immense expence; the mouth of the Orontes, where the port was made, being full of sands and rocks. When the emperor Julian set out on his expedition against the Persians, he made a long stay at Antioch; during which time, many of the Roman provinces were afflicted with a famine, but which raged more violently at Antioch than in other places. The ecclesiastical writers of those times say, that this famine followed Julian from place to place; and as he continued longer at Antioch than any other city, it raged more violently there than anywhere else. To remedy this evil, Julian fixed the price of corn: by which means the famine was greatly increased, the merchants conveying their corn privately to other places, so that this metropolis was reduced to a most deplorable situation. In 381, in the reign of Theodosius the Great, Antioch was again visited by a famine, accompanied by a grievous plague. The latter soon ceased: but, the famine still continuing, the bishop, Libanius, applied to Icarius, count of the East, requesting him by some means or other to relieve the poor, who had flocked from all parts to the metropolis, and were daily perishing in great numbers; but to this Icarius gave no other answer, than that they were abhorred and justly punished by the gods. This inhuman answer raised great disturbances; which, however, were terminated without bloodshed. In 387, Theodosius, finding his exchequer quite drained, and being obliged to be at an extraordinary expence in celebrating the fifth year of the reign of his son Arcadius, and the tenth of his own, an extraordinary tax was laid upon all the people in the empire. Most of the cities submitted willingly to this: but the people of Antioch, complaining of it as an unreasonable oppression, crowded to the house of Flavianus, their bishop, as soon as the edict was published, to implore his protection. Being unable to find him, they returned to the forum; and would have torn the governor in pieces, had not the officers who attended him kept back with great difficulty the enraged multitude, till he made his escape. Upon this, they broke some of the emperor's statues, and dragged others through the city, uttering the most injurious and abusive expressions against him and his whole family. They were, however, dispersed by a body of archers, who, by wounding only two of the rabble, struck terror into all the rest. The governor proceeded against the offenders with the utmost cruelty; exposing some to wild beasts in the theatre, and burning others alive. He did not spare even the children, who had insulted the emperor's statues; and caused several persons to be executed, who had been only spectators of the disorder. In the mean time a report was spread, that a body of troops was at hand, with orders to plunder the Antioch.

city

Antioch. city, and put all to the sword, without distinction of sex or age; upon which the citizens abandoned their dwellings in the utmost terror and confusion, retiring to the neighbouring mountains with their wives and families. As the report proved groundless, some of them returned; but the greater part dreading the cruelty of the governor, and the displeasure of the emperor, continued in their retreats. To those who returned, St Chrysostom preached some homilies, which have reached our times, and are greatly admired; and which are said by St Chrysostom himself, as well as some cotemporary writers, to have had a considerable effect in reforming the lives of this licentious and dissolute people. On hearing the news of this tumult, Theodosius was so much enraged, that he commanded the city to be destroyed, and its inhabitants to be put to the sword without distinction; but this order was revoked before it could be put into execution, and he contented himself with a punishment similar to that inflicted by Severus above mentioned. He appointed judges to punish the offenders; who proceeded with such severity, and condemned such numbers, that the city was thrown into the utmost consternation. On this occasion St Chrysostom and the hermits, who were very numerous in the neighbourhood, exerted all their eloquence in behalf of the unhappy people, and obtained a respite for those who had been condemned. They next proceeded to draw up a memorial to the emperor in favour of the citizens in general; and being joined by Flavianus, at last obtained a general pardon, and had the city restored to all its former privileges.

In the year 458, Antioch was almost entirely ruined by an earthquake, which happened on the 14th of September; scarce a single house being left standing in the most beautiful quarter of the city. The like misfortune it experienced in 529, during the reign of the emperor Justin; and in 15 years after, being taken by Cosrhoes king of Persia, that insulting and haughty monarch gave it up to his soldiers, who put all they met to the sword. The king himself seized on all the gold and silver vessels belonging to the great church; and caused all the valuable statues, pictures, &c. to be taken down and conveyed to Persia, while his soldiers carried off every thing else. The city being thus completely plundered, Cosrhoes ordered his men to set fire to it; which was accordingly done so effectually, that none of the buildings even without the walls escaped. Such of the inhabitants as escaped slaughter were carried into Persia and sold as slaves.

Notwithstanding so many and so great calamities, the city of Antioch soon recovered its wonted splendour; but in a short time underwent its usual fate, being almost entirely destroyed by an earthquake in 587, by which 30,000 persons lost their lives. In 634, it fell into the hands of the Saracens, who kept possession of it till the year 858, when it was surprised by one Burtzas, and again annexed to the Roman empire. The Romans continued masters of it for some time, till the civil dissensions in the empire gave the Turks an opportunity of seizing upon it as well as the whole kingdom of Syria. From them it was again taken by the Crusaders in 1098. In 1262, it was again taken by Bibaris sultan of Egypt, who put a final period to its glory.

Antioch, now called *Antakia*, is a ruinous town, whose houses, built with mud and straw, and narrow and miry streets, exhibit every appearance of misery and wretchedness. These houses are situated on the southern bank of the Orontes, at the extremity of an old decayed bridge: they are covered to the south by a mountain; upon the slope of which is a wall, built by the Crusaders. The distance between the present town and this mountain may he about 400 yards, which space is occupied by gardens and heaps of rubbish, but presents nothing interesting. Antioch ‖ Antiochia

Notwithstanding the unpolished manners of its inhabitants, Antioch was better calculated than Aleppo to be the emporium of the Europeans. By clearing the mouth of the Orontes, which is six leagues lower down, boats might have been towed up that river, though they could not have sailed up, as Pococke has asserted; its current being too rapid. The natives, who never knew the name Orontes, call it, on account of the swiftness of its stream, *El aasi*, that is, the rebel. Its breadth at Antioch, is about forty paces. Seven leagues above that town it passes by a lake abounding in fish, and especially in eels. A great quantity of these are salted every year, but not sufficient for the numerous fasts of the Greek Christians. It is to be remembered, we no longer hear at Antioch, either of the Grove, or Daphne, or of the voluptuous scenes of which it was the theatre.

The plain of Antioch, though the soil of it is excellent, is uncultivated, and abandoned to the Turcomans; but the hills on the side of the Orontes, particularly opposite Serkin, abound in plantations of figs and olives, vines, and mulberry trees, which, a thing uncommon in Turkey, are planted in quincunx, and exhibit a landscape worthy our finest provinces.

Seleucus Nicator, who founded Antioch, built also at the mouth of the Orontes, on the northern bank, a large and well fortified city, which bore his name, but of which at present not a single habitation remains; nothing is to be seen but heaps of rubbish, and works in the adjacent rock, which prove that this was once a place of very considerable importance. In the sea also may be perceived the traces of two piers, which are indications of an ancient port, now choked up. The inhabitants of the country go thither to fish, and call the name of the place *Souaidia*.

ANTIOCHETTA, a town of Turkey in Asia, in Caramania, with a bishop's see, over against the island of Cyprus. E. Long. 32. 15. N. Lat. 36. 20.

ANTIOCHIA, in *Ancient Geography*, a town of Assyria, situated between the rivers Tigris and Tornadotus (Pliny).—Another of Caria, on the Meander; called also *Pythopolis*, *Athymbra*, and *Nyssa*, or *Nysa*, (Stephanus): but Strabo says, that Nysa was near Tralles.—A third of Cilicia Trachea, on Mount Cragus (Ptolemy).—A fourth called *Epidaphnes*, the capital of Syria, distinguished from cities of the same name, either by its situation on the Orontes, by which it was divided, or by its proximity to Daphne (see ANTIOCH).—A fifth Antiochia, a town of Comagene, on the Euphrates (Pliny).—A sixth of Lydia *Tralles*, so called (Pliny).—A seventh, of Margiana (Strabo, Pliny, Ptolemy), on the river Margus, taking its name from Antiochus, son of Seleucus, who rebuilt it, and walled it round, being before called *Alexandria*,

Antiochia ‖ Antiparos.

from Alexander the founder, and surnamed Syria; in compass seventy stadia; whither Orodes carried the Romans, after the defeat of Crassus (Pliny).—An eighth, in Mesopotomia, on the lake Calirrhoe, the old name of Edessa (Pliny).—A ninth Antiochia, on the river Mygdonius, in Mesopotomia, situated at the foot of Mount Masius, and is the same with Nisibis (Strabo, Plutarch). It was the bulwark and frontier town of the Romans against the Parthians and Persians, till given up to the Persians, by Jovinian, by an ignominious peace (Ammian, Eutropius).—A tenth Antiochia, was that situated in the north of Pisidia (Luke, Ptolemy, Strabo): it was a Roman colony, with the appellation *Cæsarea*. There is an Antiochia at Mount Taurus, mentioned by Ptolemy, but by no other author.

ANTIOCHIAN SECT or *Academy*, a name given to the fifth academy, or branch of Academies. It took the denomination from its being founded by Antiochus, a philosopher contemporary with Cicero.—The Antiochian academy succeeded the Philonian. As to point of doctrine, the philosophers of this sect appear to have restored that of the ancient academy, except that in the article of the criterion of truth. Antiochus was really a Stoic, and only nominally an Academic.

Antiochian Epocha, a method of computing time from the proclamation of liberty granted the city of Antioch about the time of the battle of Pharsalia.

ANTIOCHUS, the name of several kings of Syria. See that article.

Antiochus of *Ascalon*, a celebrated philosopher, the disciple of Philo of Larissa, the master of Cicero, and the friend of Lucullus and Brutus. He was founder of a fifth academy: but, instead of attacking other sects, he set himself down to reconcile them together, particularly the sect of the Stoics with that of the ancient academy.

ANTIOPE, in fabulous history, the wife of Licus, king of Thebes, who, being deflowered by Jupiter in the form of a satyr, brought forth Amphion and Zethus.—Another Antiope was queen of the Amazons; and, with the assistance of the Scythians, invaded the Athenians; and was vanquished by Theseus.

ANTIPÆDOBAPTISTS, (derived from αντι, *against*, παις, παιδος, *child*, and βαπτιζω, *baptize*, whence βαπτιστης), is a distinguishing denomination given to those who object to the baptism of infants; because they say infants are incapable of being instructed, and of making that profession of faith which entitles them to this ordinance, and an admission into church communion. See Anabaptists and Baptists.

ANTIPAROS, an island in the Archipelago, opposite to Paros, from which it is separated by a strait about seven miles over. It is the *Oleares* or *Oliaros*, mentioned by Strabo, Pliny, Virgil, Ovid, &c.; and was, according to Heraclides Ponticus, as quoted by Stephanus, first peopled by a Phœnician colony from Sidon. According to Mr Tournefort's account, it is about 16 miles in circumference, produces a little wine and cotton, with as much corn as is necessary for the maintenance of 60 or 70 families, who live together in a village at one end of the island, and are mostly Maltese and French corsairs.

The island is remarkable for a subterraneous cavern or grotto, accounted one of the greatest natural curiosities in the world. It was first discovered in the last century by one Magni an Italian traveller, who has given us the following account: "Having been informed (says he) by the natives of Paros, that in the little island of Antiparos, which lies about two miles from the former, a gigantic statue was to be seen at the mouth of a cavern in that place, it was resolved that we (the French consul and himself) should pay it a visit. In pursuance of this resolution, after we had landed on the island, and walked about four miles through the midst of beautiful plains and sloping woodlands, we at length came to a little hill, in the side of which yawned a most horrid cavern, that, with its gloom, at first struck us with terror, and almost repressed curiosity. Recovering the first surprise, however, we entered boldly; and had not proceeded above 20 paces, when the supposed statue of the giant presented itself to our view. We quickly perceived, that what the ignorant natives had been terrified at as a giant, was nothing more than a sparry concretion, formed by the water dropping from the roof of the cave, and by degrees hardening into a figure that their fears had formed into a monster. Incited by this extraordinary appearance, we were induced to proceed still further, in quest of new adventures in this subterranean abode. As we proceeded, new wonders offered themselves; the spars, formed into trees and shrubs, presented a kind of petrified grove; some white, some green; and all receding in due perspective. They struck us with the more amazement, as we knew them to be mere productions of nature, who, hitherto in solitude, had, in her playful moments, dressed the scene as if for her own amusement.

Antiparos.

"But we had as yet seen but a few of the wonders of the place, and we were introduced as yet only into the portico of this amazing temple. In one corner of this half-illuminated recess, there appeared an opening of about three feet wide, which seemed to lead to a place totally dark, and that one of the natives assured us contained nothing more than a reservoir of water. Upon this we tried, by throwing down some stones, which rumbling along the sides of the descent for some time, the sound seemed at last quashed in a bed of water. In order, however, to be more certain, we sent in a Levantine mariner, who, by the promise of a good reward, with a flambeau in his hand, ventured into this narrow aperture. After continuing within it for about a quarter of an hour, he returned, carrying some beautiful pieces of white spar in his hand, which art could neither imitate nor equal. Upon being informed by him that the place was full of these beautiful incrustations, I ventured in once more with him, for about 50 paces, anxiously and cautiously descending by a steep and dangerous way. Finding, however, that we came to a precipice which led into a spacious amphitheatre, if I may so call it, still deeper than any other part, we returned; and being provided with a ladder, flambeaux, and other things to expedite our descent, our whole company, man by man, ventured into the same opening, and, descending one after another, we at last saw ourselves all together in the most magnificent part of the cavern.

"Our candles being now all lighted up, and the whole place completely illuminated, never could the eye be presented with a more glittering or a more magnifi-

Antiparos. cent scene. The roof all hung with solid icicles, transparent as glass, yet solid as marble. The eye could scarce reach the lofty and noble ceiling; the sides were regularly formed with spars; and the whole presented the idea of a magnificent theatre, illuminated with an immense profusion of lights. The floor consisted of solid marble; and in several places, magnificent columns, thrones, altars, and other objects, appeared, as if nature had designed to mock the curiosities of art. Our voices, upon speaking or singing, were redoubled to an astonishing loudness; and upon the firing of a gun, the noise and reverberations were almost deafening. In the midst of this grand amphitheatre rose a concretion of about 15 feet high, that, in some measure, resembled an altar; from which, taking the hint, we caused mass to be celebrated there. The beautiful columns that shot up round the altar, appeared like candlesticks; and many other natural objects represented the customary ornaments of this sacrament.

"Below even this spacious grotto, there seemed another cavern; down which I ventured with my former mariner, and descended about 50 paces by means of a rope. I at last arrived at a small spot of level ground, where the bottom appeared different from that of the amphitheatre, being composed of soft clay, yielding to the pressure, and in which I thrust a stick to about six feet deep. In this, however, as above, numbers of the most beautiful crystals were formed; one of which, particularly resembled a table. Upon our egress from this amazing cavern, we perceived a Greek inscription upon a rock at the mouth; but so obliterated by time, that we could not read it. It seemed to import, that one Antipater, in the time of Alexander, had come thither; but whether he penetrated into the depths of the cavern, he does not think fit to inform us."

From this account Mr Tournefort's differs considerably. Mr Magni mentions only one descent or precipice from the entry of the cave to the grotto, or most magnificent part; Mr Tournefort says that there were many very dangerous precipices and rugged ways, through which they were obliged to pass sometimes on their back, and sometimes on their belly, but gives no particular account of his journey till he come to the grand cavern. This indeed he describes very pompously; but as by it he evidently wants to support a favourite hypothesis, namely, the vegetation of stones, perhaps the particulars are not altogether to be depended upon. He informs us, that, at the entry into the cavern, he met with a Greek inscription almost effaced, containing a good number of proper names; and that there was a tradition among the inhabitants, that these were the names of those who had conspired against Alexander the Great, and having missed their aim, had taken refuge in this grotto.

The most particular account, however, of this famous grotto that hath hitherto been published, appeared in the British Magazine, in a letter signed *Charles Saunders*, and dated Feb. 24. 1746-7; which, as it is very particular, and seems to bear sufficient marks of authenticity, we shall here insert. "Its entrance lies in the side of a rock, about two miles from the seashore; and is a spacious and very large arch, formed of rough craggy rocks, overhung with brambles and a great many climbing plants, that give it a gloominess which is very awful and agreeable. Our surgeon, myself, and four passengers, attended by six guides with lighted torches, entered this cavern about eight o'clock in the morning in the middle of August last. We had not gone 20 yards in this cavity when we lost all sight of day light: but our guides going before us with light, we entered into a low narrow kind of alley, surrounded every way with stones all glittering like diamonds by the light of our torches; the whole being covered and lined throughout with small crystals, which gave a thousand various colours by their different reflections. The alley grows lower and narrower as one goes on, till at length one can scarce get along it. At the end of this passage we were each of us presented with a rope, to tie about our middles; which when we had done, our guides led us to the brink of a most horrible precipice. The descent into this was quite steep, and the place all dark and gloomy. We could see nothing, in short, but some of our guides with torches in a miserable dark place, at a vast distance below us. The dreadful depth of this place, and the horror of the descent through a miserable darkness into it, made me look back to the lane of diamonds, if I may so call it, through which we had just passed; and I could not but think I was leaving heaven, to descend into the infernal regions. The hope of something fine at my journey's end tempted me, however, to trust myself to the rope and my guides at the top, to let myself down. After about two minutes dangling in this posture, not without much pain as well as terror, I found myself safe, however, at the bottom; and our friends all soon followed the example. When we had congratulated here with one another on our safe descent; I was inquiring where the grotto, as they called it, was. Our guides, shaking their heads, told us, we had a great way to that yet: and led us forward about 30 yards under a roof of ragged rocks, in a scene of terrible darkness, and at a vast depth from the surface of the earth, to the brink of another precipice much deeper and more terrible than the former. Two of the guides went down here with their torches first; and by their light we could see, that this passage was not so perpendicular indeed as the other, but lay in a very steep slant, with a very slippery rock for the bottom; vast pieces of rough rugged rocks jutting out in many places on the right hand, in the descent, and forcing the guides sometimes to climb over, sometimes to creep under them, and sometimes to round them; and on the left, a thousand dark caverns, like so many monstrous wells, ready, if a foot should slip, to swallow them up for ever. We stood on the edge to see these people with their lights descend before us; and were amazed and terrified to see them continue descending till they seemed at a monstrous and most frightful depth. When they were at the bottom, however, they hollaed to us; and we, trembling and quaking, began to descend after them. We had not gone 30 feet down, when we came to a place where the rock was perfectly perpendicular; and a vast cavern seemed to open its mouth to swallow us up on one side, while a wall of rugged rock threatened to tear us to pieces on the other. I was quite disheartened at this terrible prospect, and declared I would go back; but our guides assured us there was no danger; and the rest of the company resolving to see the bottom now they were come so far, I would not leave them: so on we went to a corner where there

Antiparos.

Antiparos. there was placed an old slippery and rotten ladder, which hung down close to the rock; and down this, one after another, we at length all descended. When we had got to the bottom of this, we found ourselves at the entrance of another passage, which was terrible enough indeed; but in this there was not wanting something of beauty. This was a wide and gradual descent; at the entrance of which one of our guides seated himself on his breech, and began to slide down, telling us we must do the same. We could discover, by the light of his torch, that this passage was one of the noblest vaults in the world. It is about nine feet high, seven wide, and has for its bottom a fine green glossy marble. The walls and arch of the roof of this being as smooth and even in most places as if wrought by art, and made of a fine glistering red and white granite, supported here and there with columns of a deep blood-red shining porphyry, made, with the reflection of the lights, an appearance not to be conceived. This passage is at least 40 yards long; and of so steep a descent, that one has enough to do, when seated on one's breech not to descend too quickly. Our guides, that we kept with us, could here keep on each side of us; and, what with the prodigious grandeur and beauty of the place, our easy travelling through it, and the diversion of our now and then running over one another whether we would or not; this was much the pleasantest part of our journey. When we had entered this passage, I imagined we should at the bottom join the two guides we had first set down; but alas! when we were got there we found ourselves only at the mouth of another precipice, down which we descended by a second ladder not much better than the former. I could have admired this place also, would my terror have suffered me; but the dread of falling, kept all my thoughts employed during my descent. I could not but observe, however, as my companions were coming down after me, that the wall, if I may so call it, which the ladder hung by, was one mass of blood-red marble, covered with white sprigs of rock crystal as long as my finger, and making, with the glow of the purple from behind, one continued immense sheet of amethysts. From the foot of this ladder we slided on our bellies through another shallow vault of polished green and white marble, about 20 feet: and at the bottom of this joined our guides. Here we all got together once again, and drank some rum, to give us courage before we proceeded any farther. After this short refreshment, we proceeded by a strait, but somewhat slanting passage, of a rough, hard, and somewhat coarse stone, full of a thousand strange figures of snakes rolled round, and looking as if alive; hut in reality as cold and hard as the rest of the stone, and nothing but some of the stone itself in that shape. We walked pretty easily along this descent for near 200 yards; where we saw two pillars seemingly made to support the roof from falling in; bnt in reality it was no such thing; for they were very brittle, and made of a fine glittering yellow marble. When we had passed these about 200 yards, we found ourselves at the brink of another very terrible precipice: but this our guides assured us was the last; and there being a very good ladder to go down by, we readily ventured. At the bottom of this steep wall, as I may call it, we found ourselves for some way upon plain even ground; but, after about 40 yards walking, were presented by our guides with ropes again; which Antiparos. we fastened about our middles, though not to be swung down by, but only for fear of danger, as there are lakes and deep waters all the way from hence on the left hand. With this caution, however, we entered the last alley: and horrible work it was indeed to get through it. All was perfectly horrid and dismal here. The sides and roof of the passage were all of black stone; and the rocks in our way were in some places so steep, that we were forced to lie all along on our backs, and slide down; and so rough, that they cut our clothes, and bruised us miserably in passing. Over our heads, there was nothing but ragged black rocks, some of them looking as if they were every moment ready to fall in upon us; and, on our left hands, the light of our guides torches shewed us continually the surfaces of dirty and miserably looking lakes of water. If I had heartily repented of my expedition often before, here I assure you I was all in a cold sweat, and fairly gave myself over for lost; heartily cursing all the travellers that had written of this place, that they had described it so as to tempt people to see it, and never told us of the horrors that lay in the way. In the midst of all these reflections, and in the very dismallest part of all the cavern, on a sudden we had lost four of our six guides. What was my terror on this sight! The place was a thousand times darker and more terrible for want of their torches; and I expected no other but every moment to follow them into some of these lakes, into which I doubted not but they were fallen. The remaining two guides said all they could indeed, to cheer us up; and told us we should see the other four again soon, and that we were near the end of our journey. I do not know what effect this might have upon the rest of my companions; but I assure you I believed no part of the speech but the last, which I expected every moment to find fulfilled in some pond or precipice. Our passage was by this time become very narrow, and we were obliged to crawl on all-fours over rugged rocks; when in an instant, and in the midst of these melancholy apprehensions, I heard a little hissing noise, and saw myself in utter, and not to be described, darkness. Our guides called indeed cheerfully to us, and told us that they had accidentally dropped their torches into a puddle of water, but we should soon come to the rest of them, and they would light them again; and told us there was no danger, and we had nothing to do but to crawl forward. I cannot say but I was amazed at the courage of these people; who were in a place where, I thought, four of them had already perished, and from whence we could none of us ever escape; and determined to lie down and die where I was. Words cannot describe the horror or the extreme darkness of the place. One of our guides, however, perceiving that I did not advance, came up to me, and clapping his hand firmly over my eyes, dragged me a few paces forward. While I was in this strange condition, expecting every moment death in a thousand shapes, and trembling to think what the guide meant by this rough proceeding, he lifted me at once over a great stone, set me down on my feet, and took his hand from before my eyes. What words can describe at that instant my astonishment and transport! Instead of darkness and despair, all was splendour and magnificence before me: our guides all appeared about us: the place was illuminated by 50

Antiparos. torches, and the guides all welcomed me into the grotto of Antiparos. The four that were first missing, I now found had only given us the slip, to get the torches lighted up before we came; and the other two had put out their lights on purpose, to make us enter out of utter darkness into this pavilion of splendour and glory. I am now come to the proper business of this letter: which was to describe this grotto. But I must confess to you that words cannot do it. The amazing beauties of the place, the eye that sees them only can conceive. The best account I can give you, however, pray accept of.

"The people told us, the depth of this place was 485 yards; the grotto, in which we now were, is a cavern of 120 yards wide, and 113 long, and seems about 60 yards high in most places. These measures differ something from the accounts travellers in general give us; but you may depend upon them as exact, for I took them with my own hand. Imagine then with yourself, an immense arch like this, almost all over lined with fine and bright crystallized white marble, and illuminated with 50 torches; and you will then have some faint idea of the place I had the pleasure to spend three hours in. This, however, is but a faint description of its beauties. The roof, which is a fine vaulted arch, is hung all over with icicles of white shining marble, some of them ten feet long, and as thick as one's middle at the root; and among these hang a thousand festoons of leaves and flowers, of the same substance; but so very glittering, that there is no bearing to look up at them. The sides of the arch are planted with seeming trees of the same white marble, rising in rows one above another, and often enclosing the points of the icicles. From these trees there are also hung festoons, tied as it were from one to another in vast quantities; and in some places among them there seem rivers of marble winding through them in a thousand meanders. All these things are only made, in a long course of years, from the dropping of water, but really look like trees and brooks turned to marble. The floor we trod upon was rough and uneven, with crystals of all colours growing irregularly out of it, red, blue, green, and some of a pale yellow. These were all shaped like pieces of saltpetre; but so hard, that they cut our shoes; among these, here and there, are placed icicles of the same white shining marble with those above, and seeming to have fallen down from the roof and fixed there; only the big end of these is to the floor. To all these our guides had tied torches, two or three to a pillar, and kept continually beating them, to make them burn bright. You may guess what a glare of splendour and beauty must be the effect of this illumination, among such rocks and columns of marble. All round the lower part of the sides of the arch are a thousand white masses of marble, in the shape of oak trees. Mr Tournefort compares them to cauliflowers, but I should as soon compare them to toadstools. In short, they are large enough to enclose, in many places, a piece of ground big enough for a bedchamber. One of these chambers has a fair white curtain, whiter than satin, of the same marble, stretched all over the front of it. In this we all cut our names, and the date of the year, as a great many people have done before us. In a course of years afterwards, the stone blisters out like this white marble over the letters. Mr Tournefort thinks the rock grows like oaks or apple trees for this reason; but I remember I saw some of the finest cockle and muscle shells, in the rock thereabouts, that ever I saw in my life. I wonder whether he thinks they grow there too. Besides, if this rock grows so fast, the cavern ought to be all grown up by this time; and yet, according to his measures and mine, the cavern seems on the other hand to be turned larger since. Indeed, all that I can gather from his account of this glorious place is, that he had drank a bottle or two too much before he went down into it."

Antiparos, Antipas.

ANTIPAS HEROD, or HEROD-ANTIPAS, the son of HEROD the Great, by one of his wives called Cleopatra, a native of Jerusalem. Herod the Great, in his first will, appointed Antipas his successor in the kingdom; but afterwards, altering that will, he named his son Archelaus his successor, giving to Antipas the title only of tetrarch of Galilee and Peræa.

Antipas took a great deal of pains in adorning and fortifying the principal places of his dominions. He married the daughter of Aretas king of Arabia; whom he divorced about the year of Christ 33, to marry his sister-in-law Herodias, wife to his brother Philip, who was still living. St John the Baptist exclaiming continually against this incest, was taken into custody by order of Antipas, and imprisoned in the castle of Machærus, (Mat. xiv. 3, 4. Mark i. 14. vi. 17, 18. Luke iii. 19, 20.). Josephus says, that Antipas caused St John to be laid hold of, because he drew too great a concourse of people after him; and that he was afraid lest he should make use of the authority which he had acquired over the minds and affections of the people, to induce them to revolt. But the evangelists, who were better informed than Josephus, as being eye witnesses of what passed, and acquainted in a particular manner with St John and his disciples, assure us that the true reason of imprisoning St John was the aversion which Herod and Herodias had conceived against him for the liberty he had used in censuring their scandalous marriage. The virtue and holiness of St John were such, that even Herod feared and respected him; but his passion for Herodias had prevailed with him to have killed that prophet, had he not been restrained by his apprehensions of the people, who esteemed John the Baptist as a prophet. (Mat. xiv. 5, 6.). One day, however, while the king was celebrating the festival of his birth, with the principal persons of his court, the daughter of Herodias danced before him; and pleased him so well, that he promised with an oath to give her whatever she should ask of him. By her mother's advice she asked the head of John the Baptist: upon which the king commanded John to be beheaded in prison, and the head to be given her. Aretas, king of Arabia, to revenge the affront which Herod had offered to his daughter, declared war against him, and overcame him in a very obstinate engagement. Herod being afterwards detected as a party in Sejanus's conspiracy, was banished by the emperor Caius to Lyons in Gaul; whither Herodias accompanied him.

This Antipas is the Herod who, being at Jerusalem at the time of our Saviour's passion (Luke xxiii. 11.), ridiculed him, by dressing him in a white robe, and directing him to be conducted back to Pilate, as a mock king, whose ambition gave him no umbrage. The time when Antipas died is not known: however, it is certain

Antipas ‖ ntipathy.

certain he died in exile, as well as Herodias. Josephus says, that he died in Spain, whither Caius upon his coming to Gaul, the first year of his banishment, might order him to be sent.

ANTIPATER, the disciple of Aristotle, and one of Alexander the Great's generals, was a man of great abilities, and a lover of the sciences; but was accused of poisoning Alexander. He subdued the revolted Thracians, relieved Megalopolis, and overthrew the Spartans there. He died 321 years before the Christian era.

ANTIPATER, an Idumean of illustrious birth, and possessed of great riches and abilities, taking advantage of the confusion into which the two brothers Hyrcanus and Aristobulus plunged Judea by their contest for the office of high priest, took such measures as to gain Hyrcanus that office, and under his government to obtain the absolute direction of all affairs; while his great abilities and application to business made him so considerable, that he was honoured as much as if he had been invested with the royal authority in form: but he was at last poisoned by a Jew, named Malachus, 43 years before the Christian era. He left, among his other children, the famous Herod king of the Jews.

ANTIPATER, *Cælius*, a Roman historian, who wrote a history of the Punic war, much valued by Cicero. The emperor Adrian preferred him to Sallust.

ANTIPATER of Sidon, a Stoic philosopher, and likewise a poet, commended by Cicero and Seneca: he flourished about the 171st Olympiad. We have several of his epigrams in the *Anthologia*.

ANTIPATHY, in *Physiology*, is formed from the two Greek words, αντι *contrary*, and παθος *passion*. Literally taken, the word signifies *incompatibility*: but for the most part the term *antipathy* is not used to signify such incompatibilities as are merely physical; it is reserved to express the aversion which an animated or sensitive being feels at the real or ideal presence of particular objects. In this point of view, which is the light in which we at present consider the term, *antipathy*, in common language, signifies "a natural horror and detestation, an insuperable hatred, an involuntary aversion, which a sensitive being feels for some other object, whatever it is, though the person who feels this abhorrence is entirely ignorant of its cause, and can by no means account for it. Such is, they say, the natural and reciprocal hostility between the salamander and the tortoise; between the toad and the weasel; or between sheep and wolves. Such is, the invincible aversion of particular persons against cats, mice, spiders, &c.: a prepossession which is sometimes so violent, as to make them faint at the sight of these animals. Of these and a thousand other antipathies, the ancient naturalists, the schoolmen, and the vulgar, form so many legends; and relate them as certain facts, that they may demand an explication of them from the philosophers. But these sages begin with investigating whether such antipathies actually exist or not.

To explore the matter without prejudice, we shall find it necessary to abstract from the subjects of this disquisition, 1. All such antipathies as are not ascertained; as that which is supposed to be felt by hens at the sound of a harp whose strings are made of a fox's bowels, between the salamander and tortoise, and between the weasel and the toad. Nothing is less confirmed, or rather nothing is more false, than these facts, with which vulgar credulity and astonishment are amused and actuated: and though some of these antipathies should be ascertained, this would be no proof that the animals which feel them are not acquainted with their causes, according to their mode and proportion of knowledge; in which case it will be no longer the antipathy which we have defined. Antipathy.

2. We must abstract those antipathies which can be extinguished or resumed at pleasure; those fictitious aversions, which certain persons feel, or pretend to feel, with affected airs, that they may appear more precise and finical, or singularly and prodigiously elegant; that they may seem to have qualities so exquisitely fine, as require to be treated with peculiar delicacy. One who bestows any attention on the subject, would be astonished to find how many of these chimerical aversions there are, which are pretended, and passed upon the world by those who affect them as natural and unconquerable.

3. When we abstract those aversions the causes of which are known and evident; we shall be surprised after our deduction of those pretended antipathies from the general sum, how small, how inconsiderable, is the quantity of those which are conformable to our definition. Will any one pretend to call by the name of *antipathy*, those real, innate, and incontestable aversions which prevail between sheep and wolves? Their cause is obvious; the wolf devours the sheep, and subsists upon his victims; and every animal naturally flies with terror from pain or destruction; sheep ought therefore to regard wolves with horror, which for their nutrition tear and mangle the unresisting prey. From principles similar to this, arises that aversion which numbers of people feel against serpents; against small animals, such as reptiles in general, and the greatest number of insects. During the credulous and susceptible period of infancy, pains have been taken to impress on our minds the frightful idea that they are venomous; that their bite is mortal; that their sting is dangerous, productive of tormenting inflammations or tumours, and sometimes fatal: they have been represented to us as ugly and sordid; as being, for that reason, pernicious to those who touch them; as poisoning those who have the misfortune to swallow them. These horrible prepossessions are industriously inculcated from our infancy; they are sometimes attended and supported by dismal tales, which are greedily imbibed, and indelibly engraved on our memories. It has been taught us both by precept and example, when others at their approach have assumed in our view the appearance of detestation and even of terror, that we should fly from them, that we should not touch them. Is it then wonderful (if our false impressions as to this subject have been corrected neither by future reflections nor experiments) that we should entertain, during our whole lives, an aversion for these objects, even when we have forgot the admonitions, the conversations, and examples, which have taught us to believe and apprehend them as noxious beings? and in proportion to the sensibility of our frame, in proportion as our nerves are irritable, our emotions at the sight of what we fear will be more violent, especially if they anticipate

our

Antipathy. our expectation, and seize us unprepared, though our ideas of what we have to fear from them are the most confused and indistinct imaginable. To explain these facts, is it necessary to fly to the exploded subterfuge of occult qualities inherent in bodies, to latent relations productive of antipathies, of which no person could ever form an idea?

It is often sufficient to influence a person who had formerly no aversion for an object, if he lives with some other associate who gives himself up to such capricious panics; the habit is insensibly contracted to be agitated with disagreeable emotions at the presence of an object which had been formerly beheld with indifference and cold blood. I was acquainted (says the author of the article *Antipathy* in the French Encyclopédie) with a person of a very sound understanding, whom thunder and lightning by no means terrified; nay, to whom the spectacle appeared magnificent and the sound majestic: yet to a mind thus seemingly fortified against the infectious terror, no more was necessary than spending the summer with a friend in whom the appearance of lightning excited the strongest emotions, and whom the remotest clap of thunder affected with extravagant paroxysms, to become timid in excess at the approach of thunder; nor could he ever afterwards surmount the fear which it inspired. The frightful stories of dogs and cats, which have killed their masters, or which have given them mortal wounds, are more than sufficient to inspire a timorous person with aversion against these animals; and if the olfactory nerves of such a person be delicate, he will immediately discover the smell of them in a chamber: disturbed by the apprehension which these effluvia excite in his mind, he gives himself up to the most violent uneasiness, which is tranquillized when he is assured that the animal is no longer in the room. If by chance, in the search which is made to calm the uneasiness of this timorous person, one of these creatures should at last be discovered, every one presently exclaims, *A miracle;* and admits the reality of *antipathies* into his creed; whilst all this is nothing but the effect of a childish fear, founded on certain confused and exaggerated ideas of the hazard which one may run with these animals. The *antipathy* which some people entertain against eels, though they are eaten by others with pleasure, arises from nothing but the fear of serpents, to which these fishes are in some degree similar. There are likewise other *antipathies* which do not originate in the imagination, but arise from some natural incongruity; such as we often remark in children, for particular kinds of victuals, with which their taste is not offended, but which their stomachs cannot digest, and which are therefore disgorged as soon as swallowed.

To what then are those *antipathies* of which we have heard so much reducible! Either to legendary tales; or to aversions against objects which we believe dangerous; or to a childish terror of imaginary perils; or to a disrelish, of which the cause is disguised; or to a ridiculous affectation of delicacy; or to an infirmity of the stomach; in a word, to a real or pretended reluctance for things which are either invested, or supposed to be invested, with qualities hurtful to us. Too much care cannot be taken in preventing, or regulating, the *antipathies* of children; in familiarizing them with objects of every kind; in discovering to them, without emotion, such as are dangerous; in teaching them the means of defence and security, or the methods of escaping their noxious influence: and, when the rational powers are matured by age, in reflecting on the nature of those objects which we fear, in ascertaining what has been told concerning their qualities, or in vigorously operating upon our own dispositions to overcome those vain repugnancies which we may feel. See SYMPATHY, which is the opposite of *Antipathy*. Antipathy || Antiphony.

ANTIPATHY, in *Ethics*, hatred, aversion, repugnancy. *Hatred* is entertained against persons; *aversion*, and *antipathy* indiscriminately, against persons or things; and *repugnancy* against actions alone.

Hatred is more voluntary than *aversion*, *antipathy*, or *repugnancy*. These last have greater affinity with the animal constitution. The causes of ANTIPATHY are less known than those of *aversion*. *Repugnancy* is less permanent than either the one or the other. We hate a vicious character, we feel *aversion* to its exertions: we are affected with ANTIPATHY for certain persons at first sight; there are some affairs which we transact with *repugnancy*.—*Hatred* calumniates; *aversion* keeps us at a distance from certain persons: ANTIPATHY makes us detest them; *repugnancy* hinders us from imitating them.

ANTIPATRIS (Acts xxiii. 31.), a town of Palestine, anciently called *Caphar Saba*, according to Josephus, but named *Antipatris* by Herod the Great, in honour of his father Antipater. It was situated in a pleasant valley near the mountains, in the way from Jerusalem to Cæsarea. Josephus places it at about the distance of seventeen miles from Joppa.

ANTIPELARGIA, among the ancients, a law, whereby children are obliged to furnish necessaries to their aged parents. The ciconia, or stork, is a bird famous for the care it takes of its parents when grown old. Hence, in some Latin writers, this is rendered *lex ciconiaria*, or the stork's law.

ANTIPHONARY, ANTIPHONARIUM, a service book, which contained all the invitatories, responsories, collects, and whatever else was sung or said in the choir, except the lessons. This is otherwise called *responsarium*, from the responses therein contained. The author of the Roman *antiphonary* was Pope Gregory the Great. We also find mention of nocturnal and diurnal *antiphonaries*, for the use of the daily and nightly offices; summer and winter *antiphonaries;* also *antiphonaries* for country churches, &c. By the provincial constitutions of Archbishop Winchelsey, made at Merton, A. D. 1305, it is required that one of these should be found in every church within the province of Canterbury. The use of these, and many other popish books, was forbid by the 3d and 4th of Edward VI. c. 10.

ANTIPHONY, the answer made by one choir to another, when the psalm or anthem is sung between two.

ANTIPHONY sometimes denotes a species of psalmody, wherein the congregation being divided into two parts, repeat the psalms, verse for verse, alternately. In this sense, antiphony stands contradistinguished from symphony, where the whole congregation sings together.

Antiphony differs from responsorium, because in this latter the verse is only spoken by one person, where-

ntiphony ‖ ntiquare.

as in the former, the verses are sung by the two choirs alternately. The original of antiphonal singing in the western churches is referred to the time of St Ambrose, about the year 374. That father is said to have first introduced it into the church of Milan, in imitation of the custom of the eastern church, where it appears to be of greater antiquity, though as to the time of its institution, authors are not agreed; it was most probably introduced at Antioch, between the year of Christ 347 and 356.

ANTIPHONY is also used to denote the words given out at the beginning of the psalm, to which both the choirs are to accommodate their singing.

ANTIPHONY, in a more modern sense, denotes a kind of composition made of several verses extracted out of different psalms, adapted to express the mystery solemnized on the occasion.

ANTIPODES, in *Geography*, a name given to those inhabitants of the globe that live diametrically opposite to each other. The word is Greek, and compounded of *αντι*, *opposite*, and *πους*, *a foot*; because their feet are opposite to each other.

The antipodes lie under opposite meridians and opposite parallels; in the same degree of latitude, but of opposite denominations, one being north and the other south. They have nearly the same degree of heat and cold, days and nights of equal length, but in opposite seasons. It is noon to one when midnight to the other; and the longest day with the one is the shortest with the other.

Plato is esteemed the first who thought it possible that the antipodes subsisted, and is looked upon as the inventor of the word. As this philosopher apprehended the earth to be spherical, he had only one step to make to conclude the existence of the antipodes.

The ancients, in general, treated this opinion with the highest contempt; never being able to conceive how men and trees could subsist suspended in the air with their feet upwards, for so they apprehended they must be in the other hemisphere.

They never reflected that these terms *upwards* and *downwards* are merely relative; and signify only nearer to, or farther from, the centre of the earth, the common centre to which all heavy bodies gravitate; and that, therefore, our antipodes have not their feet upwards and head downwards any more than ourselves; because they, like us, have their feet nearer the centre of the earth, and their heads farther from it. To have the head downwards and feet upwards, is to place the body in a direction of gravity tending from the feet to the head: but this cannot be supposed with regard to the antipodes; for they, like us, tend toward the centre of the earth, in a direction from head to foot.

ANTIPOLIS, in *Ancient Geography*, now ANTIBES, on the coast of Provence, a colony of the Massilians, near the river Verus, in Gallia Narbonensis (Livy), three leagues to the west of Nice. E. Long. 7. 9. N. Lat. 43. 42.

ANTIQUARE, among Roman lawyers, properly denotes the rejecting of a new law, or refusing to pass it. In which sense, *antiquating* differs from *abrogating*; as the latter imports the annulling an old law, the former the rejecting a new one.

ANTIQUARE is also used for a law's growing obsolete, or into disuse, either by age or non-observance.

Antiquarii. Antiquary.

ANTIQUARII, a name given to copiers of old books. After the decline of learning among the Romans, and when many religious houses were erected, learning was chiefly in the hands of the clergy; the greatest number of whom were regulars, and lived in monasteries. In these houses were many industrious men who were continually employed in making new copies of old books, either for the use of the monastery or for their own emolument. These writing monks were distinguished by the name of *Antiquarii*. They deprived the poor librarii, or common scriptores, of great part of their business, so that these found it difficult to gain a subsistence for themselves and families. This put them upon finding out more expeditious methods of transcribing books. They formed the letters smaller, and made use of more jugations and abbreviations than had been usual. They proceeded in this manner till the letters became exceedingly small; the abbreviations were very numerous, and extremely difficult to be read. This in some measure accounts for the great variety of hands in the species of writing called *Modern Gothic*. When a number of copies were to be made of the same work, it was usual to employ several persons at the same time in writing it; each person, except him who wrote the first skin, began where his fellow was to leave off.

ANTIQUARY, a person who studies and searches after monuments and remains of antiquity; as old medals, books, statues, sculptures, and inscriptions; and, in general, all curious pieces that may afford any light into antiquity.

In the chief cities of Greece and Italy, there were persons of distinction called *antiquaries*, whose business it was to show strangers the antiquities of the place, to explain the ancient inscriptions, and to give them all the assistance they could in this way of learning.—Pausanias calls these antiquaries *Εξηγηται*. The Sicilians call them *mystagogi*.

There was an ancient college of antiquaries erected in Ireland by Ollamh Fodhla, 700 years before Christ, for composing a history of that country: And to this, say the Irish historians, it is owing that the history and antiquities of that kingdom may be traced back beyond those of most other nations.

There is a society of antiquaries in London, and another in Edinburgh, incorporated by the king's charter. See SOCIETY.

ANTIQUARY is also used by ancient writers for the keeper of the antiquarium or cabinet of antiquities. The officer is otherwise called *archæota*, or antiquary of a king, a prince, a state or the like.

Henry VIII. gave John Leland the title of his *antiquary*; a title which, says the author of his life, nobody ever enjoyed besides himself. But the restriction, we suppose, was only intended to be understood in respect of the kings of England. M. Schott, we find, had the title of *antiquary* to the king of Prussia; P. Pedruzzi, that of *antiquary* of the duke of Parma; M. Galland resided some time in Turkey under the title of *antiquary* of the king of France.—The university of Oxford have still their antiquary, under the denomination of *custos archivorum*.—The kings of Sweden have been at great expences in order to illustrate the antiquity of their country, having established an academy of antiquaries with this single view.—The office

of

Antiquary || Antiquities.

of the ancient Irish antiquaries was to preserve the genealogies of the kings of Ireland, to correct the regal tables of succession, and deliver down the pedigree of every collateral branch of the royal family.

ANTIQUATED, something obsolete, out of date, or out of use.

ANTIQUE, in a general sense, something that is ancient: but the term is chiefly used by sculptors, painters, and architects, to denote such pieces of their different arts as were made by the ancient Greeks and Romans. Thus we say, an antique bust, an antique statue, &c.

ANTIQUE is something contradistinguished from *ancient*, which signifies a less degree of antiquity. Thus antique architecture is frequently distinguished from ancient architecture.

ANTIQUITIES, a term implying all testimonies, or authentic accounts, that have come down to us, of ancient nations. Bacon calls antiquities *the wrecks of history*, or such particulars as industrious and learned persons have collected from genealogies, inscriptions, monuments, coins, names, etymologies, archives, instruments, fragments of history, &c.

Antiquities form a very extensive science, including "an historical knowledge of the edifices, magistrates, offices, habiliments, manners, customs, ceremonies, worship, and other objects worthy of curiosity, of all the principal ancient nations of the earth."

This science is not a matter of mere curiosity, but is indispensable to the theologian; who ought to be thoroughly acquainted with the antiquities of the Jews, to enable him properly to explain numberless passages in the Old and New Testaments: to the lawyer, who without the knowledge of the antiquities of Greece and Rome, can never well understand and properly apply the greatest part of the Roman laws: to the physician and the philosopher, that they may have a complete knowledge of the history and principles of the physic and philosophy of the ancients: to the critic, that he may be able to understand and interpret ancient authors: to the orator and poet; who will be thereby enabled to ornament their writings with numberless images, allusions, comparisons, &c.

Antiquities are divided into sacred and profane, into public and private, universal and particular, &c. It is true, that the antiquaries (especially such as are infected with a spirit of pedantry, and the number of these is great) frequently carry their inquiries too far, and employ themselves in laborious researches after learned trifles; but the abuse of a science ought never to make us neglect the applying it to rational and useful purposes.

Many antiquaries also restrain their learned labours to the eclaircissement of the antiquities of Greece and Rome: but this field is far too confined, and by no means contains the whole of this science, seeing it properly includes the antiquities of the Jews, Egyptians, Persians, Phœnicians, Carthaginians, Hetruscans, Germans, and, in general, all those principal nations mentioned in ancient history: so far as any accounts of them are come down to us.

If to the general subjects above-mentioned we add the particular study of antiques, of the statues, bass-reliefs, and the precious relicks of architecture, painting, camaieus, medals, &c. it is easy to conceive that antiquities form a science very extensive and very complicated, and with which only a very small acquaintance could have been attainable by any one man, if our predecessors had not prepared the way for us; if they had not left us such inestimable works as those of Gronovius, Grævius, Montfaucon, Count Caylus, Winckelman, the Hebraic antiquities of D. Iken of Bremen, the Grecian antiquities of Brunnings, the Roman antiquities of Nieupoort, and especially that work which is entitled *Bibliographia Antiquaria Joh. Alberti Fabricii*, professor at Hamburgh, &c. &c. Nor must we here forget that very valuable work, with which our countryman Mr Robert Wood has lately enriched this science, and which is so well known, and so justly esteemed by all true connoisseurs, under the title of the *Ruins of Palmyra*, and those of *Baalbec*. It is by this work that we are fully convinced of the grandeur and magnificence, the taste and elegance, of the buildings of the ancients. We here see that the invention of these matters is not all owing to the Greeks, but that there were other nations who served them as models. For though many of the edifices of Palmyra are to be attributed to the emperor Aurelian, and to Odenatus and his wife Zenobia, who reigned there about the year 264, yet there are found at the same place ruins of buildings that appear to be of far greater antiquity, and that are not less beautiful. The ancient Persepolis is sufficient to prove this assertion. When we duly reflect on all these matters, and especially if we attempt to acquire any knowledge of this science, we shall soon be convinced that it but ill becomes a petit-maitre to laugh at a learned antiquary.

Antiquities

The knowledge of those monuments of the ancients, the works of sculpture, statuary, graving, painting, &c. which they call *antiques*, requires a strict attention with regard to the matter itself on which the art has been exercised; as the wax, clay, wood, ivory, stones of every kind, marble, flint, bronze, and every sort of metal. We should begin by learning on what matter each ancient nation principally worked, and in which of the fine arts they excelled: For the matter itself, as the different sorts of marble, compositions of metals, and the species of precious stones, serve frequently to characterize the true antique, and to discover the counterfeit. The connoisseurs pretend also to know, by certain distinct characters in the design and execution of a work of art, the age and nation where it was made. They find, moreover, in the invention and execution, a degree of excellence which modern artists are not able to imitate. Now, though we ought to allow, in general, the great merit of the ancients in the polite arts, we should not, however, suffer our admiration to lead us into a blind superstition. There are pieces of antiquity of every sort, which have come down to us; some that are perfectly excellent: and others so wretched, that the meanest among modern artists would not acknowledge them. The mixture of the good and bad has taken place in all subjects, at all times and in all nations. The misfortune is, that most of our great antiquaries have been so little skilled in designing as scarcely to know how to draw a circle with a pair of compasses. It is prejudice, therefore, which frequently directs them to give the palm to the ancients, rather than a judgment directed by a knowledge of the art. That character

Antiquity || Antiseptics.

of expression which they find so marvellous in the works of antiquity, is often nothing more than a mere chimera. They pretend that the artists of our days constantly exaggerate their expressions; that a modern Bacchus has the appearance of a man distracted with intoxication; that a Mercury seems to be animated with the spirit of a fury; and so of the rest. But let them not decide too hastily. Almost all the antique figures are totally void of all spirit of expression; we are forced to guess at their characters. Every artificial expression requires, moreover, to be somewhat exaggerated. A statue or portrait is an inanimate figure; and must therefore have a very different effect from one which, being endowed with life, has the muscles constantly in play, and where the continual change of the features, the motion of the eyes, and the looks more or less lively, easily and clearly express the passions and sentiments. Whereas, in a figure, that is the produce of art, the delicate touches, that should express the passions, are lost to the eyes of the spectators: they must therefore be struck by strong bold characters, which can affect them at the first glance of the eye. A very moderate artist is sensible, at the same time, that he is not to give his figures extravagant expressions, or to place them in distorted attitudes.

ANTIQUITY signifies time or ages past long ago. Thus, we say, the heroes of antiquity, &c.

ANTIQUITY is also used to denote the works or monuments of antiquity. See ANTIQUITIES.

ANTIQUITY likewise expresses the great age of a thing; and in this sense we say, the antiquity of a family, the antiquity of a kingdom.

ANTIRRHINUM, SNAP-DRAGON, or CALVES SNOUT. See BOTANY *Index*.

ANTIRRHIUM, in *Ancient Geography*, a promontory at the mouth of the Corinthian bay, where it is scarce a mile broad, and where it separates Ætolia from the Peloponnesus; so called from its opposite situation to Rhium in Peloponnesus (Pliny): both are now called the *Dardanelles of Lepanto*.

ANTISABBATARIANS, a modern religious sect who oppose the observance of the Christian sabbath. The great principle of the Antisabbatarians is, that the Jewish sabbath was only of ceremonial, not moral obligation; and consequently is abolished by the coming of Christ.

ANTISAGOGE, in *Rhetoric*, a figure differing little from that called *concession*. The following passage from Cicero is an instance of it: *Difficilis ratio belli gerendi; at plena fidei, plena pietatis: et si dicas, magnus labor, multa pericula proponuntur; at gloria ex his immortalis est consecutura.* See CONCESSION.

ANTISCII, in *Geography*, people who live on different sides of the equator, whose shadows at noon are projected opposite ways. Thus the people of the north are Antiscii to those of the south: the one projecting their shadows at noon towards the north pole, and the other towards the south pole.

ANTISCORBUTICS, medicines good in scorbutic cases.

ANTISEPTICS (from *αντι* and *σηπτος*, *putrid*, of *σηπω*, *to putrefy*), an appellation given to such substances as resist putrefaction.

We have some curious experiments in relation to antiseptic substances by Dr Pringle, who has ascertained their several virtues. Thus, in order to settle the antiseptic virtue of salts, he compared it with that of common sea salt; which being one of the weakest, he supposes equal to unity, and expresses the proportional strength of the rest by higher numbers, as in the following table. Antiseptics.

Salts, their antiseptic virtue.

Sea salt -	1	Saline mixture -	3
Sal gemmæ -	1+	Nitre - -	4+
Tartar vitriolated	2	Salt of hartshorn	4+
Spiritus Mindereri	2	Salt of wormwood	4+
Tartarus solubilis	2	*Borax* -	12+
Sal diureticus -	2+	Salt of amber -	20+
Crude *sal ammoniac*	3	Alum -	30+

In this table the proportions are marked in integral numbers: only to some there is added the sign +, to show, that those salts are possessed of a stronger antiseptic virtue than the number in the table expresses, by some fractions: unless in the three last, where the same sign imports that the salt may be stronger by some units.

Some resinous and other substances even exceed the antiseptic virtues of the neutral salts; thus myrrh, asafœtida, terra japonica, and aloes, are at least 12 times more antiseptic than sea salt. Two grains of camphor are equivalent to 60 grains of that salt. An infusion of a few grains of Virginian snake-root, in powder, exceeds 12 times its weight of sea salt. Chamomile flowers have nearly the same extraordinary quality. The Jesuits bark has it also. Besides these, pepper, ginger, saffron, contrayerva root, are 12 times more antiseptic than sea salt. Dried sage, rhubarb, the root of the wild valerian, mint, angelica, ground ivy, senna, green tea, red roses, wormwood, mustard, and horse radish, were likewise found more antiseptic than the standard.

To the class of antiseptic medicines may likewise be added fermented liquors, acids, spirits, and even those plants called *anti-acids*, and erroneously supposed hasteners of putrefaction, particularly horse radish. Now vegetables, possessing this virtue, are the more valuable, in that being usually free of acrimony, they may be taken in much greater quantities than either spirits, acids, resins, or even the neutral salts.

Antiseptics are prescribed in all putrid, malignant, and pestilential cases. It is to be remarked, however, that different kinds of them are to be given in different diseases, and even in different stages of the same disease. Thus, the bark is a specific in gangrene, when the vessels are relaxed, and the blood resolved or disposed to putrefaction; but will fail, if the vessels are too full, or the blood be too thick. With the same caution is the bark to be used in wounds, viz. chiefly in cases of absorbed matter, when it infects the humours, and brings on a hectic fever.

By the great antiseptic virtue of alum, the bark, and other astringents, it should seem, that astriction had no small share in the cure of putrid disorders; and, indeed, the very nature of putrefaction consists in a separation or disunion of the parts. But as astringents are improper to be administered in many cases, contrayer-

Antiseptics || Antitactæ.

va root, snake root, camphor, &c. may supply their place; which, though highly antiseptic, have very little, or any, of an astringent quality.

ANTISPASMODICS, are medicines proper for the cure of spasms and convulsions. Opium, balsam of Peru, and the essential oils of many vegetables, are the principal in this class of medicines. Opium excels, for its immediate effects. Peruvian balsam, in many instances, produces more lasting benefit than opium, and sometimes succeeds where opium fails. As antispasmodics, the essential oils differ in this from opium, that they act more on a particular part than on the system in general, and have no soporific effect. Some medicines remove spasms by immediate contact, as asses milk, cream, oil of almonds; others by repelling heat, as gas, sulphur, nitre, sal ammoniac, &c. And where the strictures are produced by inanition and a defect of vital heat, spasms are removed by those medicines that restore the *vis vitæ*, such as valerian, castor, musk, &c.

ANTISTASIS, in *Oratory*, a defence of an action from the consideration that, had it been omitted, worse would have ensued. This is called by Latin writers *comparativum argumentum;* such, *e. g.* would be the general's defence who had made an inglorious capitulation, That, without it, the whole army must have perished.

ANTISTHENES, a Greek philosopher, and founder of the Cynics. He was born at Athens, and passed the former part of his life as a soldier. Having afterwards been an attendant at the lectures of Socrates, he was principally charmed with those exhortations of that great philosopher, which persuaded to frugality, to temperance, and to moderation; these Antisthenes was resolved to practise by carrying every precept to its utmost extent. Permitting therefore his beard to grow, he went about the streets in a thread-bare coat, scarcely to be distinguished from a common beggar. He prided himself upon the most rigid virtue, and thought himself obliged to attack the vicious wherever he found them. This gave him some reputation in the city; but it may be supposed, that, in a place so very luxurious as Athens, he had more enemies than disciples. His philosophy consisted rather in action than speculation: it was therefore his constant maxim, That to be virtuous was to be happy, and that all virtue consisted in action; that the wise man should live for himself, contented in all situations, and happy alone in the consciousness of his own virtue. He acknowledged nothing to be good but what was honourable; and asserted, that virtue might be acquired by practice. Laertius tells us there were 10 tomes of his works; and he has given us many of his apophthegms.

ANTISTOCHEON, in *Grammar*, the using one letter instead of another: as *olli* for *illi*.

ANTISTROPHE, in *Grammar*, a figure by which two things mutually depending on one another, are reciprocally converted; as, *the servant of the master, the master of the servant.*

ANTISTROPHE, among lyric poets, that part of a song and dance in use among the ancients, which was performed before the altar, in returning from west to east; in opposition to strophe. See STROPHE and ODE.

ANTITACTÆ, in church history, a branch of Gnostics, who held, that God was good and just, but that a creature had created evil; and consequently that it is our duty to oppose this author of evil, in order to avenge God of his adversary. Antitactæ || Antitypes.

ANTITHENAR, in *Anatomy*, a name given to the adductor indicis. See ANATOMY, *Table of the Muscles.*

ANTITHESIS, in *Rhetoric*, a contrast or opposition of words or sentiments. Such is that of Cicero, in the second Catilinarian: "On one side stands modesty, on the other impudence; on one fidelity, on the other deceit; here piety, there sacrilege; here continency, there lust, &c." Such also is that of Augustus to some seditious young men, *Audite, juvenes, senem, quem juvenem senes audivere.* Such again is that of Seneca: *Curæ læves loquuntur, ingentes stupent.* And that of Virgil:

Flectere si nequeo superos, Acheronta movebo.

St Augustine, Seneca, Salvian, and many other ancient writers, seem greatly to affect antitheses; but among the moderns they are generally decried. Desmaretz represents them as the favourites of young writers. The following is an example of modern antithesis.

——Though gentle, yet not dull;
Strong, without rage; without o'erflowing, full.

ANTITHESIS is sometimes used for controversy. In this sense, we meet with *antithetic* method, *antithetic* discourses, &c. Marcion composed a volume of Antitheses, or contrarieties and oppositions between the law and the gospel.

ANTITRAGUS MUSCULUS, in *Anatomy*, a muscle of the ear. See ANATOMY, *Table of the Muscles.*

ANTITRINITARIANS, those who deny the trinity, and teach that there are not three persons in the Godhead. Thus the Samosatenians, who do not believe the distinction of persons in God; the Arians, who deny the divinity of the Word, and the Macedonians, who deny that of the Holy Spirit, are all properly Antitrinitarians. Among the moderns, Antitrinitarians are particularly understood of Socinians, called also Unitarians.

The *Bibliotheca Antitrinitariorum*, or *Antitrinitarian Library*, is a posthumous work of Christopher Sandius, an eminent Antitrinitarian; wherein he gives a list, digested in order of time, of all the Socinian or modern Antitrinitarian authors, with a brief account of their lives, and a catalogue of their works. See UNITARIAN.

ANTITYPE, a Greek word, properly signifying a type or figure corresponding to some other type.

The word antitype occurs twice in the New Testament; viz. in the epistle to the Hebrews, ix. 24. and in St Peter, 1 Ep. iii. 21. where its genuine import has been much controverted. The former says, that "Christ is not entered into the holy places made with hands, which are, αντιτυπα, the figures or antitypes of the true—now to appear, in the presence of God for us." Now τυπος signifies the pattern by which another thing is made; and as Moses was obliged to make the tabernacle, and all things in it, according to the pattern shown him in the mount, the tabernacle so formed was the antitype of what was shown to Moses: any thing, therefore, formed according to a model or pattern,

Antitype ‖ Antoine.

tern, is an antitype. In the latter passage, the apostle speaking of Noah's flood, and the deliverance only of eight persons in the ark from it, says Ω και ημας αντιτυπον νυνσωζει βαπτισμα, *Baptism being an antitype to that, now saves us; not putting away the filth of the flesh, but the answer of a good conscience towards God, &c.* The meaning is, that righteousness, or the answer of a good conscience towards God, now saves us by means of the resurrection of Christ, as formerly righteousness saved these eight persons by means of the ark, during the flood. The word antitype, therefore, here signifies a general similitude of circumstances; and the particle ω, *whereunto*, refers, not to the immediate antecedent, υματος, *water*, but to all that precedes.

ANTITYPE, among the ancient Greek fathers, and in the Greek liturgy, is also applied to the symbols of bread and wine in the sacrament. Hence it hath been argued, by many Protestants, that the Greeks do not really believe the doctrine of transubstantiation; because they call the bread and wine *antitypes*, αντιτυπα, q. d. figures, similitudes; and this even after the consecration.

ANTIUM, in *Ancient Geography*, a city of the Volsci, (Livy); situated on the Tuscan sea, yet without a harbour, because they had a neighbouring hamlet called *Ceno*, with a harbour, (Strabo). The Romans gained their first reputation in naval affairs against the Antiates; part of whose ships they conveyed into the arsenal of Rome, and part they burnt; and with their beaks or rostra adorned the pulpit erected in the forum, thence called *Rostra*, (Livy, Florus). Here stood a famous temple of Fortune, (Horace). Addison says, there were two Fortunæ worshipped at Antium.—It is now extinct, but the name still remains in the *Capo d' Anzo*.

ANTIVARI, a strong town of Turkey in Europe, in Dalmatia, a Greek archbishop's see, and subject to the Turks. E. Long. 19. 15. N. Lat. 42. 20.

ANTIVIRGILIAN HUSBANDRY, an appellation given to Mr Tull's new method of horse-hoeing husbandry. See AGRICULTURE.

ANTLER, among sportsmen, a start or branch of a deer's attire.

Brow ANTLER, denotes the branch next the head; and,

Bes ANTLER, the branch next above the brow antler.

ANTLIA, an ancient machine, supposed to be the same with our pump. Hence the phrase *in antliam condemnari*, according to the critics, denotes a kind of punishment whereby criminals were condemned to drain ponds, ditches, or the like.

ANTOECI, in *Geography*, those inhabitants of the earth who live under the same meridian, and at the same distance from the equator: the one toward the north, and the other toward the south. Hence they have the same longitude: and their latitude is also the same, but of a different denomination. They are in the same semicircle of the meridian, but in opposite parallels. They have precisely the same hours of the day and night, but opposite seasons; and the night of the one is always equal to the day of the other.

ANTOINE, a town of France, in Dauphiny, in the diocese of Vienne, with a celebrated abbey. It is seated among the mountains, 13 miles east of Lyons. E. Long. 5. 20. N. Lat. 45. 43.

Antoine ‖ Antonides.

ANTONA, (Tacitus); a river of Britain, which Camden supposes to be a faulty reading for Avuona or Aufona, (the Avon).

ANTONACUM, ANTONNACUM, or ANTUNNACUM, a town of the Treviri; now *Andernach*, below Coblentz. E. Long. 7. 5. N. Lat. 50. 25.

ANTONIA, a citadel of Jerusalem, the origin of which we have in Josephus: who says, that Hircanus, the first high-priest of that name, built Baris near the temple, a house with turrets, where he generally resided. Herod afterwards made it stronger, for the security and defence of the temple; and in honour of Mark Antony, who then commanded in the east, called it *Antonia*. It was very extensive, and could accommodate a Roman legion: from it there was a full view of the temple.

ANTONIA, *Saint*, a town of France, in the department of Lot and Garonne, and in the diocese of Rhodez, whose fortifications are demolished. It is seated on the river Aveiron. E. Long. 0. 55. N. Lat. 44. 10.

ANTONIAN WATERS, medicinal waters of Germany, very pleasant to the taste, and esteemed good in many chronic and hypochondriac cases. See TONSTEIN.

ANTONIANO, SILVIO, a man of great learning, who raised himself from a low condition by his merit, was born at Rome in the year 1540. When he was but ten years old, he could make verses upon any subject proposed to him; and these so excellent, though pronounced extempore, that even a man of genius could not compose the like without a good deal of time and pains. The duke of Ferrara coming to Rome, to congratulate Marcellus II. upon his being raised to the pontificate, was so charmed with the genius of Antoniano, that he carried him to Ferrara, where he provided able masters to instruct him in all the sciences. From thence he was sent for by Pius IV. who made him professor of the belles lettres in the college at Rome. Antoniano filled this place with so much reputation, that, on the day when he began to explain the oration, *pro Marco Marcello*, he had a vast crowd of auditors, and among these no less than 25 cardinals. He was afterwards chosen rector of the college; and after the death of Pius IV. being seized with a spirit of devotion, he joined himself to Philip Neri, and accepted the office of secretary to the sacred college, offered him by Pius V. which he executed for 25 years with the reputation of an honest and able man. He refused a bishopric which Gregory XIV. would have given him; but he accepted the office of secretary to the briefs, offered him by Clement VIII. who made him his chamberlain, and afterwards a cardinal. Antoniano killed himself by too great fatigue: for he spent whole nights in writing letters; which brought on a sickness, whereof he died, in the 63d year of his age. He wrote with such ease and fluency, that he never almost made any blot or rasure; and it is said of him, that he preserved the flower of his virginity during his whole life.

ANTONIDES VANDER GOES, JOHN, an eminent Dutch poet, born at Goes in Zealand, the 3d of April 1647. His parents were Anabaptists, people of good character, but of low circumstances. They went to live at Amsterdam when Antonides was about four years

Antonides, Antoninus.

old; and, in the ninth year of his age, he began his studies, under the direction of Hadrian Junius and James Cocceius. Antonides took great pleasure in reading the Latin poets, and carefully compared them with Grotius, Heinsius, &c. By this means he acquired a taste for poetry, and enriched his mind with noble ideas. He first attempted to translate some pieces of Ovid, Horace, and other ancients; and, having formed his taste on these excellent models, he at length undertook one of the most difficult tasks in poetry, to write a tragedy: This was entitled *Trazil*, or, *The invasion of China*. Antonides, however, was so modest, as not to permit it to be published. Vondel, who was then engaged in a dramatic piece, which was taken also from some event that happened in China, read Antonides's tragedy; and was so well pleased with it, that he declared, if the author would not print it, he would take some passages out of it, and make use of them in his own tragedy. He accordingly did so; and it was reckoned much to the honour of Antonides, to have written what might be adopted by so great a poet as Vondel was acknowledged to be by all good judges. Upon the conclusion of the peace between Great Britain and Holland, in the year 1674, Antonides wrote a piece, entitled *Bellona aan band*, i. e. "Bellona chained;" a very elegant poem, consisting of several hundred verses. He next wrote an ingenious heroic poem, which he entitled *The River Y* (the river on which Amsterdam is built).

Antonides's parents had bred him up an apothecary; but his remarkable genius for poetry soon gained him the esteem and friendship of several persons of distinction; and particularly of Mr Buisero, one of the lords of the admiralty at Amsterdam, and a great lover of poetry, who sent him at his expence to pursue his studies at Leyden, where he remained till he took his degree of doctor of physic, and then his patron gave him a place in the admiralty. In 1678, Antonides married Susanna Bermans, a minister's daughter, who had also a talent for poetry. His marriage was celebrated by several eminent poets, particularly by the famous Peter Francius, professor of eloquence, who composed some Latin verses on the occasion. After marriage, he did not much indulge his poetic genius; and within a few years he fell into a consumption, of which he died on the 18th September 1684, being then but thirty-seven years and a few months old. He is esteemed the most eminent Dutch poet after Vondel. His works have been printed several times, having been collected by Father Antony Tansz. The last edition was printed by Nicholas Ten Hoom, at Amsterdam, in the year 1714, in 4to, under the direction of David Van Hoogstraaten, one of the masters of the Latin school of that city, who added to it also the life of the poet.

ANTONINUS Pius, a celebrated Roman emperor, was born A. D. 86, at Lanuvium in Italy. Distinguished for eminence of character, his family had long maintained the honour of the house of Nismes in Gaul, from whence they had descended. Both his father and grandfather had held the office of consul. Arius Antoninus, his maternal grandfather, by his amiable disposition and love of literature, had acquired an eminent character, and was very intimate with Pliny the younger. Under him the young Titus after his father's death completed his education. His character on arriving at the age of maturity, manifested itself in the most promising manner. To an improved understanding, a virtuous heart, a mild and dignified character, and a noble eloquence, he joined a happy physiognomy. Simple in his taste, and guided by temperance in all his actions and sentiments, he was entirely free from all affectation and pomposity. Antoninus.

In the year 120, among the many public honours which his birth and connexions gave him a claim to, he was elevated to the high post of consul, and was afterwards appointed by Adrian to be one of the four consulars, betwixt whom the supreme power of Italy was divided. Becoming in his turn proconsul of Asia, he acquitted himself with such reputation that he even excelled his grandfather Arius who had formerly enjoyed that high trust. Returning from Asia he was not only received into the favour, but likewise the confidence and council of Adrian, and was always disposed to act with lenity. He married Annia Faustina, the daughter of Annius Verus, whose character was far from being untaxed with reproach; but his lenient disposition induced him to avoid public scandal, and he behaved towards his aged father-in-law with the most becoming respect. Two sons and two daughters were the fruits of this marriage. The sons died when they were young, and the eldest daughter, who was married to Lamia Sylvanus, died when Titus proceeded towards his Asiatic government. Faustina the youngest married Marcus Aurelius, who was afterwards emperor.

After the death of Verus, Adrian resolving to adopt Antoninus, he was induced to accept of the succession to so important a charge as the Roman empire, although with a considerable degree of reluctance, and was accordingly nominated by Adrian in February 25. A. D. 138, in the presence of the council of the chief senators, who at the same time created him his colleague in performing the proconsular and tribunitial duties. Extending his plans of adoption still farther, Adrian caused Antoninus adopt the son of Verus, then seven years of age, and Marcus Annius, afterwards named Aurelius, then seventeen years of age, a relation of Adrian's, and nephew to his own wife. The dutiful and merited attention which Antoninus bestowed on Adrian during the last months of his illness, gives a very high idea of his character. On July 10. A. D. 138, he succeeded to the empire amidst the universal acclamations of the senate and people, who anticipated in his well tried virtues that happiness which a good and wise sovereign is able to bestow upon his subjects.

The Roman world enjoyed such tranquillity under his reign that it affords few materials for history; yet it is to be regretted that Capitolinus is the only historian from whom any direct information can be received concerning this peaceful period, and he is none of the most perspicuous. It however appears that the usual honours and titles, together with the addition of the surname of Pius, which both his conduct and zeal in defending and honouring the memory of his predecessor united to suggest, were willingly conferred upon him by the senate. In the beginning of his reign there were several conspiracies formed against him, but this only afforded him an instance of signalizing his clemency, which he did in the most striking manner. Although he was unable to prevent justice from taking its due

course

Antoninus. course against the ringleaders, he prohibited all investigation after their accomplices, and took the son of Attilius, one of the principal conspirators, under his protection. Various commotions were raised in several parts of the empire; but by the vigilance of his lieutenants, these were easily quelled. The incursions of the Brigantes in Britain were restrained, and a new wall which was built to the north of that of Adrian, from the mouth of the Esk to that of Tweed, and which was called the *Wall of Antoninus*, was fixed as the boundary of the Roman province in Britain. The reign of Antoninus upon the whole was singularly peaceful, and realized a saying of Scipio, "That he preferred saving the life of one citizen, to destroying a thousand enemies."

A desire of promoting the interest of his people, of protecting them from oppression, of administering justice through every corner of the realm, and of being instrumental to the happiness and peace of his government, influenced all his proceedings. He delighted greatly in laying before the senate the motives of all his actions; and in his manner of living and conversing he employed the same prudential economy and air of equality, which had so distinguished his predecessors Trajan and Adrian. On account of the sweetness of his temper he bore with firmness many indignities offered him; and under his reign the race of informers was entirely extinguished, and condemnations and confiscations were very rare. The various public calamities which occurred in his time were all relieved by him with the greatest benevolence. He avoided as much as possible laying any burthens upon his people, and on this account made few journeys through his dominions. He was frugal in the use of the public revenues, but profuse in his own patrimony, a great economist, devoid of avarice, and very liberal towards works of ornament and utility, and even towards gratifying the pleasure of his people. A temple in honour of Adrian in Rome, and perhaps the amphitheatre and aqueduct at Nismes, were his chief buildings.

Jurisprudence was to this emperor, like that of his predecessor, an interesting subject for improvement; and several decrees which he issued, display his commendable spirit of equity. The natural consequence of this equity was, that Antoninus acquired a reputation and fame which no military atchievements could have conferred; and his friendship was courted by the neighbouring princes.

There is scarcely a blot to be found to tarnish his character; and frugality, modesty, and harmless amusement continued to employ his private hours. It may perhaps be admitted that he was too indulgent towards an unworthy wife, and that the divine honours he bestowed on her memory were not merited by her conduct. In the management of his complicated business, he was exact to such a degree that it was even ridiculed by some; but he found the daily advantage of this accuracy. The growing virtue of Marcus Aurelius soon drew his attention after he ascended the throne, and having given him his daughter in marriage, he declared him Cæsar. Nor was he mistaken in his choice; for Aurelius acted with the utmost fidelity and affection amid all the honours that he continued to confer upon him. Enjoying this large share of domestic bliss, in the 74th year of his life he was seized with a fever at his favourite country seat of Lori. Convinced of his approaching fate, he convened the principal officers of the state, and confirmed his election of Aurelius, and gave him the imperial ensigns. A delirium ensued, in an interval of which he gave the watchword *Æquanimitas*, and calmly resigned his breath in the 23d year of his reign. His ashes were consigned to the tomb of Adrian, and divine honours paid to his memory. He was universally regretted, and succeeding emperors bore his name as a badge of honour. The senate and his successor erected a sculptured pillar to his memory, which is still shown to strangers as one of the chief ornaments of Rome. (*Gen. Biog.*). Antoninus.

Antoninus Philosophus, *Marcus Aurelius*, the Roman emperor, born at Rome, the 26th of April, in the 121st year of the Christian era. He was called by several names till he was admitted into the Aurelian family, when he took that of Marcus Aurelius Antoninus. Hadrian, upon the death of Cejonius Commodus, turned his eyes upon Marcus Aurelius; but, as he was not then 18 years of age, and consequently too young for so important a station, he fixed upon Antoninus Pius, whom he adopted, upon condition that he should likewise adopt Marcus Aurelius. The year after this adoption, Hadrian appointed him questor, though he had not yet attained the age prescribed by the law. After the death of Hadrian, Aurelius married Faustina, the daughter of Antoninus Pius, by whom he had several children. In the year 139, he was invested with new honours by the emperor Pius, in which he behaved in such a manner as endeared him to that prince and the whole people.

Upon the death of Pius, which happened in the year 161, he was obliged by the senate to take upon him the government; in the management of which he took Lucius Verus as his colleague. Dion Cassius says, that the reason of doing this was, that he might have leisure to pursue his studies, and on account of his ill state of health; Lucius being of a strong vigorous constitution, and consequently more fit for the fatigues of war. The same day he took upon him the name of Antoninus, which he gave likewise to Verus his colleague, and betrothed his daughter Lucilla to him. The two emperors went afterwards to the camp; where, after having performed the funeral rites of Pius, they pronounced each of them a panegyric to his memory. They discharged the government in a very amicable manner. It is said that, soon after Antoninus had performed the apotheosis of Pius, petitions were presented to him by the Pagan priests, philosophers, and governors of provinces, in order to excite him to persecute the Christians; which he rejected with indignation, and interposed his authority for their protection, by writing a letter to the common assembly of Asia, then held at Ephesus (A). The happiness which the empire began to enjoy under these two emperors was interrupted, in the year 162, by a dreadful inundation of the Tiber, which

(A) Eusebius has preserved this letter, Hist. Eccles. lib. iv. cap. 13. but he falsely ascribes it to Antoninus Pius, whereas it was wrote by Marcus Antoninus, as Valerius makes it appear in his annotations on Eusebius.

Antoninus. which destroyed a vast number of cattle, and occasioned a famine at Rome. This calamity was followed by the Parthian war; and at the same time the Catti ravaged Germany and Rhætia. Lucius Verus went in person to oppose the Parthians; and Antoninus continued at Rome, where his presence was necessary.

During this war with the Parthians, about the year 163 or 164, Antoninus sent his daughter Lucilla to Verus, she having been betrothed to him in marriage, and attended her as far as Brundusium: he intended to have conducted her to Syria; but it having been insinuated by some persons, that his design of going into the east was to claim the honour of having finished the Parthian war, he returned to Rome. The Romans having gained a victory over the Parthians, who were obliged to abandon Mesopotamia, the two emperors triumphed over them at Rome in the year 166; and were honoured with the title of *Fathers of their country*. This year was fatal, on account of a terrible pestilence which spread itself over the whole world, and a famine under which Rome laboured: it was likewise in this year that the Marcomanni, and many other people of Germany, took up arms against the Romans; but the two emperors having marched in person against them, obliged the Germans to sue for peace. The war, however, was renewed the year following, and the two emperors marched again in person; but Lucius Verus was seized with an apoplectic fit, and died at Altinum. The Romans were now defeated with great slaughter; and the emperor, not choosing to burden his subjects with new taxes, exposed to sale the furniture of the palace, the gold and silver plate belonging to the crown, and his wife's rich garments embroidered with gold, and a curious collection of pearls, which Adrian had purchased during his long progress through the provinces of the empire, and was called *Adrian's cabinet*.

In the year 170, Antoninus made vast preparations against the Germans, and carried on the war with great vigour. During this war, in 174, a very extraordinary event is said to have happened, which, according to Dion Cassius, was as follows: Antoninus's army being blocked up by the Quadi, in a very disadvantageous place, where there was no possibility of procuring water; in this situation, being worn out with fatigue and wounds, oppressed with heat and thirst, and incapable of retiring or engaging the enemy, in an instant the sky was covered with clouds, and there fell a vast quantity of rain: the Roman army were about to quench their thirst, when the enemy came upon them with such fury, that they must certainly have been defeated, had it not been for a shower of hail, accompanied with a storm of thunder and lightning, which fell upon the enemy, without the least annoyance to the Romans, who by this means gained the victory (B). Antoninus. In 175, Antoninus made a treaty with several nations of Germany. Soon after, Avidius Cassius, governor of Syria, revolted from the emperor: this insurrection, however, was put an end to by the death of Cassius, who was killed by a centurion named *Anthony*. Antoninus behaved with great lenity towards those who had been engaged in Cassius's party; he would not put to death, nor imprison, nor even sit in judgment himself upon any of the senators engaged in this revolt; but he referred them to the senate, fixing a day for their appearance, as if it had been only a civil affair. He wrote also to the senate, desiring them to act with indulgence rather than severity; nor to shed the blood of any senator or person of quality, or of any other person whatsoever; but to allow this honour to his reign, that, even under the misfortune of a rebellion, none had lost their lives, except in the first heat of the tumult. In 176, Antoninus visited Syria and Egypt: the kings of those countries, and ambassadors also from Parthia, came to visit him. He staid several days at Smyrna; and, after he had settled the affairs of the east, went to Athens, on which city he conferred several honours, and appointed public professors there. From thence he returned to Rome with his son Commodus, whom he chose consul for the year following, though he was then but 16 years of age, having obtained a dispensation for that purpose. On the 27th of September, the same year, he gave him the title of *Imperator;* and on the 23d of December, he entered Rome in triumph, with Commodus, on account of the victories gained over the Germans. Dion Cassius tells us, that he remitted all the debts which were due to himself and the public treasury during 46 years, from the time that Hadrian had granted the same favour, and burnt all the writings relating to these debts. He applied himself likewise to correct many enormities, and introduced several excellent regulations. In the year 179, he left Rome with his son Commodus, in order to go against the Marcomanni, and other barbarous nations; and the year following gained a considerable victory over them, and would, in all probability, have entirely subdued them in a very short time, had he not been taken with an illness, which carried him off on the 17th of March 180, in the 59th year of his age, and 19th of his reign. The whole empire regretted the loss of so valuable a prince, and paid the greatest regard to his memory: he was ranked amongst the gods, and almost every person had a statue of him in their houses. His book of meditations has been much admired by the best judges.

Antonine's

(B) The Pagans, as well as Christians, according to Mr Tillement (p. 621. art xvi.), have acknowledged the truth of this prodigy, but have greatly differed as to the cause of such a miraculous event; the former ascribing it, some to one magician and some to another: In Antoninus's pillar, the glory is ascribed to Jupiter, the god of rain and thunder. But the Christians affirmed, that God granted this favour at the prayer of the Christian soldiers in the Roman army, who are said to have composed the twelfth or Melitene legion; and, as a mark of distinction, we are told that they received the title of the *Thundering legion*, from Antoninus (Euseb. Eccles. Hist. lib. v. cap. 5.). Mr Moyle, in the letters published in the second volume of his works, has endeavoured to explode this story of the Thundering Legion; which occasioned Mr Whiston to publish an answer, in 1726, entitled, *Of the Thundering Legion; or, Of the miraculous deliverance of Marcus Antoninus and his army, upon the prayers of the Christians.*

Antoninus. *Antonine's Column.* See Column.

Antoninus's Wall, the name of the third rampart or defence that had been built or repaired by the Romans against the incursions of the North Britons. It is called by the people in the neighbourhood, *Graham's Dyke*; from the notion that one Graham, or Grimus, first made a breach in it after the retreat of the Romans out of Britain. The first barrier erected by the Romans was the chain of forts made by Agricola * from the frith of Forth to that of Clyde, in the year 81, to protect his conquest from the inroads of the Caledonians. The second was the vallum, or dyke, flung up by Adrian † in the year 121. It terminated on the western side of the kingdom at *Axelodunum*, or *Brugh*, on the Solway sands, and was supposed to have reached no further than *Pons Ælii*, or *Newcastle*, on the eastern. But from an inscription lately discovered, it appears to have extended as far as the wall of Severus ‡. This rampart of Adrian's was situated much farther south than Agricola's chain; the country to the north having been either, according to some authors, recovered by the native Britons after the departure of Agricola; or, according to others, voluntarily slighted by Adrian. However, this work of Adrian's did not long continue to be the extreme boundary of the Roman territories to the north in Britain. For Antoninus Pius, the adopted son and immediate successor of Adrian, having, by his lieutenant Lollius Urbicus, recovered the country once conquered by Agricola, commanded another rampart to be erected between the friths of Forth and Clyde, in the track where Agricola had formerly built his chain of forts. The great number of inscriptions which have been found in or near the ruins of this wall, or rampart, to the honour of Antoninus Pius, leave us no room to doubt its having been built by his direction and command. If the fragment of a Roman pillar with an inscription, now in the college library of Edinburgh, belonged to this work, as it is generally supposed to have done, it fixes the date of its execution to the third consulship of Antoninus, which was A. D. 140, only 20 years after that of Adrian, of which this seems to have been an imitation. This wall or rampart, as some imagine, reached from Caer-ridden on the frith of Forth to Old Kirkpatrick on the Clyde; or, as others think, from Kinniel on the east to Dunglass on the west. These different suppositions hardly make a mile of difference in the length of this work, which, from several actual mensurations, appears to have been 37 English or 40 Roman miles. Capitolinus, in his life of Antoninus Pius, directly affirms, that the wall which that emperor built in Britain was of turf. This in the main is unquestionably true; though it is evident (from the vestiges of it still remaining, which not very many years ago were dug up and examined for near a mile together) that the foundation was of stone. Mr Camden also tells us, from the papers of one Mr Anthony Pont, that the principal rampart was faced with square stone, to prevent the earth from falling into the ditch. The chief parts of this work were as follows: 1. A broad and deep ditch, whose dimensions cannot now be discovered with certainty and exactness, though Mr Pont says, it was 12 feet wide. 2. The principal wall or rampart was about 12 feet thick at the foundation, but its original height cannot now be determined. This wall was situated on the south brink of the ditch. 3. A military way on the south side of the principal wall, well paved, and raised a little above the level of the ground. This work, as well as that of Adrian, was defended by garrisons placed in forts and stations along the line of it. The number of these forts or stations, whose vestiges were visible in Mr Pont's time, was 18, situated at about the distance of two miles from each other. In the intervals between the forts, there were turrets or watch towers. But the number of these, and their distance from each other, cannot now be discovered. Antoninus.

It is not a little surprising, that though it is now more than 1600 years since this work was finished, and more than 1300 since it was slighted, we can yet discover from authentic monuments, which are still remaining, by what particular bodies of Roman troops almost every part of it was executed. This discovery is made from inscriptions upon stones, which were originally built into the face of the wall, and have been found in or near its ruins, and are carefully preserved. The number of stones with inscriptions of this kind now extant, is 11: of which six may be seen at one view in the college of Glasgow, one in the college of Aberdeen, one in the college of Edinburgh, one in the collection of Baron Clerk, one at Cochnoch house, and one at Calder house. From these inscriptions it appears in general, that this great work was executed by the second legion, the vexillations of the sixth legion and of the twentieth legion, and one cohort of auxiliaries. If these corps were all complete, they would make in all a body of 7800 men. Some of these inscriptions have suffered greatly by the injuries of time and other accidents; so that we cannot discover from them, with absolute certainty, how many paces of this work were executed by each of these bodies of troops. The sum of the certain and probable information contained in these inscriptions, as it is collected by the learned and illustrious Mr Horsley, stands thus:

	Paces.
The second legion built - - -	11,603
The vexillation of the sixth legion -	7411
The vexillation of the twentieth legion -	7801
All certain - -	26,815
The vexillation of the twentieth legion, the monument certain, and the number probable	3411
The same vexillation, on a plain monument, no number visible, supposed - - -	3500
The sixth legion, a monument, but no number, supposed - - - -	3000
Cohors prima Cugernorum - -	3000
Total	39,726

or 39 miles 726 paces, nearly the whole length of the wall. It would have been both useful and agreeable to have known how long time these troops were employed in the execution of this great work. But of this we have no information. Neither do we know what particular bodies of troops were in garrison in the several forts and stations along the line of this wall, because these garrisons were withdrawn before the *Notitia Imperii* was written.

Though we cannot discover exactly how many years this

See *Agricola.*

See *Adrian.*

See *Severus.*

Antonio. this wall of the emperor Antonius continued to be the boundary of the Roman territories in Britain, yet we know with certainty that it was not very long. For we are told by an author of undoubted credit, that, in the reign of Commodus, A. D. 180, "he had wars with several foreign nations, but none so dangerous as that of Britain. For the people of the island, having passed the wall which divided them from the Romans, attacked them, and cut them to pieces."

Dio. l. 72. p. 802.

ANTONIO, NICHOLAS, knight of the order of St James and canon of Seville, did great honour to the Spanish nation by his Bibliotheque of their writers. He was born at Seville in 1617, being the son of a gentleman whom King Philip IV. made president of the admiralty established in that city in 1626. After having gone through a course of philosophy and divinity in his own country, he went to study law at Salamanca; where he closely attended the lectures of Francisco Ramos del Manzano, afterwards counsellor to the king and preceptor to Charles II. Upon his return to Seville, after he had finished his law studies at Salamanca, he shut himself up in the royal monastery of Benedictines, where he employed himself several years in writing his *Bibliotheca Hispanica*, having the use of the books of Bennet de la Sana, abbot of that monastery and dean of the faculty of divinity at Salamanca. In the year 1659, he was sent to Rome by King Philip IV. in the character of agent general from the prince: he had also particular commissions from the inquisition of Spain, the viceroys of Naples and Sicily, and the governor of Milan, to negotiate their affairs at Rome. The cardinal of Aragon procured him, from Pope Alexander VII. a canonry in the church of Seville, the income whereof he employed in charity and purchasing of books; he had above 30,000 volumes in his library. By this help, joined to continual labour, and indefatigable application, he was at last enabled to finish his Bibliotheca Hispanica, in four volumes in folio, two of which he published at Rome in the year 1672. The work consists of two parts; the one containing the Spanish writers who flourished before the 15th century, and the other those since the end of that century. After the publication of these two volumes, he was recalled to Madrid by King Charles II. to take upon him the office of counsellor to the crusade; which he discharged with great integrity till his death, which happened in 1684. He left nothing at his death but his vast library, which he had brought from Rome to Madrid; and his two brothers and nephews being unable to publish the remaining volumes of his Bibliotheca, sent them to Cardinal d'Aguisne, who paid the charge of the impression, and committed the care thereof to Monsieur Martin, his librarian, who added notes to them in the name of the cardinal.

ANTONIO, ST one of the Cape de Verd islands, lying in E. Long. 0. 26. N. Lat. 18. 10. It is separated from St Vincent's by a clear navigable channel two leagues in breadth. On the north side it has a good road for shipping, with a collection of fresh water rising from springs, which, however, scarcely merits the name of a pond. The island stretches from north-east to south-west, and is filled with mountains; one of which is of so extraordinary a height, as to be compared with the Peak of Teneriffe: Its top is constantly covered with snow, and, notwithstanding the clearness of the sky, is generally hid in clouds. Here are produced a variety of fruits; oranges, lemons, palms, melons, &c. and some sugar canes. The potatoes and melons are particularly excellent, and are much sought after by mariners. But notwithstanding all this plenty, the inhabitants live in the most wretched poverty. They are in number about 500, chiefly negroes, under the protection of the Portuguese, whose language they speak, and imitate their manners. To the north-west stands a village, containing about twenty huts; and at least 50 families, under the direction of a governor, or, as they call him, a *captain*, a priest, and a schoolmaster.

Antonio, Antonius.

ANTONIO, ST, a Dutch fort in Axim, on the Gold coast of Africa. It stands on a high rock, which projects into the sea in form of a peninsula; and is so environed by rocks and dangerous shoals, as to be inaccessible to an enemy but by land, where it is fortified by a parapet, drawbridge, and two batteries of heavy cannon. Besides this it has a battery towards the sea. The three batteries consist of 24 cannon. Its form is triangular; the building is neat, strong, and commodious for the extent, that being but small, on account of the narrowness of the rock on which it is built. The garrison is usually composed of 25 white men, and an equal number of negroes, under the command of a serjeant. It is maintained at the expence of the West India Company; and when well stored with provisions, is capable of making a long defence against any number of negroes. It is, however, as well as all other forts on this coast, liable to inconveniences from the heavy and continual rains, which damage the walls, and render frequent reparations necessary. This obliges the Dutch always to keep ready a quantity of lime or cement made of calcined oyster shells, of which the coast produces great numbers. This settlement was first founded by the Portuguese during the reign of Emanuel. They fixed it first upon a small point; where, finding themselves insecure, they built the fort where it now stands. They were driven out by the Dutch in 1641; and upon the conclusion of a peace with the States General, the fort remained by treaty in the hands of the Dutch West India Company, who have kept possession of it ever since.

ANTONIUS, MARCUS, a famous Roman orator. While he filled the office of prætor, Sicily fell to his lot, and he cleared the seas of the pirates which infested that coast. He was made consul with A. Posthumius Albinus, in the year of Rome 653; when he opposed the turbulent designs of Sextus Titus, tribune of the people, with great resolution and success. Some time after, he was made governor of Cilicia, in quality of proconsul; where he performed so many great exploits, that he obtained the honour of a triumph. We cannot omit observing, that in order to improve his great talent for eloquence, he became a scholar to the greatest men at Rhodes and Athens, in his way to Cilicia, and when on his return to Rome. Soon after he was appointed censor; which office he discharged with great reputation, having carried his cause before the people, against Marcus Duronius, who had preferred an accusation of bribery against him, in revenge for Antonius's having erased his name out of the list of senators, which this wise censor had done, because Duronius, when tribune of the people, had abrogated a law

law which restrained immoderate expence in feasts. He was one of the greatest orators ever known at Rome; and it was owing to him, according to the testimony of Cicero, that Rome might boast herself a rival even to Greece itself in the art of eloquence. He defended, amongst many others, Marcus Aquilius; and moved the judges in so sensible a manner, by the tears he shed, and the scars he showed upon the breast of his client, that he carried his cause. He never would publish any of his pleadings, that he might not, as he said, be proved to say in one cause, what might be contrary to what he should advance in another. He affected to be a man of no learning. His modesty, and many other qualifications, rendered him no less dear to many persons of distinction, than his eloquence made him universally admired. He was unfortunately killed during those bloody confusions raised at Rome by Marius and Cinna. He was discovered in the place where he had hid himself, and soldiers were sent to dispatch him: but his manner of addressing them had such an effect, that none but he who commanded them, and had not heard his discourse, had the cruelty to kill him. His head was exposed before the rostra, a place which he had adorned with his triumphal spoils. This happened 90 years before the Christian era.

ANTONIUS, *Marcus*, the triumvir, grandson to the former, was very handsome in his youth; for which reason he was greatly beloved by Curio, a senator, who by carrying him about in all his debaucheries, made him contract such heavy debts, that his own father forbade him his house. Curio, however, was so generous as to bail him for 250 talents. When the civil war broke out, Curio took Cæsar's party, and prevailed with Antonius to do the same; for which he was made a tribune of the people, and in that office did Cæsar great service. Cæsar having made himself master of Rome, gave Antonius the government of Italy: At the battle of Pharsalia, Cæsar confided so much in him, that he gave him the command of the left wing of his army, whilst he himself led the right. After Cæsar was made dictator he made Antonius general of the horse, though he had never been prætor; in which command he exerted his power with the utmost violence. He was made consul, when Cæsar enjoyed that honour for the fifth time, the last year of that usurper's life. On Cæsar's death, he harangued the populace with great art, and raised their fury against his murderers; flattering himself that he should easily get into the place which Cæsar had filled; but his haughty behaviour made him lose all the advantages his affected concern for Cæsar had gained him. His ill treatment of Octavius, and quarrel with him, produced another civil war; which ended in an accommodation between him, Octavius, and Lepidus, fatal to the peace of Rome. They agreed to share the supreme power among them; and many of the most illustrious Romans were sacrificed by proscription to cement this bloody league, which is known by the name of the *Second Triumvirate*. But the triumvirs were too ambitious, and hated one another too much, to be long united. Antonius went into Asia to raise money for his soldiers: during his absence, Fulvia his wife quarrelled with Octavius. When Antonius was in Asia, indulging himself in all manner of luxury, the famous Cleopatra inspired him with the most violent passion. Hearing of the quarrel between Fulvia and Octavius, and finding Octavius was become publicly his enemy, Antonius entered into a confederacy with Sextus Pompeius, who was still master of Sicily. He then went into Italy, in order to fight Octavius; but Fulvia, who had been the author and promoter of this war, dying, Octavius and Antonius came to an agreement. One of the conditions of this new peace was, that they should together attack Pompey, though the former had lately made an alliance with him. Antonius then married Octavia, sister of Octavius, as a pledge of their renewed friendship: but returned soon after to his beloved Cleopatra, and again lived with her in Alexandria. Octavius took hold of this pretence to inveigh against him, and begin the war again. At last they engaged in a sea fight at Actium, in which Octavius gained a complete victory; which was followed by the deaths both of Antonius and Cleopatra. The infatuated Antonius fell upon his own sword; and Cleopatra stung herself to death with an asp, as was supposed, to avoid gracing the victor's triumph at Rome.

ANTONOMASIA, a form of speech, in which, for a proper name, is put the name of some dignity, office, profession, science or trade; or when a proper name is put in the room of an appellative. Thus a king is called his *majesty;* a nobleman, his *lordship*. We say the *philosopher* instead of Aristotle, and the *orator* for Cicero: Thus a man is called by the name of his country, a *German*, an *Italian;* and a grave man is called a *Cato*, and a wise man a *Solomon*.

ANTOSIANDRIANS, a sect of rigid Lutherans, who oppose the doctrine of Osiander relating to justification. These are otherwise denominated *Osiandromastiges*.—The Antosiandrians deny that man is made just, with that justice wherewith God himself is just; that is, they assert, that he is not made essentially, but only imputatively, just; or, that he is not really made just, but only pronounced so.

ANTRIM, the most northerly county of Ireland. It is bounded by that of Down on the south-east, that of Londonderry on the west, from which it is separated by the river Bann, part of Armagh on the south, St George's channel on the east, and the Deucaledonian ocean on the north. Its greatest length is about 46 miles, its greatest breadth abont 27; and it contains 972 square miles, or 622,059 English acres. Though the country is much encumbered with bogs and marshes, yet it enjoys a pretty good air; and it is well peopled, chiefly with Protestants. Where it is free from bogs the soil is fruitful. It sends five members to parliament, two for the shire, and one for each of the three principal towns, Belfast, Carrickfergus, and Lisburn.

Certain narrow valleys, called *glyns*, beginning here, and running a great way along the coast, belonged formerly to the Bissets, noblemen of Scotland, who having been obliged to quit that country for having assassinated Patrick earl of Athole upon a private quarrel, came hither, and had a great estate bestowed upon them by Henry III. of England; of which in the reign of Edward II. a part was forfeited by the rebellion of Hugh, then chief of the family. Another tract near this, called the *Rowte*, belonged anciently to the Macguillers, but now to the M'Donnels, earls of Antrim.

Upon the coast of this county are the promontories

Antrim || Antwerp.

called by Ptolemy, *Robogdium*, *Vennicinium* and *Boræum*, now *Fair Foreland*, *Ramshead*, and *St Helen's head*. The river also, styled by the same author *Vidua*, and now *Crodach*, runs through this county.—Here also is the remarkable natural curiosity called the *Giant's Causeway*, for a description of which see that article. See ANTRIM, SUPPLEMENT.

ANTRIM, the capital town of the county of Antrim, in Ireland, seated at the north end of the lake Lough Neagh, about six miles from the mouth of the bay, having a good road before it, with a pier near the place, within which vessels lie dry at low water. It was anciently a borough of great consequence, as appears from the mayor's being admiral of a considerable extent of coast, as well in Down as in this county; the corporation enjoying the customs paid by all vessels within those bounds, the creeks of Bangor and Belfast only excepted. This grant, however, the crown repurchased, and thereupon transferred the custom-house to Belfast, to which town it is now much inferior as well in size as in trade. It is, however, still a place of note, and formerly sent two members to the Irish house of commons. It gives the title of *earl* to the noble family of M'Donnel.—At Antrim is a seat, with noble demesnes, and beautiful and highly cultivated lands, of the earl of Massareene. W. Long. 6. 26. N. Lat. 54. 45.

ANTRUM, among *Anatomists*, a term used to denote several cavities of the body: as the *antrum highmorianum*, or that in the maxillary or jaw bone; *antrum pylori*, or that at the bottom of the pylorus, &c.

ANTWERP, a city of the duchy of Brabant, in the Netherlands, formerly capital of the marquisate of Antwerp, otherwise called the *marquisate of the holy Roman empire*, situated in E. Long. 4. 15. N. Lat. 51. 12. It lies in a low marshy ground on the Scheld, 24 miles from Brussels to the north. It is the third city in rank in Brabant, large and well built, containing 22 squares, and above 200 streets, all straight and broad, especially that called the *Mere*, in which six coaches can go abreast. Most of the houses are of freestone, and have an air of antiquity, being high, with courts before and gardens behind. At the head of the Mere is a crucifix of brass thirty-three feet high. The cathedral dedicated to the Virgin Mary, the stadthouse, and the exchange, are magnificent structures: the latter is the first building of that kind in Europe, and on its model the exchanges of London and Amsterdam are built. Its pillars are all of blue marble, and carved, but all in a different manner. The exchange cost the city 300,000 crowns. Antwerp, towards the end of the fifteenth century, was one of the most celebrated towns that ever existed. The Scheld, on which it stands, being 20 feet deep at low water, and rising 20 feet more at flood, ships of the greatest burden came up to the queys, as in the river Thames at London; but when the United Provinces formed themselves into a free state, after having shaken off the yoke of Spain, they got the entire command of the navigation of the Scheld; which ruined the trade of Antwerp, and transferred it to Amsterdam. This made the inhabitants turn their heads to painting, jewelling, and banking, which they have continued to this day with great success and reputation; for at Antwerp bills of exchange may be negotiated for any sum to any part of Europe; and in the time of Queen Anne's wars, two brothers of the name of De Koning, paid the one the army of France, and the other that of the confederates. Besides, here is a fine manufacture of tapestry and lace; and, for the promoting of trade, an insurance company has been erected. This city was the see of a bishop, who, as abbot of St Bernard, was the second prelate in Brabant. The bishopric was of great extent, and the cathedral a most noble pile, with one of the finest steeples in the world. The emperor, Charles V. when he made his entry into Antwerp, said it ought to be put in a case, and showed only once a year for a rarity. The house of the hanse towns, built when the city was in its flourishing condition, is a stately building, with magazines above for dry goods, and cellars below for wet, and in the middle story were 300 lodging rooms for merchants; but now it is turned to a horse barrack. There is a market here, called the *Friday's Market*, because it is held every Friday, where all sorts of household goods, pictures, and jewels, are sold by auction. No city in the Netherlands has so many and so fine churches as this. Many of them, particularly the cathedral and Jesuits church, are adorned with paintings, by Sir Peter Paul Rubens, who was a native of this city; and by Quintin Masseys, who is said to have been a blacksmith; but having fallen in love with a painter's daughter, and been told by her father, when he asked her of him in marriage, that he would have none but a painter for his son-in-law, he went to Italy to study painting, and, in a few years, returned so eminent in his new profession, that he found no difficulty in obtaining the father's consent. He is interred at the entry of the cathedral, where his effigy is put up, with an inscription, signifying, that conjugal love made an Apelles of a blacksmith. The above mentioned Jesuits church is extremely magnificent, and the chapel of the Virgin, joining to it, still more so. Among the cloisters the most remarkable are, the noble and rich abbey of St Michael, on the banks of the Scheld, the apartments of which are truly royal, and in which sovereign princes were often lodged; and the English nunnery, of the order of St Teresa, the nuns of which never wore linen, nor ate flesh, and lay upon straw: the grates of the convent are so dismal, that it looks like a prison. As to the fortifications of the city, it is environed with a fine wall, planted with rows of trees on each side, with walks between, broad enough for two coaches to go abreast, being also defended by a very strong, large, regular citadel, in form of a pentagon, erected by the duke of Alva in 1568, which commands the town and the neighbouring country. The magistracy of this city is chosen only out of the several patrician families; and consists of two burgomasters and 18 echevins, besides inferior magistrates. Among the privileges granted to it by its princes, there is one by which every person born in it is a citizen, though both his father and mother were foreigners.

Antwerp.

In 1585, Antwerp underwent a remarkable siege by the duke of Parma. It was then the most wealthy city in the Netherlands, and had long been the object of his designs; but the difficulties attending the enterprise obliged him to postpone it for a considerable time. In order to succeed, it was necessary to cut off the

communication

Antwerp. communication of the city with Holland, Ghent, and all places above and below Antwerp on the Scheld. To effect this, he laid siege to Liskenhousk and Tillo, places of the utmost consequence to the security and commerce of the city: both were obstinately defended; and the siege of the latter was raised, after it had been carried on for three months: however, the duke gained several other posts on the river, where he built forts, and greatly annoyed the shipping and trade of the city. He next laid siege to Dendermonde, in order to cut off the communication with Ghent, in which he succeeded by the reduction of the town. His next attempt was on Vilvorde: this place he took by assault, and thereby cut off the communication with Brussels. Finding, however, this method of hemming in the city tedious, and ineffectual while an opening to the mouth of the river remained, he formed a design of building a bridge adross the Scheld, the extremities of which were to be defended by strong forts and outworks. He began with collecting great quantities of wood at Callo and Fort St Philip, where he intended the bridge should be built; but his project was for some time retarded by the Antwerpers, who broke down the dykes, overflowed the whole country, and carried off his magazines by the inundation. Not discouraged by this loss, he applied himself diligently to repair it, and with incredible expedition cut a canal from Steken to Callo, by which he carried off the waters. He then set to work upon the bridge, and finished it in seven months, without any interruption from the Zealanders. During the building of this bridge, Aldegonde, governor of Antwerp, proposed to build a fort on Couvensteyn dyke, in order to secure that important post, and then break down the dyke when the bridge was near finished: but he was violently opposed by certain citizens; who apprehended that their lands and villas would be destroyed by the inundation. This unseasonable opposition, with the negligence of the magistrates, who, because the markets were high, had not laid in a sufficient stock of corn, occasioned the loss of the city. However, in despite of all the duke of Parma's precantion, the Zealanders found means to throw in a convoy of corn; but the citizens, knowing they would not run the risk of carrying it back again, so cheapened the price, that these bold traders refused ever to bring their goods again to so bad a market. The Antwerpers, having thus through avarice brought on their ruin, began in a short time to suffer by famine; they then pressed the Zealanders to attempt something for their relief, but it was now too late. While the magistrates were deliberating on some means for destroying the bridge, which they might have prevented from being ever completed, one Ginebelli, a Mantuan engineer, offered his services, undertaking at a certain expence to blow it into the air. Even in this extremity the expence was grudged: but necessity at last overcame this obstacle; Ginebelli was furnished with two large vessels, a number of small boats, and every thing necessary. He formed the two large vessels into fire ships, which he set adrift with the stream, deceiving the enemy by means of false fires lighted up in the fleet of small boats. The train of one of the fire ships was expended before the time expected, and she blew up with a terrible explosion, but with little damage to the bridge. The other was more successful, carrying off all the outworks, setting fire to the whole bridge, and burying above 500 soldiers in the ruins it made. The bridge however, was repaired, and the Antwerpers were soon reduced to the greatest straits, and obliged to surrender. It is said that the city of Amsterdam had obstructed every measure for the relief of Antwerp, hoping to profit by its destruction. By a stipulation between Spain and Holland at the peace of Westphalia in 1648, the navigation of the Scheld was closed. The emperor Joseph made an attempt to break this agreement in 1785, but did not succeed. At length, when the place fell into the hands of the French in 1792, the navigation of the river was declared open. Subsequent to this period, docks and store-houses were built, and the port improved. It was surrendered to the allies in 1814, after the capitulation of Paris, and now begins to revive. It contains at present 61,800 inhabitants. Antwerp, Anubis.

ANUBIS, a symbolical deity of the Egyptians, was regarded as the faithful companion of Osiris and of Isis. Temples and priests were consecrated to him, and his image was borne in all religious ceremonies.

Cynopolis, the present Minieh, situated in the Lower Thebais, was built in honour of Anubis. The temple wherein he was worshipped no longer subsists. The priests celebrated his festivals there with great pomp, and consecrated the dog to him as his living representation. "Anubis (says Strabo) is the city of dogs, the capital of the Cynopolitan prefecture. These animals are fed there on sacred aliments, and religion has decreed them a worship." An event, however, related by Plutarch, brought them into considerable discredit with the people. Cambyses having slain the god Apis, and thrown his body into a field, all animals respected it except the dogs, which alone ate of his flesh. This impiety diminished the popular veneration for them.

Cynopolis was not the only city which burned incense on the altars of Anubis. He had chapels in almost all the temples. On solemnities, his image always accompanied those of Isis and Osiris. Rome having adopted the ceremonies of Egypt, the emperor Commodus, to celebrate the Isiac feasts, shaved his head, and himself carried the god Anubis. The statue of this god was either of massive gold or gilt, as well as the attributes that accompanied him. Anubis signifies *gilded*. The denomination was mysterious; and the Egyptian priests, it would seem, had not given it without reason.

The signification of this emblematical deity is thus explained by Plutarch: "The circle which touches and separates the two hemispheres, and which is the cause of this division, receiving the name of *horizon*, is called *Anubis*. He is represented under the form of a dog, because that animal watches day and night." St Clemens of Alexandria, who was well informed in the mystic theology of the Egyptians, favours this explication. The two dogs, says he, (the two Anubes) are the symbols of two hemispheres which environ the terrestrial globe. He adds in another place: Others pretend that these animals, the faithful guardians of men, indicate the tropics, which guard the sun on the south and on the north like porters.

According to the former of these interpretations,

Anubis || Aorasia.

the priests, regarding Anubis as the horizon, gilded his statue; to mark, that this circle, receiving the first rays of the sun, appears sparkling with brightness on his rising, and that at his setting he reflects his last rays upon the earth. They said, in their sacred fables, that Anubis was the son of Osiris, but illegitimate. In fact, he only gives to the earth a borrowed light; and cannot be esteemed, like Horus, as the father of the day, or as the legitimate offspring of Osiris. It may be added, that the visible horizon turning with the sun, is his inseparable companion.

In the latter of these explications, where Anubis represents the tropics, he is also the faithful guardian of Isis and Osiris. In fact, the course of the sun and of the moon is contained between the circles wherein the solstices are performed. They neither deviate to the right nor left. These limits assigned by the Author of nature might therefore, in hieroglyphic language, be represented by a divinity with the head of a dog, who seemed to oppose the passage on the side of the two poles. The other opinion, notwithstanding, seems more natural, and to be more analogous to the ideas of the priests.

Upon the whole, it is reasonable to imagine, that Anubis at first was only a symbolical image, invented by astronomers to give a sensible expression of their discoveries; that afterwards, the people, accustomed to see it in their temples, which were the depositaries of science, adored it as a deity; and that the priests favoured their ignorance by connecting it with their religion. The worship of Anubis introduced, that of the dog became his emblem. Almost all the gods of the Gentiles have originated in this manner.

ANUS, in *Anatomy*, the lower extremity of the intestinum rectum, or orifice of the fundament.

ANVIL, a smith's utensil, serving to place the work on to be hammered or forged. The face or uppermost part of the anvil, must be very flat and smooth, without flaws, and so hard that a file will not touch it. At one end there is sometimes a pike, bickern or beak-iron, for the rounding of hollow work. The whole is usually mounted on a firm wooden block.—Forged anvils are better than those of cast work, and the best have the upper part made of steel. Locksmiths have a smaller kind of anvil called the *stake*, which is used for setting small cold work straight. See ANVIL, SUPPLEMENT.

ANVILLE, JEAN B. B. D', a celebrated French geographer. See SUPPLEMENT.

ANXUR, in *Ancient Geography*, a city of the Volsci, in Latium; called *Tarracina*, by the Greeks and Latins: Now *Terracina;* situated on an eminence (Livy, Horace, Sil. Italicus). *Anxuras*, a citizen of Anxur (Livy). And the epithet *Anxurus*, a name of Jupiter, worshipped without a beard at Anxur (Virgil). Though others read *Axuras*, or *Axyras*, without a razor. E. Long. 14. 5. Lat. 41. 18.

AONIDES, in *Mythology*, one of the many appellations of the muses; so called from Aonia, a part of ancient Bœotia.

AORASIA, in *Antiquity*, the invisibility of the gods. The word is Greek, ἀοραστια, and derived from ἀ priv. and ὁραω, *to see*. The opinion of the ancients with regard to the appearance of the gods to men, was that they never showed themselves face to face, but were known from their backs as they withdrew. Neptune assumed the form of Calchas to speak to the two Ajaces; but they knew him not till he turned his back to leave them, and discovered the god by his majestic step as he went from them. Venus appeared to Æneas in the character of a huntress; but her son knew her not till she departed from him: her divinity was then betrayed by her radiant head, her flowing robe, and her majestic pace.

Aorist || Aornus.

AORIST, among grammarians, a tense peculiar to the Greek language, comprehending all the tenses; or rather, expressing action in an indeterminate manner, without any regard to past, present, and future.

AORISTIA, in the sceptic philosophy, denotes that state of the mind wherein we neither assert nor deny any thing positively, but only speak of things as seeming or appearing to us in such a manner. The aoristia is one of the great points or terms of scepticism, to which the philosophers of that denomination had continual recourse by way of explication, or subterfuge. Their adversaries, the dogmatists, charged them with dogmatizing, and asserting the principles and positions of their sect to be true and certain.

AORNUS, a very high rock of India, having its name from its extraordinary height, as being above the flight of a bird. Its circuit was about 25 miles, its height 11 furlongs, and the way leading up to the top artificial and narrow. At the bottom, on one side, ran the river Indus; on the top was a fine plain, part of which was covered with a thick wood; the rest arable land, with a fountain furnishing abundance of excellent water. This rock was taken by Alexander the Great, in whose time there was a report that Hercules had attempted it in vain; however, according to Arrian, this report was without foundation. It is probable indeed, that it was raised after the place was taken, in order to magnify Alexander's exploit. While the Macedonian monarch was preparing all things necessary for the siege, an old man with his two sons, who had long lived in a cave near the summit, came and offered to show him a private way of ascending. This being readily accepted, Ptolemy, with a considerable body of light-armed troops, was despatched with them, with orders, in case they succeeded, to intrench themselves strongly upon the rock, in the wood to which the old man was to direct them, before they ventured to attack the Indians. Ptolemy exactly executed his orders; and gave notice, by a lighted torch set upon a pole, that he had got safely up. Upon this, Alexander gave immediate orders for a body of troops to attempt the passage by which the rock was commonly ascended; but they were repulsed with great slaughter. He then sent an Indian with letters to Ptolemy, desiring him, the next time an attack was made by the common way, to fall upon the enemy behind. but in the mean time, those who defended the rock attacked Ptolemy with great vigour; but were at last repulsed, though with much difficulty: but the next day, when Alexander renewed the attack, though Ptolemy attacked the Indians in the rear, the Macedonians were repulsed on both sides. At last, the king perceiving that the strength of the Indians lay in the straitness and declivity of the way by which they were attacked, caused a great quantity of trees to be felled, and with them filled the cavities between the plain on which

Aornus ‖ pædusia.

which the Indians were encamped and the highest of his own advanced posts. The Indians at first derided his undertaking; but at length perceiving the ardour with which the work was carried on, and having felt the effects of the missile weapons of the Macedonians, they sent deputies to propose terms of capitulation. Alexander suspecting that their design was only to amuse him till they made their escape, withdrew his troops from the avenues. As soon as he knew the Indians were descended, he, with 700 of Ptolemy's light-armed foot, took possession of the deserted rock, and then made a signal for his forces to fall upon the flying Indians. They, setting up a loud shout, so terrified the fugitives, that numbers of them fell from the rocks and precipices, and were dashed to pieces, while the greatest part of the remainder were cut off in the roads.

AORTA, in *Anatomy*, the great artery which rises immediately from the left ventricle of the heart, and is from thence distributed to all parts of the body. It is divided into two grand trunks, distinguished by the epithets *ascending* and *descending*. See ANATOMY.

AOUSTA, or AOST, a town of Italy, in Piedmont, and capital of the duchy of the same name, a bishop's see, and subject to the king of Sardinia. It is remarkable for several monuments of the Romans, and for the birth of Anselm archbishop of Canterbury. It is seated at the foot of the Alps, on the river Doria. E. Long. 7. 33. N. Lat. 45. 58.

AOUSTA, a territory of Piedmont, with the title of a duchy. It is a valley 30 miles in length, and extends from the pass of St Martin's, near the frontiers of Yvree, to St Bernard. It abounds in pastures, and all sorts of fruits. The capital is of the same name.

AOUTA, the name of the paper mulberry tree at Otaheite in the South sea, from which a cloth is manufactured that is worn by the principal inhabitants. See the article BARK.

APACHES, a people of New Mexico in North America. They are brave, resolute, and warlike, fond of liberty, and the inveterate enemies of tyranny and oppression. Of this disposition the Spaniards had fatal experience towards the end of the last century, when they revolted against the Catholic king, massacred several of his officers, and committed the greatest devastations. Ever since, they have remained the allies, not the subjects of the Spaniards; and the viceroy of Mexico has been obliged to maintain a more formidable garrison, and a greater number of troops.

APÆDUSIA, denotes ignorance or unskilfulness in what relates to learning and the sciences. Hence also persons uninstructed and illiterate are called *apædeutæ*. The term *apædeutæ* was particularly used among the French in the time of Huet; when the men of wit at Paris were divided into two factions, one called by way of reproach *apædeutæ*, and the others *eruditi*. The *apædeutæ* are represented by Huet as persons who, finding themselves either incapable or unwilling to undergo a severe course of study in order to become truly learned, conspire to decry learning, and turn the knowledge of antiquity into ridicule, thus making a merit of their own incapacity. The *apædeutæ* in effect were the men of pleasure; the *eruditi* the men of study. The *apædeutæ* in every thing preferred the modern writers to the ancient, to supersede the necessity of studying the latter. The *eruditi* derided the moderns, and valued themselves wholly on their acquaintance with the ancients.

Apædusia ‖ Apamea.

APAGOGE, in *Logic*. See ABDUCTION.

APAGOGE, in the Athenian law, the carrying a criminal taken in the fact to the magistrate. If the accuser was not able to bring him to the magistrate, it was usual to take the magistrate along with him to the house where the criminal lay concealed, or defended himself.

APAGOGE, in *Mathematics*, is sometimes used to denote a progress or passage from one proposition to another; when the first having been once demonstrated, is afterwards employed in the proving of others.

APAGOGICAL DEMONSTRATION, an indirect way of proof, by showing the absurdity of the contrary.

APALACHIAN MOUNTAINS, more properly called the *Allegany Mountains*, have their southern beginning in the latitude of 34°, extending northerly through the United States, and running nearly parallel with the sea coast to the latitude of 41° north. The length of the chain is about 800 miles. Their height is not great, being in general not above 3000 feet. Their summits, in many cases, form a continued line, neither broken by transverse fissures, nor elevated into peaks. They include properly three or four distinct ridges, the westmost of which is called Laurel Mountain, and the eastmost Blue Mountain; and they thus cover a space of a hundred miles in breadth. Between these ridges the soil is generally excellent. The valleys are wide, and not steep, and the hills are often wooded to their summits. These mountains divide the United States like a back bone, and direct the course of the rivers on the one side to the sea, and on the other to the Mississippi. Chesnuts and small oaks are the trees that principally grow on these mountains, with some *chinkapin* * and other small shrubs. The grass is thin, mixed with vetch and small pease; and in some places there is very little vegetable appearance.

* Fagus pumila.

The rocks of the Apalachian mountains are mostly of a light gray colour; some are of a coarse-grained marble like alabaster; others of a metallic lustre: some pieces are in the form of slate, and brittle; others in lumps, and hard: and some appear with spangles, or covered over with innumerable small shining specks, like silver. These frequently appear at the roots of trees when blown down. The different spars are found mostly on the highest and steepest parts of the hills, where there is little grass and few trees; but the greatest part of the soil between the rocks is generally a dark sandy-coloured kind of mould, and shallow.

APAMEA, or APAMIA, the name of several ancient cities.

1. One of Bithynia, formerly called *Myrlea*, from Myrlus, general of the Colophonians: destroyed by Philip, father of Perseus; and given to his ally Prusias, who rebuilt it, and called it *Apamea*, from the name of his queen Apama (Strabo). Stephanus says, that Nicomedes Epiphanes, son of Prusias, called it after his mother; and that it had its ancient name from Myrlea, an Amazon. The Romans led a colony thither (Strabo);

Apamea || Apanthropy.

bo); called *Colonia Apamena* (Pliny, Appian). The gentilitious name is *Apamæus* and *Apamenus* (Trajan in a letter to Pliny).

2. Another *Apamea*, called *Cibotus*, of Phrygia, at some distance from the Meander (Agathodæmon); but by a coin of Tiberius, on the Meander. The name is from Apame, mother of Antiochus Soter, the founder, and the daughter of Artabazus (Strabo). The rise, or at least the increase, of Apamea, was owing to the ruins of Celenæ. The inhabitants were called *Apamienses;* and, though inland, were worshippers of Neptune. The reason, it has been conjectured, was, that they had suffered often from earthquakes, of which he was the supposed author. Mithridates gave a hundred talents towards the restoration of the city; which, it is said, had likewise been overthrown in the time of Alexander. Their tribute money was remitted to them for five years on the same account under the emperor Tiberius. The subterraneous passage of the Lycus and the other streams, showed that the ground had many cavities; and these, it has been surmised, rendered the region very liable to be shaken.

3. A third, on the confines of Parthia and Media, surnamed *Raphane* (Strabo, Pliny).

4. A fourth *Apamea*, a town of Mesene, an island in the Tigris (Pliny, Ammian); where a branch of the Euphrates, called the *Royal River*, falls into the Tigris (Ptolemy).

5. A fifth in Mesopotamia, on the other side of the Euphrates, opposite to Zeugma on this side, both founded by Seleucus, and joined by a bridge, from which the latter takes its name (Pliny, Isidor. Characenus).

6. A sixth *Apamea*, now *Famia*, also in Syria, below the confluence of the Orontes and Marsyas; a strong city, and situated in a peninsula, formed by the Orontes and a lake. "It is here (says Strabo) that the Seleucidæ had established the school and nursery of their cavalry." The soil of the neighbourhood, abounding in pasturage, fed no less than 30,000 mares, 300 stallions, and 500 elephants; instead of which, the marshes of Famia at present scarcely afford a few buffaloes and sheep. To the veteran soldiers of Alexander, who here reposed after their victories, have succeeded wretched peasants, who live in perpetual dread of the oppressions of the Turks and the inroads of the Arabs.

Apamea was also the ancient name of *Pella*, in the Decapolis.

APANAGE, or APPENNAGE, in the French customs, lands assigned by a sovereign for the subsistence of his younger sons, which revert to the crown upon the failure of male issue in that branch to which the lands are granted.

APANOMIA, a town of Santorin, an island in the Mediterranean sea, called in this part by some the *sea of Candia*. It has a spacious harbour, in the form of a half moon; but the bottom is so deep, that ships cannot anchor there. E. Long. 25. 59. N. Lat. 36. 18.

APANTHROPY, in *Medicine*, denotes a love of solitude, and aversion for the company of mankind. Apanthropy is by some reckoned among the symptoms, by others among the species or degrees of melancholy; and also passes for an ill indication in leucophlegmatic cases.

APARINE, in *Botany*, a synonyme of the urticularia and several other plants. Aparine || Apaulia.

APARITHMESIS, in *Rhetoric*, denotes the answer to the protasis or proposition itself. Thus, if the protasis be, *Appellandi tempus non erat*,—the aparithmesis is, *At tecum anno plus vixi.*

APARTISMENUS, in the ancient poetry, an appellation given to a verse, which comprehended an entire sense or sentence in itself. This is sometimes also written *apartemenus*, i. e. suspended, as not needing any following verse.

APATHY, among the ancient philosophers, implied an utter privation of passion, and an insensibility of pain. The word is compounded of *α* priv. and *παθος*, *affection*. The Stoics affected an entire apathy; they considered it as the highest wisdom to enjoy a perfect calmness or tranquillity of mind, incapable of being ruffled by either pleasure or pain. In the first ages of the church, the Christians adopted the term *apathy*, to express a contempt of all earthly concerns; a state of mortification, such as the gospel prescribes. Clemens Alexandrinus, in particular, brought it exceedingly in vogue; thinking hereby to draw the philosophers to Christianity, who aspired after such a sublime pitch of virtue. Quietism is only apathy disguised under the appearance of devotion.

APATURIA, in antiquity, a solemn feast celebrated by the Athenians in honour of Bacchus. The word is usually derived from *απατη*, *fraud*. It is said to have been instituted in memory of a fraudulent victory obtained by Melanthus, king of Athens, over Xanthus, king of Bœotia, in a single combat, which they agreed upon, to put an end to a debate between them relating to the frontiers of their countries. Hence Budæus calls it *festum deceptionis*, "the feast of deceit."

Other authors give a different etymology of this feast: They tell us, that the young Athenians were not admitted into the tribes on the third day of the apaturia, till their fathers had first sworn that they were their own children; and that till that time, they were supposed, in some measure, to be without fathers, *απατορες*; whence the feast, say they, took its name. Xenophon, on the other hand, informs us, that the relations and friends met on this occasion, and joined with the fathers of the young people who were to be received into the tribes; and that from this assembly the feast took its name; that in *απατουρια*, the *α*, far from being a privative, being here a conjunctive, signifies the same thing with *ομυ*, *together*. This feast lasted four days: the first day, those of the same tribe made merry together; and this they called *δορπια*. The second day, which they called *αναῤῥυσις*, they sacrificed to Jupiter and Minerva. The third day, which they called *κουρεωτις*, such of their young men and maids as were of age were admitted into their tribes. The fourth day they called *επιβης*.

APAULIA, in antiquity, the third day of a marriage solemnity. It was thus called because the bride, returning to her father's house, did *απαυλιζεσθαι του νυμφιου*, lodge apart from the bridegroom. Some will have the apaulia to have been the second day of the marriage, viz. that whereon the chief ceremony was performed; thus called by way of contradistinction from the first day, which was called *προαυλια*. On the

Ape || Apelles.

the day called *απαυλια* (whenever that was), the bride presented her bridegroom with a garment called *απαυλητηρια*.

APE, in *Zoology*, the general English name of a very numerous race of animals, the natural history of which is given at large under the article SIMIA; comprehending *Apes*, properly so called, or such as want tails; and *Monkeys* and *Baboons*, or such as have tails, the former *long*, and the other *short*, ones. See SIMIA.

Sea APE, a name given by Steller to a marine animal which he saw on the coast of America, and is thus described *. "The head appeared like that of a dog, with sharp and upright ears, large eyes, and with both lips bearded: the body round and conoid; the thickest part near the head; the tail forked; the upper lobe the longest: the body covered with thick hair, gray on the back, reddish on the belly. It seemed destitute of feet. It was extremely wanton, and played a multitude of monkey tricks. It sometimes swam on one side, sometimes on the other side of the ship, and gazed at it with great admiration. It made so near an approach to the vessel, as almost to be touched with a pole; but if anybody moved, it instantly retired. It would often stand erect for a considerable space, with one-third of its body above water; then dart beneath the ship, and appear on the other side; and repeat the same thirty times together. It would frequently arise with a sea plant, not unlike the bottle gourd, toss it up, and catch it in its mouth, playing with it numberless fantastic tricks.

* *Hist. of Kamtschatka*, p. 136.

APELYTES, Christian heretics in the second century, who affirmed that Christ received a body from the four elements, which at his death he rendered back to the world, and so ascended into heaven without a body.

APELLA, among physicians, a name given to those whose prepuce is either wanting or shrunk, so that it can no longer cover the glans. Many authors have supposed this sense of the word *Apella* warranted from the passage in Horace, *credat Judæus Apella non ego*. But, according to Salmasius and others, *Apella* is the proper name of a certain Jew, and not an adjective signifying *circumcised*.

APELLES, one of the most celebrated painters of antiquity. He was born in the island of Cos, and flourished in the time of Alexander the Great, with whom he was in high favour. He executed a picture of this prince, holding a thunderbolt in his hand: a piece, finished with so much skill and dexterity, that it used to be said there were two Alexanders; one invincible, the son of Philip; the other inimitable, the production of Apelles. Alexander gave him a remarkable proof of his regard: for when he employed Apelles to draw Campaspe, one of his mistresses, having found that he had conceived an affection for her, he resigned her to him; and it was from her that Apelles is said to have drawn his Venus Anadyomene.

One of Apelles's chief excellencies was his making his pictures exactly resemble the persons represented; insomuch that the physiognomists are said to have been able to form a judgment of the person's destiny as readily from his portraits as if they had seen the originals. But what is called *grace* was the characteristic of this artist. His pencil was so famous for drawing fine lines, that Protogenes discovered by a single line that Apelles had been at his house. Protogenes lived at Rhodes: Apelles sailed thither, and went to his house with great eagerness to see the works of an artist who was known to him only by name. Protogenes was gone from home: but an old woman was left watching a large piece of canvass, which was fitted in a frame for painting. She told Apelles that Protogenes was gone out; and asked him his name, that she might inform her master who had inquired for him. "Tell him (says Apelles) he was inquired for by this person;"—at the same time taking up a pencil, he drew on the canvass a line of great delicacy. When Protogenes returned, the old woman acquainted him with what had happened. That artist, upon contemplating the fine stroke of the line, immediately pronounced that Apelles had been there; for so finished a work could be produced by no other person. Protogenes, however, himself drew a finer line of another colour; and, as he was going away, ordered the old woman to show that line to Apelles if he came again; and to say, "This is the person for whom you are inquiring." Apelles returned, and saw the line: he would not for shame be overcome; and therefore, in a colour different from either of the former, he drew some lines so exquisitely delicate, that it was utterly impossible for finer strokes to be made. Protogenes now confessed the superiority of Apelles, flew to the harbour in search of him, and resolved to leave the canvass with the lines on it for the astonishment of future artists. Apelles.

Apelles showed great liberality of mind towards Protogenes. With ideas enlarged by education and literature, he was incapable of harbouring little jealousies of noble competitors; on the contrary, he was the first who made the works of Protogenes to be valued as they deserved among the Rhodians. He acknowledged that Protogenes was in some respects superior to himself; but that in one particular himself excelled, viz. in knowing when to take his hand from the picture; an art which Protogenes had not yet learned, and therefore over-worked his pieces. Apelles equally disapproved of too elaborate diligence, or too hasty negligence in execution. A studied work of Protogenes he esteemed less on the one account; and on the other, when a silly painter once brought him a picture, and said, "This I painted in a hurry,"—he replied, "Though you had not told me so, I perceived it was painted in haste: but I wonder you could not execute more such pieces in the same time."

There are two stories related of Apelles, which show him to be at once an artist of modesty, in amending even trifling improprieties, when pointed out to him by competent judges; and yet of self-confidence sufficient to make him know the perfection and value of his own paintings. It was customary with Apelles to expose to public view the works which he had finished, and to hide himself behind the picture, in order to hear the remarks passed on it by persons who chanced to view it. He once overheard himself blamed by a shoemaker for a fault in the slippers of some picture: he corrected the fault which the man had noticed: but on the day following the shoemaker began to animadvert on the leg; upon which Apelles with some anger looked out from behind the canvass, and bade him

keep

Apelles ‖ Apenninus.

keep to his own province, "Ne sutor ultra crepidam." It is well known that Alexander forbade any one besides Apelles to paint his portrait. We are not, however, to conclude from this, that Alexander was a more skilful judge of painting than he was of poetry. Like Augustus, he cherished the fine arts more from vanity than taste. A remarkable proof is given of this prince's inability to discern merit, and of the painter's freedom in expressing the mortification he felt, when a work of his was not sufficiently commended. "Alexander (says Ælian, lib. ii. c. 3. Var. Hist.) having viewed the picture of himself which was at Ephesus, did not praise it as it deserved. But when a horse was brought in, and neighed at seeing the figure of a horse in the picture, as though it had been a real horse; *O king!* (said Apelles) *this horse seems to be by far a better judge of painting than you.*" It happened more than once that the horses drawn by him were mistaken for real ones, by living horses which saw and neighed at the pictures. In his finishing a drawing of this animal, a remarkable circumstance is related of him. He had painted a horse returning from battle, and had succeeded to his wishes in describing every other mark that could indicate a mettlesome steed, impatient of restraint; there was wanting nothing but a foam of a bloody hue issuing from the mouth. He again and again endeavoured to express this, but his attempts were unsuccessful. At last, with vexation, he threw against the reins of the horse a sponge which had in it many colours; a mixture of which coming out of the sponge, and tinging the reins, produced the very effect desired by the painter.

The works of Apelles were all admired; but the most celebrated were the picture of Alexander in the temple of Diana at Ephesus, and that of Venus emerging from the sea. Alexander was drawn with thunder in his hand; and such relief was produced by the chiaro scuro in this piece, that the fingers seemed to shoot forward, and the thunderbolt to be out of the picture. His Venus Αναδυομενη was esteemed the most exquisite figure which the pencil could create: it is therefore extolled by the Roman poets Propertius and Ovid; and the poet of Sidon, Antipater, has left us the following Greek epigram on it:

Των αναδυομεναν απο μαζηος αξιν θαλαττας
Κυπριν Απελλειη μοχθον οραα γραφιδος,
Ως χερι συμμαρψασα διαδροχον υδατι καιταν
Εκθλιβει νοτερων αφρον απο πλοκαμων,
Αυται νυν ερεωσιν Αθηναιη τε και Ηρη
"Ουκ ετι σοι μορφας εις εριν ερχομεθα."

Anth. iv. 12.

Graceful as from her natal sea she springs,
Venus, the labour of Apelles, view:
With pressing hand her humid locks she wrings,
While from her tresses drips the frothy dew:
Ev'n Juno and Minerva now declare,
"No longer we contend whose form's most rare."

APENE, in antiquity, a kind of chariot wherein the images of the gods were carried in procession on certain days, attended with a solemn pomp, songs, hymns, dancing, &c. It was very rich, made sometimes of ivory, or of silver itself, and variously decorated.

APENNINUS, now the *Apennine;* a mountain, or ridge of mountains, running through the middle of Italy, from north-west to south-west, for 700 miles, in the form of a crescent (Pliny); beginning at the Alps in Liguria, or the Rivierra di Genoa; and terminating at the strait of Messana, or at Reggio, and the promontory Leucopetra; and separating, as by a back or ridge, the Adriatic from the Tuscan sea (Pliny, Strabo, Ptolemy, Polybius, Vitruvius). This mountain, though high, is greatly short of the height of the Alps. Its name is Celtic, signifying a *high mountain.* Apenninus ‖ Apepsia.

APENRADE, a town of Denmark in the duchy of Sleswick, seated at the bottom of a gulf in the Baltic sea, between Flensbourg and Hadaschleben. It is 25 miles north from Sleswick. E. Long. 9. 28. N. Lat. 55. 4.

APENZEL, a town of Switzerland, in the canton of the same name, seated on the river Chus, E. Long. 9. 1. N. Lat. 47. 31. The canton itself, which was allied to the others in 1513, consists only of three or four valleys; having the town and abbey of St Gall on the north; the county of Toggenburg on the west; the lordship of Sax in the canton of Zurich, and that of Gambs in the canton of Schweitz, on the south; and the Rheinthall, or Rhine-valley, on the east. Its greatest length is about thirty miles, and its breadth about twenty. It yields good pasturage, and consequently is not destitute of cattle, milk, butter, or cheese. Considerable quantities also of wheat, rye, barley, oats, beans, pease, flax, and wine, are produced in it: besides a great deal of fruit, wood, and turf; with mineral waters, and warm baths. There are many mountains in the canton, the highest of which is that called the *Hohesantis*, or the *Hohe Mesmer*, which commands a prospect of a prodigious extent. There are also several lakes and rivers. The inhabitants, who are partly Protestants, and partly Roman Catholics, subsist chiefly by their manufactures of linen, crape, fustian, and thread, or by bleaching, and the sale of their cattle, butter, cheese, horses, wood, and coal. Of the twenty-three parishes in the canton, four are Popish, and nineteen Protestant. Before the Reformation, the inhabitants were subject to the abbot of St Gall; but they then shook off his yoke, and united themselves with the other cantons: after that, however, there were violent animosities between the Papists and Protestants, the former continually persecuting the latter, till at last, in 1587, by the mediation of the other cantons, the two parties came to an accommodation, by which certain districts were assigned to each party, whereas before they lived promiscuously together: and though these two divisions now constitute but one canton, yet each forms a distinct community or free state, sending its particular representatives to the diets of the confederacy, and having its separate councils and officers. In spirituals, the Papists are subject to the bishop of Constance, but the Protestants to their own consistory. The canton contains altogether 326 square miles, and and 55,414 inhabitants.

APEPSIA, (from α negative, and πεπτω, to *digest*), indigestion.

Abstemiousness and excess are alike causes of indigestion. An over-distension of the stomach may in some measure injure its proper tone; and long fasting, by inducing a bad quality in the juices secerned into the

Apepsia || Aphasia.

the stomach, renders it feeble, and generates wind. Hard drinking, and any of the causes of an anorexy, also injure digestion.

The columbo root is said to be particularly useful when the stomach is languid, the appetite defective, digestion with difficulty carried on, or when a nausea with flatulency attends. It is prescribed in substance, with any grateful aromatic, or infused in Madeira wine, now and then interposing gentle doses of the tincture of rhubarb.

A mixture of mustard seed with the columbo root is of admirable utility in complaints of this kind; particularly where acidity and flatulence prevail much in the primæ viæ.

APER, in *Zoology*, a synonyme of the sus scrofa. See Sus.

APERIENTS, in the *Materia Medica*, an appellation given to such medicines as facilitate the circulation of the humours by removing obstructions. The five aperient roots of the shops are, smallage, fennel, asparagus, parsley, and butchers broom.

APERTURE, the opening of any thing, or a hole or cleft in any continuous object.

Aperture, in *Geometry*, the space between two right lines which meet in a point and form an angle.

Aperture, in *Optics*, a round hole in a turned bit of wood or plate of tin, placed within the side of a telescope or microscope, near to the object glass, by means of which more rays are admitted, and a more distinct appearance of the object is obtained.

Apertures, or *Apertions*, in *Architecture*, are used to signify doors, windows, &c.

APETALOSE, or Apetalous, among botanists, an appellation given to such plants as have no flower leaves.

APEX, the vertex or summit of any thing.

Apex, in antiquity, the crest of a helmet, but more especially a kind of cap worn by the flamens.

Apex, among grammarians, denotes the mark of a long syllable, falsely called a *long accent*.

APHACA, in *Ancient Geography*, the name of a place in Syria, situated between Heliopolis and Byblus, near Lebanon; infamous for a temple of Venus, called *Aphacetis*, near which was a lake, round which fire usually burst forth, and its waters were so heavy, that bodies floated on them. The temple was destroyed by Constantine, as being a school of incontinence, (Eusebius). The name is of Syriac origin, signifying *embraces*.

APHÆRESIS, in *Grammar*, a figure by which a letter or syllable is cut off from the beginning of a word. Thus *ciconia*, by aphæresis, is written *conia; contemnere, temnere; omittere, mittere*, &c.

A like retrenchment at the end of a word is called apocope.

Aphæresis, in *Medicine*, denotes a necessary taking away or removal of something that is noxious.—In surgery, it signifies an operation whereby something superfluous is taken away.

APHANES, Parsley Root. See Botany *Index*.

APHASIA, (from α, and $\varphi\eta\mu\iota$, "I speak,") in the sceptic philosophy, denotes a state of doubt, wherein a person not knowing what to determine on, it is best for him to be silent. In this sense, *aphasia* stands opposed to *phasis*, under which are included both assertion and negation.

Aphasia || Aphis.

APHEK, the name of several cities mentioned in Scripture. 1. Aphek, in the tribe of Judah, where the Philistines encamped when the ark was brought from Shiloh, which was taken by them in battle, 1 Sam. iv. 1, 2, &c. It is thought to be the same with Aphekah mentioned in Josh. xv. 53. 2. Aphek in the valley of Jezreel, where the Philistines encamped while Saul and his army were near Jezreel, upon the mountains of Gilboa, Sam. xxix. 1, &c. 3. Aphek, a city belonging to the tribe of Asher, near the country of the Sidonians; (Josh. xix. 30. and xiii. 4.). 4. Aphek, a city of Syria, one of the principal in Benhadad's kingdom, near which the battle was fought between Ahab and Benhadad, wherein the Syrians were worsted; and whereof, as they retreated with precipitation into the city, the walls fell upon them, and crushed in pieces 27,000 (1 Kings xx. 26. *et seq.*). This city lay between Heliopolis and Byblus.

APHELIUM, or Aphelion, in *Astronomy*, is that point in any planet's orbit, in which it is farther distant from the sun, being that end of the greater axis of the elliptical orbit of the planet most remote from the focus where the sun is.

APHIOM, Karahissart, a town of Natolia, in Asiatic Turkey; it is named *Aphiom*, because it produces a great deal of opium, called *aphiom* by the Turks. E. Long. 30. 26. N. Lat. 38. 35.

APHIS, the Puceron, Vine-fretter, or Plant-louse. See Entomology *Index*.

Linnæus enumerates 33 species of the aphis, all of them inhabitants of particular plants, from which their trivial names are taken; as aphis *ribi*, *ulmi*, *rosæ*, &c. And he adds, that there seems to be a greater variety of plants producing aphides than there are different sorts of this insect. But some late observers have been able to distinguish more than double the above number of species; and it is probable that many more remain still to be added, as many of the same kind of plants are found to support two or three quite different sorts of aphides. Thus the plum tree has two sorts very distinct from each other; one of a yellowish green, with a round short body; the other of a bluish green, as it were enamelled with white, and the shape more oblong. On the gooseberry bush and currant the same aphides may be found; but each of these is inhabited by two very different species: the one being of a dusky green, with a short plump body; the other of paler green, the body more taper, and transversely wrinkled. The rose tree, again, supports not less than three distinct species: the largest is of a deep green, having long legs of a brownish cast, with the joints of a very dark brown, as also are the horns and antennæ; a second sort is of a paler green, has much shorter legs, and a more flat body; the third sort is of a pale red, its body transversely wrinkled, and is most frequently on the sweet-briar.

The extraordinary nature of these insects has for some time past justly excited the wonder and attention of naturalists. They were long ranked among the animals which had been classed with the true androgynes spoken of by Mr Breynius; for having never been catched copulating, it was hastily concluded that they

Aphis. they multiplied without copulation. This, however, was but a doubt, or at best a mere surmise: but this surmise was believed and adopted by Mr Reaumur; and though he supported it by some observations peculiar to himself, the question remained still undecided, till Mr Bonnet seemed to have cleared it up in the affirmative, by taking and shutting up a young aphis at the instant of its birth, in the most perfect solitude, which yet brought forth in his sight 95 young ones. The same experiment being made on one of the individuals of this family, that had been tried with its chief, the new hermit soon multiplied like its parent; and one of this third generation, in like manner brought up in solitude, proved no less fruitful than the former. Repeated experiments, in this respect, as far as the fifth or sixth generation, all uniformly presenting the observer with *fecund virgins*, were communicated to the Royal Academy of Sciences; when an unforeseen and very strange suspicion, imparted by Mr Trembley to Mr Bonnet engaged him anew in a series of still more painful experiments than the foregoing. In a letter which that celebrated observer wrote to him from the Hague, the 27th January 1741, he thus expresses himself: "I formed, since the month of November, the design of rearing several generations of solitary pucerons, in order to see if they would all equally bring forth young. In cases so remote from usual circumstances, it is allowed to try all sorts of means; and I argued with myself, Who knows but that one copulation might serve for several generations?" This "*who knows*," to be sure, was next to avouching nothing; but as it came from Mr Trembley, it was sufficient to persuade Mr Bonnet that he had not gone far enough in his investigation. If the fecundity of aphides was owing to the secret copulation suggested by Mr Trembley; this copulation served at least five or more successive generations. Mr Bonnet therefore reared to the amount of the tenth generation of solitary aphides, and had the patience to keep an account of the days and hours of the births of each generation. In short it was discovered, That they are really distinguished by sexes: That there are males and females amongst them, whose amours are the least equivocal of any in the world: that the males are produced only in the tenth generation, and are but few in number: that these, soon arriving at their full growth, copulate with the females: that the virtue of this copulation serves for ten generations: that all these generations, except the first, (from the fecundated eggs), are produced viviparous; and all the individuals are females, except those of the last generation, among whom, as we have already observed, some males make their appearance to lay the foundation of a fresh series.—These circumstances have been confirmed by other naturalists. In particular we have a curious and accurate detail of them by Dr Richardson of Rippon, in the Philosophical Transactions, vol. xi. art. 22. an extract of which we shall here insert, in order to give the reader as full an insight into the nature of these singular insects, as can be done by a mere detail of facts in themselves utterly unaccountable.

"The great variety of species which occur in the insects now under consideration, may make an inquiry into their particular nature seem not a little perplexed; having them, however, skilfully reduced under their proper genus, the difficulty is by this means considerably diminished. All the insects comprehended under any distinct genus, we may reasonably suppose to partake of one general nature; and, by diligently examining any of the particular species, may thence gain some insight into the nature of all the rest. With this view I have chosen, out of the various sorts of aphides, the largest of those found on the rose tree; not only as its size makes it the more conspicuous, but as there are few others of so long a duration. This sort appearing early in the spring, continues late in the autumn; while several are limited to a much shorter term, in conformity to the different trees and plants from whence they draw their nourishment. Aphis.

1. "If at the beginning of February the weather happens to be so warm as to make the buds of the rose tree swell and appear green; small aphides are frequently to be found upon them, not larger than the young ones in summer when first produced. But there being no old ones to be found at this time of the year, which in summer I had observed to be viviparous, I was formerly not a little perplexed by such appearances, and almost induced to give credit to the old doctrine of equivocal generation. That the same kind of animal should at one time of the year be viviparous, and at another time oviparous, was an opinion I could then by no means entertain. This, however, frequent observation has at last convinced me to be fact; having found those aphides which appear early in the spring, to proceed from small black oval eggs, which were deposited on the last year's shoots in autumn; though when it happens that the insects make too early an appearance, I have observed the greatest part to suffer from the sharp weather that usually succeeds, by which means the rose trees are some years in a manner freed from them.

"Those which withstand the severity of the weather seldom come to their full growth before the month of April; at which time they usually begin to breed, after twice casting off their exuviæ or outward covering. It appears then that they are all females, which produce each of them a very numerous progeny, and that without having intercourse with any male insect. As I observed before, they are viviparous; and what is equally uncommon, the young ones all come into the world backwards. When they first come from the parent they are enveloped by a thin membrane, having in this situation the appearance of an oval egg; which, I apprehend, must have induced Reaumur to suspect that the eggs discovered by Bonnet were nothing more than mere abortions. These egg-like appearances adhere by one extremity to the mother; while the young ones contained in them extend the other; by that means gradually drawing the ruptured membrane over the head and body to the hind feet. During this operation, and for some time after, by means of something glutinous, the fore part of the head adheres to the vent of the parent. Being thus suspended in the air, it soon frees itself from the membrane in which it was confined, and after its limbs are a little strengthened, is set down on some tender shoot, and then left to provide for itself.

2. "In the spring months, there appear on the rose trees but two generations of aphides, including those which immediately proceed from the last year's eggs; the warmth of the summer adds so much to their fertility,

Aphis. lity, that no less than five generations succeed one another in the interval. One is produced in May, which casts off its covering; while the months of June and July each supply two more, which cast off their coverings three or four times, according to the different warmth of the season. The frequent change of the outward covering is the more extraordinary, as it is the oftenest repeated when the insects come the soonest to their growth; which I have sometimes observed to happen in ten days, where warmth and plenty of nourishment have mutually conspired. From which considerations I am thoroughly convinced that these various coverings are not connate with the insect; but that they are, like the scarf skin, successively produced.

"Early in the month of June, some of the third generation which were produced about the middle of May, after casting off their last covering, discover four erect wings, much longer than their bodies; and the same is observable in all the succeeding generations, which are produced during the summer months; without, however, distinguishing any diversity of sex, as is usual in several other kinds of insects. For some time before the aphides come to their full growth, it is easy to discover which of them will have wings, by a remarkable fullness of the breast, which, in the others, is hardly to be distinguished from the body. When the last covering is rejected, the wings, which were before folded up in a very narrow compass, gradually extend themselves in a most surprising manner, till their dimensions are at last very considerable. But these winged ones have the peculiarity, that the number of them does not seem so much to depend on their original structure, as on the quantity or quality of the nourishment with which they are supplied; it being frequently observed, that those on a succulent shoot have few or none with wings among them, while others of the same generation, on a less tender branch, are most of them winged; as if only the first rudiments of wings were composed in the former, while nature thought proper to expand them in the latter, that they might be more at liberty to supply their wants.

"The increase of these insects in the summer time is so very great, that, by wounding and exhausting the tender shoots, they would frequently suppress all vegetation, had they not many enemies which restrain them. To enumerate the variety of other insects that in their worm and fly state are constantly destroying them, would exceed the bounds of the present design: there is one, however, so singular in the manner of executing its purpose, that I cannot pass by it without some further notice. This is a very small black ichneumon fly, with a slender body and very long antennæ, which darts its pointed tail into the bodies of the aphides, at the same time depositing an egg in each. This egg produces a worm which feeds upon the containing insect till it attains its full growth; when it is usually changed to that kind of fly from whence it came. In this, however, it is sometimes prevented by another sort of small black fly, which wounds this worm through its pearl-like habitation; and by laying one of its eggs therein, instead of the former fly, produces its own likeness. I must, however, further observe, notwithstanding these insects have many enemies, they are not without friends; if we may consider those as such who are very officious in their attendance, for the good things they expect to to reap thereby. The ant and the bee are both of this kind, collecting the honey in which the aphides abound: but with this difference, that the ants are constant visitors, the bee only when flowers are scarce. To which let me also add, that the ants will suck in the delicious nectar while the aphides are in the act of discharging it from the anus; but the bees only collect it from the leaves on which this honey dew has fallen. Aphis.

3. "In the autumn I find three more generations of aphides to be produced; two of which make their appearance in the month of August, and the third usually appears before the middle of September. As the two first differ in no respect from those which we meet with in summer, it would be wasting time to dwell any longer upon them; but the third differing greatly from all the rest, demands our giving it a more serious attention. Though all the aphides which have hitherto appeared were females, in this tenth generation are found several male insects; not that they are by any means so numerous as the females, being only produced by a small number of the former generation. To which I must further add, that I have observed those which produced males, previously to have produced a number of females; which in all respects resembling those already described, I shall decline taking into any further consideration.

"The females have at first altogether the same appearance with those of the former generations; but in a few days their colour changes from a green to a yellow, which is gradually converted into an orange colour before they come to their full growth. They differ likewise in another respect, at least from those which occur in the summer, that all those yellow females are without wings. The male insects are, however, still more remarkable; their outward appearance readily distinguishing them from the females of this and of all other generations. When first produced, they are not of a green colour like the rest, but of a reddish brown; and have afterwards, when they begin to thicken about the breast, a dark line along the middle of the back. These male insects come to their full growth in about three weeks time, and then cast off their last covering; the whole insect being, after this operation, of a bright yellow colour, the wings only excepted. But after this they soon change to a darker yellow; and in a few hours to a very dark brown; if we except the body, which is something lighter coloured, and has a reddish cast. They are of the winged sort; and the wings, which are white at first, soon become transparent, and at length appear like very fine black gauze.

"The males no sooner come to maturity than they copulate with the females; in which act they are readily discovered, as they remain in conjunction for a considerable time, and are not easily disturbed. The commerce between them continues the whole month of October, and may be observed at all times of the day, though I have found it most frequent about noon; especially when the weather is moderately warm, and the sun overcast. The females, in a day or two after their intercourse with the males, I have observed to lay their eggs; which they usually do near the buds, when they are left to their own choice. Where there are a number crowded together, they of course inter-

Aphis || Aphrodisia.

fere with each other: in which case they will frequently deposite their eggs on other parts of the branches, or even on the spines with which they are beset."

These insects are found in great numbers not only on the stems and leaves, but even upon roots of many trees and plants. Those trees that are most loaded with the insects, as already observed, suffer greatly from them. The plant-lice thrust their sharp-pointed rostrum into the substance of the leaf to draw out their sustenance, which warps the stems and leaves, and occasions in the latter cavities underneath, and swellings above; nay, even in some, a kind of hollow gall filled with insects, as is often seen on elm leaves.

It appears astonishing that the slight puncture of so small an animal should so greatly disfigure a plant; but it must be remembered, that plant-lice always live in numerous associations, which increase visibly by the prodigious fruitfulness of those insects; so that although each puncture be slight, yet the number of them is so great, so reiterated, that it is no longer a wonder the leaves should be disfigured. Lovers of gardening and plants are extremely anxious to free and cleanse their trees from this vermine; but their care often proves unavailing, the insect is so fruitful that it soon produces a fresh colony. The best and surest method of extirpating it is to put on the trees infested with them some larvæ of the plant-louse lion, or aphidivorous flies; for those voracious larvæ destroy every day a great number of the insects, and that with so much the more facility, as the latter remain quiet and motionless in the neighbourhood of those dangerous enemies, who range over heaps of plant-lice, which they gradually waste and diminish.

APHLASTUM, in the ancient navigation, a wooden ornament, shaped like a plume of feathers, fastened on the goose's or swan's neck used by the ancient Greeks in the heads of their ships. The aphlastum had much the same office and effect in a ship that the crest had on the helmet. It seems also to have had this further use, viz. by the waving of a party-coloured ribband fastened to it, to indicate from what quarter the wind blew.

APHONIA, among physicians, signifies a suppression or total loss of voice. It is never a primary disease; but a consequence of many different disorders. The cure is to be effected by removing the disorder from whence the aphonia proceeds.

APHORISM, a maxim or principle of a science; or a sentence which comprehends a great deal in a few words. The word comes from *αφοριζω, I separate;* q. d. a choice or select sentence. The term is chiefly used in medicine and law. We say the aphorisms of Hippocrates, of Sanctorius, of Boerhaave, &c. aphorisms of the civil law, &c.

APHRACTI, in the ancient military art, denotes open vessels, without decks or hatches, furnished only at head and stern with cross planks, whereon the men stood to fight.

APHRODISIA, in antiquity, festivals kept in honour of Venus, the most remarkable of which was that celebrated by the Cyprians. At this solemnity several mysterious rites were practised: all who were initiated to them offered a piece of money to Venus as a harlot, and received as a token of the goddess's favour a measure of salt, and a *φαλλος*; the former, because salt is a concretion of sea water, to which Venus was thought to owe her birth; the latter, because she was the goddess of wantonness.

Aphrodis || Apis.

APHRODISIACS, among physicians, medicines which were supposed to increase the quantity of semen, and create an inclination to venery.

APHRODITA. See HELMINTHOLOGY *Index.*

APHRODITE, in *Mythology*, a name of Venus, derived from *αφρος, froth;* because, according to the poets, Venus is supposed to have been produced from the froth or foam of the sea.

APHRONITRE, in *Natural History*, a name given by the ancients to a particular kind of natrum.

APHTHÆ, in *Medicine*, small, round, and superficial ulcers arising in the mouth. See MEDICINE *Index.*

APHTHARTODOCETÆ, a sect, sworn enemies of the council of Chalcedon. The word is derived from *αφθαρτος, incorruptible*, and *δοκεω, I imagine;* and was given them, because they imagined the body of Jesus Christ was incorruptible and impassible, and not capable of death. They arose among the Eutychians, and made their appearance in the year 535.

APHYLLANTHES, LEAFLESS FLOWER, or BLUE MONTPELIER PINK. See BOTANY *Index.*

APIARY, a place where bees are kept. See the article BEE. See also APIARY, SUPPLEMENT.

APIASTER, in *Ornithology*, the trivial name of a species of the merops. See MEROPS, ORNITHOLOGY *Index.*

APICES, in *Botany*, the same with ANTHERÆ.

APICIUS. There were at Rome three of that name, famous for their gluttony. The second is the most celebrated of the three. He lived under Tiberius, spent immense sums on his belly, and invented divers sorts of cakes which bore his name. He kept as it were a school of gluttony at Rome. After having spent two millions and a half in entertainments, finding himself very much in debt, he examined into the state of his affairs; and seeing that he had but 250,000 livres remaining, he poisoned himself, out of apprehension of starving with such a sum. He had prostituted himself when very young to Sejanus.

APINA, or *Apinæ*, a town of Apulia, built by Diomedes, as was also Tricæ (Pliny). *Apinæ* and *Tricæ* is a proverbial saying for things trifling and of no value (Martial); and *Apinarii* was the appellation for triflers or buffoons, (Trebellius Pollio).

APION, a famous grammarian, born in Egypt, was a professor at Rome in the reign of Tiberius. He had all the arrogance of a mere pedant, and amused himself with difficult and insignificant inquiries. One of his principal works are his Antiquities of Egypt.

APIS, in *Mythology*, a divinity worshipped by the ancient Egyptians at Memphis. It was an ox, having certain exterior marks; in which animal the soul of the great Osiris was supposed to subsist. The animal had the preference to all others, as being the symbol of agriculture, the improvement of which that prince had so much at heart.

According to several learned writers on the Egyptian religion, Apis was only a symbolical deity. "Amongst the animals consecrated to ancient rites (says Ammianus Marcellinus), Mnevis and Apis are the most celebrated; the first is an emblem of the sun, the second

Apis. cond of the moon." Porphyry tells us, that Apis bore the characteristic signs of the two stars; and Macrobius, who confirms this opinion, adds, that he was equally consecrated to them both.

This bull, become the object of public adoration, it may be supposed, could not be born like other animals; accordingly the priests published that his origin was celestial. "An Apis is seldom born, (says Pomponius Mela.) He is not produced by the ordinary laws of generation. The Egyptians say he owes his birth to celestial fire." Plutarch explains this passage: "The priests pretend that the moon diffuses a generative influence, and as soon as a cow who takes the bull is struck by it, she conceives an Apis. Accordingly we discover in him the signs of that star.

Such were the fables industriously spread by those who presided over the divine institutions. The vulgar, to whom this emblematical deity presaged abundance, received them eagerly, and implicitly believed them. Pliny has described the characters which distinguished this sacred bull: "A white spot, resembling a crescent, on the right side, and a lump under the tongue, were the distinguishing marks of Apis." When a cow, therefore, which was thought to be struck with the rays of the moon, produced a calf, the sacred guides went to examine it, and if they found it conformable to this description, they announced to the people the birth of Apis, and fecundity.

"Immediately (says Ælian) they built a temple to the new god, facing the rising sun, according to the precepts of Mercury, where they nourished him with milk for four months. This term expired, the priests repaired in pomp to his habitation, and saluted him by the name of Apis. They then placed him in a vessel magnificently decorated, covered with rich tapestry, and resplendent with gold, and conducted him to Nilopolis, singing hymns, and burning perfumes. There they kept him for forty days. During this space of time, women alone had permission to see him, and saluted him in a particular manner. After the inauguration of the god, in this city, he was conveyed to Memphis with the same retinue, followed by an innumerable quantity of boats sumptuously decked out. There they completed the ceremonies of his inauguration, and he became sacred to all the world. Apis was superbly lodged, and the place where he lay was mystically called *the bed*. Strabo having visited his palace, thus describes it: "The edifice where Apis is kept, is situated near the temple of Vulcan. He is fed in a sacred apartment, before which is a large court. The house in which they keep the cow that produced him, occupies one of its sides. Sometimes, to satisfy the curiosity of strangers, they make him go out into this court. One may see him at all times through a window; but the priests produce him also to public view." Once a year (says Solinus) they present a heifer to him, and the same day they kill her.

A bull, born in so marvellous a manner, must be possessed of supernatural knowledge. Accordingly the priests published, that he predicted future events by gestures, by motions, and other ways, which they construed according to their fancy. "Apis (says Pliny) has two temples called *Beds*, which served as an augury for the people. When they come to consult him, if he enters into a particular one, it is a favourable presage, and fatal if he passes into the other. He gives answers to individuals by taking food from their hands. He refused that offered him by Germanicus, who died soon after." It would be unjust to conclude, that this respectable writer gave credit to such auguries. He relates the opinion of the Egyptians, and contents himself with citing facts without offering his judgement. Apis.

Such was the installation of Apis. His anniversary was always celebrated for seven days. The people assembled to offer sacrifices to him, and what is extraordinary, oxen were immolated on the occasion. This solemnity did not pass without prodigies. Ammianus Marcellinus, who has collected the testimonies of the ancients, relates them in these words: "During the seven days in which the priests of Memphis celebrate the birth of Apis, the crocodiles forget their natural ferocity, become gentle, and do no harm to anybody."

This bull, however, so honoured, must not exceed a mysterious term fixed for his life. "Apis (says Pliny) cannot live beyond a certain number of years. When he has attained that period they drown him in the fountain of the priests; for it is not permitted, adds Ammianus Marcellinus, to let him prolong his life beyond the period prescribed for him by the sacred books." When this event happened, he was embalmed, and privately let down into the subterraneous places destined for that purpose. In this circumstance, the priests announced that Apis had disappeared; but when he died a natural death, before this period arrived, they proclaimed his death, and solemnly conveyed his body to the temple of Serapis.

"At Memphis was an ancient temple of Serapis which strangers were forbidden to approach, and where the priests themselves only entered when Apis was interred. It was then (says Plutarch) that they opened the gates called *Lethe* and *Cocythe* (of oblivion and lamentation), which made a harsh and piercing sound."

Ammianus Marcellinus, and Solinus, paint with great energy the general despair of the Egyptians, who with cries and lamentations demanded another Apis from heaven.

According to Plutarch, the term prescribed for the life of Apis was 25 years; which number marked a period of the sun and of the moon, and the bull was consecrated to these two bodies. Syncellius, in his Chronography, when he comes down to the 32d Pharoah, called *Aseth*, says, "before Aseth, the solar year consisted of 360 days. This prince added five to complete its course. In his reign a calf was placed amongst the gods, and named *Apis*." And in the Bibliotheca of Fabricius we have the following passage: "It was customary to inaugurate the kings of Egypt at Memphis, in the temple of Apis. They were here first initiated in the mysteries, and were religiously invested; after which they were permitted to bear the yoke of the god through the town to a place called the *Sanctuary*, the entrance of which was prohibited to the profane. There they were obliged to swear that they would neither insert months nor days in the year, and that it should remain composed of 365 days, as had been established by the ancients." From these facts, Mr Savary, in his Letters on Egypt, infers, that Apis was the tutelar divinity of the new form given to the solar year, and of the cycle of 25 years, discovered at the same

Apis ‖ Apobaterion.

same time. This deity, besides, had a marked relation to the swelling of the Nile, as is testified by a great number of historians. The new moon which followed the summer solstice, was the era of this phenomenon, on which the eyes of every body were fixed: And Pliny speaks as follows on this subject: "Apis had on his right side a white mark, representing the crescent: This mark (continues Ælian) indicated the commencement of the inundation." If Apis possessed the characteristic signs which proved his divine origin, he promised fertility and abundance of the fruits of the earth. It seems demonstrated, therefore, Mr Savary adds, that this sacred bull, the guardian of the solar year of 365 days, was also regarded as the genius who presided over the overflowing of the river. The priests, by fixing the course of his life to 25 years, and by making the installation of a new Apis concur with the renewal of the period above mentioned, had probably perceived, as the result of long meteorological observations, that this revolution always brought about abundant seasons. Nothing was better calculated to procure a favourable reception of this emblematical deity from the people, since his birth was a presage to them of a happy inundation, and of all the treasures of teeming nature.

The solemnity of his inauguration was called *Apparition*. That which was renewed every year towards the 12th or 13th of the month *Payn*, which corresponds with the 17th or 18th of June, was called *the birth of Apis*. It was a time of rejoicing, which Ælian describes in the following manner: "What festivals! what sacrifices take place in Egypt at the commencement of the inundation! It is then that all the people celebrate the birth of Apis. It would be tedious to describe the dances, the rejoicings, the shows, the banquets, to which the Egyptians abandon themselves on this occasion, and impossible to express the intoxication of joy which breaks forth in all the towns of the kingdom."

These observations Mr Savary thinks further confirmed by the name of this respectable bull; *Apis*, in the Egyptian tongue, signifying number, measure. This epithet perfectly characterizes an animal established as the guardian of the solar year, the type of the cycle of 25 years, and the presage of a favourable inundation.

Monsieur Huet, bishop of Avranches, has endeavoured to prove that Apis was a symbolical image of the patriarch Joseph, and has supported his opinion with all his erudition. Dr Bryant apprehends that the name of *Apis* was an Egyptian term for a father; that it referred to the patriarch Noah; and that the crescent which was usually marked on the side of the animal, was a representation of the ark.

APIS, or *Bee*. See ENTOMOLOGY *Index*, and BEE.

APIUM, PARSLEY. See BOTANY *Index*.

APIVOROUS, in *Ornithology*, a synonyme of a species of falco. See FALCO, ORNITHOLOGY *Index*.

APLUDA. See BOTANY *Index*.

APOBATANA, the metropolis of Media, and where the kings kept their treasure (Isiodorus Characenus); supposed to be the same with *Ecbatana*.

APOBATERION, in antiquity, a valedictory speech or poem made by a person on departing out of own country, and addressed to his friends or relations. Apobaterion ‖ Apocalypse.

APOBATHRA, a place near Sestos (Strabo); the landing place where Xerxes's ships were frozen and stuck in the ice (Eustathius).

APOCALYPSE, REVELATION, the name of one of the sacred books of the New Testament, containing revelations concerning several important doctrines of Christianity. The word is Greek, and derived from *αποκαλυπτω*, to *reveal* or *discover*.

This book, according to Irenæus, was written about the year 96 of Christ, in the island of Patmos, whither St John had been banished by the emperor Domitian. But Sir Isaac Newton places the writing of it earlier, viz. in the time of Nero. Some attribute this book to the arch-heretic Cerinthus: but the ancients unanimously ascribed it to John, the son of Zebedee, and brother of James; whom the Greek fathers called the *Divine*, by way of eminence, to distinguish him from the other evangelists. This book has not, at all times, been esteemed canonical. There were many churches in Greece, as St Jerome informs us, which did not receive it: neither is it in the catalogue of canonical books prepared by the council of Laodicea, nor in that of St Cyril of Jerusalem: but Justin, Irenæus, Origen, Cyprian, Clemens of Alexandria, Tertullian, and all the fathers of the fourth, fifth, and the following centuries, quote the Revelation as a book then acknowledged to be canonical. The Alogians, Marcionites, Cerdonians, and Luther himself, rejected this book: but the Protestants have forsaken Luther in this particular; and Beza has strongly maintained against his objections, that the Apocalypse is authentic and canonical.

The Apocalypse consists of twenty-two chapters. The three first are an instruction to the bishops of the seven churches of Asia Minor. The fifteen following chapters contain the persecutions which the church was to suffer from the Jews, heretics, and Roman emperors. Next St John prophesies of the vengeance of God, which he will exercise against those persecutors, against the Roman empire, and the city of Rome; which, as the Protestants suppose, he describes under the name of Babylon the great whore, seated upon seven hills. In the last place, the 19th, 20th, 21st, and 22d chapters, describe the triumph of the church over its enemies, the marriage of the Lamb, and the happiness of the church triumphant.

"It is a part of this prophecy (says Sir Isaac Newton), that it should not be understood before the last age of the world; and therefore it makes for the credit of the prophecy, that it is not yet understood. The folly of interpreters has been to foretel times and things by this prophecy, as if God designed to make them prophets. By this rashness they have not only exposed themselves, but brought the prophecy also into contempt. The design of God was much otherwise: He gave this and the prophecies of the Old Testament, not to gratify men's curiosities, by enabling them to foreknow things; but that, after they were fulfilled, they might be interpreted by the events; and his own providence, not the interpreters, be then manifested thereby to the world. And there is already so much of the prophecy fulfilled, that as many as will take pains

Apocalypse || Apocrypha.

pains in this study, may see sufficient instances of God's providence.

There have been several other works published under the title of *Apocalypses*. Sozomen mentions a book used in the churches of Palestine, called the *Apocalypse* or *Revelation of St Peter*. He also mentions an Apocalypse of St Paul: which the Cophtæ retain to this day. Eusebius also speaks of both these Apocalypses. St Epiphanius mentions an Apocalypse of Adam; Nicephorus, an Apocalypse of Esdras: Gratian and Cedrenus, an Apocalypse of Moses, another of St Thomas, and another of St Stephen; St Jerome, an Apocalypse of Elias. Porphyry, in his life of Plotin, makes mention of the Apocalypse or Revelations of Zoroaster, Zostrian, Nicothæus, Allogenes, &c.

APOCOPE, among grammarians, a figure which cuts off a letter or syllable from the end of a word; as *ingeni* for *ingenii*.

APOCRISARIUS, in ecclesiastical antiquity, a sort of resident in an imperial city, in the name of a foreign church or bishop, whose office was to negotiate, as proctor at the emperor's court, in all ecclesiastical causes in which his principals might be concerned. The institution of the office seems to have been in the time of Constantine, or not long after, when, the emperors being become Christians, foreign churches had more occasions to promote their suits at court than formerly. However, we find it established by law in the time of Justinian. In imitation of this officer, almost every monastery had its Apocrisarius, or resident, in the imperial city.

The title and quality of Apocrisary became at length appropriated to the pope's agent, or *nuncio*, as he is now called; who resided at Constantinople, to receive the pope's despatches, and the emperor's answers. The word is formed from *αποκρινειν*, *to answer*.

APOCRUSTICS, in *Medicine*, the same with repellents.

APOCRYPHA, or APOCRYPHAL BOOKS, such books as are not admitted into the canon of Scripture, being either not acknowledged as divine, or considered as spurious. The word is Greek; and derived from *απο*, and *κρυπτω*, to *hide* or *conceal*.

When the Jews published their sacred books, they gave the appellations of *canonical* and *divine* only to such as they then made public: such as were still retained in their archives they called *apocryphal*, for no other reason but because they were not public; so that they might be really sacred and divine, though not promulgated as such.

Thus, in respect of the Bible, all books were called *apocryphal* which were not inserted in the Jewish canon of Scripture. Vossius observes, that, with regard to the sacred books, none are to be accounted apocryphal, except such as had neither been admitted into the synagogue nor the church, so as to be added to the canon, and read in public.

The Protestants do not only reckon those books to be apocryphal which are esteemed such in the church of Rome, as the prayer of Manasseh king of Judah, the third and fourth books of Esdras, St Barnabas's epistle, the book of Hermos, the addition at the end of Job, and the 151st psalm; but also Tobit, Judith, Esther, the book of Wisdom, Jesus the son of Sirach, Baruch the prophet, the Song of the Three Children, the History of Susannah, the History of Bel and the Dragon, and the first and second books of the Maccabees. Apocrypha || Apodosis.

It is now pretended that these books were not received by the Jews, or so much as known to them. None of the writers of the New Testament cite or mention them: neither Philo nor Josephus speak of them. The Christian church was for some ages an utter stranger to these books. Origen, Athanasius, Hillary, Cyril of Jerusalem, and all the orthodox writers, who have given catalogues of the canonical books of Scripture, unanimously concur in rejecting these out of the canon. And for the New Testament, they are divided in their opinions, whether the epistle to the Hebrews, the epistle of St James, and the second epistle of St Peter, the second and third epistles of St John, the epistle of St Jude, and the Revelation, are to be acknowledged as canonical or not.

The Protestants acknowledge such books of Scripture only to be canonical as were so esteemed to be in the first ages of the church; such as are cited by the earliest writers among the Christians as of divine authority, and after the most diligent inquiry were received and so judged to be by the council of Laodicea. The several epistles above mentioned, and the book of Revelation, whatever the sentiments of some particular persons are or may have been of them, are allowed by all the reformed churches to be parts of the canon of the New Testament.

The apocryphal books, however, according to the sixth article of the church of England, are to be read for example of life and instruction of manners; but it doth not apply them to establish any doctrine.

APOCYNUM. See DOGS-BANE, BOTANY *Index*.

APODECTÆ, in antiquity, a denomination given to ten general receivers appointed by the Athenians to receive the public revenues, taxes, debts, and the like. The apodectæ had also a power to decide controversies arising in relation to money and taxes, all but those of the most difficult nature and highest concern, which were reserved to the courts of judicature.

APODECTÆI, in the Athenian government, officers appointed to see that the measures of corn were just.

APODES, in a general sense, denotes things without feet. Zoologists apply the name to a fabulous sort of birds, said to be found in some of the islands of the new world, which, being entirely without feet, supported themselves on the branches of trees by their crooked bills.

APODES, in the Linnæan system, the name of the *first order* of fishes, or those which have no belly fins. See ICHTHYOLOGY *Index*.

APODICTICAL, among philosophers, a term importing a demonstrative proof, or systematical method of teaching.

APODOSIS, in *Rhetoric*, makes the third part of a complete exordium, being properly the application or restriction of the *protasis*. The apodosis is the same with what is otherwise called *axiosis*; and stands opposed to *protasis*: e. g. *protasis*, all branches of history are necessary for a student; *catescene*, so that, without these, he can never make any considerable figure;

Apodosis || Apollinarians.

gure; *apodosis*, but literary history is of a more especial use, which recommends it, &c.

APODYTERIUM, in the ancient baths, the apartments where persons dressed and undressed.

APOGEE, in *Astronomy*, that point in the orbit of a planet which is at the greatest distance from the earth. The apogee of the sun is that part of the earth's orbit which is at the greatest distance from the sun; and consequently the sun's apogee, and the earth's aphelion, are one and the same point.

APOLIDES, in antiquity, those condemned for life to the public works, or exiled into some island, and thus divested of the privileges of Roman citizens.

APOLLINARIAN GAMES, in Roman antiquity, were instituted in the year of Rome 542. The occasion was a kind of oracle delivered by the prophet Marcus after the fatal battle at Cannæ, declaring that to expel the enemy, and cure the people of an infectious disease which then prevailed, sacred games were to be annually performed in honour of Apollo; the prætor to have the direction of them, and the decemviri to offer sacrifices after the Grecian rite. The senate ordered that this oracle should be observed the rather, because another of the same Marcus, wherein he had foretold the overthrow at Cannæ, had come true; for this reason, they gave the prætor 12,000 ases out of the public cash to defray the solemnity. There were sacrified an ox to Apollo, as also two white goats, and a cow to Latona; all with their horns gilt. Apollo had also a collection made for him, besides what the people who were spectators gave voluntarily. The first prætor by whom they were held was P. Cornelius Sylla. For some time they were moveable or indictive; but at length were fixed, under P. Licinius Varus, to the fifth of July, and made perpetual. The men, who were spectators at these games, wore garlands on their heads; the women performed their devotions in the temples at the same time, and at last they caroused together in the vestibules of their houses, the doors standing open. The Apollinarian games were merely scenical; and at first only observed with singing, piping, and other sorts of music; but afterwards there were also introduced all manner of mountebank tricks, dances, and the like: yet so as that they still remained scenical; no chariot races, wrestling, or the like laborious exercises of the body, being ever practised at them.

APOLLINARIANS, APOLLINARISTS, called also by Epiphanius *Dimaritæ*, ancient heretics, who denied the proper humanity of Christ, and maintained that the body which he assumed was endowed with a sensitive, and not a rational, soul, but that the Divine Nature supplied the place of the intellectual principle in man. This sect derived its name from Apollinaris, bishop of Laodicea, in the fourth century.

The Apollinarians have been charged with other opinions, such as, the Millenarian and Sabellian, the pre-existence of the body of Christ, and the passion of his Deity; but ecclesiastical writers are not agreed with respect to these and other particulars. Their doctrine was first condemned by a council of Alexandria in the year 362, and afterwards in a more formal manner by a council at Rome in 375; and by another council in 378, which deposed Apollinaris from his bishopric. Notwithstanding all, his doctrine spread through most of the churches of the east: and his followers were subdivided into various sects. In 388, The emperor Theodosius enacted a law, forbidding them to hold assemblies, to have any ecclesiastics or bishops, or to dwell in cities. The rigorous execution of this law, in concurrence with the decrees of different councils, reduced them to a very small number, and their doctrine had no long duration. Apollinari

APOLLINARIS, CAIUS SULPICIUS, a very learned grammarian, born at Carthage, lived in the 2d century, under the Antonines; he is supposed to be the author of the verses which are prefixed to the comedies of Terence, and contain the arguments of them. He had for his successor in the profession of grammar Helvius Pertinax, who had been his scholar, and was at last emperor.

APOLLINARIS SIDONIUS, *Caius Lollius*, an eminent Christian writer and bishop in the 5th century, was born of a noble family in France. He was educated under the best masters, and made a prodigious progress in the several arts and sciences, but particularly in poetry and polite literature. After he had left the schools, he applied himself to the profession of war. He married Papianilla, the daughter of Avitus, who was consul, and afterwards emperor, by whom he had three children. But Majorianus in the year 457 having deprived Avitus of the empire, and taken the city of Lyons, in which our author resided, Apollinaris fell into the hands of the enemy. However, the reputation of his learning softened Majorianus's resentment, so that he treated him with the utmost civility, in return for which Apollinaris composed a panegyric in his honour; which was so highly applauded, that he had a statue erected to him at Rome, and was honoured with the title of *Count*. In the year 467 the emperor Anthemius rewarded him for the panegyric which he had written in honour of him, by raising him to the post of governor of Rome, and afterwards to the dignity of a patrician and senator, and erecting a statue to him. But he soon quitted these secular employments for the service of the church. The bishopric of Clermont being vacant in 472 by the death of Eparchus, Apollinaris, who was then only a layman, was chosen to succeed him without any interest or solicitation on his part, in which see he acted with the greatest integrity. Clermont being besieged by the Goths, he animated the people to the defence of that city, and would never consent to the surrender of it; so that, when it was taken about the year 480, he was obliged to retire; but he was soon restored by Evariges king of the Goths, and continued to govern the church as he had done before. He died in peace the 21st of August 487; and his festival is still observed in the church of Clermont, where his memory is held in great veneration. He is esteemed the most elegant writer of his age, both in prose and verse. He wrote a great many little pieces; but preserved none but those which he thought were worthy of being continued down to posterity. He collected himself the nine books which we have remaining of his letters. His chief pieces in poetry are the three panegyrics upon the emperors Avitus, Majorianus, and Anthemius. The rest of them are a collection of poems addressed to his friends upon particular subjects. His letters contain a variety of particulars relating to polite literature and profane history.

APOLLINARIUS,

Apollinarius, Apollo.

APOLLINARIUS, CLAUDIUS, a learned bishop of Hierapolis, who, about the year 170, presented to Marcus Aurelius an excellent Apology for the Christians.

APOLLINARIUS *the Younger*, thus called to distinguish him from his father, called *Apollinarius the Elder*, was at first lector or reader of Laodicea, and afterwards bishop of that city. He was universally esteemed the greatest man of his age, both for learning and piety, and a most accurate and nervous defender of the faith against all its enemies: but notwithstanding this, on his advancing some opinions that were not approved, he was anathematized as an heretic by the second general council of Constantinople in 381.

APOLLO, in *Mythology*, a Pagan deity worshipped by the Greeks and Romans. Cicero mentions four of this name: the most ancient of whom was the son of Vulcan; the second a son of Corybas, and born in Crete; the third an Arcadian, called *Nomian*, from his being a great legislator; and the last, to whom the greatest honour is ascribed, the son of Jupiter and Latona.

Apollo had a variety of other names, either derived from his principal attributes, or the chief places where he was worshipped. He was called the *Healer*, from his enlivening warmth and cheering influence; *Pæan*, from the pestilential heats: to signify the former, the ancients placed the Graces on his right hand; and for the latter, a bow and arrows in his left: *Nomius*, or the shepherd, from his fertilizing the earth, and thence sustaining the animal creation: *Delius*, from his rendering all things manifest: *Pythius*, from his victory over Python; *Lycias*, *Phœbus*, and *Phaneta*, from his purity and splendour. As Apollo is almost always confounded by the Greeks with the sun, it is no wonder that he should be dignified with so many attributes. It was natural for the most glorious object in nature, whose influence is felt by all creation, and seen by every animated part of it, to be adored as the fountain of light, heat, and life. The power of healing diseases being chiefly given by the ancients to medicinal plants and vegetable productions, it was natural to exalt into a divinity, the visible cause of their growth. Hence he was also styled the *God of Physic;* and that external heat which cheers and invigorates all nature, being transferred from the human body to the mind, gave rise to the idea of all mental effervescence coming from this god; hence, likewise, poets, prophets, and musicians, are said to be *Numine afflati*, inspired by Apollo.

Whether Apollo was ever a real personage, or only the great luminary, many have doubted. Indeed, Vossius has taken great pains to prove this god to be only a metaphorical being, and that there never was any other Apollo than the sun. "He was styled the *Son of Jupiter* (says this author), because that god was reckoned by the ancients the author of the world. His mother was called *Latona*, a name which signifies *hidden;* because, before the sun was created, all things were wrapped up in the obscurity of chaos. He is always represented as beardless and youthful, because the sun never grows old or decays. And what else can his bows and arrows imply, but his piercing beams?" And he adds, that all the ceremonies which were performed to his honour, had a manifest relation to the great source of light which he represented. Whence (he concludes) it is in vain to seek for any other divinity than the sun, which was adored under the name of Apollo." However, though this be in general true, yet it does appear, from many passages in ancient authors, that there was some illustrious personage named *Apollo*, who, after his apotheosis, was taken for the sun; as Osiris and Orus in Egypt, whose existence cannot be called in question, were, after their death, confounded with the sun, of which they became the symbols, either from the glory and splendour of their reigns, or from a belief that their souls had taken up their residence in that luminary. Apollo.

Of the four Apollos mentioned by Cicero, it appears that the three last were Greeks, and the first an Egyptian; who, according to Herodotus, was the son of Osiris and Isis, and called *Orus*. Pausanias is of the same opinion as Herodotus, and ranks Apollo among the Egyptian divinities. The testimony of Diodorus Siculus is still more express; for in speaking of Isis, after saying that she had invented the practice of medicine, he adds, that she taught this art to her son Orus, named *Apollo*, who was the last of the gods that reigned in Egypt.

It is easy to trace almost all the Grecian fables and mythologies from Egypt. If the Apollo of the Greeks was said to be the son of Jupiter, it was because Orus the Apollo of the Egyptians had Osiris for his father, whom the Greeks confounded with Jupiter. If the Greek Apollo was reckoned the god of eloquence, music, medicine, and poetry, the reason was, that Osiris, who was the symbol of the sun among the Egyptians, as well as his son Orus, had there taught those liberal arts. If the Greek Apollo was the god and conductor of the Muses, it was because Osiris carried with him in his expedition to the Indies singing women and musicians. This parallel might be carried on still further; but enough has been said to prove that the true Apollo was that of Egypt.

To the other perfections of this divinity the poets have added beauty, grace, and the art of captivating the ear and the heart, no less by the sweetness of his eloquence, than by the melodious sounds of his lyre. However, with all these accomplishments, he had not the talent of captivating the fair with whose charms he was enamoured. But the amours and other adventures related of this god during his residence on earth, are too numerous, and too well known, to be inserted here. His musical contests, however, being more connected with the nature of this work, must not be wholly unnoticed.

To begin, therefore, with the dispute which he had with Pan, that was left to the arbitration of Midas.

Pan, who thought he excelled in playing the flute, offered to prove that it was an instrument superior to the lyre of Apollo. The challenge was accepted; and Midas, who was appointed the umpire in this contest, deciding in favour of Pan, was rewarded by Apollo, according to the poets, with the ears of an ass for his stupidity.—This fiction seems founded upon history. Midas, according to Pausanias, was the son of Gordius and Cybele; and reigned in the Greater Phrygia, as we learn from Strabo. He was possessed of such great riches, and such an inordinate desire of increasing them by the most contemptible parsimony, that,

Apollo

that, according to the poets, he converted whatever he touched into gold. However, his talent for accumulation did not extend to the acquirement of taste and knowledge in the fine arts; and, perhaps, his dulness and inattention to these provoked some musical poets to invent the fable of his decision in favour of Pan against Apollo. The scholiast upon Aristophanes, to explain the fiction of his long ears, says, that it was designed to intimate that he kept spies in all parts of his dominions.

Marsyas, another player on the flute, was still more unfortunate than either Pan or his admirer Midas. This Marsyas, having engaged in a musical dispute with Apollo, chose the people of Nisa for judges. Apollo played at first a simple air upon his instrument; but Marsyas, taking up his pipe, struck the audience so much by the novelty of its tone, and the art of his performance, that he seemed to be heard with more pleasure than his rival. Having agreed upon a second trial of skill, it is said that the performance of Apollo, by accompanying the lyre with his voice, was allowed greatly to excel that of Marsyas upon the flute alone. Marsyas, with indignation, protested against the decision of the judges; urging that he had not been fairly vanquished according to the rules stipulated, because the dispute was concerning the excellence of their several instruments, not their voices; and that it was wholly unjust to employ two arts against one.

Apollo denied that he had taken any unfair advantages of his antagonist, since Marsyas had employed both his mouth and fingers in performing upon his instrument; so that, if he was denied the use of his mouth, he would be still more disqualified for the contention. The judges approved of Apollo's reasoning, and ordered a third trial. Marsyas was again vanquished; and Apollo, inflamed by the violence of the dispute, flayed him alive for his presumption. See MARSYAS.

Pausanias relates a circumstance concerning this contest, that had been omitted by Diodorus, which is, that Apollo accepted the challenge from Marsyas, upon condition that the victor should use the vanquished as he pleased.

Diodorus informs us, that Apollo soon repenting of the cruelty with which he had treated Marsyas, broke the strings of the lyre, and by that means put a stop, for a time, to any further progress in the practice of that new instrument.

The next incident to be mentioned in the history of Apollo is his defeat of the serpent Python.

The waters of Deucalion's deluge, says Ovid, which had overflowed the earth, left a slime from whence sprung innumerable monsters; and among others the serpent Python, which made great havock in the country about Parnassus. Apollo, armed with his darts, put him to death; which, physically explained, implies, that the heat of the sun having dissipated the noxious steams, these monsters soon disappeared: or if this fable be referred to history, the serpent was a robber, who haunting the country about Delphos, and very much infesting those who came hither to sacrifice; a prince, who bore the name of Apollo, or one of the priests of that god, put him to death.

This event gave rise to the institution of the Pythian games, so frequently mentioned in the Grecian history; and it was from the legend of Apollo's victory over the Python that the god himself acquired the name of *Pythius*, and his priestess that of PYTHIA. The city of Delphos, where the famous oracles were so long delivered, was frequently styled *Pytho*.

Apollo.

As Apollo was the god of the fine arts, those who cultivated them were called *his sons*. Of this number was Philammon of Delphos, whom the poets and mythologists make the twin-brother of Autolychus, by the nymph Chione, and Apollo and Mercury. It is pretended that both these divinities were favoured by the nymph on the same day, and that their sires were known from their different talents. Philammon, a great poet and musician, was reported to be the offspring of the god who presides over those arts; and Autolychus, from the craftiness and subtility of his disposition, was said to have sprung from Mercury, god of theft and fraud. Philammon is one of the first, after Apollo, upon fabulous record, as a vocal performer, who accompanied himself with the sound of the lyre: his son was the celebrated Thamyris. See THAMYRIS.

There can be no doubt but that Apollo was more generally revered in the Pagan world than any other deity; having, in almost every region of it, temples, oracles, and festivals, as innumerable as his attributes: the wolf and hawk were consecrated to him, as symbols of his piercing eyes; the crow and the raven, because these birds were supposed to have by instinct the faculty of prediction; the laurel, from a persuasion that those who slept with some branches of that tree under their heads received certain vapours, which enabled them to prophecy. The cock was consecrated to him, because by his crowing he announces the rising of the sun; and the grashopper on account of his singing faculty, which was supposed to do honour to the god of music. Most of the ancient poets have celebrated this tuneful insect, but none better than Anacreon, Ode xliii.

Plato says that the grashopper sings all summer without food, like those men who, dedicating themselves to the Muses, forget the common concerns of life.

The swan was regarded by the ancients as a bird sacred to Apollo in two capacities; first, as being, like the crow and raven, gifted with the spirit of prediction; and, secondly, for his extraordinary vocal powers. The sweetness of his song, especially at the approach of death, was not only extolled by all the poets of antiquity, but by historians, philosophers, and sages; and to call a great writer the *swan* of his age and nation, was a full acknowledgement of his sovereignty. Thus Horace calls Pindar *the Theban swan*.

Plutarch, who was himself a priest of Apollo, impressed with the highest respect and veneration for him and for music, in his dialogue upon that art, makes one of his interlocutors say, that an invention so useful and charming could never have been the work of man, but must have originated from some god, such as Apollo, the inventor of the flute and lyre, improperly attributed to Hyagnis, Marsyas, Olympus, and others; and the proofs he urges in support of this assertion, show, if not its truth, at least that it was the common and received opinion.

All dances and sacrifices, says he, used in honour of Apollo,

Apollo. Apollo, are performed to the sound of flutes: the statue of this god at Delos, erected in the time of Hercules, had in its right hand a bow; and on the left stood the three Graces, who were furnished with three kinds of instruments, the lyre, the flute, and the syrinx. The youth also who carries the laurel of Tempe to Delphos, is accompanied by one playing on the flute; and the sacred presents formerly sent to Delos by the Hyperboreans, were conducted thither to the sound of lyres, flutes, and shepherds pipes. He supports these facts by the testimonies of the poets Alcæus, Alcman, and Corinna.

It seems as if the account of Apollo could not be concluded by any thing that is left to offer on the subject, so properly, as by part of the celebrated hymn of Callimachus, which during many ages was performed and heard by the most polished people on the globe with the utmost religious zeal, at the festivals instituted to this god.

Ha! how the laurel, great APOLLO's tree,
And all the cavern, shakes! Far off, far off,
The man that is unhallow'd: for the god
Approaches. Hark! he knocks; the gates
Feel the glad impulse, and the sever'd bars
Submissive clink against their brazen portals.
Why do the Delian palms incline their boughs,
Self-mov'd; and hovering swans, their throats releas'd
From native silence, carol sounds harmonious?

Begin, young men, the hymn: let all your harps
Break their inglorious silence; and the dance,
In mystic numbers trod, explain the music.
But first, by ardent pray'r and clear lustration,
Purge the contagious spots of human weakness:
Impure, no mortal can behold Apollo.
So may you flourish, favour'd by the god,
In youth with happy nuptials, and in age
With silver hairs, and fair descent of children;
So lay foundations for aspiring cities,
And bless your spreading colonies increase.
Pay sacred rev'rence to Apollo's song;
Lest wrathful the far-shooting god emit
His fatal arrows. Silent nature stands:
And seas subside, obedient to the sound
Of Io! Io Pæan! nor dares Thetis
Longer bewail her lov'd Achilles' death.
For Phœbus was his foe. Nor must sad Niobe
In fruitless sorrow persevere, or weep,
Ev'n thro' the Phrygian marble. Hapless mother!
Whose fondness could compare her mortal offspring
To those which fair Latona bore to Jove.
Io! again repeat ye, Io Pæan!

Recite Apollo's praise till night draws on,
The ditty still unfinish'd; and the day
Unequal to the godhead's attributes
Various, and matter copious of your songs.
Sublime at Jove's right hand Apollo sits,
And thence distributes honour, gracious king,
And theme of verse perpetual. From his robe
Flows light ineffable! his harp, his quiver,
And Lactian bow, are gold: with golden sandals
His feet are shod. How rich! how beautiful!
Beneath his steps the yellow min'ral rises;
And earth reveals her treasures. Youth and beauty
Eternal deck his cheek; from his fair head
Perfumes distil their sweets; and cheerful health,
His duteous handmaid, through the air improv'd
With lavish hand diffuses scents ambrosial.
Apollo, Apollodorus.
The spearman's arm by thee, great god, directed,
Sends forth a certain wound. The laurel'd bard,
Inspir'd by thee, composes verse immortal.
Taught by thy art divine, the sage physician
Eludes the urn, and chains or exiles death.

Perpetual fires shine hallow'd on thy altars,
When annual the Carnean feast is held;
The warlike Libyans, clad in armour, lead
The dance; with clanging swords and shields they beat
The dreadful measure: In the chorus join
Their women; brown, but beautiful: such rites
To thee well pleasing———

———The monstrous Python
Durst tempt thy wrath in vain; for dead he fell,
To thy great strength and golden arms unequal,
Io! while thy unerring hand elanc'd
Another and another dart, the people
Joyfully repeated *Io! Io Pæan!*
Elance the dart, Apollo; for the safety
And health of man, gracious thy mother bore thee!

PRIOR.

APOLLO Belvidere, ranked the first in the first class of ancient statues, and so called from having been placed in the Belvidere of the Vatican at Rome by Pope Julius II. where it remained for 300 years, and till Rome was taken and plundered by the French in 1797. This celebrated statue was found in the ruins of ancient Antium about the end of the 15th century. The artist is unknown. The excellence of this statue, which has attracted universal admiration, consists in the elegance and sublimity of the expression. Beside this, there are many ancient statues referred to the first which are distinguished by peculiar beauties.

APOLLODORUS, a famous architect under Trajan and Hadrian, was born at Damascus. He had the direction of the bridge of stone which Trajan ordered to be built over the Danube in the year 104, which was esteemed the most magnificent of all the works of that emperor. Hadrian, one day as Trajan was discoursing with this architect upon the buildings he had raised at Rome, would needs give his judgment, and showed he understood nothing of the matter. Apollodorus turned upon him bluntly, and said to him, Go paint gourds, for you are very ignorant of the subject we are talking upon. Hadrian at this time boasted of his painting gourds well. The insult cost Apollodorus his life.

APOLLODORUS, a celebrated painter of Athens, about 408 years before the birth of Christ, was the first who invented the art of mingling colours, and of expressing the lights and shades. He was admired also for his judicious choice of subjects, and for beauty and strength of colouring surpassed all the masters that went before him. He excelled likewise in statuary.

APOLLODORUS the Athenian, a famous grammarian, the son of Asclepiades and disciple of Aristarchus. He wrote many works not now extant; but his most famous production was his Bibliotheca, concerning the origin of the gods. This work consisted of 24 books, but only three are now in being. Several other pieces of his are to be found in Fabricius's *Bibliotheca Græca*.

Apollodorus ll Apollonius.

There were various other persons of this name. Scipio Testi, a Neapolitan, has written a treatise of the Apollodoruses, which was printed at Rome in 1555; and Dr Thomas Gale published a work of the same kind in 1675.

APOLLONIA, the name of several ancient cities, particularly of a colony of the Milesians in Thrace, from which Lucullus took away a colossus of Apollo, and placed it in the capitol. The greatest part of the town was situated in a small island in the Euxine, in which was a temple of Apollo (Strabo). Pliny says the colossus was 30 cubits high, and cost 500 talents. There was also an Apollonia at Mount Parnassus, near Delphi (Stephanus). Troezen was formerly called *Apollonia*.

APOLLONIA, feasts sacred to Apollo, instituted upon the following occasion. Apollo, having vanquished Python, went with his sister Diana to Ægialea; but, being driven from thence, he removed to the island Crete. The Ægialeans were soon after visited with a plague; upon which, consulting the soothsayers, they were ordered to send seven young men and as many virgins, to appease those deities and bring them back into their country. Apollo and Diana being thus appeased, returned to Ægialea; in memory of which they dedicated a temple to Pitho, the *goddess of persuasion*; whence a custom arose of choosing every year seven young men, and as many virgins, to go as it were in search of Apollo and Diana.

APOLLONIA, in *Geography*, a promontory of Africa, upon the coast of Guinea, near the mouth of the river Mancu.

APOLLONIUS, the author of the *Argonautics*, and surnamed *The Rhodian*, from the place of his residence, is supposed to have been a native of Alexandria, where he is said to have recited some portion of his poem while he was yet a youth. Finding it ill received by his countrymen, he retired to Rhodes; where he is conjectured to have polished and completed his work, supporting himself by the profession of rhetoric, and receiving from the Rhodians the freedom of their city. He at length returned, with considerable honour, to the place of his birth; succeeding Eratosthenes in the care of the Alexandrian library in the reign of Ptolemy Euergetes, who ascended the throne of Egypt in the year before Christ 246. That prince had been educated by the famous Aristarchus, and rivalled the preceding sovereigns of his liberal family in the munificent encouragement of learning. Apollonius was a disciple of the poet Callimachus; but their connexion ended in the most violent enmity, which was probably owing to some degree of contempt expressed by Apollonius for the light compositions of his master. The learned have vainly endeavoured to discover the particulars of their quarrel.—The only work of Apollonius which has descended to modern times is his poem above mentioned, in four books, on the Argonautic expedition. Both Longinus and Quintilian have assigned to this work the mortifying character of mediocrity: "But (says Mr Hayley) there lies an appeal from the sentence of the most candid and enlightened critics to the voice of Nature; and the merit of Apollonius has little to apprehend from the decision of this ultimate judge. His poems abound in animated description, and in passages of the most tender and pathetic beauty. How finely painted is the first setting forth of the Argo! and how beautifully is the wife of Chiron introduced, holding up the little Achilles in her arms, and showing him to his father Peleus as he sailed along the shore! But the chief excellence in our poet, is the spirit and delicacy with which he has delineated the passion of love in his Medea. That Virgil thought very highly of his merit in this particular, is sufficiently evident from the minute exactness with which he has copied many tender touches of the Grecian poet. Those who compare the third book of Apollonius with the fourth of Virgil, may, I think, perceive not only that Dido has some features of Medea, but that the two bards, however different in their reputation, resembled each other in their genius; and they both excel in delicacy and pathos."—The ancient scholia upon his *Argonautics*, still extant, are extremely useful, and full of learning.

Apollonius Apollos.

APOLLONIUS of Perga, a city of Pamphylia, was a great geometrician, under the reign of Ptolemy Euergetes, which reaches from the 2d year of the 133d Olympiad to the 3d year of the 139th. He studied a long time at Alexandria, under the disciples of Euclid: and composed several works, of which that only of the Conics remains.

APOLLONIUS, a Pythagorean philosopher, born at Tyana in Cappadocia, about the beginning of the first century. At 16 years of age he became a strict observer of Pythagoras's rules, renouncing wine, women, and all sorts of flesh; not wearing shoes, letting his hair grow, and wearing nothing but linen. He soon after set up for a reformer of mankind, and chose his habitation in a temple of Æsculapius, where he is said to have performed many wonderful cures. Philostratus has wrote the life of Apollonius, in which there are numberless fabulous stories recounted of him. We are told that he went five years without speaking; and yet, during this time, that he stopped many seditions in Cilicia and Pamphylia: that he travelled, and set up for a legislator; and that he gave out he understood all languages, without having ever learned them: that he could tell the thoughts of men, and understood the oracles which birds gave by their singing. The Heathens were fond of opposing the pretended miracles of this man to those of our Saviour; and by a treatise which Eusebius wrote against one Hierocles, we find that the drift of the latter, in the treatise which Eusebius refutes, seems to have been to draw a parallel betwixt Jesus Christ and Apollonius, in which he gives the preference to this philosopher. M. du Pin has wrote a confutation of Philostratus's life of Apollonius.

Apollonius wrote some works, viz. four books of Judicial Astrology; a treatise upon the Sacrifices, showing what was proper to be offered to each deity; and a great number of letters; all of which are now lost.

APOLLOS, in Scripture history, a Jew of Alexandria, who came to Ephesus during the absence of St Paul, who was gone to Jerusalem (Acts xviii. 24.). Apollos was an eloquent man, and well versed in the Scriptures; and as he spoke with zeal and fervour, he taught diligently the things of God: but knowing only the baptism of John, he was no more than a catechumen, or one of the lowest order of Christians, and did not as yet distinctly know the mysteries of the Christian doctrine. However, he knew that Jesus

Christ

Apollos ‖ pologue.

Christ was the Messiah, and declared himself openly to be his disciple. When therefore he was come to Ephesus, he began to speak boldly in the synagogue, and to show that Jesus was the Christ. Aquila and Priscilla having heard him, took him home with them; instructed him more fully in the ways of God; and baptized him, probably in the name of Jesus Christ.

Some time after this he had a mind to go into Achaia; and the brethren having exhorted him to undertake this journey, they wrote to the disciples, desiring them to receive him. He arrived at Corinth; and was there very useful in convincing the Jews out of the Scriptures, and demonstrated to them that Jesus was the Christ. Thus he watered what St Paul had planted in this city (1 Cor. iii. 6.): but the great fondness which his disciples had for his person had like to have produced a schism; some "saying, I am of Paul; others, I am of Apollos; I am of Cephas." However, this division, which St Paul speaks of in the chapter last quoted, did not prevent that apostle and Apollos from being closely united by the bands of charity. Apollos hearing that the apostle was at Ephesus, went to meet him, and was there when St Paul wrote the first epistle to the Corinthians; wherein he testifies that he had earnestly entreated Apollos to return to Corinth, but hitherto had not been able to prevail with him; that nevertheless, he gave him room to hope that he would go when he had an opportunity. St Jerome says, that Apollos was so dissatisfied with the division which had happened upon his account at Corinth, that he retired into Crete with Zena, a doctor of the law; and that this disturbance having been appeased by the letter which St Paul wrote to the Corinthians, Apollos returned to this city, and was bishop thereof. The Greeks make him bishop of Duras; others say, he was bishop of Iconium in Phrygia; and others, that he was bishop of Cæsarea.

APOLLYON, a Greek word that signifies *the destroyer*, and answers to the Hebrew *Abaddon*. St John in the Revelation (ix. 11.) says, that an angel having opened the bottomless pit, a thick smoke issued out of it; and with this smoke locusts, like horses, prepared for battle, and commanded by the angel of the bottomless pit, called in Hebrew *Abaddon*, but in the Greek *Apollyon*.

APOLOGETIC, Apologetical, something said or written, by way of excuse or apology, for any action or person.

The Apologetic of Tertullian is a work full of strength and spirit. He there vindicates the Christians from all that had been objected to them; particularly from the abominable crimes said to be perpetrated at their meetings, and their want of love and fidelity to their country. The ground of this last accusation was, their refusing to take the accustomed oaths, and swear by the tutelar gods of the empire.—Tertullian addresses his Apologetic to the magistrates of Rome, the emperor Severus being then absent.

APOLOGUE, in matters of literature, an ingenious method of conveying instruction by means of a feigned relation called a *moral fable*.

The only difference between a parable and an apologue is, that the former, being drawn from what passes among mankind, requires probability in the narration; whereas the apologue, being taken from the supposed actions of brutes, or even of things inanimate, is not tied down to the strict rules of probability. Æsop's fables are a model of this kind of writing.

Apologue ‖ Apono.

APOLOGY, a Greek term, literally importing an excuse or defence of some person or action.

APOMELI, among ancient physicians, a decoction of honey and vinegar, much used as a detergent, promoter of stool, urine, &c.

APOMYOS Deus (*απο*, and *μυια*, *fly*), in the Heathen mythology, a name under which Jupiter was worshipped at Elis, and Hercules as well as Jupiter at the Olympic games. These deities were supplicated under this name, to destroy or drive away the vast number of flies which always attended at the great sacrifices; and in those who accompanied the Olympic games, the first was always to the Apomyos, or Myiagrus Deus, that he might drive away the flies from the rest. The usual sacrifice was a bull.

APONEUROSIS, among physicians, a term sometimes used to denote the expansion of a nerve or tendon in the manner of a membrane: sometimes for the cutting off a nerve; and, finally, for the tendon itself.

APONO, Peter d', one of the most famous philosophers and physicians of his age, born in the year 1350, in a village about four miles from Padua. He studied some time at Paris, and was there promoted to the degree of doctor in philosophy and physic. When he came to practise as a physician, he is said to have insisted on very large sums for his visits: we are not told what he demanded for the visits he made in the place of his residence; but it is affirmed that he would not attend the sick in any other place under 150 florins a-day; and when he was sent for by Pope Honorius IV. he demanded 400 ducats for each day's attendance. He was suspected of magic, and prosecuted by the Inquisition on that account. "The common opinion of almost all authors (says Naude) is, that he was the greatest magician of his age; that he had acquired the knowledge of the seven liberal arts, by means of the seven familiar spirits, which he kept enclosed in a crystal; and that he had the dexterity to make the money he had spent come back into his purse." The same author adds, that he died before the process against him was finished, being then in the 80th year of his age; and that, after his death, they ordered him to be burnt in effigy, in the public place of the city of Padua; designing thereby to strike a fear into others of incurring the like punishment, and to suppress the reading three books which he had wrote; the first being the Heptameron, which is printed at the end of the first volume of Agrippa's work; the second, that which is called by Trithemius *Elucidareum necromanticum Petri de Albano;* and the last, that which is entitled by the same author, *Liber experimentorum mirabilium de annulis secundum xxviii. mansiones lunæ.* His body being secretly taken up by his friends, escaped the vigilance of the inquisitors, who would have burnt it. It was removed several times, and was at last placed in the church of St Augustin, without an epitaph or any mark of honour. The most remarkable book which Apono wrote, was that which procured him the surname of *Conciliator;* he wrote also a piece entitled *De medicina omnimoda.* There is a story told of him, that, having no well in his house, he caused his neighbour's to be carried into the street by devils, when

Apono || Aporia.

when he heard they had forbidden his maid fetching water thence. He had much better (says Mr Bayle) have employed the devils to make a well in his own house, and have stopped up his neighbour's; or, at least, transported it into his house, rather than into the street.

APONOGETON. See BOTANY *Index*.

APONUS, a hamlet near Patavium, with warm baths. It was the birthplace of Livy, (Martial); and is now called *Albano*. E. Long. 10. N. Lat. 45. 15.

APOPEMPTIC, in the ancient poetry, a hymn addressed to a stranger on his departure from a place to his own country. The ancients had certain holidays, wherein they took leave of the gods with *apopemptic* songs, as supposing them returning each to his own country. The deities having the patronage of divers places, it was but just to divide their presence, and allow some time to each. Hence it was, that among the Delians and Milesians we find feasts of Apollo, and among the Argians feasts of Diana, called *Epidemiæ*, as supposing these deities then more peculiarly resident among them. On the last day of the feast they dismissed them, following them to the altars with *apopemptic* hymns.

APOPHASIS, a figure in *Rhetoric*, by which the orator, speaking ironically, seems to wave what he would plainly insinuate; as, *Neither will I mention those things; which, if I should, you notwithstanding could neither confute, nor speak against them.*

APOPHLEGMATIZANTS, in *Pharmacy*, medicines proper to clear the head from superfluous phlegm, whether by spitting or by the nose.

APOPHTHEGM, a short, sententious, and instructive remark, pronounced by a person of distinguished character. Such is that of Cyrus: *He is unworthy to be a magistrate, who is not better than his subjects.* Or this: *He that will not take care of his own business, will be forced to take care of that of others.* Or that of Artaxerxes Mnemon, when reduced to hunger by the loss of his baggage: *How much pleasure have I hitherto lived a stranger to?* Or that of Cato, *Homines nihil agendo discunt malè agere.* Or, finally, that of Augustus, *Festina lentè.* The apophthegms of Plutarch are well known.

APOPHYGE, in *Architecture*, a concave part or ring of a column, lying above or below the flat member. The French call it *le conge d'en bas* or *d'en haut:* the Italians, *cavo di basso* or *di sopra;* and also *il vivo di basso.* The apophyge originally was no more than the ring, or ferril, at first fixed on the extremities of wooden pillars, to keep them from splitting; which afterwards was imitated in stone.

APOPHYSIS, in *Anatomy*, a process or protuberance of a bone. See ANATOMY.

APOPLEXY, a distemper in which the patient is suddenly deprived of all his senses, and of voluntary motion. See MEDICINE *Index*.

APORIA, is a figure in *Rhetoric*, by which the speaker shows, that he doubts where to begin for the multitude of matter, or what to say in some strange and ambiguous thing; and doth, as it were, argue the case with himself. Thus Cicero says, *Whether he took them from his fellows more impudently, gave them to a harlot more lasciviously, removed them from the Roman people more wickedly, or altered them more presumptuously, I cannot well declare.*

Aporia || Apostasy.

APORON, or APORIME, a problem difficult to resolve, and which has never been resolved, though it be not, in itself, impossible.

The word is derived from απορος, which signifies something very difficult, and impracticable; being formed from the privative α, and πορος, *passage*. Such we conceive the quadrature of the circle; the duplicature of the cube; the trisection of an angle, &c. When a question was proposed to any of the Greek philosophers, especially of the sect of Academists; if he could not give a solution, his answer was Απορω, *I cannot see through it.*—This word is also used by some law writers for an inexplicable speech or discourse.

APOSIOPESIS, in *Rhetoric*, otherwise called *reticency* and *suppression;* a figure, by which a person really speaks of a thing, at the same time that he makes a show as if he would say nothing of it. The word comes from αποσιωπαω, *I am silent.*—It is commonly used to denote the same with ELLIPSIS. Jul. Scaliger distinguishes them. The latter, according to him, being only the suppression of a word; as *me, me; adsum qui feci;* the former, the omitting to relate some part of the action; as,

Dixerat, atque illam media inter talia ferro
Collapsam adspiciunt————————

where the poet does not mention how Dido killed herself.—This figure is of use to keep up the grandeur and sublimity of a discourse.

APOSPHRAGISMA, (from απο, and σφραγιζω, *I seal*), in antiquity, the figure or impression of a seal.—It was forbid among the ancients to have the figure or image of God on their rings and seals. To this purpose the precept of Pythagoras, Εν δακτυλιω εικονα Θεου μη περιφερειν! But in process of time, this was little regarded; it was usual enough to have the figures of Egyptian and other deities, as well as of heroes, monsters, friends, ancestors, and even brutes, on their *dactyli* or ring-seals. Thus Cæsar had the image of Venus, Pollio of Alexander, Augustus of the *Sphinx*, Pompey of a frog, Lentulus of his grandfather, &c.

APOSTASIS, in *Medicine*, the same with abscess.

APOSTASY, the abandoning the true religion. The primitive Christian church distinguished several kinds of apostasy. The first, of those who went over entirely from Christianity to Judaism; the second, of those who mingled Judaism and Christianity together; and the third, of those who complied so far with the Jews, as to communicate with them in many of their unlawful practices, without making a formal profession of their religion. But the fourth sort was of those who, after having been some time Christians, voluntarily relapsed into Paganism.

The perversion of a Christian to Judaism, Paganism, or other false religion, was punished by the emperors Constantius and Julian with confiscation of goods; to which the emperors Theodosius and Valentinian added capital punishment, in case the apostate endeavoured to pervert others to the same iniquity: A punishment too severe for any temporal laws to inflict; and yet the zeal of our ancestors imported it into this country; for we find by Bracton, that in his time apostates were to be

Apostasy ‖ Apostle.

be burnt to death. Doubtless the preservation of Christianity, as a national religion, is, abstracted from its own intrinsic truth, of the utmost consequence to the civil state: which a single instance will sufficiently demonstrate. The belief of a future state of rewards and punishments, the entertaining just ideas of the moral attributes of the supreme Being, and a firm persuasion that he superintends and will finally compensate every action in human life (all which are clearly revealed in the doctrines, and forcibly inculcated by the precepts, of our Saviour Christ), these are the grand foundation of all judicial oaths: which call God to witness the truth of those facts, which perhaps may be only known to him and the party attesting: all moral evidence therefore, all confidence in human veracity, must be weakened by apostasy, and overthrown by total infidelity. Wherefore all affronts to Christianity, or endeavours to depreciate its efficacy, in those who have once professed it, are highly deserving of censure. But yet the loss of life is a heavier penalty than the offence, taken in a civil light, deserves; and, taken in a spiritual light, our laws have no jurisdiction over it. This punishment, therefore, has long ago become obsolete; and the offence of apostasy was, for a long time, the object only of the ecclesiastical courts, which corrected the offender *pro salute animæ*. But about the close of the last century, the civil liberties to which we were then restored being used as a cloak of maliciousness, and the most horrid doctrine subversive of all religion being publicly avowed both in discourse and writings, it was thought necessary again for the civil power to interpose, by not admitting those miscreants to the privileges of society, who maintained such principles as destroyed all moral obligation. To this end it was enacted, by statute 9 and 10 William III. c. 32. That if any person educated in, or having made profession of the Christian religion, shall, by writing, printing, teaching, or advised speaking, deny the Christian religion to be true, or the holy Scriptures to be of divine authority, he shall, upon the first offence, be rendered incapable to hold any office or place of trust; and, for the second, be rendered incapable of bringing any action, or of being guardian, executor, legatee, or purchaser of lands, and shall suffer three years imprisonment without bail. To give room, however, for repentance, if, within four months after the first conviction, the delinquent will in open court publicly renounce his error, he is discharged for that once from all disabilities.

APOSTATA CAPIENDO, in the *English Law*, a writ that formerly lay against a person who, having entered into some order of religious, broke out again, and wandered up and down the country.

APOSTATE, one who deserts his religion. Among the Romanists, it signifies a man who, without a legal dispensation, forsakes a religious order of which he had made profession.

A POSTERIORI, or demonstration *à posteriori*. See DEMONSTRATION.

APOSTIL, in matters of literature, the same with a marginal note.

APOSTLE properly signifies a messenger or person sent by another upon some business; and hence, by way of eminence, denotes one of the disciples commissioned by Jesus Christ to preach the gospel.

Apostle.

Our blessed Lord selected twelve out of the number of his disciples to be invested with the apostleship. Their names were Simon Peter, Andrew, James the greater, John, Philip, Bartholomew, Thomas, Matthew, James the less, Jude, surnamed Lebbeus or Thaddeus, Simon the Canaanite, and Judas Iscariot. Of these, Simon, Andrew, James the greater, and John, were fishermen; and Matthew a publican, or receiver of the public revenue: of what profession the rest were, we are not told in Scripture: though it is probable they were fishermen.

There are various conjectures as to the reason of our Saviour's making choice of *twelve* apostles. The most probable is, that it might be in allusion to the twelve patriarchs, as the founders of their several tribes; or to the twelve chief heads or rulers of those tribes, of which the body of the Jewish nation consisted. This opinion seems to be countenanced by what our Saviour tells his apostles, that "when the Son of man shall sit on the throne of his glory, *they* also shall sit upon twelve thrones judging the twelve tribes of Israel."

Our Lord's first commission to his apostles was in the third year of his public ministry, about eight months after their solemn election; at which time he sent them out by two and two. They were to make no provision of money for their subsistence in their journey, but to expect it from those to whom they preached. They were to declare, that the kingdom of heaven, or the Messiah, was at hand; and to confirm their doctrine by miracles. They were to avoid going either to the Gentiles or to the Samaritans, and to confine their preaching to the people of Israel. In obedience to their Master, the apostles went into all the parts of Palestine inhabited by the Jews, preaching the gospel, and working miracles. The evangelical history is silent as to the particular circumstances attending this first preaching of the apostles; and only informs us, that they returned, and told their Master of all that they had done.

Their second commission, just before our Lord's ascension into heaven, was of a more extensive and particular nature. They were now not to confine their preaching to the Jews, but to "go and teach ALL nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost." Accordingly they began publicly, after our Lord's ascension, to exercise the office of their ministry, working miracles daily in proof of their mission, and making great numbers of converts to the Christian faith. This alarmed the Jewish Sanhedrim; whereupon the apostles were apprehended, and being examined before the high priest and elders, were commanded not to preach any more in the name of Christ. But this injunction did not terrify them from persisting in the duty of their calling; for they continued daily, in the temple, and in private houses, teaching, and preaching the gospel.

After the apostles had exercised their ministry for twelve years in Palestine, they resolved to disperse themselves in different parts of the world, and agreed to determine by lot what parts each should take. According to this division, St Peter went into Pontus, Galatia, and those other provinces of the Lesser Asia. St Andrew had the vast northern countries of Scythia and Sogdiana allotted to his portion. St John's was partly the same with Peter's, namely the Lesser Asia.

St

Apostle. St Philip had the Upper Asia assigned to him, with some parts of Scythia and Colchis. Arabia Felix fell to St Bartholomew's share. St Matthew preached in Chaldea, Persia, and Parthia. St Thomas preached likewise in Parthia; as also to the Hyrcanians, Bactrians, and Indians. St James the less continued in Jerusalem, of which church he was bishop. St Simon had for his portion Egypt, Cyrene, Libya, and Mauritania; St Jude, Syria and Mesopotamia; and St Matthias, who was chosen in the room of the traitor Judas, Cappadocia and Colchis. Thus, by the dispersion of the apostles, Christianity was very early planted in a great many parts of the world. We have but very short and imperfect accounts of their travels and actions.

In order to qualify the apostles for the arduous task of converting the world to the Christian religion, they were, in the first place, miraculously enabled to speak the languages of the several nations to whom they were to preach: and, in the second place, were endowed with the power of working miracles, in confirmation of the doctrines they taught; gifts which were unnecessary, and therefore ceased, in the after ages of the church, when Christianity came to be established by the civil power.

St Paul is frequently called the *apostle*, by way of eminence; and the *apostle of the Gentiles*, because his ministry was chiefly made use of for the conversion of the Gentile world, as that of St Peter was for the Jews, who is therefore styled the *apostle of the circumcision*. The several apostles are usually represented with their respective badges or attributes; St Peter with the keys; St Paul with a sword; St Andrew with a cross or saltier; St James minor with a fuller's pole; St John with a cup, and a winged serpent flying from it; St Bartholomew with a knife; St Philip with a long staff, whose upper end is formed into a cross; St Thomas with a lance; St Matthew with a hatchet; St Matthias with a battle axe; St James major with a pilgrim's staff and a gourd bottle; St Simon with a saw; and St Jude with a club.

This appellation was also given to the ordinary travelling ministers of the church.—Thus St Paul, in the Epistle to the Romans, xvii. 7, says, "Salute Andronicus and Junia, my kinsmen and fellow prisoners, who are of note among the apostles." It was likewise a title given to those sent by the churches to carry their alms to the poor of other churches. This usage they borrowed from the synagogues, who called those whom they sent on this message by the same name; and the function or office itself αποστολη, *apostle*, q. d. *mission*. Thus St Paul, writing to the Philippians, tells them that Epaphroditus their apostle had ministered to his wants, ch. ii. 25.

The appellation is given in like manner to those persons who first planted the Christian faith in any place. Thus Dionysius of Corinth is called the *apostle of France;* Xavier, *the apostle of the Indies*, &c. In the East Indies the Jesuit missionaries are also called *apostles*.

Apostle is also used among the Jews for a kind of officer anciently sent into the several parts and provinces in their jurisdiction, by way of visitor or commissary, to see that the laws were duly observed, and to receive the moneys collected for the reparation of the temple, and the tribute payable to the Romans. The Theodosian code, lib. 14. *De Judæis*, calls those *apostoli, qui ad exigendum aurum atque argentum, à patriarcha certo tempore diriguntur*. Julian the apostate remitted the Jews the *apostle*, αποστολη; that is, as he himself explains it, the tribute they had been accustomed to send him. These apostles were a degree below the officers of the synagogue called *patriarchs*, and received their commissions from them. Some authors observe, that St Paul had borne this office; and that it is this he alludes to in the beginning of the epistle to the Galatians; as if he had said, Paul, no longer an apostle of the synagogue, nor sent thereby to maintain the law of Moses, but now an apostle and envoy of Jesus Christ, &c. St Jerome, though he does not believe that St Paul had been an apostle of this kind, yet imagines that he alludes to it in the passage just cited. Apostle.

Apostle, in the Greek liturgy, is particularly used for a book containing the epistles of St Paul, printed in the order wherein they are to be read in churches, through the course of the year. Another book of the like kind, containing the Gospels, is called Ευαγγελιον, *Gospel*.—The apostle, of late days, has also contained the other canonical epistles, the Acts of the Apostles, and the Revelation. Hence it is also called *Acts of the Apostles*, Πραξαποστολος; that being the first book in it.

Apostle is also thought by many to have been the original name for bishops, before the denomination *bishop* was appropriated to their order, Thus Theodoret says expressly, the same persons are anciently called promiscuously both bishops and presbyters, whilst those who are now called bishops were called *apostles*. In the arsenal of Bremen, there are twelve pieces of cannon called the *Twelve Apostles*, on a supposition that the whole world must be convinced, and acquiesce in the preaching of such apostles.

Apostles Creed: a formula, or summary of the Christian faith, drawn up, according to Ruffinus, by the apostles themselves: who, during their stay at Jerusalem, soon after the Lord's ascension, agreed upon this *creed*, as a rule of faith, and as a *word of distinction* by which they were to know friends from foes. Baronius, and some other authors, conjecture, that they did not compose it till the second year of the reign of Claudius, a little before their dispersion. As to their manner of composiug it, some fancy, that each apostle pronounced his article, which is the reason of its being called *symbolum apostolicum*, it being made up of sentences jointly contributed, after the manner of persons paying each their club (*symbolum*), or share of a reckoning.

But there are reasons which may induce us to question whether the apostles composed any such creed as this. For, first, Neither St Luke in the Acts, nor any other ecclesiastical writer before the 5th century, make any mention of an assembly of the apostles in order to the composing of a creed. Secondly, The fathers of the three first centuries, in disputing against the heretics, endeavoured to prove that the doctrine contained in this creed was the same which the apostles taught; but they never pretend that the apostles composed it. Thirdly, If the apostles had made this creed, it would have been the same in all churches, and in all ages; and

Apostle || Apostolic.

and all authors would have cited it after the same manner. But the case is quite otherwise. In the second and third ages of the church, there were as many creeds as authors, and one and the same author sets down the creed after a different manner in several places of his works; which is an evidence that there was not at that time any creed which was reputed to be the apostles. In the fourth century Ruffinus compares together the three ancient creeds of the churches of Aquileia, Rome, and the East, which differ very considerably in the terms. Besides, these creeds differed not only in the terms and expressions, but even in the articles, some of which were omitted in one or other of them; such as those of the *descent into hell*, the *communion of the saints*, and the *life everlasting*. From these reasons it may be gathered, that though this creed may be said to be that of the apostles in regard to the doctrines contained therein, yet it is not to be referred to them as the authors and first composers of it. Who was the true author of it, is not easy to determine; though its great antiquity may be inferred from hence, that the whole form, as it now stands in the English liturgy, is to be found in the works of St Ambrose and Ruffinus, the former of whom flourished in the third century, and the latter in the fourth century.

The primitive Christians, in regard they always concealed this and their other mysteries, did not publicly recite the creed, except at the times of baptism; which, unless in case of necessity, were only in Easter and Whitsuntide. The constant repeating of it was not introduced into the church till the end of the fifth century; about which time Petrus Gnapheus, bishop of Antioch, prescribed the recital of it every time divine service was performed.

APOSTOLARE, Apostolicare, *apostolizing*, in some middle age writers, denotes the being preferred to the dignity of pope.

APOSTOLATE, in a general sense, is used for mission. In this sense, Olearius has a discourse concerning the apostolate of Christ.

Apostolate more properly denotes the dignity or office of an apostle of Christ; but it is also used, in ancient writers, for the office of a bishop. In this sense we meet with several letters, petitions, requests, &c. directed to bishops, under the title of your *apostolate*, or *apostolatus vester*. But as the title *apostolicus* had been appropriated to the pope, so that of *apostolate*, became at length restrained to the sole dignity of the popedom. Every bishop's see was anciently dignified with the title of *sedes apostolica*, an apostolical see, which is now the peculiar denomination of the see of Rome.

APOSTOLI, in *Law*, denote those letters missive which are demanded in cases of appeal.

APOSTOLIC, Apostolical, something that relates to the apostles, or descends from them. Thus we say, the *apostolical* age, *apostolical* doctrine, *apostolical* character, constitutions, traditions, &c.

Apostolic, in the primitive church, was an appellation given to all such churches as were founded by the apostles; and even to the bishops of those churches, as being the reputed successors of the apostles.—These were confined to four, viz. Rome, Alexandria, Antioch, and Jerusalem. In after times, other churches assumed the same quality, on account, principally, of the conformity of their doctrine with that of the churches which were apostolical by foundation, and because all bishops held themselves successors of the apostles, or acted in their diocese with the authority of apostles.

Apostolic || Apostolici.

The first time the term *apostolical* is attributed to bishops as such, is in a letter of Clovis to the council of Orleans, held in 511, though that king does not there expressly denominate them *apostolical* (but *apostolica sede dignissimi*) highly worthy of the apostolical see. In 581, Guntram calls the bishops, met at the council of Maçon, *apostolical* pontiffs, *apostolici pontifices*.

In progress of time, the bishop of Rome growing in power above the rest, and the three patriarchates of Alexandria, Antioch, and Jerusalem, falling into the hands of the Saracens, the title *apostolical* was restrained to the pope and his church alone. Though some of the popes, and St Gregory the Great, not contented to hold the title by this tenure, began at length to insist, that it belonged to them by another and peculiar right, as being the successors of St Peter. The council of Rheims in 1049 declared that the pope was the sole apostolical primate of the universal church. And hence a great number of apostolicals; *apostolical* see, *apostolical* nuncio, *apostolical* notary, *apostolical* brief, *apostolical* chamber, *apostolical* vicar, &c.

Apostolical Constitutions. See Constitution.

Apostolical Traditions. See Tradition.

Apostolical Fathers is an appellation usually given to the writers of the first century who employed their pens in the cause of Christianity. Of these writers, Cotelerius, and after him Le Clerc, have published a collection in two volumes, accompanied both with their own annotations and the remarks of other learned men.

APOSTOLIANS, a sect of the Mennonites, which first sprung up in the year 1663, and derived its name from Apostool, one of the Mennonite ministers at Amsterdam. They concurred with them in doctrine, and admitted to their communion those only who professed to believe all the sentiments which are contained in their public confession of faith.

APOSTOLICI, or Apostolics, was a name assumed by three different sects, on account of their pretending to imitate the manner and practice of the apostles. The first apostolici, otherwise called *Apotactitæ* and *Apotactici*, rose out of the Encratitæ and Catharі in the third century. They made profession of abstaining from marriage, and the use of wine, flesh, money, &c.

Gerhard Sagarelli was the founder of the second sect; he obliged his followers to go from place to place as the apostles did, to wander about clothed in white, with long beards, dishevelled hair, and bare heads, accompanied with women, whom they called their spiritual sisters. They likewise renounced all kinds of property and possessions, inveighed against the growing corruption of the church of Rome, predicted its overthrow, and the establishment of a purer church on its ruins. Sagarelli was burnt alive at Parma in the year 1300, and was afterwards succeeded by Dulcinus, who added to the character of an apostle those of a prophet and a general, and carried on a bloody

Apostolici || Apoteichismus.

and dreadful war for the space of more than two years against Reynerius, bishop of Vercelli; he was at length defeated, and put to death in a barbarous manner in the year 1307. Nevertheless, the sect subsisted in France, Germany, and in other countries, till the beginning of the 15th century, when it was totally extirpated under the pontificate of Boniface IX.

The other branch of apostolici was of the twelfth century. These also condemned marriage, preferring celibacy, and calling themselves the chaste brethren and sisters; though each was allowed a spiritual sister, with whom he lived in a domestic relation; and on this account they have been charged with concubinage: they held it unlawful to take an oath; they set aside the use of baptism; and in many things imitated the Manichees. Bernard wrote against this sect of apostolici.

APOSTOLICUM is a peculiar name given to a kind of song or hymn, anciently used in churches. The apostolicum is mentioned by Greg. Thaumaturgus as used in his time. Vossius understands it as spoken of the apostles creed: Suicer thinks this impossible, for that this creed was then unknown in the churches of the east.

APOSTROPHE, in *Rhetoric*, a figure by which a person who is either absent or dead is addressed as if he were present and attentive to us. This figure is, in boldness, a degree lower than the address to personified objects (see PERSONIFICATION); since it requires a less effort of imagination to suppose persons present who are dead or absent, than to imitate insensible beings and direct our discourse to them. The poems of Ossian abound with the most beautiful instances of this figure. "Weep on the rocks of roaring winds, O Maid of Inistore! Bend thy fair head over the waves, thou fairer than the ghost of the hills when it moves in a sunbeam at noon over the silence of Morven! He is fallen! Thy youth is low: pale beneath the sword of Cuchullin!

APOSTROPHE, in *Grammar*, the contraction of a word by the use of a comma: as *call'd* for *called*, *tho'* for *though*.

APOTACTITÆ, or APOTACTICI, an ancient sect, who affecting to follow the evangelical counsels of poverty, and the examples of the apostles and primitive Christians, renounced all their effects and possessions. It does not appear that they gave into any errors during their first state; some ecclesiastical writers assure us they had divers holy virgins and martyrs under the persecution of Dioclesian in the fourth century; but they afterwards fell into the opinions of the Encratitæ, and taught that the renouncing of all riches was not only a matter of counsel and advice, but of precept and necessity. And hence the sixth law in the Theodosian code joins the Apotactitæ with the Eunomians and Arians.

APOTEICHISMUS, in the ancient military art, a kind of line of circumvallation drawn round a place in order to besiege it. This was also called *periteichismus*. The first thing the ancients went about, when they designed to lay close siege to a place, was the apoteichismus; which sometimes consisted of a double wall or rampart, raised of earth; the innermost to prevent sudden sallies from the town, the outermost to keep off foreign enemies from coming to the relief of the besieged. This answered to what are called *lines of contravallation* and *circumvallation* among the moderns.

Apoteichismus || Apotheosis

APOTHECARY, one who practises the art of pharmacy. In London, the apothecaries are one of the city companies. They were incorporated by a charter from King James I. procured at the solicitation of Dr Mayerne and Dr Aitkens; till that time they only made a part of the grocers company; plums, sugar, spice, Venice treacle, mithridate, &c. were sold in the same shop and by the same person. The reason of separating them was, that medicines might be better prepared, and in opposition to divers persons who imposed unwholesome remedies on the people. By an act which was made perpetual in the ninth year of George I. they are exempted from serving upon juries, or in ward and parish offices. They are obliged to make up their medicines according to the formulas prescribed in the college dispensatory; and are liable to have their shops visited by the censors of the college, who are empowered to destroy such medicines as they think not good.

They have a hall in Black Friars, where there are two fine laboratories, out of which all the surgeons chests are supplied with medicines for the British royal navy.

To his majesty belong two apothecaries: the salary to the first, 320l.; to the second, 275l.—To the household belong also two.

The charitable dispensation of medicines by the Chinese is well deserving notice. They have a stone which is ten cubits high, erected in the public squares of their cities; on this stone are engraven the names of all sorts of medicines, with the price of each; and when the poor stand in need of any relief from physic, they go to the treasury, where they receive the price each medicine is rated at.

APOTHECARY, *Apothecarius*, in writers of the middle age, denotes a shop-keeper or warehouse-keeper.

APOTHECARIUS is also used to denote a store-keeper, or officer appointed to have the direction of a magazine, granary, &c. In which sense *apothecarii* is sometimes rendered by *horearii* and *rationarii*.

APOTHEOSIS, in antiquity, a heathen ceremony, whereby their emperors and great men were placed among the gods. The word is derived from απο, and Θεος, *God*.

After the apotheosis which they also called *deification* and *consecration*, temples, altars, and images were erected to the new deity; sacrifices, &c. were offered, and colleges of priests instituted.

It was one of the doctrines of Pythagoras, which he had borrowed from the Chaldees, that virtuous persons after their death were raised into the order of the gods. And hence the ancients deified all the inventors of things useful to mankind; and those who had done any important services to the commonwealth. Tiberius proposed to the Roman senate the apotheosis of Jesus Christ, as is related by Eusebius, Tertullian, and Chrysostom.

Juvenal rallying the frequent apotheoses, introduces poor Atlas, complaining that he was ready to sink under the burden of so many new gods as were every day added to the heavens. Seneca ridicules the apotheosis of Claudius with admirable humour.

The ceremony, according to Herodian's description,

was

Apotheosis || Apparatus.

was as follows: After the body of the deceased had been burnt with the usual solemnities, an image of wax, exactly resembling him, was placed on an ivory couch, where it lay for seven days, attended by the senate and ladies of the highest quality in mourning; and then the young senators and knights bore the bed of state through the Via Sacra to the old forum, and from thence to the Campus Martius, where it was deposited upon an edifice built in form of a pyramid. The bed being thus placed amidst a quantity of spices and other combustibles, and the knights having made a solemn procession round the pile, the new emperor, with a torch in his hand, set fire to it, whilst an eagle, let fly from the top of the building, and mounting in the air with a firebrand, was supposed to convey the soul of the deceased to heaven; and thenceforward he was ranked among the gods.

We often meet with the consecration or apotheosis of emperors represented on medals: where we see the pyramids of several stories, each growing less and less; we see also the eagles flying away with the souls of the deceased emperors. A gem in the museum of Brandenburg represents the apotheosis of Julius Cæsar, mounted upon the celestial globe, and holding a helm in his hand, as if he were now the governor of heaven, as before of the earth. See DEIFICATION.

APOTHERAPIA, (from *αποθεραπευω*, *I cure*), in *Physic*, properly denotes a complete or finished cure.

APOTHERAPIA is also used in the gymnastic art, for the last part of all regular exercise, viz. friction, or unction with oil, before as well as after bathing. The design of this was partly to cleanse the skin from any filth or dust it might have contracted during the exercise, and partly to remove weariness.

APOTOME, in *Geometry*, the difference between two incommensurable lines.

APOTOME, in *Music*, the difference between a greater and a lesser semi-tone; expressed by the ratio, 128; 125.

APOTROPÆ, (from *αποτρεπω*, *I avert*), in the ancient poetry, verses composed for averting the wrath of incensed deities; and the deities invoked for averting any threatened misfortune were called *Apotrepeans;* they were also called *Alexiaci*, from *αλεξω*, *I drive away;* and *Averrunci* from *averrunco*, which denotes the same.

APOZEM, in *Medicine*, the same with decoction. See DECOCTION.

APPARATUS, a term used to denote a complete set of instruments, or other utensils, belonging to any artist or machine.

APPARATUS is frequently used for the operation of cutting for the stone. For this there are three sorts of apparatus, viz. the small, great, and high apparatus. See SURGERY.

APPARATUS is also used as a title of several books composed in form of catalogues, bibliothecas, dictionaries, &c. for the ease and conveniency of study. The apparatus to Cicero is a kind of concordance, or collection of Ciceronian phrases, &c. The *apparatus sacer* of Possevin, is a collection of all kinds of ecclesiastical authors, printed in 1611, in three volumes.—Glossaries, comments, &c. are also frequently called *apparatuses*.

Apparent, Apparition.

APPARENT, in a general sense, something that is visible to the eyes, or obvious to the understanding.

APPARENT, among mathematicians and astronomers, denotes things as they appear to us, in contradistinction from real or true; thus we say, the apparent diameter, distance, magnitude, place, figure, &c. of bodies.

APPARENT Heir, in *Law*. No inheritance can vest, nor can any person be the actual complete heir of another, till the ancestor is previously dead. *Nemo est hæres viventis*. Before that time the person who is next in the line of succession is called an *heir apparent*, or *heir presumptive*. Heirs *apparent* are such, whose right of inheritance is indefeasible, provided they outlive the ancestor; as the eldest son or his issue, who must by the course of the common law be heirs to the father whenever he happens to die. Heirs *presumptive* are such, who, if the ancestor should die immediately, would in the present circumstances of things be his heirs: but whose right of inheritance may be defeated by the contingency of some nearer heir being born; as a brother, or nephew, whose presumptive succession may be destroyed by the birth of a child; or daughter, whose present hopes may be hereafter cut off by the birth of a son. Nay, even if the estate hath descended, by the death of the owner, to such brother, or nephew, or daughter, in the former cases, the estate shall be divested, and taken away by the birth of a posthumous child; and, in the latter, it shall also be totally divested by the birth of a posthumous son.

APPARITION, in a general sense, denotes simply the appearance of a thing. In a more limited sense, it is used for a spectre or ghost. Several instances of apparitions occur in the Bible; that of Samuel, raised by the witch of Endor, has occasioned great disputes. We find great controversies among authors, in relation to the reality, the existence or non-existence, the possibility or impossibility, of apparitions. The Chaldeans, the Jews, and other nations, have been the steady assertors of the belief of apparitions. The denial of spirits and apparitions is by some made one of the marks of infidelity, if not of atheism. Many of the apparitions we are told of in writers, are doubtless mere delusions of the sense; many others are fictitious, contrived merely to amuse, or answer some purpose. Apparitions, it is certain, are machines that on occasion have been of good service both to generals, to ministers of state, to priests, and others.

Partial darkness, or obscurity, are the most powerful means by which the sight is deceived: night is therefore the proper season for apparitions. Indeed the state of the mind, at that time, prepares it for the admission of these delusions of the imagination. The fear and caution which must be observed in the night; the opportunity it affords for ambuscades and assassinations; depriving us of society, and cutting off many pleasing trains of ideas, which objects in the light never fail to introduce, are all circumstances of terror: and perhaps, on the whole, so much of our happiness depends upon our senses, that the deprivation of any one may be attended with proportionable horror and uneasiness. The notions entertained by the ancients respecting the soul, may receive some illustration from these principles. In dark or twilight, the imagination frequently transforms

Apparition || Appeal

an inanimate body into a human figure; on approaching, the same appearance is not to be found: hence they sometimes fancied they saw their ancestors; but not finding the reality, distinguished these illusions by the name of *shades*.

Many of these fabulous narrations might originate from dreams. There are times of slumber when we are not sensible of being asleep. On this principle, Hobbes has ingeniously accounted for the spectre which is said to have appeared to Brutus. "We read," says he, "of M. Brutus, that at Philippi, the night before he gave battle to Augustus Cæsar, he saw a fearful apparition, which is commonly related by historians as a vision; but, considering the circumstances, one may easily judge it to have been but a short dream. For sitting in his tent, pensive, and troubled with the horror of his rash act, it was not hard for him, slumbering in the cold, to dream of that which most affrighted him; which fear, as by degrees it made him wake, so it must needs make the apparition by degrees to vanish: and having no assurance that he slept, he could have no cause to think it a dream, or any thing but a vision."—The well known story told by Clarendon, of the apparition of the duke of Buckingham's father, will admit of a similar solution. There was no man in the kingdom so much the subject of conversation as the duke; and from the corruptness of his character, he was very likely to fall a sacrifice to the enthusiasm of the times. Sir George Villiers is said to have appeared to the man at midnight: therefore there is the greatest probability that the man was asleep; and the dream affrighting him, made a strong impression, and was likely to be repeated.

APPARITOR, among the Romans, a general term to comprehend all attendants of judges and magistrates appointed to receive and execute their orders. *Apparitor*, in England, is a messenger that serves the process of a spiritual court, or a beadle in a university who carries the mace.

APAUMEE, in *Heraldry*, denotes one hand extended, with the full palm appearing, and the thumb and fingers at full length.

APPEAL, in *Law*, the removal of a cause from an inferior to a superior court or judge, when a person thinks himself aggrieved by the sentence of the inferior judge. Appeals lie from all the ordinary courts of justice to the house of lords. In ecclesiastical cases, if an appeal is brought before a bishop, it may be removed to the archbishop; if before an archdeacon, to the court of arches, and thence to the archbishop; and from the archbishop's court to the king in chancery.

APPEAL, in *Common Law*, denotes an accusation by a private subject against another for some heinous crime; demanding punishment on account of the particular injury suffered, rather than for the offence against the public.

This private process, for the punishment of public crimes, had probably its original in those times, when a private pecuniary satisfaction, called a *weregild*, was constantly paid to the party injured, or his relations, to expiate enormous offences. This was a custom derived to the English, in common with other northern nations, from their ancestors the ancient Germans; among whom, according to Tacitus, *luitur homicidium certo armentorum ac pecorum numero; recipitque satisfactionem universa domus.* In the same manner, by the Irish Brehon law, in case of murder, the brehon or judge was used to compound between the murderer and the friends of the deceased who prosecuted him, by causing the malefactor to give unto them, or to the child or wife of him that was slain, a recompense which they called an *eriach*. And thus we find in the Anglo-Saxon laws (particularly those of King Athelstan) the several weregilds for homicide established in progressive order, from the death of the ceorl or peasant, up to that of the king himself. And in the laws of Henry I. we have an account of what other offences were redeemable by weregild, and what were not so. As, therefore, during the continuance of this custom, a process was certainly given for recovering the weregild by the party to whom it was due; it seems that, when these offences by degrees grew no longer redeemable, the private process was still continued, in order to ensure the infliction of punishment upon the offender, though the party injured was allowed no pecuniary compensation for the offence. Appeal.

But though appeals were thus, in the nature of prosecutions for some atrocious injury, committed more immediately against an individual, yet it also was anciently permitted, that any subject might appeal another subject of high treason, either in the courts of common law, or in parliament, or (for treasons committed beyond the seas) in the court of the high constable and marshal. The cognizance of appeals in the latter still continues in force; and so late as 1631, there was a trial by battle awarded in the court of chivalry, on such an appeal of treason: but that in the first was *virtually* abolished by the statutes 5 Edw. III. c. 9. and 2 Edw. III. c. 24. and in the second *expressly*, by statute 1 Hen. IV. c. 14. So that the only appeals now in force for things done within the realm, are appeals of felony and mayhem.

An appeal of felony may be brought for crimes committed either against the parties themselves or their relations. The crimes against the parties themselves are *larceny*, *rape*, and *arson*. And for these, as well as for mayhem, the persons robbed, ravished, maimed, or whose houses are burnt, may institute this private process. The only crime against one's relation, for which an appeal can be brought, is that of *killing* him, by either murder or manslaughter. But this cannot be brought by every relation; but only by the wife for the death of her husband, or by the heir male for the death of his ancestor; which heirship was also confined by an ordinance of Henry I. to the four nearest degrees of blood. It is given to the wife on account of the loss of her husband; therefore, if she marries again, before or pending her appeal, it is lost and gone: or, if she marries after judgment, she shall not demand execution. The heir, as was said, must also be heir male, and such a one as was the next heir by the course of the common law at the time of the killing of the ancestor. But this rule has three exceptions: 1. If the person killed leaves an innocent wife, she only and not the heir, shall have the appeal. 2. If there be no wife, and the heir be accused of the murder, the person, who next to him would have been heir male, shall bring the appeal. 3. If the wife kills her husband, the heir may appeal her of the death. And, by the statute of Glou-

cester,

Appeal. cester, 6 Edw. I. c. 9. all appeals of death must be sued within a year and a day after the completion of the felony by the death of the party: which seems to be only declaratory of the old common law; for in the Gothic constitutions we find the same "*præscriptio annalis, quæ currit adversus actorem, si de homicida ei non constat intra annum à cæde facta, nec quenquam interca arguat et accuset.*

These appeals may be brought previous to any indictment; and, if the appellee be acquitted thereon, he cannot afterwards be indicted for the same offence. In like manner as by the old Gothic constitution, if any offender gained a verdict in his favour, when prosecuted by the party injured, he was also understood to be acquitted of any crown prosecution for the same offence; but, on the contrary, if he made his peace with the king, still he might be prosecuted at the suit of the party. And so, in England, if a man be acquitted on an indictment of murder, or found guilty, and pardoned by the king, still he ought not (in strictness) to go at large, but be imprisoned or let to bail till the year and day be past, by virtue of the statute 3 Hen. VIII. c. 1. in order to be forthcoming to answer any appeal for the same felony, not having as yet been punished for it: though, if he hath been found guilty of manslaughter on an indictment, and hath had the benefit of clergy, and suffered the judgment of the law, he cannot afterwards be appealed: for it is a maxim in law, "that *nemo bis punitur pro eodem delicto.*" Before this statute was made, it was not usual to indict a man for homicide within the time limited for appeals; which produced very great inconvenience.

If the appellee be acquitted, the appellor (by virtue of the statute of Westm. 2. 13 Edw. I. c. 12.) shall suffer one year's imprisonment, and pay a fine to the king, besides restitution of damages to the party for the imprisonment and infamy which he has sustained: and, if the appellor be incapable to make restitution, his abettors shall do it for him, and also be liable to imprisonment. This provision, as was foreseen by the author of Fleta, proved a great discouragement to appeals; so that thenceforward they ceased to be in common use.

If the appellee be found guilty, he shall suffer the same judgment, as if he had been convicted by indictment: but with this remarkable difference, that on an indictment, which is at the suit of the king, the king may pardon and remit the execution; on an appeal which is at the suit of a private subject, to make an atonement for the private wrong, the king can no more pardon it, than he can remit the damages required on an action of battery. In like manner as, while the weregild continued to be paid as a fine for homicide, it could not be remitted by the king's authority. And the ancient usage was, so late as Henry IV's time, that all the relations of the slain should drag the appellee to the place of execution: a custom, founded upon that savage spirit of family resentment which prevailed universally through Europe after the irruption of the northern nations, and is peculiarly attended to in their several codes of law; and which prevails even now among the wild and untutored inhabitants of America: as if the finger of nature had pointed it out to mankind, in their rude and uncultivated state. However, the punishment of the offender may be remitted, and discharged by the concurrence of all parties interested; and as the king by his pardon may frustrate an indictment, so the appellant by his release may discharge an appeal: "*nam quilibet potest renunciare juri pro se introducto.*" Appeal || Appellation.

APPEARANCE, in a general sense, the exterior surface of a thing, or that which immediately strikes the senses.

Appearance, in *Law*, signifies a defendant's filing a common or special bail, on any process issued out of a court of judicature.

APPELLANT, in a general sense, one who appeals. See Appeal.

Appellants, in church history, an appellation given to such of the catholic clergy as appeal from the constitution unigenitus to a general council.

APPELLATION, the name by which any thing is known or distinguished when spoken of. See Name.

Nothing can be more foreign to the original meaning of many words and proper names, than their present appellations, frequently owing to the history of those things being forgotten, or an ignorance of the language in which they were expressed. Who, for example, when the crier of a court bawls out, "O yes, O yes," would dream that it was a proclamation commanding the talkers to become hearers, being the French word *Oyez*, "listen," retained in our courts ever since the law pleadings were held in French? Or would any person suppose that the headland on the French coast, near Calais, called by our seamen Blackness, would be so titled from its French name of *Blanc Nez*, or the *White Headland*.

King Henry the Eighth having taken the town of Boulogne in France, the gates of which he brought to Hardes in Kent, where they are still remaining, the flatterers of that reign highly magnified this action, which, Porto Bello like, became a popular subject for signs; and the port or harbour of Boulogne, called *Boulogne Mouth*, was accordingly set up at a noted inn in Holborn. The name of the inn long outliving the sign and fame of the conquest, an ignorant painter, employed by a no less ignorant landlord, to paint a new one, represented it by a bull and a large gaping human mouth (answering to the vulgar pronunciation of *Bull and Mouth*). The same piece of history gave being to the *bull and gate*, originally meant for Boulogne gate, and represented by an embattled gate or entrance into a fortified town.

The *barber's pole* has been the subject of many conjectures; some conceiving it to have originated from the word *poll*, or head, with several other conceits as far-fetched and as unmeaning: but the true intention of that party-coloured staff was to show that the master of the shop practised surgery, and could breathe a vein as well as mow a beard; such a staff being to this day, by every village practitioner, put into the hand of a patient undergoing the operation of phlebotomy. The white band which encompasses the staff, was meant to represent the fillet, thus elegantly twined about it.

Nor were the *chequers*, (at this time a common sign of a public house) less expressive, being the representation of a kind of draught-board called *tables*, and showed that there that game might be played. From their colour, which was red, and the similarity to a lattice,

it

Appellation || Appetite.

it was corruptly called the *red lettuce*, which word is frequently used by ancient writers to signify an alehouse.

The Spectator has explained the sign of the *bell-savage inn* plausibly enough, in supposing it to have been originally the figure of a beautiful female found in the woods, called in French *la belle sauvage*. But another reason has since been assigned for that appellation, namely, that the inn was once the property of Lady Arabella Savage, and familiarly called *Bell Savage's Inn*, probably represented, as at present, by a bell and a savage or wild man, which was a rebus for her name; rebusses being much in fashion in the 16th century; of which the bolt and tun is an instance.

The three blue balls prefixed to the doors and windows of pawnbrokers shops, by the vulgar humorously enough said to indicate that it is two to one that the things pledged are never redeemed, was in reality the arms of a set of merchants from Lombardy, who were the first that publicly lent money on pledges. They dwelt together in a street, from them named Lombard Street, in London, and also gave their name to another at Paris. The appellation of Lombard was formerly all over Europe considered as synonymous with that of usurer.

At the institution of yeomen of the guards, they used to wait at table on all great solemnities, and were ranged near the buffets; this procured them the name of *buffetiers*, not very unlike in sound to the jocular appellation of *beef-eaters*, now given them; though probably it was rather the voluntary misnomer of some wicked wit, than an accidental corruption arising from ignorance of the French language.

The opprobrious title of *bum bayliffe*, so constantly bestowed on the sheriff's officers, is, according to Judge Blackstone, only the corruption of *bound bayliffe*, every sheriff's officer being obliged to enter into bonds and to give security for his good behaviour, previous to his appointment.

A *cordwainer* seems to have no relation to the occupation it is meant to express, which is that of a shoemaker. But *cordonier*, originally spelt *cordaunier*, is the French word for that trade; the best leather used for shoes coming originally from Cordova in Spain. Spanish-leather shoes were once famous in England.

APPELLATIVE NAMES, in *Grammar*, in contradistiction to proper names, are such as stand for universal ideas, or a whole rank of beings, whether general or special. Thus, *fish*, *bird*, *man*, *city*, *river*, are common or appellative names; and so are *trout*, *eel*, *lobster*; for they all agree to many individuals, and some to many species. See NAME.

APPELLEE, among lawyers, the person against whom an appeal is brought. See APPEAL.

APPENDIX, in literature, a treatise or supplement added at the end of a work, to render it more complete.

APPERCEPTION, or ADPERCEPTION, a term used by Leibnitz and his followers for consciousness.

APPETITE, in a general sense, the desire of enjoying some object, supposed to be conducive to our happiness. When this inclination is guided by reason, and proportioned to the intrinsic value of the object, it is called *rational appetite*; as, on the other hand, it is denominated *sensitive appetite*, when we have only a blind propensity to a thing, without determinate ideas of the good qualities for which we desire it. Appetite || Applause

Appetites are passions directed to general objects, in contradistinction to passions directed to particular objects, which retain their proper name. Thus we say, an *appetite* for fame, for glory, for conquest, for riches; but we say the *passion* of love, of gratitude, of envy, &c. Appetite may be also distinguished from passion, since the latter has no existence till a proper object be presented; whereas the former exists first, and then is directed to an object.

APPETITE, in *Medicine*, a certain painful or uneasy sensation, always accompanied with a desire to eat or drink.—An excessive appetite is called by physicians *bulimy* or *fames canina*; a defect or loss of it *anorexy*; and that after things improper for food, *pica*.

APPIA VIA, a way reaching from Rome through Capua to Brundusium, between 330 and 350 miles long. Appius Claudius, surnamed *Cæcus*, in the year of the city 441, carried it from the Porta Capena to Capua (Livy, Frontinus). It was afterwards carried on to Brundusium; but by whom, or when, is uncertain. It was laid with very hard stone, brought from a great distance, large, and squared (Diodorns); and it was so wide, that several waggons could go abreast. Statius calls it *the queen of roads*. Its course is described by Horace, Strabo, and Antonine.

APPIAN, an eminent writer of the Roman history in Greek, under the reigns of Trajan and Hadrian. He was of a good family in Alexandria in Egypt; whence he went to Rome, and there distinguished himself so well as an advocate, that he was chosen one of the procurators of the empire, and the government of a province was committed to him. He did not complete the Roman history in a continued series; but wrote distinct histories of all nations that had been conquered by the Romans, in which he placed every thing relating to those nations in the proper order of time. His style is plain and simple: in the opinion of Phocius, he has shown the greatest knowledge of military affairs, and the happiest talent at describing them, of any of the historians; for while we read him, we in a manner see the battles which he describes. Of all this voluminous work there remains only what treats of the Punic, Syrian, Parthian, Mithridatic, and Spanish wars, with those against Hannibal, the civil wars, and the wars in Illyricum, and some fragments of the Celtic or Gallic wars.

APPIUS CLAUDIUS, a Sabine by birth, one of the principal inhabitants of Regillum: His shining merit having drawn the envy of his fellow citizens upon him, he retired to Rome with all his family. Appius was admitted into the senate, and was made consul with Publius Servilius Priscus, in 258 from the building of Rome; but he was hated by the plebeians, being an austere opposer of their clamours and seditions. The Claudian family continued long one of the most illustrious of the patrician families in Rome; and several in succession of the name of Appius supported the same stern character that distinguished their first founder.

APPLAUSE, an approbation of something, signified by clapping the hands, still practised in theatres.—Applause, in antiquity, differed from ACCLAMATION, as the latter was articulate and performed with the voice, the former with the hands. Among the Romans,

mans, applause was an artificial musical kind of noise, made by the audience or spectators to express their satisfaction. There were three species of applause, denominated from the different noises made in them, viz. *Bombus*, *Imbrices*, and *Testæ*; the first a confused din, made either by the hands or the mouth; the second and third, by beating on a sort of sounding vessels placed in the theatres for this purpose. Persons were instructed to give applause with skill; and there were even masters who professed to teach the art. The proficients in this way let themselves out for hire to the vain-glorious among the poets, actors, &c. and were properly disposed to support a loud applause. These they called *Laudicæni*, and Σοφοκλεις. At the end of the play, a loud peal of applause was expected, and even asked of the audience, either by the chorus or the persons who spoke last. The formula was *Spectatores plaudite*, or *Valete et plaudite*. The plausores, or applauders, were divided into chori, and disposed in theatres opposite to each other, like the choristers in cathedrals, so that there was a kind of concert of applauses.

APPLE, the fruit of the pyrus malus. See PYRUS, BOTANY *Index*.

APPLE of the Eye, a name not unfrequently given to the pupil. See ANATOMY.

APPLES of Love. See LYCOPERSICON, BOTANY *Index*.

Mad APPLES. See MELONGENA, BOTANY *Index*.

APPLEBY, the county town of Westmoreland, where the assizes are held, is seated on the banks of the river Eden, which almost surrounds it. It was formerly a very considerable town, and had great privileges: but it is long ago gone to decay, and now only consists of mean houses in one broad street, which runs with an easy ascent from north to south; at the head of which is the castle, almost entirely surrounded by the river. It has two churches; a town-hall, in which the assizes are held; a county jail; and an hospital for a governess and twelve widows, founded in 1651 by a daughter of Lord Clifford. It is governed by a mayor, twelve aldermen, a common council, and two serjeants at mace, &c. It contained 2160 inhabitants in 1811, and sends two members to parliament. W. Long. 3. 52. N. Lat. 54. 30.

APPLICATION, in a general sense, is the laying two things together, in order to discover their agreement or disagreement.

APPLICATION, in *Geometry*, is used either for division; for applying one quantity to another, whose areas, but not figure, shall be the same; or, for transferring a given line into a circle or other figure, so that its ends shall be in the perimeter of the figure.

APPLICATION, in *Theology*, is particularly used, by some divines, for the act whereby our Saviour transfers, or makes over to us, what he had earned or purchased by his holy life and death. Accordingly it is by this application of the merits of Christ that we are to be justified and entitled to grace and glory. The sacraments are the ordinary means or instruments whereby this application is effected.

APOGGIATURA, in *Music*, a small note inserted by the practical musician, between two others, at some distance.

APPOINTEE, a foot soldier in the French army before the revolution, &c. who for long service and bravery received pay above private sentinels. They were suppressed in France, except in the regiment of French guards, where forty appointees were retained to each company of 150 men.

Till the year 1670, they had also captains and lieutenants under the appellation of *appointees*, who, without residing in the regiment, received their pay.

APPOINTEE, in *Heraldry*, the same as *aguiseé*: Thus we say, a cross appointée, to signify that with two angles at the end cut off, so as to terminate in points.

APPOINTMENT, in a general sense, the same as ASSIGNATION.

APPOINTMENT, in a particular sense, denotes a pension or salary given by great lords and princes to persons of worth and parts, in order to retain them in their service. The term is chiefly used among the French. The king of France gave large appointments to several of the officers in his service. Appointments differ from wages, in that the latter are fixed and ordinary, being paid by the ordinary treasurers; whereas appointments are annual gratifications granted by *brevet* for a time uncertain, and are paid out of the privy purse.

APPOSER signifies an examiner. In the court of exchequer there is an officer called the *foreign apposer*. In the office of confirmation, in the first liturgy of Edward VI. the rubric directs the bishop, or such as he shall appoint, to appose a child; and a bishop's examining chaplain was anciently called his *poser*.

APPOSITION, in *Grammar*, the placing two or more substantives together, in the same case, without any copulative conjunction between them; as *Ardebat Alexim, delicias domini*.

APPRAISER (from *ad*, "to," and *pretium*, "value"), one who rates or sets a value upon goods, &c. He must be a skilful and honest person. It is not a business of itself, but is practised by brokers of household furniture; to which set of men the word is chiefly applied: Yet upholsterers and other brokers are employed, or even any person or persons who are supposed to be skilled in the commodities to be appraised or valued. They are employed in cases of death, executions brought in upon goods, or of stock to be turned over from one person to another, or divided between copartners; and are called *sworn appraisers*, from their taking an oath to do justice between party and party. They sometimes appraise on behalf of both sides, each party agreeing to have the same appraiser or appraisers; sometimes in opposition, each party choosing one or more of a side; and sometimes by commission or deputation of trustees, masters in chancery, &c.

APPRAISING, the act of rating, valuing or setting a price on goods, by a person who is a competent judge, and is authorized thereto. See APPRAISER.

APPREHENSION, in *Logic*, denotes the simple attention of the mind to an object presented either to our sense or our imagination, without passing a judgement or making any inference.

APPREHENSION, is likewise used to express an inadequate and imperfect idea; and thus it is applied to our knowledge of God, in contradistinction to comprehension.

APPREHENSION, in *Law*, signifies the seizing a criminal, in order to bring him to justice.

APPRENTICE,

Apprentice, Apprentice-ship.

APPRENTICE, (from *apprendre*, "to learn,") one who is bound by covenant to serve a tradesman or artificer a certain time, upon condition of the master's instructing him in his art or mystery.

Apprentices may likewise be bound to husbandmen, or even to gentlemen; and they, as well as tradesmen in England, are compellable to take the children of the poor, whom the overseers, with the consent of two justices, may bind till the age of 24 years. Apprentices may be discharged on reasonable cause; but if any, whose premium has been less than ten pounds, run away from their masters, they are compellable to serve out the time of absence, or give satisfaction for it, at any period within seven years after expiration of the original contract. Apprentices gain a settlement in that parish where they last served 40 days; and by the 5th of Elizabeth, c. 4. they have an exclusive right to exercise the trade in which they have been instructed, in any part of England. However, the resolutions of the courts have in general rather confined than extended the restriction of this statute. See Blackstone's Com. vol. i. p. 426, &c.

In France, the sons of tradesmen, living in their father's house till seventeen years of age, are reputed to have served an apprenticeship. In that country, the times of serving are different in the different professions, from three years to eight. After serving out an apprenticeship, the person becomes what they call an *aspirant*, or candidate for mastership, and is to be examined by proper officers as to his skill and proficiency, and also to exhibit a *chef d'œuvre* or masterpiece in the art he has been bred to, before he be suffered to set up to practise for himself.

Anciently, benchers in the inns of court were called *apprentices of the law*, in Latin *apprenticii juris nobiliores;* as appears by Mr Selden's note on Fortescue: and so the learned Plowden styles himself. Sir Henry Finch, in his *Nomotechnia*, writes himself, *apprentice de ley:* Sir Edward Coke in his *Inst.* says *Apprenticii legis*, in pleading, are called *homines consiliarii et in lege periti;* and in another place, *apprentices* and other counsellors of law.

Apprentices indentures and articles of clerkship, pay of duty 6s. Parish indentures are excepted, and pay 6d. only, by 5 William III. c. 21. For fees given with apprentices, clerks, or servants, bound or articled by indentures, from 1l. to 50l. masters pay for every pound 6d.; and for fees above 50l. one shilling in the pound. 8 Ann. c. 9.

For an account of the more recent statutes and regulations on this subject, see APPRENTICE, SUPPLEMENT.

APPRENTICESHIP, the servitude of an apprentice, or the duration of his indenture.

Seven years seem anciently to have been, all over Europe, the usual term established for the duration of apprenticeships in the greater part of incorporated trades. All such incorporations were anciently called *universities*, which indeed is the proper Latin name for any incorporation whatever. The university of smiths, the university of taylors, &c. are expressions which we commonly meet with in the old charters of ancient towns. When those particular incorporations which are now peculiarly called *universities* were first established, the term of years which it was necessary to study, in order to obtain the degree of master of arts, appears evidently to have been copied from the term of apprenticeship in common trades, of which the incorporations were much more ancient. As to have wrought seven years under a master properly qualified was necessary in order to entitle any person to become a master, and to have himself apprentices in a common trade; so to have studied seven years under a master properly qualified was necessary to entitle him to become a master, teacher or doctor (words anciently synonymous), in the liberal arts, and to have scholars or apprentices (words likewise orginally synonymous) to study under him.

Apprenti ship.

By the 5th of Elizabeth, commonly called the *statute of apprenticeship*, it was enacted, that no person should for the future exercise any trade, craft, or mystery at that time exercised in England, unless he had previously served to it an apprenticeship of seven years at least; and what before had been the bye-law of many particular corporations, became in England the general and public law of all trades carried on in market towns. For though the words of the statute are very general, and seem plainly to include the whole kingdom, by interpretation its operation has been limited to market towns; it having been held, that in country villages a person may exercise several different trades, though he has not served a seven years apprenticeship to each, they being necessary for the conveniency of the inhabitants, and the number of people frequently not being sufficient to supply each with a particular set of hands.

By a strict interpretation of the words, too, the operation of this statute has been limited to those trades which were established in England before the 5th of Elizabeth, and has never been extended to such as have been introduced since that time. This limitation has given occasion to several distinctions which, considered as rules of police, appear as foolish as can well be imagined. It has been adjudged, for example, that a coachmaker can neither himself make, nor employ journeymen to make his coach wheels, but must buy them of a master wheelwright, this latter trade having been exercised in England before the 5th of Elizabeth. But a wheelwright, though he has never served an apprenticeship to a coachmaker, may either himself make, or employ a journeyman to make, coaches; the trade of a coachmaker not being within the statute, because not exercised in England at the time when it was made. The manufacturers of Manchester, Birmingham, and Wolverhampton, are many of them upon this account not within this statute; not having been exercised in England before the 5th of Elizabeth.

In France the duration of apprenticeships is different in different towns and in different trades. In Paris, five years is the term required in a great number; but before any person can be qualified to exercise the trade as a master, he must, in many of them, serve five years more as a journeyman. During this latter term he is called the *companion* of his master, and the term itself is called his *companionship*.

In Scotland there is no general law which regulates universally the duration of apprenticeships. The term is different in different corporations. Where it is long, a part of it may generally be redeemed by paying a small fine. In most towns, too, a very small fine is sufficient to purchase the freedom of any corporation.

The

Apprenticeships, Apprising.

The weavers of linen and hempen cloth, the principal manufactures of the country, as well as all other artificers subservient to them, wheelmakers, reedmakers, &c. may exercise their trades in any town corporate without paying any fine. In all towns corporate, all persons are free to sell butcher's meat upon any lawful day of the week. Three years is in Scotland a common term of apprenticeship, even in some very nice trades: and in general there is no country in Europe in which corporation laws are so little oppressive.

Apprenticeships were altogether unknown to the ancients. The reciprocal duties of master and apprentice make a considerable article in every modern code. The Roman law is perfectly silent with regard to them. There is no Greek or Latin word which expresses the idea we now annex to the word apprentice; a servant bound to work at a particular trade for the benefit of a master during a term of years, upon condition that the master shall teach him that trade.

Wealth of Nations, vol. i. p. 190.

Long apprenticeships Dr Smith considers as altogether unnecessary. The arts which are much superior to common trades, such as those of making clocks and watches, contain no such mystery as to require a long course of instruction. The first invention of such beautiful machines, indeed, and even that of some of the instruments employed in making them, must, no doubt, have been the work of deep thought and long time, and may justly be considered as among the happiest efforts of human ingenuity: but when both have been fairly invented and are well understood; to explain to any young man, in the completest manner, how to apply the instruments, and how to construct the machines, cannot well require more than the lessons of a few weeks; perhaps those of a few days might be sufficient. In the common mechanic trades, those of a few days might certainly be sufficient. The dexterity of hand, indeed, even in common trades, cannot be acquired without much practice and experience. But a young man would practise with much more diligence and attention, if from the beginning he wrought as a journeyman, being paid in proportion to the little work which he could execute, and paying in his turn for the materials which he might sometimes spoil through awkwardness and inexperience. His education in this way generally would be more effectual, and always less tedious and expensive. The master, indeed, would be a loser; he would lose all the wages of the apprentice, which he now saves, for seven years together. In the end, perhaps, the apprentice himself would be a loser. In a trade so easily learnt he would have more competitors; and his wages when he came to be a complete workman, would be much less than at present. The same increase of competition would reduce the profits of the masters as well as the wages of the workmen. The trades, the crafts, the mysteries, would be all losers: but the public would be a gainer: the work of all artificers coming in this way much cheaper to market.

APPRISING, in *Scots Law*, the name of that action by which a creditor formerly carried off the estate of his debtor for payment. It is now abolished, and adjudications are appointed in place of it. Adjudications, charter, resignation, *clarè constat*, cognition of heirs, heritable right, confirmation, novodamus, principal and original instrument of surrender, retour, seisin, and service in Scotland, pay by different acts 4s. 9d. duty.

Apprising ‖ Appropriation.

APPROACH, or APPROACHING, in a general sense, the acceding or coming together of two or more things.

APPROACHES, in *Fortification*, the works thrown up by the besiegers, in order to get nearer a fortress, without being exposed to the enemy's cannon.

APPROACHING, in fowling, a term used to express such devices as are contrived for the getting within shot of shy birds. It is principally used in marshy low places. The best method of approaching is by means of three hoops tied together at proper distances according to the height of the man that is to use it, and having boughs of trees tied all round it, with cords to hang it over his shoulders: a man getting into this, conceals himself, and approaches by degrees towards his game in the form of a moving bush. Geese, ducks, and teal, quit the waters in the evening, and pass the night in the fields; but at the approach of morning they return to the water again, and even when on the water they will retire to great distances, on the approach even of a horse or cow, so that the business of the stalking horse is of little use; but this device of approaching by the moving bush succeeds tolerably well with them.

APPROACHING, in *Gardening*, the inoculating or ingrafting the sprig of one tree into another, without cutting it off the parent tree.

APPROBATION, a state or disposition of the mind, wherein we put a value upon, or become pleased with, some person or thing. Moralists are divided on the principle of approbation, or the motive which determines us to approve and disapprove. The Epicureans will have it to be only self-interest: according to them, that which determines any agent to approve his own action, is its apparent tendency to his private happiness; and even the approbation of another's action flows from no other cause but an opinion of its tendency to the happiness of the approver, either immediately or remotely. Others resolve approbation into a moral sense, or a principle of benevolence, by which we are determined to approve every kind affection either in ourselves or others, and all publicly useful actions, which we imagine to flow from such affection, without any view therein to our own private happiness.

APPROBATION, is more particularly used, in speaking of recommendations of books, given by persons qualified or authorized to judge of them. Those appointed to grant licenses and imprimaturs, frequently express their approbation of books. Books were formerly subjected to a licenser in England, (see 13th Car. II. c. 33.), which act is long since expired; and being incompatible with the noble principles of the Revolution, has never since been, and it is hoped never will be, revived.

APPROPRIATION, in the canon law, a severing of a benefice ecclesiastical to the proper and perpetual use of some religious house. See the article PARSON.

The contrivance of appropriations seems to have sprung from the policy of the monastic orders, who have never been deficient in subtle inventions for the increase of their own power and emoluments. At the first establishment of parochial clergy, the tithes

Appropriation.

of the parish were distributed in a fourfold division; one for the use of the bishop, another for maintaining the fabric of the church, a third for the poor, and the fourth to provide for the incumbent. When the sees of the bishops became otherwise amply endowed, they were prohibited from demanding their usual share of these tithes, and the division was into three parts only. And hence it was inferred by the monasteries, that a small part was sufficient for the officiating priest; and that the remainder might well be applied to the use of their own fraternities (the endowment of which was construed to be a work of the most exalted piety), subject to the burden of repairing the church and providing for its constant supply. And therefore they begged and bought, for masses and obits, and sometimes even for money, all the advowsons within their reach, and then appropriated the benefices to the use of their own corporation. But, in order to complete such appropriation effectually, the king's license, and consent of the bishop, must first be obtained; because both the king and the bishop, may some time or other have an interest, by lapse, in the presentation to the benefice; which can never happen if it be appropriated to the use of a corporation, which never dies: and also because the law reposes a confidence in them, that they will not consent to any thing that shall be to the prejudice of the church. The consent of the patron also is necessarily implied, because the appropriation can be originally made to none but to such spiritual corporation as is also the patron of the church; the whole being indeed nothing else but an allowance for the patrons to retain the tithes and glebe in their own hands, without presenting any clerk, they themselves undertaking to provide for the service of the church. When the appropriation is thus made, the appropriators and their successors are perpetual parsons of the church; and must sue and be sued, in all matters concerning the rights of the church by the name of *parsons*.

This appropriation may be severed, and the church become disappropriate, two ways; as, first, If the patron or appropriator presents a clerk, who is instituted and inducted to the parsonage: for the incumbent so instituted and inducted is to all intents and purposes complete parson; and the appropriation being once severed, can never be reunited again, unless by a repetition of the same solemnities. And, when the clerk so presented is distinct from the vicar, the rectory thus vested in him becomes what is called a *sinecure*; because he hath no cure of souls, having a vicar under him to whom that cure is committed. Also, if the corporation which has the appropriation is dissolved, the parsonage becomes disappropriate at common law; because the perpetuity of person is gone, which is necessary to support the appropriation.

In this manner, and subject to these conditions, may appropriations be made at this day: and thus were most, if not all of the appropriations at present existing originally made; being annexed to bishoprics, prebends, religious houses, nay, even to nunneries, and certain military orders, all of which were spiritual corporations. At the dissolution of monasteries, by statutes 27 Hen. VIII. c. 28. and 31 Hen. VIII. c. 13. the appropriation of several parsonages, which belonged to those respective religious houses (amounting to more than one third of all the parishes in England), would have been by the rules of the common law disappropriated; had not a clause in those statutes intervened, to give them to the king in as ample a manner as the abbots, &c. formerly held the same at the time of their dissolution. This, though perhaps scarcely defensible, was not without example: for the same was done in former reigns, when the alien priories (that is, such as were filled by foreigners only) were dissolved and given to the crown. And from these two roots have sprung all the lay appropriations or secular parsonages which we now see in the kingdom; they having been afterwards granted out from time to time by the crown. See the artiele *Parson and Vicar*.

Approver || Appulse.

APPROVER, in *Law*, one who, professing felony in himself, appealeth or impeacheth another or more of his accomplices. He is so called from the French *approuver*, *comprobare*, because he must prove what he hath alleged in his appeal. This proof was anciently either by battle, or by the country, at the choice of the appellee; and the form of this accusation may be found in Crompt. Just. 250.

Approvers of the king, are those who have the letting of the king's demesnes in small manors, &c. In the statute of the 1st of Ed. III. c. 8. sheriffs are called the king's *approvers*.

It being in the discretion of the court to suffer one to be an approver, this method of late hath seldom been practised. But we have, in cases of burglary and robbery on the high way, what seems to amount to the same by statute; it being ordained, that where persons charged with such crimes out of prison, discover two others concerned in the crime, they shall have a pardon, &c. Stat. 5th Anne, c. 31.

Approver is particularly used, in ancient law writers, for a bailiff or land steward, appointed to have the care of a manor, franchise, or the like, and improve and make the most of it for the benefit of his master. In this sense, the word is also written *appruare*.

APPROXIMATION, in *Arithmetic* and *Algebra*, the coming nearer and nearer to a root, or other quantity sought, without expecting to be ever able to find it exactly.

APPUI, in the manege, (q. d. rest to stay upon the hand), is the reciprocal effort between the horse's mouth and the bridle-hand, or the sense of the action of the bridle on the hand of the horseman.

A just appui of the hand, is the nice bearing up or stay of the bridle, so that the horse, being awed by the sensibility and tenderness of his mouth, dares not rest too much upon the bitmouth, nor check or beat upon the hand to withstand it. A horse is said to have no appui, when he is too apprehensive of the hand, and cannot bear the bit. He is said to have too much appui, when he rests or throws himself too much upon the bit. Horses designed for the army ought to have a full appui upon the hand. To give a horse a good appui, he should be galloped, and put often back.

APPULSE, in *Astronomy*, the approach of any planet, to a conjunction with the sun, or a star. It is a step towards a transit, occultation, conjunction, eclipse, &c. Mr Flamsted, M. de la Hire, and others, have given observations of the moon's appulses to the Pleiades. *Phil. Trans.* N° 76. p. 361. *M. Acad. Science, an.* 1708.

APRICOT,

Apricot || Apta.

APRICOT, in *Botany*. See PRUNUS.

APRIES, son of Psammis, king of Egypt; the same with Pharaoh Hophrah in Jeremiah and Ezekiel. He ruined Sidon, and some say he put Jeremiah to death. He thought neither God nor man could dethrone him; which yet was easily done by Amasis, and he himself was strangled by the Egyptians.

APRIL, the fourth month of the year, according to the common computation; but the second, according to that of the astronomers. It contains 30 days.—The word is derived from *aprilis*, of *aperio*, "I open;" because the earth, in this month, begins to open her bosom for the production of vegetables. In this month the sun travels through the sign of Taurus.

A PRIORI, a kind of demonstration. See DEMONSTRATION.

APRON, in *Naval Architecture*, is a piece of curved timber fixed behind the lower part of the stern, immediately above the foremost end of the keel.

APRON is also a name given to a platform or flooring of plank, raised at the entrance of a dock, against which the dock gates are shut.

APRON, in *Gunnery*, a piece of lead which caps or covers the vent or touch-hole of a great gun.

APSIS, or ABSIS, signifies the bowed or arched roof of a house, room, or oven, &c. as also the ring or compass of a wheel.

APSIS, in ecclesiastical writers, denotes an inner part in the ancient churches, wherein the clergy sat, and where the altar was placed. It is supposed to have been thus called, because covered with an arch or vault of its own, by the Greeks called αψις, by the Latins *absis*. Apsis, in this sense, amounts to the same with what is otherwise called *choir*, *concha*, *camera*, and *presbyterium*; and stands opposed to the *nave* or body of the church.

APSIS is more particularly used for the bishop's seat, or throne, in ancient churches. This was peculiarly called *apsis gradata*, because raised on steps above the ordinary stalls. It was also denominated *exedra*, and in latter times *tribune*.

ASPIS is also used for a reliquary, or case, wherein the relicks of saints were anciently kept. It took the name *apsis*, from its being round or arched at the top; or perhaps from the place where it was kept. The *apsis* was commonly placed on the altar: it was usually of wood, sometimes also of gold and silver, with sculptures, &c.

APSIS, in *Astronomy*, a term used indifferently for either of the two points of a planet's orbit, where it is at greatest or least distance from the sun or earth; and hence the line connecting those points is called the line of the *apsides*. The word is Greek, and derived from απτω, *to connect*. The apsis, at the greatest distance from the sun, is called the *aphelion*, and at the greatest distance from the earth the *apogee*; while that at the least distance from the sun is termed the *perihelion*, and at the least distance from the earth the *perigee*.

APSIRTIDES. See ABSORUS.

APTA, or APTA JULIA, (Pliny); now *Apte*, in Provence, on the river Calavon, seven leagues to the north of Aix, and nine to the north of Avignon. In the Notitiæ it is called *Civitas Aptensium*: Pliny reckons it among the Latin towns. That it was a colony, appears from an inscription on a stone found at Arles, (Sirmond). E. Long. 5. 56. N. Lat. 43. 23.

Apta || Apuleius.

APTERA, (Strabo, Stephanus); APTYRON, (Pliny); APTERIA, (Ptolemy): An inland town of Crete, whose port was Cisamus, on the west side of the island, (Strabo); 12 miles to the south of Cydonia towards the Montes Leuci, and as many from the Sinus Amphimales. So called from the Sirens, who, being there vanquished in song by the Muses, stript themselves of their wings, and out of grief leaped into the sea, (Stephanus). There was a town of Lycia of the same name. E. Long. 25. N. Lat. 35. 50.

APTERA, a term used by Linnæus for his seventh order of insects, comprehending such as have no wings.

APTHANE, a title anciently given to the higher degrees of nobility in Scotland. See THANE.

APTITUDE, (from *aptus*, "fit"), the natural disposition any thing hath to serve for such or such a purpose.—Thus, oil hath an *aptitude* to burn, and water to extinguish fire.

APTITUDE, or APTNESS, is often used, in speaking of the talents of the mind, for a promptitude, or disposition to learn things with ease and expedition: in which sense *aptness* amounts to the same with what the Greeks call ευμαθια, *bona indoles*, and we sometimes *docility*. Charlton divides *aptness* into three parts, viz. *acuteness*, *sagacity*, and *memory*.

APTOTE, among grammarians, an indeclinable noun, or one which has no variation of cases.

APULEIUS, LUCIUS, a Platonic philosopher, universally known by his performance of the Golden Ass. He lived in the second century, under the Antonines; and was born at Madura, a Roman colony in Africa. He studied first at Carthage, then at Athens, and afterwards at Rome, where he learned the Latin tongue without the help of a master. He was a man of a curious and inquisitive disposition, especially in religious matters: this prompted him to take several journeys, and to enter into several societies of religion. He spent his whole fortune almost in travelling; so that, at his return to Rome, when he was about to dedicate himself to the service of Osiris, he had not money enough to defray the expence attending the ceremonies of the reception, and was obliged to pawn his clothes to raise the necessary sum. He supported himself afterwards by pleading causes: and as he was a great master of eloquence, and of a subtle genius, many considerable causes were trusted to him. But he availed himself more by a good marriage than by his pleadings; a widow, named *Pudentilla*, who was neither young nor handsome, but wanted a husband and was very rich, took a great fancy to him. This marriage drew upon him a troublesome law suit. The lady's relations, pretending he made use of sorcery to gain her heart and money, accused him of being a magician before Claudius Maximus proconsul of Africa. Apuleius was under no great difficulty of making his defence. As Pudentilla was determined, from considerations of health, to enter upon a second marriage, even before she had seen this pretended magician, the youth, deportment, pleasing conversation, vivacity, and other agreeable qualities of Apuleius, were charms sufficient to engage her heart. He had the most favourable opportunities too of gaining her friendship, for he lodged some time at her house: Pudentilla's eldest son

Apuleius ‖ Apus.

having a great friendship for him, was likewise desirous of the match, and solicited him in favour of Pudentilla. "Do you make a wonder said Apuleius, in his defence) that a woman should marry again, after having lived a widow 13 years? It is much more wonderful that she did not marry again sooner. You think that magic must have been employed to prevail with a widow of her age to marry a young man; on the contrary, this very circumstance shows how little occasion there was for magic." He offered to prove by his marriage-contract, that he got nothing of Pudentilla but a promise of a very moderate sum, in case he survived her and had children by her. He was also obliged to make such confessions in court as Pudentilla would gladly have excused He said she was neither handsome nor young, nor such as could any ways tempt him to have recourse to enchantments: moreover, he added, that Pontianus her son proposed the marrying his mother to him only as a burden, and the action of a friend and philosopher. He also took notice of many inconveniences which attend the marrying of widows, and spoke highly of the advantages of a maid above a widow: "A handsome virgin (said he), let her be ever so poor, is abundantly portioned; she brings to her husband a heart quite new, together with the flower and first fruits of her beauty. It is with great reason that all husbands set so great a value upon the flower of virginity: all the other goods which a woman brings her husband are of such a nature, that he may return them again, if he has a mind to be under no obligation to her: that alone cannot be restored, it remains in the possession of the first husband. If you marry a widow, and she leaves you, she carries away all that she brought you." Upon which passage Mr Bayle makes a very coarse remark, viz. "That this good which is never taken back out of the hands of a husband, is very chimerical; and that there is never a baker nor a butcher, who would lend sixpence upon this unperishable possession." The apology is still extant, and is reckoned a very fine piece. Apuleius was extremely indefatigable in his studies: and composed several books, some in verse, and others in prose; but most of them have been lost. He took great pleasure in declaiming, and was heard generally with great applause: When he declaimed at Oeea, the audience cried out with one voice, that they ought to confer upon him the honour of citizen. The citizens of Carthage heard him with great satisfaction, and erected a statue to him; and several other cities did him the same honour. Several critics have published notes on Apuleins's Golden Ass, and there have been translations of it into different languages.

APULIA, now PUGLIA, a territory of Italy, bordering on the Adriatic, and extending from the river Frento to Tarentum in length, and from the Adriatic to the Lucani in breadth. *Apuli* the people (Horace); divided into the *Apulia Daunia*, now called *Puglia Pinna* or the *Capitanata*; and into the *Apulia Peucetia*, now *Terra di Bari*, (Pliny, Ptolemy). Apulia abounded in sheep, which yielded the finest wool (Martial). It is now the east side of the kingdom of Naples.

APUS, *Avis Indica*, in *Astronomy*, a constellation of the southern hemisphere placed near the pole, between the triangulum australe and the chameleon, supposed to represent the bird of paradise.

APYCNI SUONI, in *Music*, sounds distant one or more octaves, and yet concord.

Apycni ‖ Aqua Vitæ.

APYCNOS, in *Music*, is said of the diatonic genus, on account of its having spacious intervals, in comparison of the chromatic and enharmonic.

APYREXY, among physicians, denotes the intermission of a fever.

APYROUS, a word applied to denote that property of some bodies, by which they resist the most violent fire without any sensible alteration. Apyrous bodies ought to be distinguished from those which are refractory. Refractory substances are those which cannot by violent heat be fused, whatever other alteration they may sustain. But a body, properly speaking, apyrous, can neither be fused by heat, nor can undergo any other change. Diamonds were long thought to be possessed of this property. But some late experiments have shown, that diamonds may be entirely dissipated or evaporated by heat, and are therefore not entitled to be ranked among apyrous substances. Perhaps there is no body in nature essentially and rigorously apyrous. But it is sufficient that there be bodies apyrous relatively to the degree of fire which art can produce, to entitle them to that name.

AQUA, a term frequently met with in the writings of physicians, chemists, &c. for certain medicines, or menstruums, in a liquid form, distinguished from each other by peculiar epithets, as *Aqua Alexiteria*, *Aqua Aluminosa*, *Aqua Mirabilis*, *&c.* for which see PHARMACY.

Aqua Extincta, or *Extinguished Water*, is aquafortis into which some river water has been poured, in order to qualify it, and render it less corrosive. Its use is to get the silver from the aquafortis that served to part gold from it.

Aqua Fortis, a name given by artists to nitric acid of a certain strength, from its dissolving power. See CHEMISTRY *Index*.

Aqua Marina, a name by which the jewellers call the beryl, on account of its sea-green colour. See BERYL.

Aqua Regia, a compound of nitric and muriatic acid, in different proportions according to the purpose for which it is intended. It is usually made by dissolving in nitric acid, sal ammoniac, or common salt, both which are combinations of muriatic acid with alkali. When made with sal ammoniac, the common proportion is one part of this salt to four parts of nitric acid; but to dissolve platina, equal parts are requisite. A purer aqua regia may be made by simply mixing the two acids. It is particularly used as a menstruum for gold; it likewise dissolves all other metals, except silver. The gold dissolved in aqua regia is, in fact, dissolved in the oxygenated muriatic acid only, which gives out its oxygen to the gold, and then dissolves the oxide: for metals are not soluble in acids until they are oxidated. See CHEMISTRY *Index*.

Aqua Secunda, aquafortis diluted with much pure water. It is employed in several arts, to clear the surface of metals and certain stones.

Aqua Tofana, a poison much used in Italy in the seventeenth century. See SUPPLEMENT.

Aqua Vitæ, is commonly understood of what is otherwise called *brandy*, or spirit of wine either simple, or prepared with aromatics. Some, however, distinguish

Aqua Vitæ ‖ Aquæ Pannoniæ.

distinguish between them; appropriating the term *brandy* to what is drawn from wine, or the grape; and *aqua vitæ* to that drawn after the same manner from malt, &c.

Aquæ Augustæ (Ptolemy); *Aquæ Tarbellicæ* (Antonine); *Aquensis Civitas*, in the Notitia. Now *Acqs*, or *Dax*, a town in Gascony, on the river Adour, famous for its baths. W. Long. 1. 40. N. Lat. 43. 56.

Aquæ Bilbilitanæ, (Antonine): baths 24 miles to the west of Bilbilis. Now *Banos de Alhama*, in Aragon.

Aquæ Calidæ, (Ptolemy); *Aquæ Solis*, (Antonine); a place of the Belgæ in Britain, famous for its hot waters. Now Bath in Somersetshire. W. Long. 1. 5. Lat. 51. 20.

Aquæ Calidæ, (Ptolemy); *Aquicaldensis*, (Pliny); formerly in great repute, and a public bath; whose ruins still remain, testimonies of the Roman grandeur. Now *Orense*, in Galicia, still famous for its baths; on the river Minho, 54 miles south-east of Compostella. W. Long. 8. 30. N. Lat. 42. 30. Also a place in the bay of Carthage, (Strabo). Other *Aquicaldenses*, to the north of Gerunda in Catalonia, (Ptolemy).

Aquæ Calidæ, a colony between the rivers Serbetes and Savus, in Mauritania Cæsariensis (Ptolemy).

Aquæ Celeinæ, (Ptolemy); or *Cilinæ*, (Antonine). Now *Caldas*, a hamlet on the Minho, in Galicia.

Aquæ Convenarum, a hamlet of Gaul, in Aquitaine, (Antonine), and on the borders of the Convenæ, or le Cominge, at the foot of the Pyrenees, near the source of the Garonne. Now Bagneres. W. Long. 3. 39. N. Lat. 42. 20.

Aquæ Cutiliæ, a lake of the Sabines, in the territory of Reat (Pliny); *Lacus Cutiliensis*, (Varro); with a moveable island in it, (Seneca, Pliny); supposed to be the centre of Italy, (Varro). The waters were medicinal, and extremely cold, good for a weak stomach and in weak nerves; they seemed to act by a kind of suction, which approached to a bite, (Pliny). Vespasian used them every summer; and there he died, (Sueton. Xiphilin from Dio). Now *Lago di Contigliano*.

Aquæ Flaviæ, a town on the confines of Galicia and Portugal, so called from Vespasian and Titus. The inhabitants are called *Aquiflavienses* on coins. Now called *Chiaves*, a mean hamlet; but the ruins of its bridge testify its former grandeur. W. Long. 6. 6. N. Lat. 41. 40.

Aquæ Helvetiæ, described by Tacitus as a municipal town, and much frequented for its excellent water; and though he does not mention its name, Cluverius supposes it to be Baden, in Switzerland, on the rivulet Limat, which soon after falls into the Aar. It is called the Upper, to distinguish it from another called the Lower Badén, in Alsace. E. Long. 8. 49. N. Lat. 47. 55.

Aquæ Merom (Joshua), famous for the defeat of Jabin: supposed to be the lake called *Samachonites*, or *Semechonites*, by Josephus; into which the river Jordan falls, before it comes to the sea of Genesereth, or Galilee.

Aquæ Pannoniæ, famous baths of Austria, now called *Baden*, 28 miles to the south of Vienna.

Aquæ Patavinæ, are baths in the territory of Venice near Padua, (Pliny); called *Fontes Aponi* (Livy, Martial). Now *Bagni d'Abano*. E. Long. 13. 48. N. Lat. 45. 15.

Aquæ Patavinæ ‖ Aquæduct.

Aquæ Quintianæ, put by Ptolemy in room of the *Aquæ Cilinæ* of Antonine. Now supposed to be *Sarria*, a town of Galicia, on a rivulet of the same name, three leagues to the south of Lugo.

Aquæ Sextiæ, a colony to the north of Marseilles, so called both from the founder Sextius Clavinus, and from its quantity of water, and number of cold and hot springs; built after the defeat of the Salyes, or Salvii, whose territory in the south of Provence, reached from the Rhone on the borders of Italy, (Livy, Velleius, Strabo, Ptolemy). By an inscription the colony appears to have been either increased or renewed by Augustus. In the Notitia it is called *Civitas Aquensis*. Now *Aix*. Here the Teutones and Cimbri were defeated with great slaughter by Marius. E. Long. 6. 4. N. Lat. 48. 4.

Aquæ Statiellæ, or *Statiellorum*, (Pliny), a town in Liguria, on the river Bormia. Now *Acqui*, a town of Montferrat. E. Long. 8. 40. N. Lat. 44. 45.

Aquæ Tauri, hot waters or baths in Tuscany, at the distance of three miles from the sea, said to be discovered by a bull, hence the appellation. There are still to be seen the ruins of these baths. Now *Aquapendente*, in Orvieto. E. Long. 12. 40. N. Lat. 42. 20.

AQUÆDUCT, in *Hydraulics* and *Architecture*, a structure formed for conveying water from one place to another, over grounds that are unequal. The word is compounded of the Latin substantive *aqua*, water, and *ductus*, a channel by which that water may be conducted.

Architects distinguish two kinds of aquæducts; the *visible*, and the *subterraneous*.—The *visible* are constructed in valleys or marshes, and protracted in longitude or latitude as the situation requires. They are composed of adminicula for supporting the arches and confining the stream, and of arcades.—The *subterraneous* are formed, by piercing the mountains, and conducting them below the surface of the earth. They are built of stone hewn or rough: and covered above with vaults, or with flat stones, which may be termed *flags*; these flags shelter the waters from the heat of the sun.

They divide them still into *double* and *triple* aquæducts; that is to say, such as are supported either by two or by three ranges of arcades. Such was the aquæduct which Procopius records to have been built by Cosroes king of the Persians, for the city of Petra in Mingrelia: it had three conduits upon the same line, each elevated above the other.

Frequently aquæducts are paved. Sometimes the waters flow through a natural channel of clay. Frequently they are conveyed by pipes of lead into reservoirs of the same metal, or into troughs of hewn stone. The channels are cut with an imperceptible descent, that the current may be accelerated by its own weight. Parallel to its course, on each side, is cut a narrow footpath, where people may walk when necessary. By conduits, or grooves, the waters are conveyed into large cisterns, but not forced above their original level. To make them rise and issue from their apertures

Aquæduct. apertures with force, they must be confined in tubes of a small diameter, and abruptly fall from a considerable declivity.

Aquæducts of every kind were long ago the wonders of Rome: the vast quantities of them which they had; the prodigious expence employed in conducting waters over arcades from one place to another, at the distance of 30, 40, 60, and even 100 miles, which were either continued or supplied by other labours, as by cutting mountains and piercing rocks; all this ought to surprise us: nothing like this is undertaken in our times: we dare not even think of purchasing public conveniency at so dear a rate. Appius the censor advised and constructed the first aquæduct. His example gave the public luxury a hint to cultivate these objects; and the force of prodigious and indefatigable labour diverted the course of rivers and floods to Rome. Agrippa, in that year when he was ædile, put the last hand to the magnificence of these works. It is chiefly in this respect that the modern so much resembles the ancient city of Rome. For this advantage, she is peculiarly indebted to Sextus V. and to Paul V. who for grandeur and magnificence emulated the masters of the universe *. There are still to be seen, in different places contiguous to Rome, striking remains of these aquæducts; arches continued through a long space, over which were extended the canals which carried the water to the city. The arches are sometimes low, sometimes raised to a vast height, to humour the tumidities or depressions of the ground. There are some which have two arcades; one constructed above the other; and this precaution was observed, lest the height of a single arcade, if extended as far as the situation required, might render the structure less firm and permanent. They are commonly of bricks: which by their cement cohere so strongly, that the parts are not separated without the utmost difficulty.—When the elevations of the ground were enormous, it became necessary to form *subterraneous* aquæducts. These carried the waters to to such aquæducts as were raised above ground, in the declivity or at the foot of mountains. If the artificial channel of the water was not susceptible of a downward bias but by passing through a rock, through this they cut a passage at the same height with the superior aqueduct: such a one may be seen above the city of Tivoli, and at the place called *Vivacaro*. The canal which formed the course of the aquæduct is hewn out of the rock to the extent of more than a mile, about five feet in height and four in breadth.

* See *New Memoirs of Italy*, vol. i.

There is one thing, however, which deserves to be remarked. It is, that these aquæducts, which might have been directed in a straight line to the city, did not arrive at it but by frequent and winding mazes. Some have said that this oblique track was pursued to avoid the expence which must attend the building of arcades to an extraordinary height: others, that it was their intention to diminish the impetuosity of the current; which, rolling in a straight line through an immense space, must always have increased its velocity, must have worn the canals by perpetual and forcible attrition, and of consequence afforded an impure and unwholesome draught to the inhabitants. But since there was so great a descent between the cascade of Tivoli and Rome, it is demanded why they should go to draw water from the same river at the distance of more than 20 miles higher; nay, of more than 30 miles, if we reckon the curvatures of its direction through that mountainous country? It is replied, the motive of obtaining the water more salubrious and more limpid, was sufficient to make the Romans think their labour necessary, and their expence properly bestowed; and to those who reflect that the waters of this river were impregnated with mineral particles, and by no means wholesome, the answer will appear satisfactory. Aquæd

If any one will cast his eyes upon Plate 128th of the Antiquities of Father Montfaucon, he will see with how much care these immense works were constructed. From distance to distance spiramenta were left, that, if the water should happen to be stopped by any accident, it might gradually disembogue, till they could clear its ordinary passage. There were likewise, even in the very canals which conveyed the water, cavities considerably deeper than its internal surface, into which the stream was precipitated, and where it remained stagnant till it was refined from mud and feculence; and ponds, where it might expand itself till it was purified.

The aquæduct of the *Aqua Marcia* had an arch of 16 feet in diameter. The whole was composed of three different kinds of stone; one of them reddish, another brown, and a third of an earth colour. Above, there appeared two canals; of which the highest was fed by the new waters of the Tiverone, and the lower by what they called the *Claudian* river. The entire edifice is 70 Roman feet high. Near this aquæduct, we have in Father Montfaucon the plan of another with three canals; the highest supplied by the water called *Julia*, that in the middle from Tepula, and the lowest from the Aqua Marcia. Vol. iv.

The arch of the aquæduct of the Aqua Claudia is of hewn stone, very beautiful: that of the aquæduct of the Aqua Neronia is of bricks: they are each of them 72 Roman feet in height.

The canal of the aquæduct which was called the *Aqua Appia*, deserves to be mentioned for a singularity which is observed in it; for it is not, like the others, plain, nor gradual in its descent; but much narrower at the lower than the higher end.

The consul Frontinus, who superintended the aquæducts under the emperor Nerva, mentions nine of them which had each 13,594 pipes of an inch in diameter. Vigerus observes, that, in the space of 24 hours, Rome received 500,000 hogsheads of water.

We might likewise have mentioned the aquæduct of Drusus, and that of Riminius: but we shall satisfy ourselves with observing here, that Augustus caused all the aquæducts to be repaired; and afterwards pass to other monuments of the same kind, and still more important, which give the most striking ideas of Roman magnificence.

One of these monuments is the aquæduct of Metz, of which a great number of arcades still remain. These arcades crossed the Moselle, a river which is broad and vast at that place. The copious sources of Gorze furnished water for the representation of a sea fight. This water was collected in a reservoir: from thence it was conducted by subterraneous canals formed of hewn stone, and so spacious that a man could walk erect in them: it traversed the Moselle upon its superb and lofty arcades, which may still be seen at the distance of two

Aquæduct || Aquarius.

two leagues from Metz; so nicely wrought and so firmly cemented, that, except those parts in the middle which have been carried away by the ice, they have resisted, and will still resist, the severest shocks of the most violent seasons. From these arcades, other aquæducts conveyed the waters to the baths, and to the place where the naval engagement was mimicked.

If we may trust Colmenarus, the aquæduct of Segovia may be compared with the most admired labours of antiquity. There still remain 159 arcades, wholly consisting of stones enormously large, and joined without mortar. These arcades, with what remains of the edifice, are 102 feet high; there are two ranges of arcades, one above another. The *aqueduct* flows through the city, and runs beneath the greatest number of houses which are at the lower end.

After these exorbitant structures, we may be in some degree believed when we speak of the *aqueduct* which Louis XIV. caused to be built near Maintenon, for carrying water from the river Bucq to Versailles: it is perhaps the greatest aqueduct which now subsists in the world: it is 700 fathoms in length, and contains 242 arcades.

AQUAMBOE, one of the greatest monarchies on the coast of Guinea in Africa, stretching 20 miles in breadth, and ten times that space in length from east to west. According to Bosman, the coast is divided into a great number of petty royalties, but all of them subject to the king of Aquamboe, who indiscriminately uses an unlimited authority over them and the meanest of his subjects. His despotism gave rise to a proverbial saying, that "there are only two ranks of men at Aquamboe; the royal family, and slaves." The natives of this country are haughty, turbulent, and warlike; and their power is formidable to all the neighbouring nations. They grievously infest such nations as are tributaries to the king of Aquamboe, entering their territories by troops, and carrying off from the inhabitants whatever they think proper; nor do they ever meet with any opposition from the inhabitants, as they are sensible the king would not fail to resent this as an indignity offered to him.

AQUAPENDENTE. See Fabricius.

AQUARIANS, Christians in the primitive church who consecrated water in the eucharist instead of wine. This they did under pretence of abstinence and temperance; or, because they thought it universally unlawful to eat flesh or drink wine. Epiphanius calls them *Encratites*, from their abstinence; St Austin, *Aquarians*, from their use of water; and Theodoret, who says they sprang from Tatian, *Hydroporastatæ*, because they offered water instead of wine.

Besides these, there was another sort of Aquarians, who did not reject the use of wine as unlawful; for they administered the eucharist in wine at evening service; but, in their morning assemblies, they commonly used water, for fear the smell of wine should discover them to the heathens.

AQUARIUS, the Water-carrier, in *Astronomy*, the 11th sign of the zodiac, reckoning from Aries; from which also the 11th part of the ecliptic takes its name.—The sun moves through Aquarius in the month of January; it is marked thus, ♒.

The poets feign, that Aquarius was Ganymede, whom Jupiter ravished under the shape of an eagle, and carried away into heaven, to serve as a cup-bearer, in the room of Hebe and Vulcan; whence the name.—Others hold, that the sign was thus called, because, when it appears in the horizon, the weather usually proves rainy.

Aquarius || Aquatinta.

The stars in the constellation Aquarius, in Ptolemy's catalogue, are 45; in Tycho's 41; in Hevelius's 47; in Flamsted's 108.

AQUARTIA. See Botany *Index*.

AQUATIC, in *Natural History*, an appellation given to such things as live or grow in water.

AQUATINTA, a method of etching on copper, lately invented, by which a soft and beautiful colour is produced, resembling a fine drawing in water colours or Indian ink.

Previous to the operation upon the plate, the following powder must be prepared.—Take of asphaltum and fine transparent rosin, equal parts, suppose two ounces of each, and pound them separately. Through a muslin sieve (which may be formed with part of a chipbox of three or four inches diameter) sift upon a sheet of paper a thin stratum of the asphaltum, above which sift a similar layer of the rosin, and upon this another layer of asphaltum, continuing these alternate layers till both of the powders are exhausted; then pass the mixtures through the same sieve upon the paper once or twice, or till both appear to be sufficiently incorporated; when the powder is ready for use. Some, instead of the above mixture, use gum sandarach pounded.

The main process is as follows:—A copperplate being polished in the usual way, lay the etching ground upon it, and etch the outlines of your design in the manner directed under the article Etching: The ground is then to be softened with a little grease, and wiped off with a piece of rag: leaving, however, as much grease upon the plate as just to dim the copper. You now sift your powder upon the surface of the plate; after which, strike the other side of it pretty smartly against the edge of the table, in order to discharge it of the loose powder: This done, with a hand-vice hold the back of the plate over a chaffing dish of charcoal fire, till it become so hot as to give pain upon being touched with the back of the hand; and the powder which adhered to the grease will now be fixed to the plate. The plate being then suffered to cool, take turpentine varnish mixed with ivory black; and with a hair pencil dipt in it, cover all the lights or places where there is no work or shades. A rim or border of bees-wax is now to be raised under the plate: Then having reduced the aquafortis to a proper strength by vinegar or water, you pour it on, and let it stand five minutes for the first or lightest shade: after which, pour it off; and having washed the plate with water, set it on edge to dry: Then with the varnish stop up your light shades: pour on the aquafortis for the second tint, and let it stand five minutes more; proceeding in the same manner for every tint till you produce the darkest shades. If a bold open ground is wanted in any part, this requires an after operation: The ground must be laid as the other, by sifting on the powder; only this powder is much coarser, and the plate must be much more heated in order that the particles of the powder may spread, and form small circles: even good clean rosin will do by itself.

In

Aquatinta || Aquila.

In etching landscapes, the sky and distant objects are also performed by a second operation, and the powder is sifted upon the plate with a finer sieve. If the trees or any part of the fore-ground require to be higher finished, the plate must be entirely cleansed from grease with bread, and a ground laid in the common way of etching; when you may finish as highly and neatly as you please with the needle or point, by stippling with dots, and biting up those parts, or by a rolling-wheel.

The preceding is the method for prints of one single tint. But if different colours are to be expressed, there will be required as many different plates, each plate having only the part etched upon it which is designed to be charged with its proper colour; unless (as may happen in particular subjects) some of the colours are so distant from each other as to allow the printer room to fill them in with his rubber without blending them; in which case, two or more different colours may be printed from the same plate at once.—Where different plates are necessary, a separate one, having a pin in each corner, must be provided as a sole or bottom to the aquatinta plates; and these again must be exactly fitted, having each a small hole in their corners for passing over the pins of the sole; the said pins serving the double purpose of retaining the plates successively in their due position, and of directing the printer in placing the paper exactly on each plate so as not to shift; by which means each tint or colour will be exactly received on its proper place.—This is the method practised at Paris. A landscape or similar subject, however, may be printed off at once in the different proper colours, by painting these upon the plate. In this case, the colours must be pretty thick in their consistence; and the plate must be carefully wiped in the usual way after the laying on of each tint, as well as receive a general wipe upon its being charged with all the tints.

This art is kept as secret as possible by those who practice it; and it is believed that no particular explanation or directions, before the present, have been communicated to the public. In order to succeed, however, great care and judgment are requisite; and much depends upon a certain nicety of management, which is only attainable by practice.

AQUAVIVA, a town of the kingdom of Naples, and province of Bari.

AQUEDUCT. See AQUÆDUCT.

AQUEOUS, in a general sense, something partaking of the nature of water, or that abounds with it.

Aqueous Humour. See ANATOMY, p. 276.

AQUILA, in *Ornithology*, a synonyme of the eagle. See FALCO.

AQUILA, the EAGLE, in *Astronomy*, a constellation of the northern hemisphere; usually joined with Antinous. The stars in the constellation Aqua and Antinous, in Ptolemy's catalogue, are 15; in Tycho's 19; in Hevelius's 42; in the Britannic catalogue, 71.

AQUILA, a fine large city of Italy, and the capital of Abruzzo, seated on a hill, on the banks of the river Pescaro, near its source. It has an ancient castle, and is a bishop's see immediately under the pope. The land about it produces great plenty of saffron. It was very near being all destroyed by an earthquake, in February 1703. The first shock was so terrible, that the inhabitants abandoned the city; but returning to vespers, it being Candlemas day, the shocks followed one another with such violence, that 24,000 people perished, and great numbers were wounded; 800 were killed in one single church; many other churches, monasteries, noble buildings, and the townhouse, were either swallowed up or overturned, together with the greater part of the city and its walls. Aquila stands 30 miles from the sea, and about 16 from the confines of the pope's dominions. E. Long. 14. 20. N. Lat. 42. 20.

Aquila || Aquilei

AQUILEGIA, COLUMBINE. See BOTANY *Index.*

AQUILEIA, a large city of the Carni, or Veneti, and a noble Roman colony, which was led thither between the first and second Macedonian wars, (Livy). It is washed by two rivers, the Natiso and Turrus, (Pliny). The reason of leading this colony was, in order to be a bulwark against the neighbouring barbarians. The colony was afterwards increased with 1500 families by a decree of the senate, (Livy); from which it became a very famous port town, (Herodian). The emperor Julian ascribes the appellation to the augury of an eagle at the time of building it; but Isaac Vossius on Mela, to the great plenty of water, as if the town were called *Aquilegia.* The harbour, at the mouth of the Natiso, is distant 60 stadia from the city; so that ships of burden are towed up the river, (Strabo). In 452 it was besieged by Attila with an innumerable host of barbarians. The walls were assaulted by a formidable train of battering rams, moveable turrets, and engines that threw stones, darts, and fire; and the monarch of the Huns employed the forcible impulse of hope, fear, emulation, and interest, to subvert the only barrier which delayed the conquest of Italy. Aquileia was at that period one of the richest, the most populous, and the strongest of the maritime cities of the Hadriatic coast. Three months were consumed without effect in the siege; till the want of provisions and the clamours of his army compelled Attila to relinquish the enterprise, and reluctantly to issue his orders that the troops should strike their tents the next morning and begin their retreat. But as he rode round the walls, pensive, angry, and disappointed, he observed a stork preparing to leave her nest in one of the towers, and to fly with her infant family towards the country. He seized, with the ready penetration of a statesman, this trifling incident which chance had offered to superstition; and exclaimed in a loud and cheerful tone, that such a domestic bird, so constantly attached to human society, would never have abandoned her ancient seats, unless those towers had been devoted to impending ruin and solitude. The favourable omen inspired an assurance of victory; the siege was renewed and prosecuted with fresh vigour; a large breach was made in the part of the wall from whence the stork had taken her flight; the Huns mounted to the assault with irresistible fury; and the succeeding generation could scarcely discover the ruins of Aquileia. The place, however, is still called *Aquileia;* and there are several inscriptions and antiquities to be seen in it, which are worthy of a traveller's notice; and, though dwindled into a poor village, it gives a title to the patriarch of Aquileia.

The

Aquileia ‖ Aquinum.

The patriarch is named by the Venetians, and resides at Udino, because the town of Aquileia belongs to the House of Austria. E. Long. 13. 20. N. Lat. 45. 40.

AQUILICIUM, or AQUILICIANA, in Roman antiquity, sacrifices performed in times of excessive drought, to obtain rain of the gods.

AQUILINE, something belonging to or resembling an eagle: Thus an aquiline nose is one bent somewhat like an eagle's beak.

AQUILO, is used by Vitruvius for the north-east wind; or that which blows at 45° from the north toward the east point of the horizon.—The poets gave the name *aquilo* to all stormy winds dreaded by the mariner.

AQUILUS, among the ancients, a dark or dusky colour approaching to black. Hence some of the Heathen gods were called *dii aquili*, q. d. *nigri*.

AQUIMINARIUM, in antiquity, a kind of lustral vessels, wherein the Romans carried their holy water for expiation and other religious offices.

AQUINAS, ST THOMAS, styled the *Angelical Doctor*, was of the ancient and noble family of the counts of Aquino, descended from the kings of Sicily and Arragon; and was born in the castle of Aquino, in the Terra di Lavora in Italy, in the year 1224 or 1225. He entered into the order of the Dominicans; and, after having taught school divinity in most of the universities of Italy, at last settled at Naples; where he spent the rest of his life in study, in reading of lectures, and in acts of piety; and was so far from the views of ambition or profit, that he refused the archbishopric of that city, when it was offered him by Pope Clement IV. He died in 1274, leaving an amazing number of writings, which were printed at Venice in 17 vols. folio, in the year 1490. He was canonized by Pope John XXII. in the year 1323; and Pius V. who was of the same order with him, gave him, in 1567, the title of the Fifth Doctor of the church, and appointed his festival to be kept with the same solemnity as those of the other four doctors. His authority has always been great in the schools of the Roman Catholics. Lord Herbert, in his life of Henry VIII. tells us, that one of the principal reasons which induced that king to write against Luther was, that the latter had spoken contemptuously of Thomas Aquinas.

AQUINO, PHILIP D', in Latin *Aquinas* or *Aquinius*, having turned from Judaism, had a pension from the clergy of France; and acquired much reputation by his knowledge of the Hebrew language, which he taught at Paris, in the reign of Louis XIII. and by the books he published, among which is his *Dictionarium Hebræo-Chaldæo-Thalmudico-Rabbinicum*. His grandson, Anthony D'Anquin, was first physician to Louis XIV.

AQUINO, a town of Italy, in the kingdom of Naples, and Terra di Lavora; a bishop's see, but ruined by the emperor Conrade, and now consisting of about 35 houses. It was the birthplace of the poet Juvenal, and of Thomas Aquinas. E. Long. 14. 30. N. Lat. 41. 32.

AQUINUM, in *Ancient Geography*, a large municipal town, and a Roman colony on the borders of the Samnites, washed by the river Melpha (Strabo). The inhabitants are called *Aquinates*. Now *Aquino*, but almost in ruins, in the territory of Lavora. E. Long. 17. 11. N. Lat. 41. 35.

Aquinum ‖ Arabia.

AQUITANIA, in *Ancient Geography*, one of the three principal divisions of Gallia Comata (Cæsar); bounded by the Garonne, the Pyrenees, and the ocean: this is the *Aquitania Cæsariana*, or *Vetus*. Augustus set the different boundaries, viz. the Loire, the Cevennes, the Pyrenees, and the ocean (Strabo). It was called *Gallia Aquitanica* (Pliny); and in the old Notitiæ *Provincia Aquitanica*. The people are called *Aquitani* (Cæsar). Now comprising Guienne (which seems to be a corruption of Aquitania) and Gascony.

AR, in *Ancient Geography*, the metropolis of Moab, in Arabia Petræa (Moses), and the royal residence, situated on the east side of the river Arnon. It was called also *Rabba* (Joshua): and to distinguish it from Rabba of the Ammonites, *Rabbat Moab*, and on coins *Rabbath Moma* (Reland). Eusebius says it was called *Areopolis* in his time, from *Ar* and *Polis*. The inhabitants are called *Areopolitæ*. St Jerome says that this city was entirely destroyed by an earthquake when he was a young man.

ARA THURIBULI, the altar of incense, in *Astronomy*, a southern constellation, not visible in our hemisphere, consisting, according to Ptolemy, of seven stars; and according to Sharp's Catalogue, annexed to that of Mr Flamsted, of nine stars.

ARA, in *Astronomy*, a southern constellation, containing eight stars.

ARAB or ARABIAN HORSE. See EQUUS.

ARABESQUE, or ARABESK, something done after the manner of the Arabians. *Arabesque*, *Grotesque*, and *Moresque*, are terms applied to such paintings, ornaments of friezes, &c. where there are no human or animal figures, but which consist wholly of imaginary foliages, plants, stalks, &c. The words take their rise from hence, that the Moors, Arabs, and other Mahometans, use these kind of ornaments; their religion forbidding them to make any images or figures of men or other animals.

1 Whence named.

ARABIA, a country of Asia, famous from the remotest antiquity for the independency of its inhabitants during the vast conquests of the Assyrians, Persians, Greeks, and Romans; and, in later times, for being the centre of an empire equal, if not superior, in extent to any that ever existed.

This country, or at least the greater part of it, was in the earliest ages called *Arabah*. Concerning the etymology of this word there are various conjectures. It has most generally been derived from the Hebrew word ערב, signifying *the west*, *mixture*, or *traffic*; but, according to M. Volney, *Arab*, in the ancient language of these countries, signifies a *solitude* or *desert*. In its largest extent, Arabia lies between the 12th and 35th degrees of N. Lat. and the 36th and 61st of E. Long. Its greatest length from north to south is about 1430 miles, and its breadth from east to west is 1200. It is bounded on the west by Palestine, part of Syria, the isthmus of Suez, and the Red sea, called by the Arabs the sea *Al Kolzom*; on the east by the Euphrates, the Persian gulf, and bay of Ormus; on the north, by part of Syria, Diyar Becr, Irak, and Khuzestan; and on the south by the straits of Babelmandel and the Indian ocean. It grows narrower as we approach the frontiers of Syria and Diyar Becr:

2 Boundaries, &c.

Arabia. Becr: and, by reason of the proximity of the Euphrates to the Mediterranean, may be looked upon as a peninsula, and that one of the largest in the whole world. —Arabia Proper, however, is much narrower, including little more than what was comprehended by the ancients under the name of Arabia Felix, which we shall presently describe; and here the Arabs have been settled almost since the flood.

3 Division. The first division of the peninsula of Arabia was into *Arabah* and *Kedem*, as we learn from Scripture; the first of which implies the west, and the other the east, denoting the situation of the two countries. Ptolemy was the first who divided the peninsula we speak of into three parts, Arabia Petræa, Arabia Deserta, and Arabia Felix, which division has generally prevailed since his time.

Arabia Petræa, on the east was bounded by Syria and Arabia Deserta; on the west, by Egypt, or rather the isthmus of Suez, which separates Asia from Africa, and the Hieropolitan gulf or western arm of the Red sea; on the north, by Palestine, the lake Asphaltites, and Cœlosyria; and on the south by Arabia Felix. This tract did not admit of much cultivation, the greatest part being covered with dry sands, or rising into rocks, interspersed here and there with some fruitful spots. Its metropolis was Petra, which by the Syrians was styled *Rakam*, and in Scripture *Joktheel*. Several other cities of Arabia Petræa are mentioned by Ptolemy; but as it is very improbable sueh a barren country should abound with large cities, we must look upon them as inconsiderable places.

Arabia Deserta was bounded on the north by the Euphrates, which separated it from Mesopotamia; on the west, by Syria, Judæa, and Arabia Petræa; on the east, by a ridge of mountains which separated it from Babylonia and Chaldea; on the south, by Arabia Felix, from which it was likewise separated by several ridges of hills. By far the greatest part of this kingdom, as well as the former, was a lonesome desert, diversified only with plains covered with sand, or mountains consisting of naked rocks and precipices; nor were they ever, unless sometimes at the equinoxes, refreshed with rain. The few vegetables which they produced were stunted by a perpetual drought, and the nourishment afforded them by the nocturnal dews was greatly impaired by the heat of the sun in the day-time. Throughout the deserts were found huge mountains of sand, formed by the violence of the winds that continually blew over them in the day-time, though they ceased in the night. Wells and fountains were for the most part exceedingly rare; however, notwithstanding the sterility of these countries, the vast plains of sand just now mentioned were interspersed with fruitful spots, which appeared here and there like so many islands in the midst of the ocean. These being rendered extremely delightful by their verdure, and the more so by the neighbourhood of those frightful deserts, the Arabs encamped upon them; and having consumed every thing they found upon one, removed to another, as is the custom of their descendants the Bedoweens at this day. These fruitful spots were likewise frequent in Libya, and by the Egyptians called *auases*, or *abases*, as we learn from Strabo. The barren part of Arabia Felix, bordering upon the Red sea, was in like manner interspersed with abases; which probably gave the name of *Abaseni* to a nation settled there, and in the adjacent fertile region. A body of these, it is said, crossing the straits of Babelmandel, passed into Ethiopia, which from them received the name of *Abassia*. From this account of Arabia Deserta, we may reasonably conclude, that the towns said by Ptolemy to have been situated in it were places of very little consequence. Arabia.

Arabia Felix was bounded on the north by the two kingdoms just described; on the south, by the Red sea; on the east and west, by part of that sea, together with the Arabian and Persian gulfs. In Strabo's time, it was divided into five provinces, by the oriental historians called *Yaman*, *Hejaz*, *Tehamah*, *Najd*, and *Yamama*. In this district stood several towns, particularly Nysa, famous for being the birthplace of Bacchus; and Musa, or Muza, a celebrated emporium or harbour, where the Arabian merchants resorted with their frankincense, spices, and perfumes. These two were situated in the province of Yaman. In that of Hejaz stood the still more famous cities of Mecca and Medina; also Thaisa or Taisa, Gjudda or Joddo, Yanbo or Al Yanbo, and Madian, the Modiana of Ptolemy, and the Midian or Madian of Scripture.

4 When peopled. At what time the above-mentioned kingdoms were first peopled we have no certain accounts. The most considerable nations inhabiting Arabia Petræa, in the early ages, were the Ishmaelites, the Nabatæi or Nabatheans, the Cedræi or Kedareni, and the Agareni or Hagareni; and of these the Ishmaelites were the most powerful, if they did not comprehend all the rest; and if the Hagareni were not the same people with them, they must at least have been nearly related. Kimchi, an oriental historian, insinuates, that they were originally the children of Hagar by an Arab, after she had left Abraham. In after ages, the names of all the nations situated here were absorbed in that of *Saracens*, by which the Ishmaelites are distinguished in the Jerusalem Targum. A nation is also mentioned by Pliny, called *Arraceni*, and *Saraceni* by Ptolemy and Dioscorides, which was probably no other than the Ishmaelites above mentioned. In Arabia Deserta several tribes resided, all of whom were very obscure, except the Aisitæ and Araei. The former are supposed by Bochart to have been Job's countrymen, and the latter to have been the same with the Hagareni, Arraceni, or Saraceni, above mentioned. Arabia Felix was inhabited by many different tribes; the most remarkable of which were the Sabæi, Gerræi, Minæi or Minnæi, Atramitæ, Marinatæ, Catabani, Ascitæ, Homeritæ, Sapphoritæ, Omanitæ, Saraceni, Nabathæi, Thamydeni, and Bnizomenæ; but neither their limits nor situation can now be determined with any manner of precision.

5 Division of the Arab. According to the oriental historians, the Arabs are to be divided into two classes; viz. the *old lost Arabians*, and the *present*. The most famous tribes among the former were those of Ad, Thamud, Tasm, Jades, Jorham, Amalek, Amtem, Hasbem, Abil, and Bar. Concerning these, though now entirely lost and swallowed up among other tribes, there are some remarkable traditions, of which the following may serve as a specimen.

The

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6 Tradition concerning the tribe of Ad.

The tribe of Ad deduced their origin from Ad the son of Aws, or Uz, the son of Aram, the son of Shem, who, after the confusion of tongues, settled in Al Abkaf, or the winding sands in the province of Hadramant, on the confines of Yaman, where his posterity greatly multiplied. Their first king was Sheddad, the son of Ad, who built a stately palace, and made a delightful garden in the deserts of Aden, which he designed as an imitation of the celestial paradise. This garden he called *Irem:* and when it was finished, he set out with a great retinue to take a view of it; but, having some thoughts of assuming divine honours, he was destroyed by a tempest from heaven, while yet a day's journey from his paradise. The garden and palace, however, were preserved, though invisible, as a monument of divine vegeance.

After the death of Sheddad, the kingdom of Ad was governed by a long series of princes, concerning whom many fables are related by the eastern writers. The conclusion of their history, however, is as follows. "The Adites, in process of time, falling from the worship of the true God into idolatry, God sent the prophet Hûd, supposed to be the same with Heber, to preach to and reclaim them. But they refusing to acknowledge his mission, or to obey him, God sent a hot and suffocating wind, which blew seven nights and eight days, and entering at their nostrils passed through their bodies, and destroyed them all, a very few only excepted, who had listened to Hûd, and retired with him to another place." Others relate, "that before this terrible catastrophe, they had been previously chastised with a three years drought; and therefore sent Kail Ebn Ithar, and Morthen Ebn Sdaa, with 70 other principal men, to Mecca, then in the hands of the tribe of Amalek, whose prince was Moahwiyah Ebn Becr, to obtain of God some rain. Kail having begged of God that he would send rain to the people of Ad, three clouds appeared, a white, a red, and a black one; and a voice from heaven ordered him to choose which he would. Kail failed not to make choice of the last, thinking it would be laden with most rain; but when this cloud came over them, it proved to be fraught with the divine vengeance, and a tempest broke forth from it which destroyed them all.

7 Arabs from whom descended.

The *present Arabs*, according to their own historians, are sprung from Kahtan, the same with Joktan, the son of Eber, and Adnan, descended in a direct line from Ishmael the son of Abraham. The former of these they called *genuine* or *pure* Arabs, and the latter the *naturalized* or *insititious* Arabs.

Joktan the son of Eber had 13 sons, who some time after the confusion of languages settled in Arabia, extending themselves from Mesha to Sephar, a mountainous place in the south-eastern part of that peninsula. According to the Arabian historians, he had 31 sons, all of whom left Arabia and went into India, except two, viz. Yarab and Jorham; the former of whom, they say, gave the name both to their country and language. Ishmael and his mother Hagar having been dismissed by Abraham, entered into the wilderness of Paran, as related in the book of Genesis. The sacred historian informs us, that during his residence in the wilderness he married an Egyptian; and the Arabian writers say that he also took to wife the daughter of Modab king of Hejaz, lineally descended from Jorham the founder of that kingdom. By the Egyptian he was probably the father of the Scenite or wild Arabs; and having allied himself to the Jorhamites, he is considered by the Arabians as the father of the greatest part of their nation.

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8 Joktan the first king.

Kahtan, or Joktan, is said to have first reigned, and worn a diadem, in Yaman; but the particulars of his reign we nowhere learn. He was succeeded by Yarab already mentioned, he by Yashab, and Yashab by Abd Shems. He was successful in his expeditions against his enemies, carried off great spoils, and took many of them prisoners. He is said to have built the city of Saba or Mareb, and above it a stupendous mound or building, which formed a vast reservoir, containing all the water that came down from the mountains. By means of this reservoir the kings of Yaman not only supplied the inhabitants of Saba and their lands with water, but likewise kept the territories they had subdued in greater awe, as by cutting off their communication with it they could at any time greatly distress them.

9 Reservoir of Saba.

Abd Shems was succeeded by his son Hamyar, from whom the tribe of Hamyar is said to take its name; and he by a series of 17 kings, concerning whom we have no remarkable particulars, except that from one of them, called *Africus*, the continent of Africa took its name. The last of these was succeeded by a daughter named *Balkis* or *Belkis*, whom some will have to be the queen of Sheba who paid a visit to Solomon. After Balkis came Malca, surnamed *Nasherolneam* on account of his magnificence and liberality. Having had bad success in an expedition, where his army was overwhelmed by torrents of sand, he caused a brazen statue to be erected, with the following inscription in the old Hamyaritic character: "There is no passage behind me, no moving farther; the son of Sharhabil." He was succeeded by Shamar Yaraash, so called on account of his being affected with a constant tremour. To this prince the city of Samarcand is said to owe its existence. After Shamar Yaraash we have a list of 15 kings, of whom nothing worth mentioning is recorded, except of one Abu Carb Asaad, who adorned the Caaba or temple of Mecca with tapestry, and first introduced Judaism among the Hamyarites. He was put to death by his subjects, probably on account of religion. The last of the 15 kings above mentioned was called *Abrahah*, who was succeeded by his son Sabban. He had that famous sword called *Samsannah*, which afterwards came into the hands of the caliph Al Rashid. This prince was succeeded by Dhu Shanater, who had six fingers on each hand. He was abandoned to unnatural lust, and dethroned for abusing some of the noblest youths in the kingdom. To him succeeded Yusef, who lived about 70 years before Mahomet. He persecuted all those who would not turn Jews, putting them to death by various tortures, the most common of which was throwing them into a glowing pit of fire; whence he had the appellation of the *lord of the pit*. This persecution is taken notice of in the Koran. The last of the Hamyaritic monarchs was Dhu Jadan, according to Abulfeda; but, according to others, the Yusef just mentioned, who was surnamed *Dhu Nowas* on account of his flowing curls, and was the last who reigned in an uninterrupted succession. He was a bigotted Jew, as already mentioned: and treated his subjects with such

10 Balkis supposed to be the queen of Sheba.

11 Samarcand by whom built.

12 Yusef a bloody persecutor.

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such barbarity, that they were obliged to ask the assistance of Elesbaas, or Elasbaan, king of Ethiopia, against him. Dhu Nowas, not being able to make head against the Ethiopians, was at last driven to such extremity, that he forced his horse into the sea, and lost both his life and crown together.

13 His subjects call in the king of Ethiopia, who dethrones Yusef.

The king of Ethiopia, having thus become master of Yaman, established there the Christian religion, and fixed upon the throne one Abryat an Ethiopian. He was succeeded by Abraha Ebn-Al Sabah, surnamed the *Slit-nosed*, from a wound he had formerly received in it. He was likewise styled *lord of the elephant*, from a story too ridiculous to deserve notice. He was succeeded by two other Ethiopian princes; but at last Sief Ebn Dhu Yazan, of the old royal family of Hamyar, having obtained assistance from the king of Persia, which had been denied him by the emperor Heraclius, recovered his throne, and drove out the Ethiopians; but was himself slain by some of them who were left behind. The succeeding princes were appointed by the Persians, till Yaman fell into the hands of Mahomet.

14 Christian religion established in Arabia.

15 Ethiopians driven out.

16 Terrible inundation by the breaking down of the reservoir of Saba.

We have already taken notice of the vast mound or reservoir made by Abd Shems, from which he supplied the city of Saba with water. This building stood like a mountain above the city, and was by the Sabæans esteemed so strong, that they were under no fear of its ever failing. The water rose almost to the height of 20 fathoms; and was kept in on every side by a work so solid, that many of the inhabitants had their houses upon it. About the time of Alexander the Great, however, a terrible inundation happened. According to the Arabian historians, God being displeased at the pride and insolence of the inhabitants of this city, resolved to humble them: and for this purpose sent a mighty flood, which broke down the mound by night whilst the inhabitants were asleep, and carried away the whole city with the neighbouring towns and people. This inundation is styled in the Koran the *inundation of Al Haram;* and occasioned so terrible a destruction, that from thence it became a proverbial saying to express a total dispersion, "that they were gone and scattered like Saba."—By this accident no less than eight tribes were forced to remove their habitations; some of which gave rise to the kingdoms of Hira and Ghassan.

17 Origin, &c. of the kingdom of Hira.

The kingdom of Hira was founded by Malec, a descendant of Cahlan the brother of Hamyar; but after three descents, the throne came by marriage to the Lakhmians, who were descendants of Lakhm the son of Amru, the son of Abd Ems. These princes, whose general name was *Mondar*, preserved their dominion, notwithstanding some small interruption from the Persians, till the caliphate of Abu Becr, when Al Mondar Maghrur, the last of them, lost his life and crown by the arms of Khaled-Ebn-Al-Walid. This kingdom continued 622 years and eight months, according to Ahmed Ebn Yusef. Its princes were under the protection of the kings of Persia, and were their lieutenants over the Arabs of Irak, as the kings of Ghassan were for the Roman emperors over those of Syria.

18 Of Ghassan.

The kingdom of Ghassan was founded by the tribe of Azd, who according to some, settling in Syria Damascena, near a water called *Ghassan*, from thence took their name; but others say they went under this appellation before they left Yaman. Having driven out the Dajaamian Arabs, who before possessed the country, they made themselves masters of a considerable territory. Here they maintained themselves, according to some 400, according to others 600, and according to Abulfeda 613 years, when the last of their kings submitted to the caliph Omar, and embraced the Mahometan religion; but receiving afterwards a disgust, soon returned to Christianity, and took refuge in Constantinople.

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19 Of Hejaz.

The kingdom of Hejaz was founded by Jorham the son of Kahtan, where princes of his line reigned till the time of Ishmael, who married the daughter of Modad one of those princes. Some authors relate that Kidar, one of Ishmael's sons, had the crown resigned to him by his uncles the Jorhamites: but, according to others, the descendants of Ishmael expelled that tribe; who, retiring to Johainah, were after various adventures destroyed by an inundation. After the expulsion of the Jorhamites, the government of Hejaz seems not to have continued long in the hands of one prince, but to have been divided among the heads of tribes, almost in the same manner as the Arabs of the desert are governed at this day. The tribe of Khozaab, after the above mentioned inundation of Saba, fled into the kingdom of Hejaz, and settled themselves in a valley called *Marri* near Mecca. Here they founded an aristocracy, assuming to themselves both the government of the city of Mecca, and the custody of the Caaba or temple there. They continued masters of this city and territory, as well as presidents of the Caaba, for many ages, till at length one Kosa, of the tribe of Koreish, circumvented Abu Gabshan, a weak and silly man, of whom, while in a drunken humour, he bought the keys of the temple for a bottle of wine; but when Abu Gabshan grew cool, and reflected on his imprudence, he sufficiently repented of what he had done; whence the Arabian proverbs, "More vexed with late repentance than Abu Gabshan; More foolish than Abu Gabshan," &c. The tribe of Khozaab endeavoured afterwards to give some disturbance to the Koreish in the possession of the keys of the Caaba, which furnished the latter with a pretence for depriving them of the civil government of Mecca. After the Koreish had possessed themselves of this city, they kept up the same form of government which had prevailed there before. Besides these kingdoms, there were many others of lesser note, of which we find nothing remarkable.

20 Tribe of Khozaab assumes the government of Mecca.

21 Folly of Abu Gabshan.

Thus we have briefly mentioned the most memorable events recorded by the Arabian historians previous to the time of Mahomet; but, before entering upon an account of that famous impostor and the kingdom founded by him, it will be proper to take notice of several circumstances in different parts of the world, which at that time concurred to facilitate his scheme, and without which, in all probability, he would never have been able to accomplish it.

22 Causes of Mahomet's success.

The first and great cause of Mahomet's success in his imposture, was the gross corruption and superstition with which the Christian religion was at that time obscured in all parts of the world. Had the pure doctrines of Christianity been then as publicly known as the ridiculous fopperies which deformed the Eastern and Western churches, Mahometanism could never have got a hearing. But along with the true religion, mankind seemed also to have lost the use of their rational

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rational faculties, so that they were capable of swallowing the grossest absurdities; such as it now appears almost incredible that any of the human race could receive as truths. Another cause was, the manner of government and way of life among the Arabs. Divided into small independent tribes, they never were capable of a firm union but by superstition; and had Mahomet attempted their conquest in any other way, it was impossible he could have succeeded. As there were also among them Jews, Pagans, and Christians of all sorts, this impostor, by adopting something out of every religion then extant, cunningly recommended himself to the professors of every one of them. Add to all this, that by allowing of polygamy, and setting forth his paradise as consisting in the enjoyment of women, he adapted himself to the corrupt dispositions of mankind in general.

If the distracted state of religion favoured the designs of Mahomet on the one hand, the weakness of the Grecian and Persian monarchies assisted him no less powerfully on the other. Had those once formidable empires been in their vigour, either of them would have been sufficient to crush Mahometanism in its birth; but both of them were then strangely reduced. The Roman empire had continued to decline after the time of Constantine; the western parts of it were then entirely overrun by the Goths and other barbarous nations; and the eastern, or Greek empire, was so much reduced by the Huns on the one hand, and the Persians on the other, as to be incapable of making any great effort. The Persian monarchy itself was in little better condition. It is true, they ravaged the dominions of the Greeks, and often overcame them in the field; but that was owing more to the weakness of the Grecian empire, than to the strength of the Persians, and so effectually did the intestine broils, which arose chiefly on account of religion, weaken the kingdom of Persia, that the most considerable part of it was annexed by the caliph Omar to his dominions.

As the Greeks and Persians were then in a languishing situation, so the Arabs were strong and flourishing. Their country had been peopled at the expence of the Grecian empire; whence the violent proceedings of the different religious sectaries forced many to take refuge in Arabia. The Arabs were not only a populous nation, but unacquainted with the luxuries and delicacies of the Greeks and Persians. They were inured to hardships of all kinds, and consequently much better fitted than their effeminate neighbours to endure the fatigues of war, as the event very fully verified.

23 Mahomet's birth, descent, &c.

Mahomet was born in the year of Christ 569. According to the eastern historians, he was descended in a direct line from Ishmael. Keder, or, as the Arabians call him *Kidar*, after his father Ishmael's death, communicated his name to the greatest part of Arabia Petræa. He was succeeded in his authority and possessions by his son Hamal; Hamal by Nabat, and Nabat by Salaman. After Salaman came Al Homeisa, then Al Yasa, whose son Odad was succeeded by Odd the father of Adnan. Counting ten generations forward in the same line, we come at last to Fehr, who seems to

24 Fehr head of the Koreish.

have distinguished himself by some glorious actions, as he was denominated *Koreish*, on account of his bravery. He is to be considered as the root of the politest and most celebrated tribe of the Arabs. He had three sons, Galeb, Mohareb, and Al Hareth. From Mohareb the Banu Mohareb, denominated likewise *Sheiban*, took their origin; from Al Hareth, the Banu Al Kholoj: and from Galeb in a direct line, the impostor Mahomet. Galeb was the father of Lowa; and he of Caab, whose son Morrah had for his immediate descendant Kelab the father of Kosa. It was this Kosa who aggrandized the tribe of the Koreish, by purchasing the keys of the Caaba from Abu Gabshan, as we have already related. By this he not only aggrandized his tribe, but became the prince of it himself. He was succeeded by his second son Abd Menaf, to whom the *prophetic light*, which is said to have manifested itself in his face, gave the right of primogeniture. Abd Menaf was succeeded by his son Amni, surnamed *Hashem*, or "one that broke bread," on account of his singular generosity during a famine at Mecca. Having amassed great sums of money, he took a journey into Syria, where he purchased a vast quantity of meal, which he made into cakes, and divided with his own hands amongst the people of Mecca. He likewise killed a prodigious number of camels, with which he fed them, and relieved them in the time of their distress; and finding that the soil about Mecca was so barren as to produce no fruits but what are common in the deserts, and consequently no corn or grain, which the Meccans are obliged to bring from other places, he appointed two caravans to set out yearly for that purpose, the one in summer, and the other in winter; by means of which the city was amply supplied with provisions of all kinds. The provisions brought by them, were distributed twice a-year; and Hashem, by his prudent conduct, raised the glory of his people to the highest pitch; insomuch, that all the neighbouring great men and heads of tribes made their court to him. Nay, so great veneration is the memory of Hashem held in by the Arabs, that from him the family of Mahomet among them are called *Hashemites;* and he who presides over Mecca and Medina, who must always be of the race of Mahomet, has to this day the title of the "Chief or Prince of the Hashemites."

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25 Hashem's generosity.

Hashem died at Gaza in Syria, and was succeeded by his son Abdal Motalleb or Mateleb. He is said to have been extremely affable and easy of access, as well as just and generous to a great degree; so that, in the beginning of the month *Ramadan*, he entertained the poor upon the flat roof of his house, and afterwards supplied the fowls of the air and wild beasts of the field with provisions of various kinds, which he ordered his servants to leave upon the summits of the neighbouring mountains. The well which God showed to Hagar in the wilderness is said to have been miraculously discovered to Abdal Motalleb, about 500 years after it had been filled up by Amru, prince of the Jorhamites. This well is by the Arabs called *Zemzem;* which some derive from her calling to Ishmael, when she spied it, in the Egyptian tongue, *Zem, Zem*, i. e. Stay, Stay: though others ascribe it to a different origin. The water of this well, which is on the east side of the Caaba, and covered with a small building and cupola, is highly reverenced; being not only drank with particular devotion by the pilgrims, but also sent in bottles as a great rarity to most parts of the Mahometan dominions.

26 Well Zemzem discovered by Abdal Motalleb.

Abdalla the father of Mahomet, was a younger son of

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of Abdal Motalleb, and remarkable for his beauty. In his 24th or 25th year, he married Amina, the daughter of Waheb, the son of Abdal Menaf. She is represented as the most beautiful, prudent, and virtuous lady of her tribe; and consequently the most worthy of such an extraordinary person as Abdalla. He died young, and, in his father's lifetime, left his widow and infant son in very mean circumstances; his whole substance consisting only of five camels and one female Ethiopian slave. Abdal Motalleb was, therefore, obliged to take care of his grandson Mahomet; which he not only did during his life, but at his death enjoined his eldest son Abu Taleb to provide for him for the future. Abu Taleb was extremely kind to his nephew, and instructed him in the business of merchandise: for which purpose he took him into Syria when he was but 13 years of age, recommending him to Khadijah, a noble and rich widow, for her factor; in whose service he behaved so well, that she married him, and thus raised him to an equality with the richest in Mecca.

27 Mahomet at first a merchant.

28 Begins to broach his doctrine.

Though Mahomet had probably formed a design of introducing his new religion pretty early, he did not think proper to avow it till the 40th year of his age. The grand article of his faith was, the unity of the divine nature, which he pretended was violated by the Jews and Christians no less than by the Pagans; for which reason, he resolved to make an attempt to rescue the world from the ignorance and superstition which prevailed at that time. This reformation he intended should begin in his own family; and therefore, having retired with his household to a cave in Mount Hara, near Mecca, he there opened the secret of his mission to Khadijah; acquainting her that the angel Gabriel had just appeared to him, and told him that he was appointed the Apostle of God. He also repeated to her a passage which he said had been revealed to him by the ministry of the angel, with an account of many prodigies which happened at his birth. (See MAHOMET). This pretended revelation was received by Khadijah with the greatest joy; and in a kind of ecstasy she immediately communicated the good news to her cousin Waraka Ebn Nawfal, who, being a Christian, could write in the Hebrew character, and was pretty well versed in the Scriptures both of the Old and New Testament. He very readily came into her opinion, swore by God that what she said was true, and that "Mahomet was the great prophet foretold in the law by Moses the son of Amram."

29 Converts his wife and cousin, &c.

Mahomet finding his first step successful, as Waraka was a very considerable person, began to entertain great hopes of accomplishing his design. He next converted his servant Zeid, to whom he gave his liberty on the occasion, which afterwards became a rule to his followers; and then Ali the son of Abu Taleb, though at that time only nine or ten years of age. This last, however, making no account of the other two, he used to call *the first of believers*. The next person he applied to was Abu Becr, a man of very considerable authority among the Koreish. He was easily gained over, and by his influence several others; so that Mahomet now made his mission no longer a secret. To Abu Becr he gave the name of *Al Saddik*, or *the faithful witness;* because he not only vouched for every thing he said, but also greatly increased the number of his followers. Mahomet likewise complimented him with the title of *Atik*, or *preserved;* intimating thereby that he was certainly saved from hell fire. Arabia.

Having given out that he was commanded from heaven to admonish his near relations, Mahomet directed Ali to prepare an entertainment, and invite to it the sons and descendants of Abdal Motalleb. He intended to open his mind to them: but Abu Laheb, one of Mahomet's uncles, making the company break up before the prophet had an opportunity of speaking to them, he was obliged to invite them again the next day. Having now proposed the matter, he asked which of them would become his wazir, prime minister, or vicegerent. This was accepted by Ali; upon which Mahomet said to him, "This is my brother, my deputy, and my (*caliph*) successor, or vicar; therefore show yourselves submissive and obedient to him." At this speech all the company fell a-laughing, telling Abu Taleb that he must now pay obedience and submission to his own son. Notwithstanding this repulse, however, Mahomet was so far from being discouraged, that he began to preach to the people in public. They heard him with some patience till he began to upbraid them with the idolatry, obstinacy, and perverseness of themselves and their fathers; which so highly provoked them, that they openly declared themselves his enemies, except some few who were converted. The prophet was now protected by the authority of his uncle Abu Taleb; who, however, was earnestly solicited to persuade his nephew to desist, and at last threatened with an open rupture in case he could not prevail on him so to do. This had such an effect upon Abu Taleb, that he advised his nephew not to push the matter any farther; representing the great danger he and his followers would otherwise run: but our prophet was not to be so intimidated; and told his uncle plainly, that "if they set against him the sun on his right hand, and the moon on his left, he would not abandon his enterprise." Abu Taleb, therefore, finding him so firmly resolved, used no further arguments, but promised to stand by him to the utmost of his power: so that notwithstanding the people of his tribe came to a determination to expel both Mahomet and his followers, he found a powerful support in his uncle against all their machinations.

30 Rejected by the Koreish.

31 His resolution.

Mahomet now entered upon his apostolic function with uncommon diligence and application; and soon gained over his uncle Hamza, and Omar Ebn Al Khattah, a person very much esteemed, and who before had been his violent opposer. Notwithstanding this success, however, the Koreish continued their opposition, and came to a resolution to proscribe all who had embraced Mahomet's doctrine. In consequence of this resolution, the *Moslems*, as his followers were called, were now treated with such severity, that they found it no longer safe to continue in Mecca: nay, several of them in the fifth year of his mission found themselves obliged to fly into Ethiopia, where they were kindly received by the Najashi or king of that country, who refused to deliver them up to those whom the Koreish sent to demand them. At this refusal they were so exasperated, that they came to a resolution to suppress effectually the new religion, which had now made a considerable progress. In order to this, they entered into a solemn league or covenant against the Hashemites,

32 His followers persecuted.

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Hashemites, and the family of Abdal Motalleb in particular, engaging themselves to contract no marriages with them, nor to have any manner of communication with them otherwise; and, to give this the greater weight, they reduced it into writing, and laid it up in the Caaba. Upon this the tribe became divided into two factions; and all the family of Hashem, both Moslems and unbelievers, repaired to Abu Taleb as their head; except only Abdal Uzza; surnamed Abu Laheb, the son of Abdal Motalleb, who, out of hatred to his nephew and his doctrine, went over to the opposite party. After this the authority of Abu Taleb was scarce sufficient to protect Mahomet from the fury of the Koreish; who, according to Al Jannabi, made frequent attempts upon him; sometimes endeavouring to destroy him by force, at other times by secret wiles and machinations: nay, to compass their end, he tells us that they had recourse to magic, enchantments, and diabolical illusions. In short, they gave him at last so much trouble, that he was obliged to change his habitation, and seek a new asylum for himself and his companions. This he found in the house of one Orkam, which was advantageously situated on a hill called *Safa*. Here he converted Orkam's family, and the house was afterwards held in high estimation by the Moslems.

33 The Koreish enter into a league against him.

34 Their writing destroyed by a worm.

The two factions into which the tribe of Koreish was divided subsisted for five years, when they were put an end to by a very strange accident. Mahomet told his uncle Abu Taleb, that God had manifestly showed his disapprobation of the covenant entered into against them, by sending a worm to eat out every word of the instrument except the name of God. With this particular Abu Taleb, immediately acquainted the Koreish; offering, in case it proved false, to deliver up his nephew to them; but if it should prove true, he insisted that they ought to lay aside their animosity, and annul the league they had made against the Hashemites. To this they acquiesced; and going to inspect the writings, found it to be as Abu Taleb had told them; the words "In thy name, O God," being the only ones which remained. On so remarkable a proof of the divine displeasure, the league was immediately annulled, and all the acts of hostility between the two parties ceased.

35 Mahomet ill persecuted by the Koreish.

After this memorable event Mahomet remained with his uncle Abu Taleb, who survived the reconciliation only about eight months. The same year also died Khadijah, Mahomet's wife. Her death, as well as that of his uncle, proved a great detriment to his affairs; for the Koreish, notwithstanding the former reconciliation, began now to persecute him with more violence than ever. He was therefore obliged to fly for shelter to Al Tayef; which he chose on account of its being the residence of his uncle Al Abbas, whose protection he imagined he would be able to secure. In this, however, he found himself mistaken: and though he staid a month in the city, during which time he gained over a few, yet at last the lower sort of people rose against him, and obliged him to return to Mecca. This refusal, though it greatly discouraged the new converts, did not in the least abate the zeal of Mahomet; on the contrary, he continued to preach boldly to the public assemblies at the pilgrimage to Mecca, exclaiming against idolatry, and particularly against the worship of two idols Allat and Al Uzzua, to which the tribes, especially the women of that of Thakif, were very much addicted. By this the prophet was often exposed to great danger: however, he gained some converts, and amongst them six of the inhabitants of Yathreb, of the Jewish tribe of Khazraj; who, on their return home, failed not to speak much in commendation of their new religion, and exhorted their fellow citizens immediately to embrace it. These converts of the tribe of Khazraj, are by the Arab writers called *Al Ansar*, *Al Ansarii*, or *Ansars*; that is, assistants, favourers, supporters, &c. because they assisted and supported the prophet when he was pursued to the very brink of destruction. They first met Mahomet on a little hill called *Al Akabah*, where a temple stood, and where they first took an oath to exert themselves in support of their new apostle and his religion. An uninterrupted friendship and harmony reigned for a long time amongst the members of the Jewish tribes of Khazraj, Koreidha, and Nadir, whose great progenitor, says the Arabs, was Aaron the son of Amram. Mahomet therefore insinuating himself into the good graces of the Ansars, they readily embraced his religion, and proved of very considerable service.

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36 Ansars, who.

37 Mahomet's journey to heaven,

The next remarkable thing recorded of Mahomet is the invention of his night journey to heaven. This he probably intended to supply the place of miracles. The absurdities contained in that relation, however, are so great, that when he related it to his uncle Al Abbas, and Omm Hana, the daughter of Abu Taleb, they endeavoured to dissuade him from making it public. This advice he was so far from following, that he related the whole to Abu Jahl, one of his most inveterate enemies, who ridiculed him for it, and placed the story in such a ridiculous light to the Koreish, that they were on the point of insulting him; several of his followers also left him; and the whole design had probably been ruined, had not Abu Becr vouched for his veracity, and declared, that, if Mahomet affirmed it to be true, he firmly believed the whole. This declaration not only retrieved the prophet's credit, but increased it to such a degree, that he was sure of making his disciples swallow whatever he pleased; and on this occasion it is said by some that he gave Abu Becr the name of the *faithful witness*, as we have already related.

38 almost proves the ruin of his cause.

In the twelfth year of Mahomet's mission, twelve men of Yathreb, or Medina, of whom ten were of the tribe of Kharaj, and two of that of Aws, came to Mecca, and took an oath of fidelity to the prophet at the hill Al Akabah. When they had solemnly engaged to do all required of them, Mahomet sent one of his disciples, named *Masab Ebn Omair*, home with them, to instruct them more fully in the grounds of their new religion. Masab being arrived at Medina, with the assistance of the new proselytes, gained several others; and acquainting Mahomet with the success of his mission, desired leave to form a congregation of Moslems at Medina. This the prophet readily granted; in consequence of which, the new Moslems regularly assembled, to the number of forty persons, in the house of Saad Ebn Khaithama. The next year Masab returned to Mecca, accompanied by 73 men and two women of Medina, who had professed Mahometanism, besides several others who were yet unbelievers. On their arrival they sent immediately to Mahomet, and offered

39 Congregation of Moslems formed at Medina.

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offered him their assistance, of which he now stood in the greatest need; for his adversaries were by this time grown so powerful in Mecca, that he could not stay there much longer without imminent danger. He therefore accepted their proposal, and met them one night by appointment at the hill Al Akabah. At this interview he was attended by his uncle Al Abbas; who, though then an unbeliever, wished his nephew well, and made a speech to the people of Medina; wherein he told them, that as Mahomet was obliged to quit his native city and seek an asylum elsewhere, and as they had offered him their protection, they would do well not to deceive him; and if they were not firmly resolved to defend, and not to betray him, they had better declare their minds, and let him seek for protection somewhere else. Upon their protesting their sincerity, Mahomet swore to be faithful to them, a part of the Koran being read to all present, on condition they should protect him from all insults, as heartily as they would do their own wives and families. They then asked him what recompense they were to expect if they should happen to be killed in his quarrel: he answered, Paradise; upon which they pledged their faith to him, after Mahomet had chosen twelve out of their number, who were to have the same authority under him that the twelve apostles had under Christ.

Finding now a confederacy formed in his favour, our prophet began to pull off the mask as to his true sentiments concerning the means of reformation. Hitherto he had propagated his religion by fair means only; and in several passages of the Koran, which he pretended were revealed before this time, he declared, that his business was only to preach and admonish; that he had no authority to compel any person; and that whether they believed or not, was none of his concern, but belonged solely to God. But no sooner did he find himself enabled, by the alliance above mentioned, to resist his enemies, than he gave out that God had allowed him and his followers to defend themselves; and at length, as his forces increased, he pretended not only to have leave to act on the defensive, but to attack the infidels, destroy idolatry, and set up the true religion by the power of the sword. To this he was excited by an apprehension that pacific measures would greatly retard, if not entirely overthrow, his designs; and therefore he determined to use the most violent methods to convert the Pagan Arabs, or rather to extend his own authority.

40 The Koreish resolve to put Mahomet to death.

The Koreish, in the mean time, finding that Mahomet had considerably extended his influence, and hearing of the league concluded with the Ansars, began to think it absolutely necessary that he should be prevented from escaping to Medina; and, in order to do this the more effectually, they resolved in a council, wherein it is said the devil assisted in person, to put an end to his life. To accomplish this with the greater safety, they agreed that a man should be chosen out of every tribe, and that each should have a blow at him; that so the guilt of his death might fall equally on all the tribes; and thus the Hashemites would be prevented from attempting to revenge the death of their kinsman, as they were much inferior in power to the rest of the tribes put together. Mahomet now directed his companions to repair to Medina, where, in consequence of the late treaty, they might be assured of protection. This they accordingly did: but he himself, with Abu Becr and Ali, remained behind; not having received, as he pretended, the divine permission to retire. Here he narrowly watched the motions of the Koreish, and was soon apprised of their machinations: for the abovementioned conspiracy was scarcely formed, when by some means or other it came to Mahomet's knowledge; and he gave out that it was revealed to him by the angel Gabriel, who also commanded him to retire from Mecca. The conspirators were already assembled at the prophet's door; but he, to amuse them, ordered Ali to lie down in his place, and wrap himself in his green cloak: this Ali complied with, and Mahomet miraculously, according to the Arabs, escaped to the house of Abu Becr. The conspirators, in the mean time, perceiving through a crevice Ali wrapped up in the green cloak, took him for Mahomet himself, and watched there till morning, when Ali arose, and they found themselves deceived. The prophet next retired in company with Abu Becr to a cave in Mount Thur, a hill a little south of Mecca. Here he had a still more narrow escape; concerning which we have the following account from an Arabic tradition. "The Koreish having detached a party from Mecca to reconnoitre the mouth of the cave, when they came there, found it covered by a spider's web, and a nest built at the entrance by two pigeons, which they saw, and which had laid two eggs therein. On sight of this they reasoned with themselves in the following manner: 'If any person had lately entered this cavern, the eggs now before us would infallibly have been broken, and the spider's web demolished; there can therefore be nobody in it:' after which they immediately retired. As the prophet, therefore, and his friend, were now saved so miraculously by means of the pigeon's eggs and the interposition of the spider's web, he afterwards enjoined his followers, in memory of so remarkable an event, to look upon pigeons as a kind of sacred animals, and never to kill a spider."

Arabia.

41 He outwits them and escapes.

42 In great danger at Mount Thur.

43 He is pursued and overtaken, but still escapes.

The prophet and Abu Becr having staid in this cave three days in order to recover a little from their consternation, set out for Medina; but the Koreish, being informed of the route they had taken, sent a party after them, under the command of Soraka Ebn Malec. These overtook them; and, as the Arab historians tell us, Soraka's horse fell down when he attempted to seize Mahomet. Upon this he recommended himself to the prophet's prayers, and remounted his horse without hurt: but, as he still continued the pursuit, his horse fell down with him a second time; upon which he returned to Mecca, without offering any farther violence: and Mahomet, thus happily delivered from the greatest dangers, arrived without farther molestation at Medina, where he was received with the greatest demonstrations of joy. This flight of the prophet from Mecca to Medina was reckoned so remarkable by the Moslems, that they made it the era from whence all their remarkable transactions were dated, calling it the *Era of the Hegira*, or *flight*. The beginning of the Hegira corresponded with the 16th of July, A. D. 622.

44 Era of the Hegira.

On Mahomet's arrival at Mecca, his first care was to build a mosque for his religious worship, and a house for himself. The city of Medina at that time was inhabited

Arabia. habited partly by Jews and partly by heretical Christians, that formed two factions which persecuted one another with great violence. This gave the impostor such an opportunity of propagating his new religion, that in a short time the city was entirely at his devotion. Here he strengthened himself by marrying Ayesha the daughter of Abu Becr, though then only seven years of age, and gave his own daughter Fatima in marriage to Ali, the son of Abu Taleb. The next point he had in view was the union of the Mohajerin, or those who fled from Mecca on account of their religion, with the Ansars above mentioned. To facilitate this, after his mosque and house were finished, he established among the Moslems a fraternity, the principal statute of which was, that they should not only treat one another like brethren, but likewise most cordially love and mutually cherish one another to the utmost of their power. But lest even this should prove insufficient, he coupled the individuals of the two bodies of Ansars and Mohajerin; and this was the last transaction of the first year of the Hegira.

45 Union of the Ansars and Mohajerin.

The next year was ushered in according to Abulfeda, with a change of the *Kebla*, or place whither the Mahometans were to turn their faces in prayer. At first it had been declared to be perfectly indifferent where they turned their faces. Afterwards he directed them to pray with their faces towards the temple of Jerusalem, probably with a view to ingratiate himself with the Jews; and now, in order to gain the Pagan Arabs, he ordered his followers to pray with their faces towards the east. This inconstancy gave great offence, and occasioned the apostasy of many of his disciples. About this time Mahomet receiving advice that a rich caravan of the Koreish was on the road from Syria to Mecca, he detached his uncle Hamza, at the head of 30 horse, to seize upon it; who accordingly lay in wait for it in one of the woods of Yamana, through which it was to pass: here, however, he was informed that the caravan was guarded by 300 men, so that he returned without making any attempt; but the prophet made the proper dispositions for acting hereafter against the Koreish with success. This year also Mahomet sent out a party of 60 or 80 horse, all Mohajerin, except one who was an Ansar, to make reprisals on the Koreish. They were met by a party of their enemies, and both sides immediately prepared for an engagement: however, they parted without bloodshed, except one of the Koreish, who was killed by an arrow shot by one of the Moslems.

46 Mahomet takes a caravan, and gains the battle of Bedr.

Mahomet having now put himself into an offensive posture, began in earnest to make reprisals on the Koreish. His first exploit was the taking of a caravan attended by a small guard; and this being accomplished by a party consisting only of nine men, contributed greatly to encourage the Moslems. But what most established the impostor's affairs, and was indeed the true foundation of all his future greatness, was his gaining the battle of *Bedr;* of which we have the following account.—The prophet being informed that Abu-Sofian Ebn Harb escorted a caravan of the Koreish with only 30 or 40 men, resolved to advance at the head of a small detachment of his troops to intercept it. To this he was excited by the riches of the caravan, which consisted of a large quantity of merchandise, consisting of the riches of Syria, carried on the backs of a thousand camels. He therefore sent out a party to reconnoitre it, with orders to wait in some convenient place where they might remain undiscovered. But Abu Sofian having notice of Mahomet's motions, despatched a courier to Mecca, requesting succours from his countrymen, that he might be able to defend the caravan. Upon this Mahomet drew together all his force, which amounted to no more than 313, while his enemies consisted of very near 1000, Abu Sofian having been reinforced by the Meccans with 950 men. The two armies did not long remain in a state of reaction: but before the battle three champions from each party engaged each other in single combat. In this the Moslem champions were victorious, and the event greatly discouraged the Korcish. Mahomet, in the meantime, taking advantage of this lucky event, offered up his prayers to God with great fervency and vehemence; after which, feigning himself in a trance, he pretended that God had assured him of victory. Then throwing an handful of dust or gravel towards the enemy, he cried out, "May the faces of them be confounded;" and attacked the Koreish with such bravery, that they were soon put to flight, leaving 70 dead on the spot, and having as many taken prisoners. The loss on Mahomet's side was only 14 men, and among the prisoners was Al Abbas, the prophet's uncle.

Though this action may seem of little consequence in itself, it was of very great advantage to Mahomet's affairs at that time. He was immediately treated with the highest respect by the Najashi, or king of Ethiopia, who received a particular account of the victory soon after it was gained; while the superstitious Moslems did not fail to look upon it as an evident declaration of heaven in their favour. Nay, notwithstanding the small number of enemies to be overcome, and who were only mortal men, these ignorant bigots did not hesitate to own the assistance of no less than 4000 angels, who according to them, rode on black and white horses, having on their heads white and yellow sashes, that hung down between their shoulders.

Notwithstanding this disaster, however, Abu Sofian made a pretty good retreat, and conducted the greatest part of the caravan to Mecca. This chagrined the Moslems, though they found great spoil on the field of battle; the division of which had likely to have proved fatal to their cause, by the quarrels that it occasioned among them. So violent, indeed, were the disputes on this occasion, that the impostor was obliged to pretend an immediate revelation from heaven, empowering him to retain a fifth part for religious purposes, and to distribute the rest equally. This became a law for his successors; but, with regard to himself, the prophet often took the liberty of infringing it; for which, no doubt, a new revelation was always a ready and convenient salvo. As for those who were slain on Mahomet's part in this battle, they were all looked upon by the Moslems as martyrs; and the prophet perceiving among the prisoners two of his inveterate enemies, immediately caused their heads to be struck off.

47 His law concerning the division of spoils.

The Koreish, in order to be revenged on Mahomet for their late defeat at Bedr, sent Amru Ebn Al As, who afterwards conquered Egypt, with some other of their principal people, on an embassy to the king of Ethiopia,

Arabia. Ethiopia, in order to interest him in the quarrel. To do this the more effectually, they accused Mahomet and his followers of speaking disrespectfully of JESUS and his mother MARY; which accusation they hoped would likewise induce him to deliver up the Moslem refugees that were then at his court. But the bad success that had attended the arms of the Koreish hitherto, joined to the excuses made by the refugees, not only hindered the Najashi from delivering them up, but also prompted him to dismiss the ambassadors, and return the presents they had brought him. In the mean time, Abu Sofian, who had sworn never to use perfumes or enjoy women till he had another battle with Mahomet, set out from Mecca with a body of 200 horse. He advanced to a post within three miles of Medina; from whence he sent a detachment, who burnt a barn, together with a man in it that was winnowing wheat. Mahomet being informed of this outrage, moved immediately towards him with a detachment of cavalry; but Abu Sofian was so intimidated by his approach, that he fled with precipitation, leaving behind him all the sacks of flour or meal that had been brought for the subsistence of his troops. Instead therefore of coming to an engagement with the impostor, as he had sworn, he contented himself with alarming the country, and pillaging such as he suspected of favouring Mahometanism.—This year also Mahomet conquered the tribes called *Banu Solcim*, *Ghatfan*, and the *Banu Kainoka;* plundering likewise a rich caravan belonging to the Koreish, and acquiring from thence 25,000 dirhems for his own share of the plunder.

48 Abu Sofian's cowardice.

In the year of Christ 625, being the third of the Hegira, the Koreish assembled an army of 3000 men, among whom were 200 horse and 700 armed with coats of mail. The command of this army was given to Abu Sofian, who was attended with his wife Henda Bint Otba, and sat down at a village about six miles distant from Medina. Mahomet being much inferior to the enemy, resolved at first to keep himself within the town, and receive them there; but afterwards, by the advice of his companions, marched out against them at the head of 1000 according to some, 1050 according to others, or, as some say, only 900 men. Of these 200 were cuirassiers; but he had only one horse beside his own in the whole army. He distributed three standards among his troops; of which one was given to the tribe of Aws, another to that of Khazraj, and the third to the Mohajerin. The grand standard was carried before the prophet by Mosaab Ebn Omair. With these forces Mahomet formed a camp in a village near Ohod, a mountain about four miles north of Medina, which he contrived to have on his back: and the better to secure his men from being surrounded, he placed 50 archers, the flower of his troops in the rear, with strict orders not to quit their post. On the other hand, the army of the Koreish was drawn up in the form of a crescent, and made a very good appearance. The right wing was commanded by Khaled Ebn Al Walid, afterwards so terrible to the Greeks; the left by Acrema Ebn Abu Jahl; and the centre by Abu Sofian. The corps de reserve was headed by Abu Sofian's wife, accompanied by 15 other matrons, who performed the office of drummers,

49 Battle of Ohod.

lamenting the fate of their countrymen slain at Bedr, in order to animate the troops who attended them. The attack was begun by the Moslems, who fell upon the enemy with such fury, that their centre immediately began to give way. Ali, or, according to Abulfeda, Hamza, slew Arta the enemy's great standard-bearer; which struck them with such terror, that they soon betook themselves to flight, falling foul upon their own corps de reserve. Victory had now been no longer doubtful, notwithstanding the vast inferiority of Mahomet's troops, had not the 50 archers, contrary to the prophet's express command, quitted their post to pillage the enemy. Upon this Khaled, perceiving the Moslem army to be greatly exposed, attacked them in the rear with such bravery, that he turned the fortune of the day. Not content with putting the troops there in disorder, he cried out with all his might, "Mahomet is slain;" and this had such an effect upon the Moslems, that they immediately took to their heels, nor could the utmost endeavours of the prophet himself afterwards rally them. He therefore found himself obliged to quit the field of battle; in doing which he was very near losing his life, being struck down by a shower of stones, and wounded in the face by two arrows, which occasioned the loss of two of his fore-teeth. He likewise received a contusion on his upper lip; and had even been killed on the spot, had not one of his companions, named *Telha*, Abu Becr's nephew, received a blow that was levelled at him. On this occasion Telha received a wound in his hand, which deprived him ever after of the use of some of his fingers. Of the Moslems 70 were slain; among whom were Hamza, the prophet's uncle, and Mosaab, the standard-bearer. Amongst the wounded were Abu Becr, Omar, and Othman; but as soon as they understood that the prophet was safe, they returned to the charge with a considerable body, and after an obstinate dispute, carried him off. The good retreat made by these champions so discouraged the troops of Abu Sofian, that they did not pursue the flying enemy, but contented themselves with remaining masters of the field of battle; nor did that general, though he exulted not a little in his victory, make any further use of it than to give Mahomet a challenge to meet him the next year at Bedr, which was accepted; and after his return to Mecca, he desired a truce with the Moslems, which was readily granted.

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50 Mahomet defeated.

51 He apologizes for defeat.

This defeat had like to have proved the total ruin of the impostor's affairs, and must have inevitably done so had the conquerors made the least use of their victory. Some of his followers now asserted, that had he been really a prophet sent from God, he could not have been thus defeated: and others were exasperated on account of the loss of their friends and relations who had been slain in the late engagement. To still the murmurs of the former, he laid the blame on the sins of those who had accompanied him; and, to pacify the latter, he pretended a revelation from heaven, wherein the period of all men's lives was said to be unalterably fixed, without regard to their own actions, or to any external objects: so that those who were killed in battle behoved to have died, though they had remained at home in their own houses. By the assistance of this last doctrine he encouraged his followers to fight, without

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out fear, for the propagation of their faith, as all their caution would not be sufficient to avert their destiny, or prolong their lives even for a single moment.

The next year, (A. D. 626), Mahomet, besides several other less considerable successes, redueed a fortress belonging to the Jewish tribe of Al Nadir, who had revolted on account of the defeat at Ohod. On this occasion, by an express revelation as he pretended, he kept the whole booty to himself: and, about the same time, forbade his followers the use of wine, or to play at games of chance, on account of the disturbances and quarrels which were likely to be excited by that means among them. This year also he marched with a body of infantry to Bedr, to meet Abu Sofian, as he had promised the year before: but that general's heart failing him, he returned home without facing the prophet; and this piece of cowardice the Moslems did not fail to

52 Siege of Medina.

impute to a terror sent immediately from God. The year following, however, the Koreish, in conjunction with the tribe of Ghatfan, and the Jews of Al Nadir and Koreidha, assembled an army of 12,000 men, with which they formed the siege of Medina; thus threatening the impostor and all his followers with utter destruction at once. On the enemy's approach, Mahomet, by the advice of a Persian named *Salman*, ordered a deep ditch to be dug round the city, and went out to defend it with 3000 men. The Arabs having invested the town, both sides remained in a state of inactivity for some time; which was so well employed by the impostor, that he found means to corrupt some of the leading men in the enemy's camp. The good effects of this soon appeared; for a champion having advanced to the Moslem intrenchments, and challenged the best man in their army to fight him in single combat, the challenge was immediately accepted by Ali, who slew him and another that came to his assistance; after which, those who had been corrupted by Mahomet's agents so soured a considerable part of the forces, that

53 The siege raised.

they deserted their camp; upon which all the rest were obliged to raise the siege and return home.

The prophet, being now happily delivered from the most powerful combination that had ever been formed against him, was visited by the angel Gabriel; who asked him, whether he had suffered his men to lay down their arms, when the angels had not laid down theirs? ordering him at the same time to go immediately against the tribe of Koreidha, and assuring him that he himself would lead the way. Upon this Mahomet immediately set out for the fortress of the Koreidhites, and pushed on the siege with so much vigour, that, though it was deemed impregnable, he obliged the garrison to capitulate in 25 days. The Koreidhites, not daring to trust themselves to the impostor's mercy, surrendered at discretion to Saad Ebn Moadh, prince of the tribe of Aws, hoping that he, being one of their old friends and confederates, would have some regard for them. Here, however, they found themselves disappointed; for Saad, being highly provoked at them for assisting the Koreish while in league with Mahomet, ordered the men to be put to the sword, the women and children made slaves, and their goods divided

54 Khoreidhites massacred.

among the Moslems. This sentence was no sooner heard by Mahomet, than he cried out that Saad had pronounced the sentence of God; and, in consequence of this decision, ordered the men, to the number of 600 or 700, to be immediately massacred. The women and children were also carried into captivity. Their immoveable possessions were given to the Mohajerin, and the goods divided equally.

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Mahomet now continued to be successful, gradnally reducing the Arab tribes one after another. In 628, he sent an agent to Constantinople, desiring leave of the Greek emperor to trade with his subjects; which was immediately granted. The same year also he concluded a peace for ten years with the inhabitants of Mecca, and obtained liberty the next year to perform his devotions at the Caaba. What tended considerably to bring about this pacification was an account brought to the Koreish by one whom they had sent with an actual defiance to Mahomet, of the prodigious veneration which his followers had for him. This messenger acquainted them that he had been at the courts both of the Roman emperors and of the kings of Persia, but never saw any prince so highly respected as Mahomet was by his companions. Whenever he made the ablution, in order to say his prayers, they ran and caught the water which he had used; whenever he spit, they licked it up, and gathered up every hair that fell from him, with great veneration. This intimated how desperately they would fight in his defence, and probably inclined his enemies to avoid hostilities. In 629, the impostor began to think of propagating his religion beyond the bounds of Arabia, and sent messengers to several neighbouring princes to invite them to embrace Mahometanism; but, before sending the letters, he caused a silver seal to be made, on which were engraved in three lines the following words, "MAHOMET THE APOSTLE OF GOD." This seal he believed would procure the letters to which it was affixed a more favourable reception at the courts of those princes whither they were directed. The first to whom he applied was Khosru Parvis the king of Persia; but he, finding that Mahomet had put his own name before his, tore the letter in pieces, and sent away the messenger very abruptly. He also sent a letter to the same purpose to Constantinople; but though the emperor Heraclius dismissed his messengers honourably, he refused to abandon the Christian faith. Besides these, he wrote five other letters, which he distributed among those who he thought would be most likely to acknowledge him for an apostle. However, we do not hear that by means of letters he ever introduced his religion into a foreign country.—

55 Prodigious veneration for Mahomet.

56 He invites foreign princes to embrace his religion.

But while our impostor was thus going on in the full career of success, and indnstriously propagating his infamous falsehoods by all the means he could think of, he was poisoned by a maid, who wanted, as she said, to make an experiment whether he was a prophet or not. This was done by communicating some poison to a shoulder of mutton, of which one of his companions, named *Bashar Ebn Al Bara*, eating heartily, died upon the spot; and Mahomet himself, though he recovered a little, and lived three years after, yet never enjoyed perfect health. Notwithstanding this misfortune, however, he still continued his enterprises. The year 630 proved remarkably fortunate. It was ushered in by the conversion of Khaled Ebn Al Walid, Amru Ebn Al As, and Othman Ebn Telha, three of the most considerable persons among the Koreish; and this soon enabled him to become master of the whole peninsula of Arabia. This year also the inhabitants of Mecca

57 Is poisoned, but recovers.

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58 Meccans violate the treaty with Mahomet.

took it into their heads to violate the treaty concluded with Mahomet: for the tribe of Becr, who were the confederates of the Koreish, attacking those of Khozaab, who were in alliance with Mahomet, massacred 20 of them, and afterwards retired; being supported in this action by a party of the Koreish themselves.—The consequence of this violation was soon apprehended; and Abu Sofian himself made a journey to Medina, in order to heal the breach and renew the truce: but in vain; for Mahomet, glad of this opportunity, refused to see him. Upon this he applied to Abu Becr, Ali, Omar, and Fatima, to intercede for their countrymen with the prophet; but some of these giving him rough answers, and others none at all, he was obliged to return to Mecca as he came. Mahomet immediately gave orders for the necessary preparations, that he might surprise the Meccans, who were by no means in a condition to receive him; but Hateb Ebn Abu Baltaa, hitherto a faithful Moslem, attempted to give them notice of their danger by a letter; though without effect. His letter was intercepted: and he alleged in his excuse, that the only reason he had for his conduct was to induce the Koreish to treat his family with kindness. This excuse the prophet accepted, as he had greatly distinguished himself at the battle of Bedr, but strictly forbade any such practices for the future; which having done, he immediately made the necessary dispositions for setting forward.

Mahomet's army, on this occasion, was composed of Mohajerin, Ansars, and other Arabs, who had lately become proselytes. As they drew near to Mecca, he set up his standards, and advanced in order of battle to Mar Al Dharan, a place about four parasangs from Mecca, where the whole army encamped. Here he ordered 10,000 fires to be lighted, and committed the defence of the camp to Omar, who cut off all communication with the town, so that the Meccans could receive no certain advice of their approach. Among others that came from Mecca to reconnoitre the Moslem camp, Abu Sofian Ebn Harb, Hakim Ebn Hezam, and Bodail Ebn Warka, fell into Omar's hands; and being conducted to Mahomet, were obliged to embrace Mahometanism in order to save their lives.

The first rumour of this expedition had not a little terrified the Koreish, though they were not apprised that the prophet had resolved upon a war; but perceiving now, upon the report of Abu Sofian, who had been sent back to them, that the enemy was at their gates, they were thrown into the utmost consternation. Of this Mahomet being informed, he resolved to take advantage of the confusion that then reigned among them. He therefore first despatched Hakem and Bodail to the Meccans, inviting them to take an oath of allegiance to him, and become converts to his new religion; after which, he made the following disposition of his forces. Al Zobeir was ordered to advance with a detachment toward the town on the side of Mount Cada. Saad Ebn Obad, prince of the tribe Khazraj, marched by his order with another detachment towards the height of Coba, which commands the plain of Mecca. Ali commanded the left wing of the army, consisting of Ansars and Mohajerin. The prophet put into his hands the great standard of Mahometanism, with orders to post himself upon Mount Al Hajun, and to plant the standard there; strictly enjoining him, however, not to stir from thence till he himself arrived, and till a proper signal should be given him from Saad for that purpose. Khaled led the right wing, consisting of the Arabs lately converted, with which he was to possess himself of the plain of Mecca. Abu Obeidah commanded in the centre, which consisted entirely of infantry; the prophet himself remained in the rear, from whence he could most easily despatch his orders to all the generals as occasion should require. He expressly prohibited Khaled and all his other officers from acting offensively unless they were first attacked. Things being in this situation, the army upon a signal given put itself immediately in motion. The prophet mounted his camel with great alacrity, and was that day clothed in red. Al Zobeir pursued the route assigned him without opposition; nor did Saad discover the faintest traces of an enemy: Ali took possession of his post without the loss of a man; and in like manner Abu Obeidah seized on the suburbs. Khaled, however, in his march to the plain, was met by a large body of the Koreish and their confederates, whom he immediately attacked and defeated, putting 28 of them to the sword. Not content with this, he pursued them into the town, and massacred a great number of the inhabitants; which so terrified the rest, that some shut themselves up in their houses, while others fled different ways in order to avoid the fury of the merciless and impious tyrant, who was now become master of the city. Thus was Mecca reduced, with the loss only of two men on the side of the impostor.

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59 Mecca taken.

Mahomet being now master of the city, made his public entry into it exactly at sunrising. When the first tumult was over, he went in procession round the Caaba seven times, touching the corner of the black stone with the staff in his hand, as often as he passed it, with great devotion. Then he entered the Caaba; where observing several idols in the form of angels, and the statues of Abraham and Ishmael with the arrows of divination in their hands, he caused them all to be destroyed. He also broke in pieces with his own hands a wooden pigeon, that had long been esteemed a deity by the idolatrous Koreish. Afterwards entering into the interior part of the Caaba, he repeated with a loud voice the form used at this day by the Mahometans, "Allah Akbar, God is great," &c. turning towards every part of the temple. Then he prayed between the two pillars there, with two inclinations, as well as without the Caaba; saying to those that attended him, "This is your Kebla, or the place towards which you are to turn your faces in prayer."

Having thus effectually subdued the Koreish, put an end to all commotions, and purged the Caaba of 360 idols, the prophet's next care was to ingratiate himself with the people. Sending therefore for some of the principal of them, he asked them what kind of treatment they expected from him, now he had conquered them? To this they replied, "None but what is favourable, O generous brother:" upon which he dismissed them, telling them they were from that moment a free people. After this, pretending a new revelation, he restored the keys of the Caaba to Othman Ebn Telha, who was in possession of them before; and who was now so much affected by this piece of justice, that he immediately became a proselyte. Next day the prophet declared Mecca an asylum, and publicly

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gave out that he would maintain to the utmost of his power the inviolable security of the place. He then was solemnly inaugurated; after which he proscribed, according to some, six men and four women, according to others, eleven men and one woman: but of these only three men and one woman were put to death; the rest being pardoned on their embracing Mahometanism, and one woman making her escape. The remainder of this year was spent in various expeditions against different tribes of the Arabs, which were in general attended with success.

The 9th year of the Hegira, being that of Christ 631, is called by the Mahometans the year of *Embassies;* for the Arabs, who had hitherto been expecting the issue of the war between Mahomet and the Koreish, no sooner saw that tribe, which was the most considerable of the whole, submit to him, than they began to come in to him in great numbers, and to send embassies to make their submissions to him, both while at Mecca and after his return to Medina, whither he had returned soon after the taking of Mecca: and this good fortune continued without interruption to the year 632, when the famous impostor breathed his last, having just reduced under his subjection the whole peninsula of Arabia, and being ready to break into the neighbouring kingdoms in order to satisfy his ambition.

60 Mahomet dies.

61 Great confusion on his death.

The death of Mahomet occasioned such a consternation in Mecca, that the governor hid himself, fearing to be called to an account for his former conduct; and the inhabitants, upon the first arrival of this melancholy news, considered themselves as destitute of all manner of protection. After the first impressions of their fear, however, were over, they began to meditate a revolt; but were prevented by one Sohail Ebn Amru, a principal man of the Koreish. The tumults at Medina, however, were not so easily appeased. The news of this sad event were no sooner published there, than a number of people assembled before his door, crying out, "How can our apostle be dead! Our intercessor, our mediator has not entirely left us! He is taken up into heaven, as was Isa (Jesus); therefore he shall not be buried." This was confirmed by Omar; who drew his sword, and swore, that if any person affirmed Mahomet to be dead, he would cut off his hands and his feet. "The apostle of God (says he) is not dead: he is only gone for a season, as Moses the son of Amram was gone from the people of Israel for 40 days, and then returned to them again." The populace therefore kept the body above ground, even after the belly began to swell; nor could the prophet's uncle Al Abbas, notwithstanding this, convince them to the contrary. Upon hearing of these transactions, Abu Becr immediately posted from Al Sonah, another quarter of the city, and expostulated with them in the following manner: "Do you worship Mahomet, or the god of Mahomet? If the latter, he is immortal, and liveth for ever; but if the former, you are in a manifest error, for he is certainly dead." The truth of this assertion he immediately evinced from several passages of the Koran, in so clear and conclusive a manner, that he not only satisfied Omar, but calmed the minds of all the people.

The prophet having left no directions concerning a successor, very warm disputes arose between the Mohajerin and the Ansars about the right of electing a caliph. The former insisted on having that right, because they had attended Mahomet in his flight to Medina; and the others, because they had supported him when expelled from his native city, &c. In short, the disputes became so hot, that an open rupture must have commenced, had not they been terminated by a proposal that each party should choose a caliph. This amused them a little for the present; but not proving perfectly agreeable to the Mohajerin, Abu Becr proposed two persons, Omar and Abu Obeidah, offering to swear allegiance to him on whom the suffrages of both parties should fall. But this producing no decision, Omar swore fealty to Abu Becr, and his example was followed by all the Moslems on the spot; upon which he was acknowledged both by the Mohajerin and Ansars as the rightful successor of Mahomet.

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62 Abu Becr succeeds him.

63 Ali dissatisfied.

These transactions, however, were not at all agreeable to Ali, who, as son-in-law to the prophet, had undoubtedly the best title to the succession. He expostulated with Abu Becr about the manner of his election, which had been effected without his knowledge; and received for answer, that the exigence of affairs would not admit of deliberation; and that, had not the election been so sudden, the opposite party would have wrested the power entirely out of their hands. Ali was in Fatima's apartment when Abu Becr had the good luck to be elected caliph; and, upon the arrival of the news, expressed great dissatisfaction. He found himself, however, soon obliged to change his note, when the new caliph sent Omar with orders to burn the house where he and his friends were assembled, in case he did not concur in supporting the election. But notwithstanding his forced compliance on this occasion, it is not to be doubted that he reckoned himself injured; and his pretensions were thought to be just by a great number of Moslems: which notion is entertained by a very considerable party of Mahometans even at this day; and these are called *Shiites* or *sectaries*.

Soon after Abu Becr's accession, many of the Arabs refused to pay the tribute imposed upon them by Mahomet, and even attempted to shake off his yoke altogether. This so alarmed the caliph and his subjects at Medina, that, fearing a general revolt, they sent all not able to bear arms into the cavities of the rocks and mountains, and put themselves in as good a posture of defence as the short time would permit. In the mean time Khaled was despatched with an army of 4500 men to reduce the rebels: and he soon coming up with them, gave them a total defeat, brought off a vast quantity of plunder, and made many of their children slaves. Nor was he content with this; for being sent by Abu Becr to Malek Ebn Noweirah, an eminent person among the Arabs, and famous for his skill in poetry as well as his horsemanship and bravery, to bring him over by fair means, he immediately ordered his head to be cut off. By this means, indeed, he extinguished all the remains of rebellion; but rendered himself exceedingly obnoxious to Abu Becr, who would have put him to death, had not Omar strongly interceded for him: for Khaled had greatly exceeded his commission, as Malek had returned to Mahometanism, and had offered to pay the money. This was not, however, the only piece of service Khaled performed at this time; he also defeated and killed Moseilama, who had set up for a prophet in the time of Mahomet, and even wanted to take the grand impostor himself into company with him. The same

64 Rebellions extinguished by Khaled.

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same general likewise defeated and dispersed the troops of another prophet, called *Toleiah Ebn Khowailed*, obliging himself to remain concealed till after the death of Abu Becr. About the same time another body of rebels committed great disorders in the province of Bahrein. Against these Abu Becr despatched Al Ola at the head of a considerable army, who soon obliged them to return to Mahometanism; having put great numbers of them to the sword, and plundered their country in a dreadful manner.

65 War with the Greeks.

Abu Becr having now no enemy to contend with in Arabia, and being free from all apprehensions of a competitor, resolved next to turn his arms against the Greek emperor. Some skirmishes had happened, in the time of Mahomet, between the Moslems and Greeks; in one of which Zeid, a Moslem commander, had been killed. To revenge his death, his son Osama was on the point of making an irruption into Syria at the time of Mahomet's decease. This enterprise the caliph ordered him to go on with; and it was executed by Osama with great success. He entered Syria, and laid waste the country, doing the Greeks a good deal of damage: after which he returned to Arabia without any considerable loss.

66 Kingdom of Hira destroyed.

Soon after the caliph sent Khaled at the head of a powerful army to invade Irak, and put an end to the kingdom of Hira. In this undertaking he was attended with his usual success. The king Al Mondar Al Maghrur lost his life in defence of his dominions; and the kingdom was totally destroyed, after it had continued 622 years and eight months, as we have already hinted. The inhabitants became tributaries; and, according to Eutychius, the tribute collected on this occasion amounted to 70,000 pieces of money. This, according to Al Makin, was the first tribute money ever brought to Medina.

The exigence of the caliph's affairs in Syria, however, did not suffer Khaled long to remain in Irak. Before the departure of the army under his command, Abu Becr had come to a resolution to invade Syria; and finding his design approved by the principal officers of his court, he sent circular letters to the petty princes of Yaman, the chief men of Mecca, &c. informing them of his intention to take Syria out of the hands of the infidels; acquainting them, at the same time, that a war for the propagation of the true religion was an act of obedience to God. To these letters they paid a proper regard; and in a very short time appeared at Medina at the head of their respective troops, and pitched their tents round the city. Here they staid till the Moslem army destined to act against the emperor was completely formed, and in a capacity to begin its march. The caliph having viewed the troops from the top of a hill, and prayed to God for success, attended the generals a little way on foot. As the generals were on horseback, they could not forbear expressing their uneasiness at the caliph's thus demeaning himself; but he told them, that it signified little whether they walked on foot or rode, as they had all the same views, viz. the service of God, and the propagation of religion. At parting, he addressed Yezid Ebn Abu Sofian, whom he had invested with the supreme command, in the following manner: "Take care, Yezid Ebn Abu Sofian, to treat your men with tenderness and lenity. Consult with your officers on all pressing occasions, and encourage them to face the enemy with bravery and resolution. If you shall happen to be victorious, destroy neither old people, women, nor children. Cut down no palm trees, nor burn any fields of corn. Spare all fruit trees, and slay no cattle but such as you shall take for your own use. Adhere always inviolably to your engagements, and put none of the religious persons you shall meet with in monasteries to the sword. Offer no violence to the places they serve God in. As for those members of the synagogues of Satan *who shave their crowns*, cleave their skulls, and give them no quarter, except they embrace Islamism (Mahometanism), or pay tribute."

67 Abu Becr's directions to his general.

Arabia

The Greek emperor was greatly alarmed at the approach of the Moslem army; however, he made all necessary preparations for his defence, and sent out a detachment to reconnoitre the enemy. These having fallen in with the Arabs, a battle ensued, in which the Greeks were defeated with the loss of 1200, while the Arabs lost only 120 men. This was succeeded by a great many skirmishes, in which the Moslems were generally victorious. The rich spoil taken on these occasions were sent as a present to the caliph; who having acquainted the inhabitants of Mecca with his good success, they were thereby so elated, that they furnished him with a strong reinforcement, which was immediately ordered into Syria. The Greek emperor, in the mean time, having ordered another body of his troops to advance towards the frontiers, they found an opportunity of engaging the Moslem army under Abu Obeidah, a person of great piety, but little experience in war. Him they totally defeated; and Abu Becr was so much provoked at his defeat, that he deprived him of the command, which was given to Khaled, who was for this purpose recalled from Irak. That general's first exploit was the reduction of Bostra, a very rich and populous city of Syria Damascena; which, however, he accomplished by treachery rather than by force of arms. Having left a garrison of 400 men in Bostra, and being joined by Abu Obeidah's forces, he laid siege to Damascus with an army of 45,000 men. This so alarmed the emperor, that he despatched an army of 100,000 men, commanded by one Werdan, to the relief of that city. Khaled, on hearing of the approach of this formidable army, was for marching immediately with all his forces, and giving them battle; but this was opposed by Abu Obeidah, as it would enable the inhabitants of Damascus to procure fresh supplies both of arms and provisions, and consequently render the reduction of the place more difficult. It was, therefore, at last agreed that a body of troops should be detached under Derar Ebn Al Wazar, an excellent officer, and an implacable enemy to the Christians (as indeed were all the Moslem generals except Abu Obeidah), to fight the enemy, whilst the siege was carried on by the two generals.

68 The Moslems defeated.

69 Damascus besieged

Khaled, fearing lest Derar's furious zeal and hatred to the Christians should prove fatal to his troops, told him before his departure, that though they were commanded to fight for the propagation of their religion, yet they were not allowed to throw away the lives of their men; and therefore ordered him to retire to the main body of the army, in case he found himself pressed by a superior force. But Derar, deaf to this salutary admonition, with his small body of troops rushed upon

70 The Gr defeate with gr slaught

Arabia.

upon the whole Christian army, notwithstanding the vast disproportion of numbers. He charged them, however, with such bravery, that he penetrated to the spot where the general gave his orders, killed the standard-bearer, and carried off the standard itself, in which was a cross richly adorned with precious stones. Nay, he would in all probability have put Werdan's army to flight, had not the general's son, the commandant of Hems, arrived in the heat of the engagement, with a body of 10,000 men; with which he attacked the Moslems so briskly in the rear, that he forced them to retire, and took Derar himself prisoner. This so discouraged them, that they would have taken to their heels, had not Rafi Ebn Omeirah animated them with the following words: "What! do you not know, that whoever turns his back upon his enemies offends God and his prophet? and that the prophet declared the gates of paradise should be open to none but such as fought for religion? Come on! I will go before you. If your captain be dead, or taken prisoner, yet your God is alive, and sees what you do." This exhortation had such an effect upon his troops, that returning to the charge, they maintained their ground with unparalleled bravery, till Khaled arrived with a considerable body of infantry and 1000 horse. The arrival of this general soon turned the fortune of the day. A party of the imperial army went over to the Moslems, and the rest took to their heels. Derar also was retaken, and carried off in triumph. However, Werdan having collected the scattered remains of his forces, and received a reinforcement from the emperor, found his army still to amount to 70,000 men, with which he resolved to make another attempt for the relief of Damascus. They were attended with still worse success in this second attempt than they had been before; being utterly defeated, with the loss of 50,000 men, so that they were no more in a condition to attempt any thing; and, in consequence of this, the city was soon taken, notwithstanding the utmost efforts of the besieged.

71 The city taken.

72 Abu Beer dies, and is succeeded by Omar.

This disastrous event happened in the year 634; and the very day that Damascus was taken, Abu Beer died of a consumption in the 63d year of his age. He was succeeded by Omar, who was proclaimed caliph that very day; and the first title assigned him was, *The caliph of the caliph of the apostle of God.* But the Arabs considering, that by the additions to be continually made at the accession of every new caliph, the title would become too long, they with one voice saluted him, *Emperor of the believers;* which illustrious title descended afterwards to his successors by a kind of incontestable right.

The new caliph was no sooner settled than he replaced Abu Obeidah in the command of the army in Syria, being greatly displeased with the cruel and bloodthirsty disposition of Khaled. He also commanded Abu Obeidah to have an eye upon Palestine, and to invade it as soon as an opportunity offered. Khaled bore his disgrace with great magnanimity; and swore, that though he had always had the greatest regard for Abu Beer, and the utmost aversion to Omar, he would submit to God's will, and obey the new caliph as the lawful successor of Mahomet. The Moslem forces in the mean time having made all proper dispositions for improving the advantages they had gained, Abu Obeidah sent a detachment of 500 horse to a place called *Dair Abel Kodos*, about 30 miles from Damascus, to plunder the Christians there. In this place there lived a priest so eminent for his sanctity, that the neighbouring people of all ranks resorted to him for his blessing and instruction. When any person of distinction married, he took with him his new spouse, in order to receive this holy man's benediction. The fame of this priest's sanctity drew such numbers of people to that place every Easter, that a great fair was kept annually at his house, to which were brought vast quantities of the richest silk, plate, jewels, &c. When the Arabs drew near to this place, to which they were conducted by a Christian, they were informed that the governor of Tripoli had married his daughter to a person of distinction, who had carried his lady to the above-mentioned priest. She was attended by a guard of 5000 men; besides which, the Jews, Greeks, Copts, and Armenians, at that time assembled about the monastery, amounted to 10,000. Notwithstanding this, the Moslem commander determined to carry off the lady; and having told his men, that they should either enjoy the riches of the Christians, or the pleasures of paradise, he commanded them to fall on the enemy. The impetuosity of these enthusiasts at first bore all down before them; but the Christians, perceiving they were but a handful of men, surrounded them on all sides, and resolved to make them pay dear for their temerity. But Abu Obeidah, being informed of their dangerous situation, immediately despatched Khaled with a strong detachment to the relief of his distressed countrymen. The consequence of this was, that the Christians were entirely defeated, and the unhappy lady carried off, with 40 maids that waited upon her, as well as all the wealth brought to the above-mentioned fair; among which were many rich garments curiously wrought, and in particular one adorned with the effigies of our Saviour. All these were sold for ten times their weight of gold to some of the opulent Arabs of Yaman. The young lady was given to Abdallah, who kept her to the reign of Yezid. Of this advantage Abu Obeidah sent notice to the caliph by a letter, in which he also acquainted him that some of his men had drunk wine. These delinquents, by the advice of Ali, had each of them 80 stripes bestowed upon the soles of their feet: after which, many others, who had never been suspected of drinking this prohibited liquor, made a voluntary confession, and received the same chastisement.

73 Governor of Tripoli's daughter carried off.

74 Punishment of some soldiers who had drunk wine.

The Moslem general next set about reducing the principal fortresses in Syria, and soon became master of Kinnisrin, Baalbec, Adestan, Shaizar, and Hems; on the news of which, the Greek emperor Heraclius, resolving if possible to put a stop to the cruel and unprovoked ravages of these barbarians, sent against them an army of 240,000 men, commanded by one Manuel, whom the Arabs called *Mahan*. But this vast multitude was utterly defeated by Khaled; upon whom Abu Obeidah conferred the supreme command, on account of his superior skill in military affairs. This battle was fought near a village called *Yermouk;* and, according to the Arabian historians, the Christians had 150,000 men killed and 40,000 taken prisoners, while the Moslems lost no more than 4030 men.

75 The Greeks utterly defeated at Yermouk.

The defeat at Yermouk was immediately followed by

Arabia.

by the loss of the whole province of Palestine. The reduction of Jerusalem was one of its first consequences; and Omar, being apprised of the success of his arms, immediately set out to visit that holy place, at the request, it is said, of the inhabitants. The caliph was attended in his journey by a numerous retinue, most of whom afterwards returned home. He rode upon a red camel, and carried with him two sacks, one of which contained a sort of provision consisting of barley, rice, or wheat, sodden and unhusked, and the other fruits. Before him he had a leather bottle, very necessary in these desert countries to put water in; and behind him a wooden platter. Before he left the place where he had rested the preceding night, he constantly said the morning prayer; after which he addressed himself to his attendants in a devout strain, always uttering before them some pious ejaculations. Then he communicated his provision to them; every one of his fellow travellers eating with him out of the same platter, without the least distinction. His clothes were made of camels hair, and were in a very tattered condition; nor could any thing be more mean or sordid than the figure he made. On the road he distributed justice among his subjects; concerning which we have several anecdotes; but that most to his honour is the following: Having observed some poor tributaries exposed to the heat of the sun, a very cruel punishment in those hot countries, for not being able to pay the sum demanded of them, he ordered them to be released; telling his attendants, that he once heard the apostle of God say, "Do not afflict men in this world; for those who do so, God shall punish in hell fire at the day of judgment." His orders were immediately executed, to the great grief of the oppressors; and the caliph continued his route. On the confines of Syria he was met by Abu Obeidah attended by an escort, who conducted him to the Moslem camp, where he was received with the utmost demonstrations of joy; and from thence to Jerusalem. The morning after his arrival, he said prayers and preached to the troops. In his sermon he repeated the following passage out of the Koran. "Whomsoever God shall direct, he shall be rightly directed; and whomsoever he shall cause to err, thou shalt not find any to defend or to direct." Upon this a Christian rose up, and said aloud twice, "God causes no one to err." Omar made no answer to him, but commanded the Moslems near him to strike off the infidel's head if he repeated those words again; but the priest took care to give him no further interruption. After the conclusion of his sermon, he pitched his tent, made of hair, within sight of the city: then he signed the articles of capitulation; by which the inhabitants were entitled to the free exercise of their religion, the possession of their properties, and his protection.

76 Omar visits Jerusalem.

77 Anecdote of him.

The articles of capitulation being signed, Omar, in pursuance of his engagements, gave the inhabitants a schedule, by which they were secured in the full possession of all that had been agreed upon: after which the gates were opened to him, and he entered the town. He was waited upon by the patriarch Sophronius, with whom he conversed familiarly, and asked him many questions concerning the antiquities of the city. One of the first places they visited was the temple of the resurrection, in the midst of which Omar sat down; and when the hour of prayer was come, told the patriarch he had a mind to pray, and desired him to show him a place for that purpose. Sophronius told him he might do so where he was; but this he absolutely refused. Then the patriarch led him to St Constantine's church; but he likewise declined praying there. At last he said his prayers upon one of the steps of the east gate of the church; telling the patriarch afterwards, that had he prayed in any of the churches, the Moslems would infallibly have taken it from them, which, he said, they might attempt as it was, and therefore gave him a paper wherein the Moslems were commanded not to pray on the steps of St Constantine's church in any numbers, but only one by one. After this he desired the patriarch to show him a place where he might erect a mosque; and was conducted to the place where Jacob's stone lay, on which he slept when he saw the vision of the ladder. This stone had been hitherto slighted, and no building suffered to be erected upon it, in order to fulfil our Saviour's prophecy, that the habitation of the Jews should be left unto them desolate, and that not one stone should be left upon another. In consequence of this neglect it was entirely covered with dirt, which the caliph immediately began to carry away in his vest; and the Moslems soon hastening to assist him, the stone was cleared in a very short time. We are told by Theophanes, that when Omar entered the temple of the resurrection, he was clad in such mean and dirty apparel, that the patriarch took great offence at his appearance, and with much difficulty at last prevailed upon him to put on some clean linen and clothes till his own could be washed. The same author relates, that when the patriarch first saw Omar in that place, he could not forbear crying out, "This is of a truth the abomination of desolation, spoken of by Daniel the prophet, standing in the holy place!" These words, as Mr Ockley imagines, being overheard by the Moslems, they trumped up a story of the patriarch's having owned that the conquest of Jerusalem by Omar was foretold by the prophet Daniel; and that an ancient prophecy was kept in Jerusalem, concerning Omar, wherein his person was described, his name and religion specified, and he declared to be the only man that could reduce that city.

Before the caliph left Syria, he divided that country into two parts; one of which, that lay between Haûran or Aûran and Aleppo, which was not perfectly conquered, he committed to the care of Abu Obeidah, giving him the strictest orders to reduce it as soon as possible. Yezid Ebn Abu Sofian was commanded to take upon him the care of the other, which comprehended Palestine, and the sea coast, and to make himself absolute master of it, having a body of troops assigned him for that purpose. He also directed Amru Ebn Al As to invade Egypt, then in a very languishing condition, with a body of Moslem forces. After having made these dispositions for extending his conquests, Omar set out for Medina, where he arrived in perfect health, to the great joy of the inhabitants, who apprehended, from his long stay at Jerusalem, that he had intended to fix his residence there.

78 He returns to Medina.

Soon after Omar's departure, Yezid advanced to Cæsarea; but found the place so strong that he was obliged to continue some time in a state of inaction.

Abu

Arabia. Abu Obeidah, in the mean time, advanced towards Aleppo, the citadel of which was at that time the strongest in Syria. The citizens were struck with the utmost consternation at his approach. They had at that time two governors, who were brothers, and resided in the castle, which was situated at a little distance from the city. The names of these two governors, who were of very different dispositions, were Youkinna and John. Their father, by the emperor Heraclius's appointment, presided over all that tract which lay betwixt Aleppo and the Euphrates; and, after his death, the chief management of affairs devolved upon Youkinna, his brother John spending his time mostly in devotion and acts of charity. He would therefore gladly have prevailed upon Youkinna to purchase a peace from the Arabs with money, rather than make his country a scene of blood and ravages; but this not suiting the martial genius of Youkinna, he armed a considerable number of the citizens, among whom were several Christian Arabs, and distributed money among them. He then told his men that he intended to act offensively against the Arabs, and even to engage them if possible before they drew too near. To inspire them with the greater resolution, he observed, that the Moslem army was divided into several bodies; one of which had orders to besiege Cæsarea, another to march to Damascus, and the third to invade Egypt. Having thus animated his troops, he put himself at the head of 12,000 of them, and marched forwards to get intelligence of the enemy's motions.

79 A Moslem detachment defeated by Youkinna. Abu Obeidah, in the mean time, had sent before him Caab Ebn Damarah, with 1000 men: giving him express orders not to fight till he had received information of the enemy. Youkinna's spies discovered Caab and his men resting themselves and watering their horses without the least apprehension of danger; of which the general being apprised, he posted one part of his troops in ambuscade, and with the other attacked the Moslems. The Arabs behaved with their usual valour; and at first repulsed the Christians, notwithstanding their superiority in numbers; but being attacked by the troops that lay in ambush, they were at last forced to retire; having 170 killed, and almost all the rest wounded.

80 Aleppo submits to Abu Obeidah. After Youkinna's departure, the inhabitants of Aleppo, considering the calamities that awaited them if their city should be taken by storm, submitted without delay to Abu Obeidah, and were taken under the protection of the caliph. This disagreeable news being communicated to Youkinna, he posted home with all possible expedition, lest an attempt should be made on the castle in his absence. On his arrival at Aleppo, he was so highly incensed against the inhabitants,

81 Cruelty of Youkinna. that he threatened them with death if they did not disannul the treaty with the Arabs, and deliver up the authors of it into his hands. This demand not being immediately complied with, he fell upon the citizens with great fury, and killed 300 of them; among whom was his brother John, whose head he caused to be struck off, charging him with being the author and abettor of the late pernicious scheme. He would have made a much greater slaughter, had not the Moslem army at that instant arrived before the town; upon which Youkinna retired into the castle with a considerable body of troops; but before this could be effected, he was obliged to sustain an attack from the Arabs, Arabia. in which he lost 3000 men. The action was no sooner ended than the inhabitants of Aleppo brought out forty of Youkinna's men, and as a proof of their fidelity delivered them into Abu Obeidah's hands. Of these seven embraced Mahometanism, and the rest were beheaded.

82 He is besieged in the citadel. Immediately after Youkinna had shut himself up in the castle, a council of war was held in the Moslem camp, wherein it was deliberated what measures were to be pursued on the present occasion. Khaled gave it as his opinion, that the castle ought immediately to be attacked with all the Arab forces, before the emperor had time to send them any assistance. This advice was followed by Abu Obeidah, who caused the citadel to be immediately invested; and soon after he had surrounded it with all his forces, made a most vigorous assault. The besieged defended themselves with great bravery, and after a very warm dispute drove the enemy into their camp; and as they threw a great many stones out of their military engines, many of the Moslems were killed, and a much greater number wounded. This encouraged Youkinna to make a sally with a strong party of the garrison the following night. The fires being then out in the Moslem camp, and the besiegers not expecting such an unseasonable visit, 60 of them were killed on the spot, and 50 taken prisoners. Youkinna, however, being briskly attacked by Khaled, who soon drew together a body of troops to oppose him, lost about 100 men in his retreat. The next day, he caused the prisoners to be beheaded in sight of the Moslem camp; and receiving advice that a strong party of Arabian cavalry was sent out to forage, he ordered a body of his horse to drive them to their camp; which they accordingly did, killed 130 of them, seized all their camels, horses, &c. and then retired to the mountains. Here they proposed to remain concealed till the following night, and then return to the castle; but Abu Obeidah, being informed of what had happened, detached Khaled and Derar with a body of troops to pursue the Greeks, and revenge the late affront. Khaled, being informed of the route the Christians had taken, possessed himself of the only pass by which they could return to the castle; and having posted there a body of his men whose courage he could depend upon, took 300 of the Greeks prisoners as they attempted to return, and put all the rest to the sword. The next morning, to retaliate Youkinna's cruelty, the prisoners were all brought out and beheaded in sight of the garrison.

83 His vigorous defence. Notwithstanding this disaster, Youkinna made several sallies with good success, wherein he killed a great number of the enemy, and harassed them to such a degree, that Abu Obeidah found himself obliged, for his greater security, to remove his camp to about a mile's distance from the castle; by which manœuvre he likewise hoped that Youkinna would be less upon his guard. Herein, however, he found himself mistaken: for the Greek commander, by the prudent measures he took, eluded all surprise: and though Abu Obeidah continued the siege for four months after the last mentioned blow given to the garrison by Khaled, yet he had scarce any hopes of making himself master of it at last. Having nothing material to write to the caliph, he remained a long time silent; at which

Arabia. Omar being very much concerned, wrote to him, desiring an account of the affairs in Syria. Abu Obeidah acquainted him that the city of Aleppo had submitted to him; and that the citadel was the only place which held out in all that country, before which he had lost a great number of men, which, he said, had induced him to think of raising the siege, and moving with his army in that tract which lay between Antioch and Aleppo. This news was by no means agreeable to the caliph, who commanded his general to continue the siege at all events, and sent him a reinforcement of Arab troops, together with 70 camels, to assist the infantry in their march.

84 The citadel taken by stratagem. Among the troops sent by Omar in this occasion, there was an Arab of a gigantic size, called *Dames*, who was a man of great courage and resolution. He observing the little progress made by the Moslems, bethought himself of a stratagem by which that fortress might be reduced, which seemed so difficult to be accomplished by force. He therefore desired that Abu Obeidah would assign him the command of a party consisting only of thirty men; which at Khaled's request was readily granted. Then he begged the general to raise the siege, and retire to about three miles distance from the castle, which was likewise immediately complied with. The following night Dames, who had posted himself with his party very near the citadel, found means to seize a Greek, from whom he learned that Youkinna, after the siege was raised, had exacted large sums of money from the citizens, on account of the treaty they had concluded with the Arabs; and that he was one of those who had endeavoured to make their escape from the oppression of such a tyrant, by leaping down from the wall. This man Dames took under his protection; but beheaded five or six others who fell into his hands, and could give no good account of themselves. He then covered his head and shoulders with a goat's skin, and took a dry crust in his hand, creeping on the ground till he got close to the foot of the wall. If he heard any noise, or suspected any person to be near, he made such a noise with his crust as a dog does when he is gnawing a bone; his companions sometimes walking, and sometimes creeping after him in the same manner. He had before despatched two of his men to Abu Obeidah, to desire that a detachment of horse should be sent him by break of day to support his small party, and facilitate the execution of the plan he had formed. At last Dames found an opportunity of raising seven men upon his shoulders, who stood upon one another's shoulders in such a manner that the highest reached the top of the wall. Here he soon placed himself, seized a watchman whom he found asleep, and threw him over the wall. Two others, whom he found in the same condition, he stabbed with his dagger, and threw them over likewise. Then he let down his turban, and drew up the second of his brethren, as they two did the third, and by their help Dames himself and all the rest were enabled to mount the wall. He then privately stabbed the sentry at each of the gates, and put his men in possession of every one of them. The soldiers of the garrison, however, were at last alarmed, and surrounded the Arabs, who were on the point of perishing, when Khaled appeared at the head of a detachment of cavalry. On the sight of that general, who was now grown terrible to the Christians, the besieged threw down their arms, and surrendered at discretion. Youkinna and some of the principal officers turned Mahometans, in order to save their possessions; and the castle, being taken by storm, was pillaged by the Moslems. Dames acquired great glory by this exploit; and, out of complaisance to him, the army did not decamp from Aleppo till he and his men were perfectly cured of their wounds.

Arabia. 85 Youkinna's apostasy.

After the reduction of the citadel of Aleppo, Abu Obeidah intended to march to Antioch; but was diverted by Youkinna, who was now become a violent enemy to the Christians. He told the Moslem general, that his conquest of that part of the country would not be complete without the reduction of Azaz, a place of great importance, where Theodorus, Youkinna's cousin-german, was commandant. This fortress he proposed to become master of, by putting himself at the head of 100 Arab horse, dressed in the Greek habit, who were to attend him to Azaz. Upon his arrival there, he was to assure Theodorus that he was still in reality a Christian, and had taken that opportunity to escape from the Moslem camp. But to make his story more probable, Abu Obeidah was to send after him a detachment of 1000 horse, who were to pursue him as far as Morah, a village in the neighbourhood of Azaz, with orders to post themselves there; from whence, if such a measure should be found necessary, they might easily advance to Azaz, to facilitate the conquest of that place. To this scheme Abu Obeidah agreed; but Youkinna with all his men were immediately taken prisoners by Theodorus, who had been informed of the whole affair by a spy in the Moslem camp, who had sent him a letter by a pigeon. The fortress, however, was soon reduced, and Youkinna regained his liberty; but was soon after taken prisoner a second time, and brought before his old master Heraclius, who then resided at Antioch. He told the emperor, that he had only pretended to embrace Mahometanism, in order to be able to do his imperial majesty the more essential service; and so far gained upon him, that he was soon after appointed governor of that city; the consequence of which was, that the Arabs were put in possession of it by his treachery.

86 He is taken prisoner and brought before Heraclius.

87 Attempts assassination of Omar miscarries.

The emperor being quite disheartened at his continual bad success, it was suggested to him by the king of Ghassan, who had fled to him for refuge, as we have already observed, that, however desperate his affairs might be, they would be perfectly restored by the assassination of the caliph. This piece of service he undertook to perform for the emperor; and despatched one Wathek Ebn Mosafer, an Arab of his tribe, and a resolute young man, to Medina for that purpose. Wathek, some time after his arrival there, having observed the caliph to fall asleep under a tree, on which he had placed himself so as not to be observed by any one, drew his dagger, and was upon the point of stabbing him; but, as the Arab writers tell us, he was deterred by a lion, who walked round the caliph, and licked his feet till he awoke, after which he instantly went away. This struck Wathek with a profound reverence for Omar; he came down from his tree where he had been confined by the lion, confessed his design, and embraced the Mahometan religion.

88 The Greek sent defeated

Soon after the reduction of Antioch, Abu Obeidah

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sent an account of his success to Omar; and receiving an order to invade the mountainous parts of Syria, he asked his general officers which of them would command the body of troops destined for this purpose. One Meisarah Ebn Mesrouk having offered his service, the general gave him a black standard, with the following inscription upon it in white letters: "There is but one God; Mahomet is the Apostle of God." The body assigned him for this purpose consisted of 300 Arabs, and 1000 black slaves commanded by Dames. Meisarah, at the head of his troops, with some difficulty ascended the mountains, and, with much more, advanced to that part where the emperor's forces were posted. The cold was so intense on the summits of those mountains, that the Arabs, who had been accustomed to a warm climate, could hardly bear it. For some time they could not meet with a single person to give them intelligence of the enemy's motions; but at last they took a Greek prisoner, who informed them, that the imperial army, which consisted of 30,000 men, lay encamped on a spot not three leagues distant. The prisoner refusing to profess Mahometanism, they cut off his head, and then marched towards the imperial camp. The Greeks, hearing of their approach, advanced to meet them; and the Moslems being surrounded on all sides, were on the point of being all cut off, when Khaled appeared at the head of 3000 horse, and after him Ayab Ebn Ganem with 2000 more. At the approach of the horse under the command of the terrible Khaled, the Greeks retired, leaving all their tents, together with their rich furniture and effects, to the Arabs. In this engagement, one of Omar's chief favourites, named *Abdalla Ebn Hodasa*, was taken prisoner, and sent directly to Constantinople. The caliph was so much concerned at this, that he sent a letter to Heraclius, desiring his release; which the emperor not only complied with, but made him many valuable presents, sending at the same time a jewel of immense value as a present to the caliph. This Omar offered to the jewellers of Medina, but they were ignorant of its value: the Moslems therefore begged him to keep it for his own use; but this he said he could not be answerable for to the public. It was therefore sold, and the money deposited in the public treasury.

89 Omar's disinterestedness.

About this time also Khaled advanced with a body of troops as far as the Euphrates, and took Manbij, Beraa, Balos or Balis; exacting of the inhabitants 100,000 dinars for their present security, and imposing on them an annual tribute for the future. He also made himself master of Raaban, Dulouc, Korus, the Cyrus or Cyrrhus of the ancients, and several other fortified towns, nothing being now able to stand before him. Amru Ebn Al As now likewise prepared for the reducing some places in Palestine that still held out. While he remained in this province, he had a conference with Constantine the emperor's son, who endeavoured to persuade him to make peace with the Christians; but this he not agreeing to, unless they would consent to pay tribute, all hopes of an accommodation vanished, and the generals on both sides prepared to enter upon action. In the mean time an officer came from the Christian camp, dressed in very rich apparel, who challenged the stoutest man among the Moslems to fight him in single combat. The challenge was accepted by a young Arab officer of Yaman; who being animated by a notion, derived from the prophet himself, that "the spirits of the martyrs rest in the crops of green birds, that eat of the fruits and drink of the rivers of paradise," discovered an uncommon eagerness to encounter his enemy. But the Christian officer not only killed this youth, but two or three more of the Moslems who came to his assistance. He was then attacked by Serjabil Ebn Hosanah, one of the generals, but a man so weakened by fasting, that he could scarce stand before him, and would therefore have been undoubtedly killed, had not a Greek horseman very opportunely interposed, and with one blow of his scimitar cut off the Christian's head. Serjabil, greatly surprised at this deliverance, asked the horseman who he was, and from whence he came; to which he replied in the following terms: "I am the unfortunate Toleiha Ebn Khowaid, who set up for a prophet, and, lying against God, pretended to inspiration." In consequence of having saved his life, Serjabil introduced him to Amru; and writing a letter to Omar, wherein he acquainted him with the signal proof Toleiha had given of his repentance, he obtained his pardon from the caliph.

Arabia.

90 Account of Toleiha the false prophet.

Though the two armies did not come to a general engagement, yet they had frequent skirmishes, in which the Arabs always got the better, and in some the Greeks suffered very considerably. This, together with the severity of the season, which was then uncommonly cold, so dejected the soldiery, that they began to desert in great numbers. Constantine, therefore, finding his troops to diminish daily, and the Arabs to grow stronger and stronger, took the advantage of a tempestuous night to escape to Cæsarea, which Yezid had not been able to take, leaving his camp to be plundered by the enemy. This city was soon after invested by Amru; and at the same time, Youkinna having made himself master of Tripoli by treachery, seized 50 ships from Cyprus and Crete, which carried a supply of arms and provisions for the emperor's troops, and had entered the port without knowing that the Arabs were masters of the town. With these ships he undertook an expedition against Tyre; and telling the inhabitants that he brought a supply of arms and provisions for Constantine's army, he was admitted into the town, and received with great kindness. Here, however, he had not been long before he was discovered by one of his own soldiers, and put under arrest, with 900 of his men. He was, however, set at liberty by those to whose care he was committed; and then opened the gates of the town to Yezid, by whom it had been invested. Constantine having got intelligence at Cæsarea of the loss of Tripoli and Tyre, was so disheartened, that he set sail from that city with all his family and the greatest part of his wealth; and the citizens then thought proper to make the best terms they could with Amru. The surrender of this city was followed by that of all the other cities and fortresses in the province; and thus the Arabs drove the Greeks out of the whole country of Syria extending from the Mediterranean to the Euphrates. This conquest was completed in the 18th year of the Hegira, six years after it had been undertaken.

91 Youkinna taken prisoner.

92 Tyre and Cæsarea reduced.

This year there happened such violent storms of hail in the peninsula of the Arabs, that a considerable extent of territory was laid waste by them, and a great num-

93 Violent storms, plague, &c.

Arabia. ber of animals of various kinds destroyed. An epidemical distemper likewise raged at Medina, which spread itself all over the neighbouring territory, and swept away great numbers of people. Syria was also visited by a dreadful plague; so that the Moslems lost there 25,000 men, among whom were Abu Obeidah himself, Yezid Ebn Abu Sofian, and many other persons of distinction. In short, so great was the mortality occasioned by the plague, both in Arabia and Syria, that the Arabs style the 18th year of the Hegira the *year of destruction*.

94 Egypt reduced; Amru Ebn Al As, having now executed the caliph's orders in Syria, set out on his expedition against Egypt. His first attempt was on Tarma, a town situated on the isthmus of Suez. This he reduced after a month's siege; and having narrowly viewed its situation, he formed a design of cutting through the isthmus, and thus joining the Mediterranean and Red sea: but this project was not well relished by the caliph, who apprehended that it would facilitate the entrance of the Christians into the peninsula of Arabia. From Tarma he marched to Mesr, the Memphis of the ancient geographers; which, after a siege of seven months, was delivered up to him by the treachery of Al Mokawkas the governor. From Mesr he continued his march towards Alexandria, and having defeated the emperor's army, closely invested that city. While his army lay before this capital, Amru himself had the misfortune to be taken prisoner and carried into the town. Being brought before the governor, he asked him why he committed such ravages and depredations in the Christian territories? To this Amru resolutely answered, "We are come hither to oblige you either to profess Mahometanism, or pay an annual tribute to the caliph; to one of which conditions you must submit, or be all of you put to the sword." A Greek who stood by hearing this, told the governor that Amru was certainly the Moslem general, and therefore desired him to cut off his head. Upon this Werdan, one of Amru's slaves, perceiving the extreme danger his master was in, gave him a box on the ear, exclaiming against his impudence for talking in such a manner. The governor being imposed upon by this shallow artifice, not only saved his life, but to show his generosity, dismissed him without ransom. This was soon followed by the loss of Alexandria, and that by the conquest of the whole kingdom: after which, Amru despatched Okba Ebn Nara with a body of troops to penetrate farther

95 together with Barca and Tripoli. into Africa; and that general made himself master of all the country lying between Barca and Zoweilah, reducing under his dominion also that part of the continent which now forms the piratical kingdom of Tripoli in Barbary.

Soon after the Moslems had made themselves masters of Alexandria, a grievous famine raged in Arabia, particularly at Medina, then the residence of the caliph. This obliged Omar to write to Amru to send him a supply of corn, with which Egypt at that time abounded. In compliance with this order, Amru sent a train of camels laden with corn, in a continued line from Egypt to Medina; the first of which were entering Medina when the last were leaving Alexandria. But this method of conveying corn proving too tedious and expensive, he ordered him to clear the Amnis Trajanus of Ptolemy, now the Khalis, which runs from one end of Cairo to the other, of the sand and gravel with which it was choked. This he accordingly did, and by that means rendered the communication between Egypt and Arabia much more easy than it had formerly been. Arabia.

96 The Persians defeated. While the Arabs thus extended their conquests in the west, they were no less successful in the east. We have already taken notice of Khaled's having been sent into Irak to reduce the kingdom of Hira, and of his being recalled to assist in the conquest of Syria. As the kings of Hira were under the protection of the Persian monarchs, the destruction of that kingdom necessarily brought on a war with the Persians. After the departure of Khaled, the command of the forces was left with Abu Obeid Ebn Masud, together with Al Mothanna Ebn Haretha, Amru Ebn Hasem, and Salit Ebn Kis. Abu Obeid having passed a river contrary to the advice of the other generals, was killed, and his troops in great danger; however, Al Mothanna made an excellent retreat, and repassed the river without any considerable loss. After this he fortified himself in his camp till he received a considerable reinforcement from the caliph; when the Moslem army marched to Dir Hind, and thence continued to make frequent excursions, ravaging that part of Irak that lay next to the Euphrates. A body of 12,000 chosen horse was now despatched against those invaders, under the command of one Mahran. At first the Persians had the advantage, and obliged the Arabs to retire; but they were soon brought back by Al Mothanna, and the battle lasted from noon till sunset. At last Al Mothanna, engaging Mahran in single combat, laid him dead at his feet; upon which the Persians fled to Al Madayen, a town situated on the Tigris, about a day's journey from Bagdad. After this a powerful army was despatched by the Persians under the command of one Rustam: but he also was killed, and his troops were entirely dispersed. At the same time, Abu Musa, another Moslem general, defeated a formidable body of troops under the command of Al Harzaman, a noble Persian, at Ahwaz.

Not content with those victories, soon after the reduction of Damascus, the caliph despatched Saad Ebn Abu Wakkas, to dislodge the Persians from some districts they possessed in the neighbourhood of the Euphrates. Saad having drawn together a body of 12,000 men, advanced to Kadesia, a city bordering upon the deserts of Irak; where, having utterly defeated an army of 120,000 Persians, he made himself master of the opulent city of Al Madayen, and possessed himself of Yezdejerd's treasury, which was so rich, if we may believe the Arabian writers, that Saad took out of it three thousand millions of dinars, amounting to two thousand and twenty-five millions of pounds sterling; an enormous and almost incredible sum. From thence Saad went to that part of the palace where the king's plate was deposited, which he carried off, as well as an immense quantity of camphire with which another part of the palace was entirely filled. This last the Arabs seemed to have carried off merely for the sake of plundering, as they were so much unacquainted with the nature of it, that they mixed it with their bread, which gave it a bitter and disagreeable taste. Afterwards the Arab general carried off the crown and royal garments, adorned with gold and jewels of inestimable value. He also plundered his armoury, which was well stored

97 Incredible treasure taken from them.

with

Arabia. with all sorts of weapons; after which he caused the roof of his porch to be opened, where he found another treasure, equal in value to ten millions of crowns. He also found among the furniture of the palace a piece of silk tapestry, 60 cubits square, which was adorned with a great variety of beautiful flowers, herbs, and plants, formed of gold, silver, and jewels, the most valuable that could be procured. This being brought to Omar, he cut it in pieces, and distributed it among the Moslems: and that part which fell to Ali's share, and which was yet none of the best, he sold for 20,000 crowns.

98 Mesopotamia reduced. In the 20th or 21st year of the Hegira, the Arabs, still unsated with conquest, invaded Mesopotamia under Aiyad Ebn Ganem, where the city of Edessa submitted on the first summons. From Edessa he marched to Constantia, or Constantina, supposed to be the Nicephorium of the ancients. This he took by storm, as likewise Daras, where he massacred all the people he found in the place; and these repeated successes so terrified the rest of the fortified towns, that they all submitted without resistance. At the same time Al Mogheirah Ebn Shaabah, one of the caliph's commanders, made himself master of Shiz, a place famous for the birth of Zerdusht the Persian philosopher, and overran the whole province of Aderbijan. He also possessed himself of all the country of Armenia bordering on Mount Taurus; nay, he in a manner obliged the whole region to own the authority of the caliph, and penetrated into Cappadocia. The same year also Saad made himself master of Ahwas, the capital of Khuzestan (the ancient Susiana); in consequence of which he became master of the greatest part, if not the whole, of that province; at the same time that Al Nooman conquered the greatest part of Khorasan. But while Omar's troops were thus irresistibly overrunning the finest countries in the known world, a period was put to his conquests and his life by a Persian named *Abu Lulua*, who stabbed him thrice in the belly while he was performing his devotions at Medina. The reason of this was, because the caliph refused to remit him some part of the tribute which, according to the Mahometan custom, he was obliged to pay for the free exercise of his religion. The Arabs, perceiving that he had killed their sovereign, immediately rushed upon him; but the assassin defended himself so desperately, that he killed seven of them and wounded thirteen: but at last one of the caliph's attendants threw his vest over him, and seized him; upon which he stabbed himself, and soon after expired.

99 Omar murdered.

Omar having languished three days after the wounds given him by the Persian, expired in the 10th, 11th, or 12th year of his reign, and after his death Othman Ebn Assan was chosen; though Ali had a better title, and seems indisputably to have been the most virtuous, if not the only virtuous person, as well as the bravest warrior, among them. He was inaugurated in the 24th year of the Hegira, nearly coincident with the year of our Lord 645.

100 Succeeded by Othman.

Othman was no sooner settled on the throne, than he commanded Al Mogheirah to complete the conquest of the territory of Hamadan; which he easily accomplished, and at the same time reduced Bira, a strong castle in Mesopotamia, which either had never submitted, or had revolted on the departure of the Moslem troops out of that province. Another army, under Abdallah Ebn Amar, was also despatched into Persia to deprive Yezdejerd of the poor remains of his dominions; and this was done so effectually, that the unhappy monarch was obliged to fly to Sijestan and abandon Persia altogether. Arabia.

In the 27th year of the Hegira, the island of Cyprus was reduced by Moawiyah; who soon after conquered the island of Aradus, and took Ancyra; after which he reduced the island of Rhodes, broke in pieces the famous Colossus, and sold the metal of it to a Jew of Edessa. In the mean time another of the Arab commanders entered Isauria, where he committed dreadful depredations, plundering many towns and villages, putting a great number of people to the sword, and carrying off 5000 prisoners. In the 31st year of the Hegira, one Habib having made an irruption into that part of Armenia, which was still unconquered, defeated a body of the emperor's troops, pursuing them as far as Mount Caucasus, and laying waste all the neighbouring territory. About the same time also, Abul Abar, who had been constituted admiral by Moawiyah, gave the emperor Constans a signal defeat by sea, on the coast of Lycia, in which such a number of Christians were killed, that the neighbouring sea was dyed with their blood.

101 Colossus of Rhodes destroyed.

102 Insurrections against the caliph.

But while Othman was thus carrying every thing irresistibly before him abroad, he neglected to secure the affections of his subjects at home, which soon proved his ruin. Sedition was industriously propagated through all the provinces of the empire, and articles of accusation brought against the caliph. The chief of these were, That he had recalled one who had been banished by the prophet; that he had removed Saad, an officer of distinguished bravery, and supplied his place by one who drank wine, and was otherwise of a scandalous life; that he had squandered away vast sums among his favourites; that he had removed Amru from the government of Egypt, to which he had preferred his own foster brother; and, lastly, that he had presumed to sit on the top of Mahomet's pulpit, whereas Abu Becr had always sat on the highest step and Omar on the lowest. To this formidable accusation the poor caliph pleaded guilty, and promised to make all the reparation in his power; but his condescension only served to increase the insolence of the rebels. They were however appeased by Ali; and public tranquillity had undoubtedly been restored, had it not been for Ayesha, one of Mahomet's widows, who procured the destruction of the caliph by a scheme truly worthy of the wife of such a husband. That traitress, being desirous of raising one of her favourites named Telha to the dignity of caliph, prevailed on Merwan the secretary of state to write a letter to the prefect of Egypt, enjoining him to put to death Mahomet Ebn Abu Becr, with whom it was sent, and who was to be his successor. This letter Merwan took care should be discovered: and Mahomet taking it for a genuine order of the caliph, published the supposed injury all over the neighbouring countries. He then marched with a body of rebels to Medina, where the innocent caliph was besieged in his palace; and, notwithstanding all his protestations, nothing less than his death could satisfy the enraged multitude. In this deplorable situation Othman sent to Ali for assistance; who commanded his two sons Hasan and

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and Hosein to defend the palace gates. This they did for some time with fidelity enough, till finding the caliph reduced to great straits for want of water, they abandoned their posts; upon which the rebels easily made themselves masters of the palace, and cruelly murdered the caliph, in the 82d year of his age, after he had reigned 12 years. His body remained three days unburied; and was at last thrown into a hole made for it, without the usual ablution, or the least funeral solemnity.

103 He is murdered.

The arms of the Moslems had hitherto been so successful, and their conquests so rapid, that they may seem not only to have vied with Alexander, but to have bid fairer for universal monarchy than any nation either before or since.—The ruin of mighty empires always originates from the impossibility of keeping them united. Divisions arise; civil wars break out; and the kingdom being weakened by these intestine feuds, the common enemies take advantage of them to ruin the whole fabric. If we consider Mahomet, as in truth he was, not as an enthusiast, but as a politician and the founder of an empire; we shall find him in that capacity superior perhaps to any that ever existed. The empire of Alexander the Great, which arose with still more rapidity than that of the Arabs, had no support but from his own ambition and personal qualifications. While he lived, he was without a rival, because all were afraid of him; but when he died, the bands of union, whereby his empire had been held together, were immediately dissolved. His captains were not inspired with the same veneration for his son, who was unborn at the time of his death, that they had for his father; and therefore they sought not to conquer for him, but for themselves; and the consequence was that the kingdom fell to pieces the moment that he died. The same thing happened to the empires of Jenghis Khan, Tamerlane, and others, who made vast conquests in a short time. They erected mighty empires indeed; but their duration, we may say, was but momentary. The empire of the Romans was founded on a kind of enthusiastic desire of aggrandizing the city of Rome: patriotism became fashionable; and as the city never ceased to exist, those who conquered always had the same end in view, namely, to exalt the republic more and more. This empire, therefore, was not only very extensive, but very durable; though as it was impossible that mankind could always continue to venerate a city, the same divisions that ruined other empires at last brought this to an end. The foundation of Mahomet's empire seemed to be still more firm. He was not only the king, but, we may say, the god of his people. Whatever enthusiasm people may show in defending their country, nay even their nearest relations, experience has taught us that it is greatly inferior to what is shown by those who fight in defence of religion. This enthusiasm Mahomet had taken care not only to bring over to his side, but to exalt to its highest pitch, by inculcating upon his followers, that their rewards in the next world should be proportionable to the fury with which they fought in this. To live at peace, except with those who submitted to his will, did not at all enter into his plan; and he who made no conquests, or at least did not strive to make them, was no true believer. By this means, let his empire be ever so much extended, the temptation to making fresh conquests was still equally strong; and not only the commanders of armies, but every private person, had the most powerful motives to urge him towards the conquest of the whole world, had that been possible. The only thing Mahomet seems to have failed in was, the appointment of the succession to the apostleship; and why he was deficient in this is inconceivable. From this one source proceeded the divisions which ruined his empire when it was scarce erected, and of which we are now to give the history.

Arabi

104 Causes the dec of the M lem em

Though the prophet had been so deficient in providing for the safety of his kingdom as not to name a successor at his death; yet his son-in-law Ali was always of opinion that the succession belonged of right to him; and that it ought to be, like that of other kingdoms, hereditary. This disposition to render the apostleship hereditary in the family, was, in all probability, what disgusted the Moslems with Ali: against whom they could otherwise have no objection; for he was endowed with every amiable quality; a firm believer in Mahomet; and of such unparalleled strength and courage, that he never declined a combat to which he was challenged, nor ever failed to come off victorious; for which reason he was styled by his countrymen, "the lion of God."

105 Charac of Ali.

On the death of Othman, however, notwithstanding the prejudices against Ali, as none could pretend so good a right to the caliphate as he, the Arabs immediately took the oath of allegiance to him, though with an intention to break it as soon as possible, as was fully evinced by the event. The disturbances which happened immediately on Ali's succession were owing partly to the machinations of Ayesha, who having got Othman murdered on purpose to raise Telha to the dignity of caliph, and now finding Ali unanimously chosen, resolved to destroy him also. She therefore pretended great concern for the death of the late caliph, and accused Ali of being his murderer; but being reproved by one of the Moslems for endeavouring to blacken an innocent person, when she could not but know herself guilty; she replied, that Othman's infidelity had indeed made her his enemy, but that she had forgiven him upon his repentance. At the time of Ali's inauguration she was at Mecca, where she enjoyed a very considerable share of influence and authority. At her instigation, Telha Ebn Obeidallah, and Zobeir Ebn Al Awam, began to represent to Ali, that the murderers of Othman ought to be brought to condign punishment: offering themselves at the same time for that purpose. This they did purely to sow dissension, for they themselves had been deeply concerned in the murder: and Ali, sufficiently aware of their intention, told them it was impossible till the empire should be more settled. Finding themselves disappointed in this attempt, they next begged the government of Cufa and Basra, that they might with the greater facility extinguish any rebellion that should happen. Here again Ali was aware of their intention; and refused their request, under pretence that he stood in need of persons of their great capacity, as counsellors, about his person. Then they desired leave to perform a pilgrimage to Mecca, which the caliph could not refuse; and they were no sooner got there, than they set about raising an army against him without any provocation at all.

106 He is c sen cali

107 Disturb ces rais by Ayes

This, however, was not the only source of discord at

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at present. Ali had been displeased with the governors of provinces appointed by Othman; and therefore dismissed them immediately upon his accession. This was very impolitic; but he was prompted to do it by that rashness and want of prudence which is inseparable from, or rather is the very essence of, great courage. The consequence of this was, that Moawiyah, governor of Syria, was, immediately upon his dismission by Ali, proclaimed caliph by the troops under his command. Thus the Moslems were divided into two factions; the one under Moawiyah and Ayesha, who adhered to the house of Ommiyah, to which Othman and Moawiyah belonged; and the other to Ali. The adherents of the house of Ommiyah were called *Motazalites*, or *separatists*.

108 Id Moawiyah.

109 Ali raises an army.

Ali, finding how matters were situated, and that a very strong party was formed against him, endeavoured to ingratiate himself as much as possible with the Koreish; and to raise an army against Ayesha, who had now taken the field, and even reduced the city of Basra. He made a formal speech to the people on hearing this bad news, and desired their assistance. But though he was very much beloved on account of his personal merit, and the best orator of the age, he could not with all his eloquence for some time prevail on them to give a decisive answer in his favour. At last Ziyad Ebn Hantelah stept to Ali of his own accord, and said, "Whosever retreats, we will advance." Upon this two Ansars, doctors of the law, stood up, and pronounced Ali innocent of the death of Othman; which decision soon induced the Ansars and the body of the people to espouse his quarrel. He then left Medina with a body of 900 men, and advanced to Arrabah, where he was joined by several other parties. From this place he wrote to the people of Cufa and Medina, pressing them to send him farther assistance, and to dispose the Motazalites to an accommodation. From Medina he very soon obtained a large supply of horses, arms, and other necessaries; and from Cufa he obtained with difficulty a reinforcement of 8000 men.

Being greatly animated by this seasonable supply, Ali advanced towards Basra, where the troops of Ayesha were ready to receive him. Both parties seemed averse to an engagement; and Ayesha began to be very much intimidated at the sight of Ali's army, which, however, was inferior to her own: but, by some means or other, a battle was at last brought about, in which Ayesha was defeated and taken prisoner. The only remarkable effort that was made by the troops of Ayesha in this engagement, was in defence of her person. It is said, that no fewer than 70 men who held her camel by the bridle, had their hands cut off successively; and that the pavilion in which she sat was so full of darts and arrows, that it resembled a porcupine. Ayesha was treated very kindly by Ali, who at first set her at liberty, but afterwards confined her to her house at Medina, and commanded her to interfere no more with state affairs, though he still allowed her to perform the pilgrimage to Mecca.

110 He defeats and takes Ayesha prisoner.

After this victory, Ali had no enemies to contend with either in Arabia, Irak, Egypt, Persia, or Khorasan. A strong party, however, still remained in Syria, headed by Moawiyah, who founded his claims to the caliphate on a pretended declaration of Othman that he should be his successor. In this defection he was joined by Amru Ebn Al As, who had obtained a promise of the government of Egypt, provided Moawiyah could be advanced to the dignity of caliph. Arabia.

Ali, with his usual good nature, endeavoured to bring the rebels to a sense of their duty, and often sent proposals of accommodation to Moawiyah; but he still remained inflexible. Perceiving therefore, that it would be necessary to invade Syria, he entered that country with an army of 70,000 men, while Moawiyah advanced to meet him with 80,000; and by repeated reinforcements Ali's army at last amounted to 90,000 and Moawiyah's to 120,000. The two armies came in sight of each other towards the close of the 36th year of the Hegira, when they seemed ready to enter upon action; but only some skirmishes happened between them, wherein neither party sustained any considerable loss. The first month of the 37th year was spent in fruitless negotiations; but in the second month they began to fight in different parties, without ever hazarding a general engagement. These battles continued, according to some, for 40 days, and according to others, 110. Moawiyah's loss amounted to 45,000 men, and Ali's to 25,000, among whom were 26 who had been intimately acquainted with Mahomet himself, and were dignified with the title of *The Companions*. The most famous of these was Ammar Ebn Yasar, Ali's general of horse, who was upwards of 90 years of age, and was highly esteemed by both parties. The loss of this general so exasperated Ali, that he charged the Syrians with a body of 12,000 men, broke them, and challenged Moawiyah to fight him in single combat. This challenge Moawiyah declined, insisting that it was not a fair one, as Ali could not but be sensible of his superiority in strength. As the challenge was given in the hearing of both armies, Amru insisted that Moawiyah could not in honour refuse it; but the coward made no other reply than that Amru aspired to the caliphate himself, and wanted to enjoy it after his death. The battle being now renewed with great fury, Moawiyah's forces were pushed to their camp; which had certainly been taken, had not Amru bethonght himself of the following stratagem to retrieve Moawiyah's affairs, when he seemed on the very brink of destruction. He ordered some of his men to fix copies of the Koran to the points of their lances, and carry them to the front of the battle, crying out at the same time, "This is the book that ought to decide all differences between us; this is the book of God between us and you, that absolutely prohibits the effusion of Moslem blood." This produced the desired effect. The caliph's troops threw down their arms, and even threatened him with death if he did not sound a retreat; which he therefore found himself obliged to do, and thus had a decisive victory wrested out of his hands.

111 Moawiyah challenged to a single combat by Ali.

112 Amru's stratagem.

According to this new mode of decision, the two parties were each to choose their arbitrator; but even this was not allowed to Ali, though Moawiyah had liberty to choose Amru Ebn Al As. The troops of Irak, not content with offering so gross an affront to the caliph, insisted on naming for his arbitrator Abu Musa Al Ashavi; a very weak man, and one who had already betrayed him. The consequence of this appointment was, that Ali was deposed by both arbitrators; and he accordingly dropt his title to the caliphate, but without

113 Ali deposed.

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without laying down his arms, or putting himself in Moawiyah's power.

After this decision, Ali retired to Cufa; where he was no sooner arrived, than 12,000 of those troops who had themselves forced him to accept of the arbitration, pretending to be offended with the step he had taken, revolted from him. These were called *Kharejites*, that is, rebels or revolters: and *Mohakkemites*, or judiciarians, because they affirmed that Ali had referred to the judgment of men what ought to have been only referred to the judgment of God; and, therefore, that instead of keeping the peace he had made with Moawiyah, he ought to pursue his enemies, who were likewise the enemies of God, without mercy. To this Ali replied, That as he had given his word, he ought to keep it; and, in so doing, he only followed what was prescribed by the law of God. The Kharejites replied, That God was the only judge between him and Moawiyah, and that consequently he had committed an enormous sin, of which he ought sincerely to repent. This irritating Ali, he with some warmth replied, That if any sin had been committed on this occasion, it was by themselves, who had forced him to take the steps of which they now complained. This answer not proving agreeable, they chose for their general Abdallah Ebn Waheb, who appointed for their rendezvous Naharwan, a town situated between Waset and Bagdad, about four miles to the eastward of the Tigris. Here they assembled an army of 25,000 men; and Ali, having tried gentle methods ineffectually, at last marched against them in person. Before he attacked them, however, he planted a standard without the camp, and made proclamation by sound of trumpet, that whoever should repair to it should have quarter, and whoever would retire to Cufa should find a sanctuary there. This had such an effect, that Abdallah's army was soon reduced to 4000 men, with whom he rushed upon the caliph's forces; but all of them were cut in pieces, except nine who escaped.

114 He defeats the Kharejites.

Had Ali marched against Moawiyah immediately after the defeat of the Kharejites, and while his troops were flushed with victory, he had probably reduced him entirely: but by allowing his troops to refresh themselves, they all deserted him, and Moawiyah's party had an opportunity of gathering still more strength; and though Moawiyah's troops often made incursions into the territories of Ali, the latter seems afterwards to have acted only on the defensive. At last the Kharejites, imagining that it would be for the good of the Moslem affairs, that Moawiyah, Ali, and Amru, were dead, despatched assassins to murder all the three. Moawiyah was wounded, but recovered; Amru's secretary was killed by mistake; but Ali was wounded with a poisoned sword, which occasioned his death. The assassin was taken, and Ali would have pardoned him had he recovered, but ordered him to be put to death if he died, that he might, as he said, "have an immediate opportunity of accusing him before God." Even in this order he shewed his usual clemency, as he ordered the assasin to be despatched at one blow, and without torture of any kind.

115 They attempt to murder Ali, Amru, and Moawiyah.

116 Ali assassinated.

Thus fell Ali, the most virtuous of all the Mahometan caliphs, after he had reigned near five years, and lived 63. He was pressed by those about him to nominate a successor before he died; but this he declined, saying, he would follow the example of the Apostle of God, who had not named any: and, as his son Hasan inherited his father's piety, though not his courage, he was declared caliph without any scruple. Moawiyah, however, behaved in such a manner towards him, as showed his hostile intentions; and those about Hasan pressed him to declare war immediately. This Hasan, who was of an exceeding mild and peaceable disposition, could hardly be persuaded to do; and though he at last took the field, yet he immediately perceived his incapacity to dispute the empire with Moawiyah; and therefore resigned it, in spite of all the remonstrances of his friends, to a traitor, who caused him after some years to be poisoned by his wife.

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117 Succeeded by Hasan

118 who resigns the caliphate to Moawiya

Moawiyah being thus left sole master of the Moslem empire, found himself under the necessity of reducing the Kharejites, who were his enemies as well as Ali's, and had now gathered together a considerable army. Against these rebels the caliph would have despatched Hasan, but that prince refused; upon which he sent the Syrian troops against them, who were defeated: however the Cufans, being at last persuaded to take up arms, soon extinguished the rebellion, and settled Moawiyah more firmly than ever on the Moslem throne. In the 48th year of the Hegira, the caliph sent his son Yezid with a powerful army to besiege Constantinople. In this expedition he was attended by three or four of the *Companions*, who, notwithstanding their age, were prompted by zeal to undergo incredible fatigues. The Moslem forces too, though they suffered extremely, were animated to surmount all difficulties by a tradition, according to which the prophet in his lifetime declared, "That the sins of the first army that took the city of Constantinople should be forgiven." Concerning the particulars of this expedition we are in the dark: only, in general, that it proved unsuccessful; and in it Abu Ayub, who had been with Mahomet at the battles of Bedr and Ohod, lost his life. His tomb is held in such veneration by the Moslems, that the sultans of the Ottoman family gird their swords on at it on their accession to the throne. In the 54th year of the Hegira, the Arabs made an irruption into Bukharia, and defeated a Turkish army that opposed them. The Turks lost a great number of men; and the queen, who commanded in person, with great difficulty made her escape. She had only time to put on one of her buskins; the other fell into the hands of the Arabs, who valued it at no less than 2000 dinars. About this time also, according to the Greek historians, a treaty was concluded between the emperor and the Moslems, whereby the latter were allowed to keep the territories they had seized; in consideration of which they were to pay 3000 pounds weight of gold, 50 slaves, and as many choice horses. To these dishonourable conditions they were obliged to submit in consequence of their late unsuccessful expedition to Constantinople, and some other defeats they had received. This peace was to continue for 30 years. The next year, Moawiyah, having conferred the government of Khorasan upon Saad, Othman's grandson, that general, soon after his promotion, passed the Jihun, or Amu, the Oxus of the ancients, and advanced with a body of troops to Samarcand, which opened its gates to him on his approach; soon after which he defeated an army of Usbeck Tartars, and marched directly to Tarmud, or Tarmid,

119 Constantinople besieged without success.

120 Turks defeated.

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mid, which also surrendered without opposition. The 57th year of the Hegira was remarkable for nothing but vast swarms of locusts, which did incredible damage in Syria and Mesopotamia; and great discontents on account of the caliph's having nominated for his successor his son Yezid, a person of scandalous life, and no way worthy of the throne. The 58th year of the Hegira was rendered remarkable by the death of Ayesha, Mahomet's widow; and the 60th by that of Moawiyah, after having reigned, from Hasan's resignation, nineteen years, three months, and five days: but concerning his age authors are not agreed. He was interred at Damascus, which was made the residence of the caliphs as long as the house of Ommiyah continued on the throne.

121 Moawiyah dies.

122 Succeeded by Yezid.

Yezid was proclaimed, in consequence of his nomination, the same day his father died. His inauguration was performed on the new moon of the month Rajeb, corresponding to April 7. 680. Immediately after his election, he wrote to Al Walid, governor of Medina, to seize Hosein, the remaining son of Ali, and Abdallah Ebn Zobeir, in case they refused to acknowledge his right. He accordingly tendered the oath of allegiance to Hosein, who returned an evasive answer, and found means to escape to his own house. As for Abdallah, he delayed waiting upon the governor, under various pretences, for 24 hours; after which he made his escape to Mecca; hither Hosein followed him; but received an invitation from the people of Cufa, who promised to assist him in vindicating the rights of his father Ali and himself. In the mean time, Yezid, being informed of Al Walid's negligence in suffering Abdallah and Hosein to escape, removed him from his employment, appointing in his room Amru Ebn Saad, at that time commandant of Mecca. The new governor immediately despatched against Abdallah, Amer Ebn Zobeir, Abdallah's own brother, who mortally hated him; but Abdallah having engaged Amer in the field, defeated and took him prisoner; which greatly raised his reputation at Medina, although Hosein's superior interest among them still rendered him incapable of aspiring to the caliphate by himself.

123 Hosein and Abdallah refuse to acknowledge him.

While Abdallah was thus strengthening himself at Mecca and Medina, Hosein was doing the same at Cufa. On the first notice of their inclinations, he had sent to them Moslem Ebn Okail, to whom, as representative of the son of Ali, they had taken an oath of allegiance, and were now very pressing on Hosein to honour their city with his presence. Besides this, Hosein was supported by the forces of Irak, who retained a great veneration for the memory of his father, and had all along considered the government of Moawiyah as a downright usurpation.

Notwithstanding all these steps taken at Cufa in favour of Hosein, the deliberations of the conspirators were carried on with such secrecy, that Al Nooman, the governor, continued a stranger to them, even after the Cufans had determined immediately to enter upon action with an army of 18,000 men. At last, however, he began to be roused from his lethargy; but Yezid being displeased with his conduct, removed him from his government, appointing for his successor Obeidallah Ebn Ziyad. This governor entered the city in the evening, and was received with all possible demonstrations of joy by the Cufans, who mistook him for Hosein, owing to a black turban which he had on his head, resembling that which Hosein usually wore. His first care was to extinguish the sedition that had been excited by Moslem. In order to this, he commanded a trusty servant to disguise himself, and personate a stranger come out of Syria to see the inauguration of Hosein: that he might get admission into Moslem's house, and penetrate all his counsels. This commission was faithfully executed; and Obeidallah understanding that Moslem lodged in the house of one Sharik, who was then sick, sent a messenger to Sharik, letting him know that he intended to visit him on a certain day. Sharik immediately came to a resolution to receive him, and appointed Moslem a place in the corner of the room whence he might rush out upon Obeidallah and kill him. The visit was accordingly made; but Moslem's heart failing him, the governor escaped: Hani, however, in whose house Moslem had first lodged, was imprisoned by Obeidallah. Upon the news of this, Moslem assembled about 4000 men, and besieged Obeidallah in the castle. The governor, however, not in the least dispirited, made a speech to Moslem's followers; which had such an effect upon them that they all deserted him except about 30. By the favour of the night, Moslem escaped to a poor woman's cottage in the neighbourhood; but being betrayed by her son, Obeidallah sent a detachment of 80 horse to seize him. Moslem made a gallant resistance, and thrice cleared the house of them; but being at last overpowered with numbers, and grievously wounded, he was taken and brought to Cufa. While on the road, he endeavoured to send an account of his bad success to Hosein, then, as he supposed, on the road to Cufa; but without success. When arrived at the castle he begged a draught of water: but those who stood by told him he should have none till he drank the hamim, or boiling liquor, which the Mahometans pretend is drunk by the damned in hell; and soon after this, being brought before the governor, he was beheaded along with Hani, and both their heads sent as a present to Yezid.

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124 Hosein's obstinacy.

Hosein, in the mean time, was preparing to set out for Cufa, having received the most favourable advices from Moslem, of whose fate he was ignorant, and who had sent him a list of 140,000 men that were ready to obey his orders. This the wisest of his friends represented as a desperate enterprise, and entreated him to drop it, or at least to defer his journey till he should be better assured of success: but Hosein was deaf to all salutary counsel; nay, he would not, by the most earnest entreaties, be prevailed upon to forbear taking his wives and children along with him. The consequences of this obstinacy may be easily imagined: Obeidallah despatched first 1000 and then 5000 men against him; with orders, however, not to offer any violence to him provided he submitted himself. To these terms the infatuated Hosein would not agree: he offered indeed to return home, if Obeidallah would permit; but that not being granted, he desperately engaged the troops of Obeidallah, and was, after long resistance, cut in pieces with all his men. His head was brought to Obeidallah, who struck it over the mouth with a stick, and treated it with great contempt. He was also inclined to have put his family to death: but probably feared an insurrection, as the people of Cufa expressed

125 He is defeated and killed.

Arabia. great resentment on account of Hosein's death; nor was it at all agreeable to the caliph Yezid, who treated the family of the unfortunate Hosein with the greatest kindness.

This year, the 61st of the Hegira, Yezid appointed Salem Ebn Ziyad governor of Khorasan; who, soon after entering upon the government, made an irruption into the Turkish territories. He took his wife along with him in this expedition, who was delivered of a child in the neighbourhood of Samarcand; on which occasion she is said to have borrowed some jewels from the prince of Sogd's lady, which she afterwards carried off with her. In the mean time Salem detached Mohalleb with a considerable body of troops to Khowarazm, the principal city of the Turks or Tartars in those parts, from which he extorted the immense sum of 50,000,000 pieces of money; from whence advancing to Samarcand, he forced the inhabitants of that city also to pay him an immense sum; and then retired with little loss, into the province he governed.

In the mean time Abdallah Ebn Zobeir, finding himself, by the death of Hosein, at the head of the partizans of the house of Hashem, who were greatly oppressed by Yezid, began in earnest to aspire to the caliphate. As he had therefore never owned the authority of Yezid, he now openly declared against him,
126 Abdallah proclaimed caliph. and was proclaimed caliph at Medina soon after the arrival of Hosein's family in that place. Soon after his inauguration, to render himself the more popular, he expatiated on the circumstances of Hosein's death, which indeed were very tragical, and represented the Cufans as the most abandoned and perfidious villains upon earth. This went so well down with the citizens of Mecca and Medina, that they flocked to him in great numbers, so that he soon found himself at the head of a considerable force. The caliph Yezid being informed of his progress, swore he would have him in chains; and accordingly sent a silver collar for him to Merwan, then governor of Medina: but the interest of Abdallah was now so strong, that he laughed at the menaces both of the caliph and Merwan. Nay, the governor of Mecca, though he secretly hated him, thought it good policy, as matters then stood, to keep up a good understanding with Abdallah: but this coming to the ears of Yezid, he deposed the governor; appointing in his place Walid Ebn Otbah, a man of known fidelity, and a bitter enemy of Abdallah. The new governor, therefore, immediately on his accession, used all his art and skill to circumvent Abdallah; but to no purpose, as the latter was always on his guard. This conduct, however, giving him great disgust, as well as terrible apprehensions, he wrote to the caliph, informing him that all the disturbances were owing to the untractable disposition of Walid; and that, if he would send a person of a different character, peace would soon be restored. This letter, the caliph very injudiciously gave ear to, and dismissed his faithful governor, appointing in his room one who was totally unqualified for that post. The people of Medina now having fresh intelligence of Yezid's dissolute manner of life, renounced their allegiance to him, and formally deposed him in a very singular manner. After they
127 Yezid formally deposed. had assembled in the mosque, about the pulpit there, one of them said, "I lay aside Yezid as I do this turban," and immediately threw his turban on the ground. Another said, "I put away Yezid as I do this shoe," casting away his shoe at the same time. These examples being followed by others, there was a large heap of shoes and turbans almost instantly formed upon the spot. They then dismissed Yezid's governor, and banished from the city all the friends and dependants of the house of Ommiyah. These, to the number of about 8000, took refuge in the house of Merwan Ebn Al Hakem, where they were so closely besieged by Abdallah's party, that they found themselves obliged to send to Yezid for immediate assistance; acquainting him, that if they were not succoured, they must all inevitably perish. The caliph, though he wondered that such a number of men should suffer themselves to be so cooped up without making the least resistance, despatched Moslem Ebn Okba to Medina, with a considerable body of troops, to quell the disturbances. He ordered him to spare Ali the son of Hosein and his family, as they had no hand at all in the disturbances: then he was to summon the town of Medina to surrender for three days successively; which if they refused, he was to take it by storm, and give it up to be plundered by the soldiers for three whole days. Arabia.

The inhabitants of Medina being now sensible of their danger, suffered the friends of the house of Ommiyah to withdraw quietly out of the city; though before they departed, a promise was extorted from them not to appear in arms against the reigning faction. Moslem, in the mean time, advanced towards the city at the head of 5000 foot and 12,000 horse; and having summoned it according to his instructions, upon its refusal made the necessary preparations for an attack. The garrison, however, for a considerable time, made a vigorous defence; but at last, most of the Ansars and principal officers being killed, the Arabs proposed
128 Medina ken and plundere by the c liph's fo ces. a capitulation. Moslem, however, would hearken to no terms, and insisted on their surrendering at discretion; which being refused, he entered the city after a faint resistance. Ali was treated with great respect; but all the men that had carried arms were put to the sword, and Moslem suffered his troops to ravish 1000 women, and to pillage the city for three days successively. Those that escaped the slaughter he forced to acknowledge themselves the slaves and vassals of Yezid. For this extreme severity he was surnamed by the Arabs *Al Musreif*, or *The extravagant*, and ever after considered as an impious person, especially as the prophet had declared that the wrath of God should most certainly remain upon those who sacked or plundered the city of Medina.

After the reduction of Medina, Moslem directed his course to Mecca, where Abdallah then resided; but he died by the way, and the command of the troops devolved upon Hosein Ebn Thamir Al Selwi. This general advanced to Mecca, which he besieged for 40 days, battering the town with such fury, that he beat down a great part of the famous temple there, and burnt the rest; nor would the city itself have escaped the same fate, had not an end been put to the war by the arrival of certain accounts of the death of Yezid,
129 Yezid d who departed this life in the 64th year of the Hegira, answering to the year 684 of the Christian era, having lived 39, and reigned three years and six or eight months. On the news of his death, Hosein offered to take

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take the oath of allegiance to Abdallah; but the latter at that time durst not trust him, of which he had afterwards sufficient reason to repent.

130 Yezid was succeeded by his son Moawiyah II. who was proclaimed caliph at Damascus the same day that his father died; but being of a weakly constitution, and unable to bear the fatigues of government, resigned the crown six weeks after his inauguration, and died soon after without naming a successor.

This abdication having left the Moslem empire absolutely without a master, great commotions ensued. On the death of Yezid, Obeidallah Ebn Ziyad, governor of Basra, represented to the citizens that they ought to choose a protector till a new caliph should be chosen; and if the person so chosen should be disagreeable to them, they might then remain in the state of independency under the protector whom they had chosen. The inhabitants perceiving the drift of this speech, complimented him with that honour; which he accepted with seeming difficulty: but sending a deputy to Cufa, the inhabitants of that city not only refused to acknowledge his authority, but threw dust and gravel at his messenger. This coming to the ears of the people of Basra, they not only deprived Obeidallah of the dignity they had newly conferred upon him, but even expelled him the city. Nor could he prevail upon the Najari, a tribe of Ansars, to espouse his quarrel, nor even upon his own relations, though he distributed among them great part of the sixteen millions of pieces of money which he had found in the treasury of Basra, and kept the remainder to himself. Nay, so odious had he rendered himself to all ranks, on account of his cruelties, particularly the death of Hosein the son of Ali, that his brother Abdallah was unable to protect him from the fury of the populace, though he kept him concealed in women's clothes, and distributed among the mob 200,000 pieces of money. He was therefore at last constrained to leave the city, attended by a guard of 100 men. Immediately after his departure, the mob plundered his house, and pursued him, so that he was obliged to exchange his camel for an ass, and thus with the utmost difficulty escaped into Syria.

131 Obeidallah forced to flee into Syria.

In the mean time, Hosein Ebn Thamir, being returned into Syria with the forces under his command, gave a faithful account of the situation of affairs in Arabia to Merwan Ebn Al Hakem. He also acquainted him of the offer he had made to Abdallah of the oath of allegiance, which the latter had refused, or at least would not come to Damascus in order to be invested with the supreme authority there. On this account he advised Merwan to take care of himself and the rest of the house of Ommiyah, who had fled to Damascus after their expulsion from Medina. On this discourse Merwan was inclined to submit to Abdallah; but was diverted from it by Obeidallah, who insisted that no superior ought to be acknowledged by Merwan, who was at the head of the Koreish. The people of Damascus had constituted Dahak Ebn Kais their protector, who inclined to Abdallah. The Basrans were at this juncture entirely in tumult and confusion, not being able to agree about a protector after the expulsion of Obeidallah; so that at last they wrote to Abdallah, offering him the government of their territory. This he accepted, but could not be prevailed upon to stir from Mecca; nor could Merwan be persuaded to suffer any of the Syrians to perform the pilgrimage to Mecca, lest they should join Abdallah, and thereby contribute to his exclusion from the throne. Arabia.

In the midst of this confusion Abdallah might have easily secured the caliphate to himself, had he not with the utmost imprudence as well as inhumanity given orders for the extermination of the house of Ommiyah. This ruined his affairs; for they being now obliged to provide for their own safety, Merwan was proclaimed caliph at Damascus; and thus the whole Moslem empire was rent into two potent factions, the one under Merwan and the other under Abdallah.

132 Merwan proclaimed caliph at Damascus.

We have already observed, that Dahak Ebn Kais inclined to favour Abdallah. This he continued to do after Merwan was proclaimed caliph, insomuch that a battle soon ensued between his followers and those of Merwan, in which Dahak was defeated and killed; and thus Merwan became master of all the province of Syria. Soon after this victory, Merwan advanced with a considerable body of troops towards Egypt; but sent before him Amru Ebn Said with a detachment, in order to facilitate his passage. That general having defeated Abdalrahman, Abdallah's lieutenant, in several brisk actions, he at last surrendered the whole country to Merwan for a sum of money, and retired with the Arabs under his command to Hejaz. The Syrian troops, therefore, immediately took possession of that country, and obliged the inhabitants to take an oath of allegiance to Merwan; who having appointed his son Abdalaziz to preside over Egypt, returned with the greatest part of his forces to Damascus. Here he was informed that Abdallah had despatched against him his brother Musab with a considerable army. Against him Merwan despatched Amru Ebn Said; who having soon come up with him, gave him a total defeat, and dispersed his troops in such a manner that Musab found it impossible to rally them again.

133 Abdallah's forces defeated by Merwan's.

In the 65th year of the Hegira, the inhabitants of Cufa, pretending to be seized with remorse of conscience for their treachery to Hosein the son of Ali, raised an insurrection against both the caliphs, and therefore assembled a body of 16,000 men, under the command of one Soliman, who was to revenge the death of Hosein, upon Obeidallah Ebn Ziyad and his adherents. But while Soliman and his troops remained yet inactive, Al Mokhtar, who had served under Abdallah, and was disgusted at not having been promoted as he expected, arrived at Cufa, and representing the incapacity of Soliman, who indeed appears to have been totally unfit for such an enterprise, offered to take the command upon himself. This, however, was refused; and as Al Mokhtar had no opinion of Soliman's military capacity, he found means to draw off 2000 of his troops; while 10,000 more chose rather to violate the oaths they had taken, than run the risk of being cut to pieces by a superior enemy. Soliman, however, put a good face upon the matter; and, telling his troops that they were to fight for another world and not this, set forward to invade Syria with the 4000 who remained with him: but being advanced as far as Eksas upon the Euphrates, he found that he had lost 1000 men by desertion; nor was he joined by the Separatists of Basra and Al Madayen, though they had promised him a reinforcement. Firmly persuaded, however,

134 The Cufans revolt.

135 Joined by Al Mokhtar.

136 Soliman's folly and enthusiasm.

Arabia. however, that his cause was the cause of heaven, Soliman continued his march all night, and next day arrived at the tomb of Hosein, where his men performed their devotions with such enthusiasm of penitence, that one present swore he never saw such crowding about the black stone in the temple of Mecca itself.—Continuing still to advance, he received a friendly letter from Abdallah Ebn Yezid, the governor of Cufa, advising him to return, and representing to him the folly of engaging so powerful an army as would be sent against him, with a handful of men: but Soliman, imagining that he was only recalled in order to support Abdallah Ebn Zobeir in his pretensions to the caliphate, persisted in his resolution of penetrating into Syria. He told his troops, that they would never be nearer the two Hoseins (Hosein, and his brother Hasan, to whom also the Shiites gave that name) than they were at present; and that should they at this time meet with death, they would be in a state of repentance, and consequently could never die in a more proper time; and after this speech, continuing still to advance, he was at last met by Obeidallah, at the head of 20,000 horse, who, after an obstinate engagement, cut to pieces Soliman and all his troops.

137 He is cut in pieces with all his men.

138 Merwan dies.

Soon after this decisive action died the caliph Merwan, after he had reigned eleven months. He is said by some authors to have been poisoned by his wife Zeinab, Moawiyah's widow. Her he had married, with a promise that her son Khaled should succeed him; but afterwards altering the succession in favour of his own son Abdalmalec, young Khaled reproached him with his breach of promise: upon this Merwan calling him *bastard*, the child complained to his mother; who, to be revenged for this affront, is said to have poisoned him, or smothered him with a pillow.

In the beginning of the caliphate of Abdalmalec, Al Mokhtar, who had been imprisoned by the governor of Cufa, was released at the intercession of Abdallah Ebn Omar, who had married his sister. The year following, having put himself at the head of the Shiite sectaries, he sent proposals of alliance to Abdallah Ebn Zobeir; but he, justly suspecting his sincerity, by a stratagem cut off near 3000 of his men. Upon this disaster, Al Mokhtar, fearing the house of Ali might be intimidated, sent a letter to Mahomet Ebn Hanifyah, one of that family, in which he offered his assistance with a powerful army. This offer Mahomet declined, declaring himself only for pacific measures; but though he and all the rest of Ali's family behaved in the most peaceable manner, Abdallah did not think himself safe till they owned his authority. He therefore imprisoned them, together with 17 of the principal citizens of Cufa, whom he threatened to put to death, and afterwards burn their bodies, if they did not within a limited time take an oath of allegiance to him. Al Mokhtar being informed of the distressed situation they were in, sent a body of 750 horse to Mecca, under Abu Abdallah, to release them. That general not only executed his orders with great bravery, but took Abdallah himself prisoner, whom he would have cut to pieces on the spot, had he not been released at the intercession of Mahomet, who for the present adjusted the differences to the mutual satisfaction of all parties. After this reconciliation, Abu Abdallah, or rather Mahomet himself, distributed among 4000 of Ali's friends a sum of

139 Narrow escape of the family of Ali.

money brought for that purpose, in order to indemnify them for the losses they had sustained. Thus the friends of Ali were happily delivered, when only two days of the time granted them by Abdallah remained, and a sufficient quantity of wood and other combustibles was collected, in order to consume their bodies. Notwithstanding the reconciliation, however, that had lately taken place, Mahomet Ebn Kanifyah thought proper to post himself on a mountain near Mecca with a body of 4000 men. Arabia.

The Cufans having received advice before Merwan's death, that he had sent Obeidallah with a powerful army towards their city, and even given them permission to plunder it in case it should be taken, appointed Yezid Ebn Ares, a man of undaunted courage, to oppose him; but Merwan dying before Obeidallah could execute his commission, an end was put for the present to this expedition. The memory of it, however, still remained; and Al Mokhtar, to whom Obeidallah was personally obnoxious, assembled a body of troops to act offensively against him, and even against the Syrian caliph himself in case he should support Obeidallah. Among other preparations for this enterprise, Al Mokhtar caused a kind of portable throne to be made, telling his troops, that "it would be of the same use to them that the ark was to the children of Israel." It was therefore carried on a mule before the troops that were to march against Obeidallah, and the following prayer said before it: "O God! grant that we may live long in thy obedience; help us; and do not forget us, but protect us." This expedient was so well adapted to the hot-headed enthusiasts who composed Al Mokhtar's army, that they attacked Obeidallah's camp, defeated him, and gained a complete victory. Obeidallah himself was killed in the action, his head sent to Al Mokhtar, and his body reduced to ashes.—By this victory the sectaries were rendered so formidable, that Nisibin or Nisibis, and several other cities, surrendered to them without opposition. They now began to entertain thoughts of deposing both the caliphs, and placing on the Moslem throne one of the family of Ali; but all their towering hopes were soon frustrated by the defeat and death of Al Mokhtar by Musab brother to Abdallah Ebn Zobeir. Al Mokhtar, after being defeated in a general engagement by Musab, fled to the castle of Cufa, where he defended himself with great bravery for some time; but being at last killed, his men, to the number of 7000, surrendered at discretion, and were all of them put to the sword on account of the outrages they had committed.

140 Impiety of Al Mokhtar.

141 Obeidallah defeated and kille

142 Al Mokhtar defeated and killed by Musab.

The next year, the 68th of the Hegira, the Azarakites, so denominated from Nafe Ebn Al Azarak, the author of their sect, having assembled a considerable force, made an irruption into Irak. They advanced almost to the gates of Cufa, and penetrated to Al Madayen. Being sworn enemies of the house of Ommiyah, and acknowledging no government, spiritual or temporal, they committed terrible ravages in every part of the Moslem territories through which they passed. They carried their excesses to such a height as to murder all the people they met with, to rip open women with child, and commit every species of cruelty that could be invented upon the inhabitants without distinction. The governor of Mawsel and Mesopotamia, being

143 Horrid cruelties committe by the Azarakites

Arabia. ing informed of these unparalleled outrages, marched against them with a body of troops, and carried on a brisk war with them for eight months. During this period their leader Nafe Ebn Al Azarak died; and was succeeded by Katri Ebn Al Fojat, under whose conduct they continued their depredations. Musab not being pleased with his lieutenant's management of the war, recalled him, and sent in his place one Omar Ebn Abdallah Temini, who gave the Azarakites a great overthrow at Naisabur in Khorasan, put many of them to the sword, and pursued the rest as far as Ispahan and the province of Kerman. Here having received a reinforcement, they returned into the province of Ahwaz, and did incredible damage to the country through which they passed. But Omar advancing against them a second time, they retired at his approach to Al Madayen, ravaging the district belonging to the city in a dreadful manner. However, Omar pursuing them thither also, they fled into the province of Kerman, and thence gradually dispersed themselves. This year there was a grievous famine in Syria, which suspended all military operations.

144 They are defeated and dispersed.

The next year, being the 69th of the Hegira, Abdalmalec left Damascus to march against Musab. In his absence he left Amru Ebn Said governor of the city; but he immediately seized upon it for himself, which obliged the caliph to return. After several skirmishes had happened between some detachments of the caliph's troops with those of Amru, a pacification was concluded at the intercession of the women: but Abdalmalec barbarously put Amru to death with his own hand, notwithstanding his promise; and was immediately seized with such a tremor, that he lost the use of almost all his faculties, and was obliged to be laid in bed. In the mean time the palace was attacked by Yahyah, Amru's brother, at the head of 1000 slaves. After a warm dispute, they forced open the gates, killed several of the guards, and were upon the point of entering the palace, when the people within threw Amru's head among them. This so cooled their ardour, that they desisted from the attempt; and some money having been afterwards distributed among them they retired. So great, however, was Abdalmalec's avarice, that after the tumult was appeased, he recalled all the money which had been distributed, and commanded it to be deposited in the public treasury.

145 Barbarity of Abdalmalec.

146 Disgraceful treaty with the Greeks.

In the 70th year of the Hegira, the Greeks made an irruption into Syria; and Abdalmalec having occasion for all his forces to act against Abdallah Ebn Zobeir, was obliged to pay a tribute of 1000 dinars per day, according to Theophanes, and send every year 365 slaves and as many horses to Constantinople. In this treaty, it was also stipulated, that the revenues of Cyprus, Armenia, and Heria, should be equally divided between the caliph and the Greek emperor.

147 Musab defeated and killed by Abdalmalec.

Abdalmalec being now at leisure to pursue his intended expedition against Musab, marched against him in person; and having arrived at Masken, a small town on the frontiers of Mesopotamia, where he was waited for by Musab, the latter was defeated through the treachery of his troops, and himself killed. After the battle, Abdalmalec repaired to Cufa, where he was received with the utmost submission; and people of all ranks came in crowds to take the oath of allegiance to him. He then ordered vast sums of money to be distributed among them, and gave a splendid entertainment to his new subjects, to which even the meanest of them were not refused admittance. During this entertainment, the unfortunate Musab's head was presented to the caliph; upon which one of the company took occasion to say to him, "I saw Hosein's head in this same castle presented to Obeidallah: Obeidallah's to Al Mokhtar; Al Mokhtar's to Musab; and now at last Musab's to yourself." This observation so affected the caliph, that, either to avert the ill omen, or from some other motive, he ordered the castle to be immediately demolished. Abdallah Ebn Zobeir, in the mean time, having received the melancholy news of the defeat and death of his brother, assembled the people of Mecca, and from the pulpit made a speech suitable to the occasion. He also did his utmost to put Mecca in a proper posture of defence, expecting a speedy visit from his formidable competitor, who now gave law to Irak, Syria, and Egypt, without controul. Arabia.

Soon after Abdalmalec's return to Damascus, he appointed his brother Bashar governor of Cufa, and Khaled Ebn Abdallah governor of Basra. The latter had no sooner entered upon his office, than he indiscreetly removed from the command of the army Al Mohalleb, one of the greatest generals of the age; appointing in his room Abdalaziz, who was greatly his inferior in military skill. Of this dismission the Azarakites being informed, they immediately attacked Abdalaziz, entirely defeated him, and took his wife prisoner. A dispute arising among the victors about the price of that lady, one of them, to end it, immediately cut off her head. Upon this disaster, Khaled was commanded to replace Al Mohalleb, which he did; and having in conjunction with him attacked the Azarakites, forced their camp, and entirely defeated them.

148 Azarakites defeated.

In the 72d year of the Hegira, Abdalmalec having no enemy to contend with but Abdallah Ebn Zobeir, made great preparations for an invasion of Hejaz, giving the command of the army to be employed on this occasion to Al Hejaj, one of his most warlike and eloquent captains. Before that general had put his army in march for Mecca, he offered his protection to all the Arabs there that would accept of it. Abdallah being informed of the enemy's approach, sent out several parties of horse to reconnoitre, and give him intelligence of their motions. Between these and some of Al Hejaj's advanced guards several skirmishes happened, in which Abdallah's men had generally the worst. This encouraged Al Hejaj to send to the caliph for a reinforcement, his troops amounting to no more than 2000 men, who were insufficient for reducing Mecca. He assured him at the same time, that Abdallah's fierceness was very much abated, and that his men deserted to him daily. The caliph, upon this, ordered a reinforcement of 5000 men under the command of Tharik Ebn Amer; but notwithstanding this additional strength, he made but little progress in the siege for some time. While he battered the temple of Mecca with his machines, it thundered and lightened so dreadfully, that the Syrians were struck with terror, and refused to play them any longer upon that edifice. Upon this Al Hejaj stuck the corner of his vest into his girdle, and putting into it one of the stones that was to be

149 Mecca besieged by Al Hejaj.

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be discharged out of the catapults, slang it into the town, and this occasioned the recommencement of the operations. The next morning the Syrians were annoyed by fresh storms, which killed 12 men, and quite dispirited them. Al Hejaj, however, animated them, by observing that he was a son of Tehama; that this was the storm of Tchama, and that their adversaries suffered as much as they. The day following some of Abdallah's men were killed by a very violent storm, which gave Al Hejaj a further opportunity of animating his troops. At last, Abdallah having been deserted by most of his friends, 10,000 of the inhabitants of Mecca, and even by his own sons Hamza and Khobeib, desired to know his mother's sentiments as to what course he was to take. He represented to her, that he was almost entirely abandoned by his subjects and relations; that the few who persisted in their fidelity to him could scarce enable him to defend the city any longer; and that the Syrian caliph would grant him any terms he could think fit to demand. His mother, however, being of an inflexible resolution, and not able to bear the thoughts of seeing her son reduced to the rank of a private person, being herself the daughter of Abu Becr, the first caliph, advised him by no means to survive the sovereignty, of which he was on the point of being deprived. This advice being agreeable to his own sentiments, he resolved to die in defence of the place. In pursuance of this resolution, he defended the city, to the amazement of the besiegers, for ten days, though destitute of arms, troops, and fortifications. At last, having taken a final leave of his mother, and being animated by despair, he made a sally upon the enemy, destroyed a great number of them with his own hand, and was at length killed fighting valiantly upon the spot. At the last interview he had with his mother, she is said to have desired him to put off a coat of mail he had on for his defence; and, in order to inspire him with the greater fortitude, she gave him a draught in which a whole pound of musk had been infused. Al Hejaj ordered his head to be cut off, and his body to be affixed to a cross; and by reason of the musk he had drank, the body emitted a grateful odour for several days.

150 Abdallah killed.

By the reduction of Mecca, and the death of Abdallah Ebn Zobeir, Abdalmalec remained sole master of the Moslem empire; but he sustained a great loss next year, in having an army of 100,000 men totally cut off by the Khazarians in Armenia. The governor, however, having marched in person against them at the head of only 40,000 men, but all chosen troops, penetrated into the heart of Armenia, defeated and dispersed a large body of the Khazarians, drove them into their temples, and reduced them to ashes. One of his generals also defeated an army of 80,000 Khazarians at the Iron or Caspian Gates, and destroyed a great number of them, obliging the rest to embrace the Mahometan religion.

151 Khazarians reduced.

152 Cruelty of Al Hejaj.

Al Hejaj, in consequence of his services, was made governor, first of Medina, and then of Irak, Khorasan, and Sijistan; in all which places he behaved with the greatest cruelty. Having entered the city of Cufa muffled up in his turban, he was surrounded by crowds of people who pressed forward to see him. He told them their curiosity would soon be gratified; which he effectually did, by ascending the pulpit, and treating them in a very coarse manner; swearing that he would make the wicked bear his own burden, and fit him with his own shoe; and telling them among other things, that "he imagined he saw the *heads* of men ripe and ready to be gathered, and turbans and beards besprinkled with blood." At Basra he made a speech much to the same purpose; and, to give the inhabitants a taste of his discipline, caused one of them who had been informed against as a rebel to be beheaded on the spot without any trial. So great indeed was the abhorrence in which he was held by those over whom he presided, that having once recommended himself to the prayers of a religious Moslem, the latter instantly prayed that it would please God to kill Al Hejaj quickly; "for nothing, said he, could be more advantageous for himself or the people." In consequence of these cruelties, rebellions were soon raised against him; but they were easily suppressed, and Al Hejaj continued in the full enjoyment of all his employments till he died.

Arabia.

153 Saleh and Shebib rebel.

In the 76th year of the Hegira, one Saleh Ebn Marj, a hot-headed enthusiast, and Shebib Ebn Zeid, a Kharejite, took up arms against the caliph. They had conspired against him the year before when on a pilgrimage to Mecca; and Al Hejaj had been ordered to seize them: but at that time they found means to make their escape; and having now assembled about 120 men, Saleh was proclaimed emperor of the faithful at Daras in Mesopotamia. The governor soon received intelligence of their motions; and ordered a body of 500 men, under the command of one Adi, to march against them: but that general, being afraid to attack them notwithstanding his superiority in numbers, demanded a reinforcement. He therefore was supplied with 500 more troops, with which he advanced to Daras; but being still afraid of the rebels, he entered into negociations with them; during which they attacked him, entirely defeated his army, and made themselves masters of his camp. Upon this the governor sent a detachment of 1500 horse against them; but the rebels, notwithstanding the smallness of their number, defended themselves in such a manner, that the caliph's troops were forced to dismount and fight on foot. The engagement continued till night; when the rebels, finding themselves unable to contend with such numbers, retired to Mawsel. After this, Al Hejaj being informed that they had taken post at Dascara, sent against them an army of 5000 men. The rebels hearing of this formidable army, abandoned their camp; but were so closely pursued, that they found themselves obliged to stand an engagement at Modbaj, a small village on the Tigris. Saleh's forces, consisting only of three companies of 30 men each, were soon thrown into disorder, and himself killed: but Shebib made an excellent retreat to a neighbouring castle; from whence he sallied out at midnight on the caliph's forces, penetrated to the very heart of the camp, where he wounded the general himself, and dispersed the greatest part of his army.

154 Their bravery.

155 Saleh killed.

After this victory, the rebels became terrible even to Al Hejaj himself, whom they afterwards defeated in several engagements; and taking advantage of his being at Basra, made themselves masters of Cufa with little opposition. Al Hejaj was now constrained to write

156 Al Hejaj defeated by Shebib.

Arabia.

write to the caliph for a strong detachment of the Syrian troops, with which he advanced against Shebib; whose army bearing no proportion to that of Al Hejaj, the former was totally defeated, had his wife's brother killed in the action, and was obliged to fly into Kerman. Having refreshed his men in this province, he again advanced to Ahwaz, where he was met by one of Al Hejaj's generals at the head of the Syrian army. Shebib defended himself with incredible valour, and several times repulsed the caliph's forces; but being overpowered by numbers, as his army consisted of no more than 600 men, he was at last put to flight, and in passing a bridge, was thrown off by his horse and drowned. His body was drawn up by a net, and the head sent to Al Hejaj, who was not a little pleased at the sight. After his death, the rebels quarrelled among themselves, so that the caliph's troops cut off the greatest part of them. The remainder, under Katri Ebn Fojat, fled to Tabrestan. Here they were kindly received by Ashid the king, who assigned them a part of his territories for their habitation. But they had not been long settled before they insisted upon Ashid's either embracing Mahometanism, or paying them an annual tribute; which he refusing, they drove him into Irak, where he implored the caliph's protection. Ashid afterwards conducted a body of Moslem troops into Tabrestan; where they fell upon the rebels with such fury, that they killed Katri himself, cut a great number of his men to pieces, and took all the rest prisoners.

157 Shebib's valour and death.

158 Ingratitude of the rebels.

159 They are all destroyed.

This year also (the 76th of the Hegira) money was first coined in Arabia. Before this time, the dinars, or gold coins, had Greek inscriptions; and the dirhems, or silver ones, Persic inscriptions. The first erection of a mint in Arabia was occasioned by the following accident. Abdalmalec added to the letters he wrote to the Greek emperor this short passage of the Koran, "Say, God is one;" or "Say, there is one God;" and then inserted the year of the Hegira, with the name of the prophet, in such a manner as gave the emperor great offence. Upon this he wrote to Abdalmalec, desiring him to alter that manner of writing, or he would send him some coins in which the name of Mahomet should be mentioned in such a manner as would not prove very agreeable. Abdalmalec now resolved to coin money of his own; and accordingly some dirhems were this year stamped by Al Hejaj, with the inscription "*Alla Samad*, "God is eternal;" which gave great offence to the superstitious Moslems, as they imagined that the name of God would be thereby profaned by the touch of unclean persons.

160 Money first coined in Arabia.

In the 77th year of the Hegira, the Arabs made an incursion into the imperial territories, and had Lazica and Bernucium betrayed to them; and the next year they made themselves masters of Africa Propria, demolishing the city of Carthage so effectually, that scarce a vestige of it was left. They were soon driven out, however, by John the Patrician, a man of great valour and experience in war; but returning with a superior force, they obliged John in his turn to fly to Constantinople.

161 Carthage demolished.

The 79th year of the Hegira is remarkable for nothing but the rebellion of Abdalrahman in Persia; who drove the khan, or emperor of the Turks, Tartars, or Moguls, out of that country: but the following year, one of the Greek generals, named Heraclius, penetrated into Syria as far as Samosata, and destroyed 200,000 Arabs, ravaging the country in a terrible manner; and Abdalrahman was defeated and killed by Al Hejaj, after a great number of engagements, some say 81, and others 100. In the 83d year of the Hegira, the nobility of Armenia revolting, drove the Arabs out of that province; but Mahomet, one of the caliph's generals, entering the country with a powerful army, got the authors of the revolt into his hands, and caused them all to be burnt alive. Encouraged by this success, the Moslems invaded Cilicia under one Azar; but were, to the number of 10,000, cut in pieces by Heraclius; and the next year, having again entered that country, 12,000 of them were destroyed by the same general, and the rest forced to fly into their own country.

Arabia.

162 200,000 Arabs destroyed by Heraclius.

In the 86th year of the Hegira died the caliph Abdalmalec, after a reign of 21 years. He is said to have had such a stinking breath, that the flies which accidentally settled on his lips were almost instantly struck dead by it. He was succeeded by Al Walid, who greatly extended the Moslem dominions. The first year of his reign, one of his generals having passed the Oxus (now the Jihun), defeated a numerous army of Turks and Tartars. He then overran and entirely reduced the countries of Sogd or Sogdiana, Bagrass, Shash, Targana, and the whole immense tract going under the name of Mawaralnahr, or Great Bukharia. He also conquered the khan of Khowarazm, obliging him to pay an annual tribute of two millions of dinars. About the same time another general, called Mahomet, made an irruption into India, and subdued a considerable part of that country. He also entirely subdued the kingdom of Al Sind, lying between Persia and India. In this expedition, Derar king of Al Sind was defeated and killed, and had his head cut off by Mahomet.

163 Abdalmalec dies.

164 Prodigious conquests of the Moslems.

In the 90th year of the Hegira, the Moslems made an irruption into Cappadocia, defeated the emperor's army who opposed them, and took the city of Tyana. The next year they made another incursion into the imperial territories, whence they carried off numbers of slaves; and the year following one Othman penetrated into the heart of Cilicia, where he made himself master of several cities, but does not appear to have long kept his conquests.

In the 93d year of the Hegira, answering to that of Christ 712, Tarik Ebn Zarka made a descent on Spain, defeated Roderic, the last king of the Goths, reduced the city of Toledo, and overran a considerable part of the kingdom. Being afterwards joined by Musa, commander of the African Moslems, the two generals made themselves masters of most of the fortresses, subjugating in a manner the whole country, and obliging it to pay tribute to the caliph. In these expeditions the Moslems acquired spoils of immense value; and, amongst other things, an exceeding rich table, called by the Arab writers "the table of Solomon the son of David." According to these writers, this table consisted entirely of gold and silver, and was adorned with three borders of pearls; but Roderic of Toledo, a Spanish historian, says it consisted of one entire stone, of a green colour, and of an immense size, having no less than 365 feet. He adds, that it was found

165 They make a descent on Spain,

166 and overrun the whole country.

Arabia.

found in a certain village or town, near the mountain called in his days *Jibal Soliman*, or "the mountain of Solomon."

After Musa and Tarik had committed dreadful depredations in Spain, they were both recalled by the caliph; but the next year, Tarik having undertaken another expedition into the same country, landed a body of 12,000 men at Gibraltar, with which he plundered the whole province of Bætica, and overran the greatest part of Lusitania. Roderic hearing of these depredations, sent against him an army of raw undisciplined troops, who were easily defeated, and most of them left dead on the spot; which so animated the Arab commander, that he resolved not to lay down his arms till he had made an absolute conquest of Spain. About the same time that Tarik made such progress in Spain, another Moslem general entered Pisidia with a powerful army, took the city of Antioch, and, after having ravaged the country, retired into the caliph's territories with very little loss.

167 Al Hejaj dies.

In the 95th year of the Hegira died Al Hejaj governor of Irak, &c. after he had presided over that country 20 years. He exercised such cruelties upon those who were in subjection to him, that he is said to have killed 120,000 men, and to have suffered 50,000 men and 30,000 women to perish in prison. To excuse this cruelty, he used frequently to say, That a severe, or even violent government, is better than one too weak and indulgent; as the first only hurts particular persons, but the latter the whole community. This year also the Arabs gained a complete victory in Spain over Roderic king of the Goths, who perished in the action. In this campaign, Tarik possessed himself of immense treasures; by which means he was enabled to reward not only his officers, but common soldiers also. In the eastern parts of the world also, the Arabs were this year very formidable; Moslema, an Arab general, having entered the imperial territories, ravaged the whole province of Galatia, carrying off with him many rich spoils, and a vast number of prisoners. The Greek emperor, hearing that Al Walid designed to attack him both by sea and land, sent some of his nobles to treat of a peace; and, among other things, desired them to bring him a particular account of the force with which the caliph designed to invade the Greek empire. This they represented as so terrible, that it would be next to impossible to oppose it. The emperor therefore caused a great number of light ships to be built, the walls to be repaired, and ordered such of the citizens as had not laid up provisions for three years to depart the city. Al Walid, in the mean time, continued his warlike preparations with the utmost vigour, being determined to make himself master of Constantinople in a single campaign.

168 Al Walid dies, and is succeeded by Soliman.

In the 96th year of the Hegira died the caliph Al Walid; and was succeeded by his brother Soliman. This year the Moslem conquests on the east side were increased by the reduction of Tabrestan and Jurgan or Georgia. In Spain, also, the city of Toledo which had revolted was reduced, and Cæsarea Augusta, now Saragossa, as well as several others. The next year Moslema set out for Constantinople, which he besieged without success till the 99th year of the Hegira; at which time he was obliged to return, after having lost before it 120,000 men. The soldiers were reduced to

169 Constantinople unsuccessfully besieged.

Arabia.

the greatest extremities of hunger, being forced to live upon hides, the roots and bark of trees, the most noisome animals, and even the dead bodies of their companions. This year also (the 99th of the Hegira) is remarkable for the death of the caliph Soliman. According to some, he was poisoned by Yezid his brother, governor of Persia, who was displeased with his having appointed his cousin-german, Omar Ebn Abdalaziz, as his successor, to the exclusion of himself. According to others he died of an indigestion; which is not greatly to be wondered at, if, as those authors say, he used to devour 100 pounds weight of meat every day, and dine very heartily after eating three lambs roasted for breakfast. In the latter part of his reign, the Moslems were by no means successful in Spain: the kingdom of Navarre being founded at this time by Pelagius, or Pelayo, whom the Arabs were never able to reduce.

170 Death of Soliman.

The new caliph Omar Ebn Abdalaziz was by no means of a martial character; but is said to have been very pious, and possessed of very amiable qualities. He suppressed the usual malediction, which was solemnly pronounced by the caliphs of the house of Ommiyah against the house of Ali; and always showed great kindness to the latter. He was poisoned by Yezid, after a short reign of two years and five months. It is related, as an instance of this caliph's humility, that when Moslema visited him in his last sickness occasioned by the poison, he lay upon a bed of palm tree leaves, supported by a pillow formed of beasts skins, and covered with an ordinary garment. He had also on a dirty shirt; for which Moslema blamed his sister Fatima, Omar's wife; but she excused herself by telling him, that the emperor of the faithful had not another shirt to put on.

171 New caliph poisoned.

Concerning Yezid the successor of Omar we find very little worth mentioning. He did not long enjoy the dignity he had so iniquitously purchased, dying after a reign of little more than four years. He died of grief for a favourite concubine named *Hababah*, who was accidentally choked by a large grape which stuck in her throat.

Yezid was succeeded by his brother Hesham, who ascended the throne in the 105th year of the Hegira. In the second and third year of his reign, several incursions were made into the imperial territories, but generally without success. In the 109th year of the Hegira, Moslema drove the Turks out of Armenia and Aderbijan, and again confined them within the Caspian Gates. The next year he obliged them to take an oath that they should keep their own country; but this they soon violated, and were again driven back by Moslema. About this time also the Arabs, having passed the Pyrenees, invaded France to the number of 400,000, including women and slaves, under the command of one Abdalrahman. Having advanced to Arles upon the Rhone, they defeated a large body of French that opposed them; and having also defeated Count Eudo, they pursued him through several provinces, wasted the whole country with fire and sword, making themselves masters of the city of Tours, most of which they reduced to ashes. Here, however, a stop was put to their devastations by Charles Martel; who coming up with them near the above-mentioned city, engaged them for seven days together, and at last gave them a total overthrow.

172 The Turks defeated.

173 France invaded by the Arabs.

174 They are utterly defeated by Charles Martel.

Arabia. overthrow. The French general made himself master of all their baggage and riches; and Abdalrahman, with the shattered remains of his army, reached the frontiers of Spain with the utmost difficulty. The following year also, according to some historians, the Arabs were overthrown at Illiberis, scarce any of them making their escape. To make amends for this bad fortune, however, the caliph's arms were successful against the Turks, who had again invaded some of the eastern provinces.

In the 125th year of the Hegira died the caliph Hesham, after a reign of 19 years, seven months, and eleven days. He was succeeded by Al Walid II. who is represented as a man of a most dissolute life, and was assassinated the following year on account of his professing *Zendicism*, a species of infidelity nearly resembling Sadducism. He was succeeded by Yezid the son of Al Walid I. who died of the plague, after a reign of six months: and was succeeded by Ibrahim Ebn Al
175 eign of erwan. Walid, an imprudent and stupid prince. He was deposed in the 127th year of the Hegira by Merwan Ebn Mahomet, the governor of Mesopotamia; who gave out, as an excuse for his revolt, that he intended to revenge the murder of the caliph Al Walid II. He was no sooner seated on the throne, than the people of Hems rebelled against him. Against them the caliph marched with a powerful army; and asking them what could excite them to this rebellion, summoned them to surrender. They assured him that they were disposed to admit him into their city; and, accordingly, one of the gates being opened, Merwan entered with about 3000 of his troops. The men that entered with him were immediately put to the sword; and the caliph himself escaped with great difficulty. However, he afterwards defeated them in a pitched battle, put a great number of them to the sword, dismantled the city, and crucified 600 of the principal authors of the revolt.

This, however, was far from quieting the commotions in different parts of the empire. The inhabitants of Damascus soon followed the example of those of Hems, and deposed the caliph's governor; but Merwan, immediately after the extinction of the former rebellion, marched to Damascus with great celerity, entered the city by force, and brought to condign punishment the authors of the revolt. Peace, however, was no sooner established at Damascus, than Soliman Ebn Hesham set up for himself at Basra, where he was proclaimed caliph by the inhabitants. Here he assembled an army of 10,000 men, with whom he marched to Kinnissin, where he was joined by vast numbers of Syrians, who flocked to him from all parts. Merwan, receiving advice of Soliman's rapid progress, marched against him with all the forces he could assemble, and entirely defeated him. In this engagement Soliman lost 3000 men; so that he was obliged to fly to Hems, where 900 men took an oath to stand by him to the last. Having ventured, however, to attack the caliph's forces a second time, he was defeated, and again forced to fly to Hems. But, being closely pursued by Merwan, he constituted his brother Said governor of the city, leaving with him the shattered remains of his troops, and himself fled to Tadmor. Soon after his departure Merwan appeared before the town, which he besieged for seven months; during which time he battered it incessantly with 80 catapults. The citizens, Arabia. being reduced to the last extremity, surrendered, and delivered Said into the caliph's hands. In consideration of this submission, Merwan pardoned the rebels, and took them all under his protection. About the same time, another pretender to the caliphate appeared at Cufa; but Merwan took his measures so well, that he extinguished this rebellion before it could come to any height.

176 Notwithstanding the success, however, that had hi- A party formed a- therto attended Merwan, a strong party was formed gainst him against him in Khorasan by the house of Al Abbas. in Khora- The first of that house that made any considerable fi- san. gure was named *Mahomet*, who flourished in the reign of Omar Ebn Abdalaziz. He was appointed chief of the house of Al Abbas about the hundredth year of the Hegira; and is said to have prophesied, that after his death, one of his sons, named *Ibrahim*, should preside over them till he was killed, and that his other son Abdallah, surnamed *Abul Abbas Al Saffah*, should be caliph, and exterminate the house of Ommiyah. Upon this Al Saffah was introduced as the future sovereign, and those present kissed his hands and feet.

After the decease of Mahomet, his son Ibrahim nominated as his representative in Khorasan one Abu Moslem, a youth of 19 years of age; who beginning to raise forces in that province, Merwan despatched against him a body of horse under the command of Nasr 177 Ebn Sayer; but that general was entirely defeated by Merwan's Abu Moslem, and the greatest part of his men killed. forces de- The next year (the 128th of the Hegira) Merwan feated. made vast preparations to oppose Abu Moslem, who after the late victory began to grow formidable to several parts of the empire. According to some authors, Merwan gained two victories over some of Ibrahim's generals; but the year following, Abu Moslem brought such a formidable army into the field, that the caliph's troops could not make head against them; his officers in Khorasan therefore were obliged either to take an oath of allegiance to Ibrahim, or to quit the province within a limited time.

In the 130th year of the Hegira, the caliph's general Nasr having drawn together another army, was again defeated by Khataba another of Ibrahim's generals, and forced to fly to Raya, a town of Dylam, according to some, or of Khorasan, according to others. 178 The next year Ibrahim having foolishly taken it into Ibrahim put his head to go on a pilgrimage to Mecca, attended by to death. a numerous retinue splendidly accoutred, was seized and put to death by Merwan; and the year following Abu Abbas was proclaimed caliph at Cufa. As soon as the ceremony was ended, he sent his uncle Abdallah with a powerful army to attack Merwan's forces that were encamped near Tubar at a small distance from Mosul, where that caliph was then waiting for an account of the success of his troops under Yezid governor of Irak, against Khataba one of Al Saffah's generals. Khataba receiving advice of Yezid's approach, immediately advanced against him, and entirely defeated him; but in crossing the Euphrates, the waters of which were greatly swelled, he was carried away by the current and drowned. The pursuit, however, was continued by his son Hamid, who dispersed the fugitives in such a manner that they could never afterwards be rallied. At the news of this disaster, Merwan was

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at first greatly dispirited; but soon recovering himself, he advanced to meet Abdallah. In the beginning of the battle, the caliph happened to dismount; and his troops perceiving their sovereign's horse without his rider, concluded that he was killed, and therefore immediately fled; nor was it in the power of the caliph himself to rally them again, so that he was forced to fly to Damascus; but the inhabitants of that city, seeing his condition desperate, shut their gates against him. Upon this he fled to Egypt, where he maintained himself for some time; but was at last attacked and killed by Saleh, Abdallah's brother, in a town of Thebais, called *Busir Kurides*. The citizens of Damascus, though they had shamefully deserted Merwan, refused to open their gates to the victors; upon which Saleh entered the city by force, and gave it up to be plundered for three days by his soldiers.

179 Merwan himself defeated,

180 and killed.

By the total defeat and death of Merwan, Al Saffah remained sole master of the Moslem throne; but we hear of no very remarkable events that happened during his reign: only that he massacred great numbers of the partisans of the house of Ommiyah; and that Constantine Copronymus, taking advantage of the intestine divisions among the Moslems, ravaged Syria. The caliph died of the small-pox in the 136th year of the Hegira, in the 33d year of his age; and was succeeded by his brother Al Mansur. In the beginning of Al Mansur's reign, hostilities continued against the house of Ommiyah, who still made resistance, but were always defeated. Abdallah, however, the caliph's uncle, caused himself to be proclaimed caliph at Damascus; and having assembled a powerful army in Arabia, Syria, and Mesopotamia, advanced with great expedition to the banks of the Masius near Nisibis, where he encamped. Al Mansur, being informed of this rebellion, despatched Abu Moslem against Abdallah. This general, having harassed him for five months together, at last brought him to a general action; and having entirely defeated him, forced him to fly to Basra. Notwithstanding all his services, however, Abu Moslem was soon after ungratefully and barbarously murdered by Al Mansur, on some ridiculous pretences of being deficient in respect towards him.

181 Reign of Al Mansur.

182 He murders Abu Moslem.

After the death of Abu Moslem, one Sinan, a Magian, or adorer of fire, having made himself master of that general's treasures, revolted against the caliph; but he was soon defeated by Jamhur Ebn Morad, who had been sent against him with a powerful army. In this expedition Jamhur having acquired immense riches, the covetous disposition of the caliph prompted him to send a person express to the army to seize upon all the wealth. This so provoked Jamhur, that he immediately turned his arms against his master; but was soon defeated, and entirely reduced. The following year (the 139th of the Hegira), one Abdalrahman, of the house of Ommiyah, after the entire ruin of that family in Asia, arrived in Spain, where he was acknowledged caliph; nor did he or his descendants ever afterwards own subjection to the Arabian caliphs.

183 Abdalrahman proclaimed caliph in Spain.

184 Attempt to assassinate the caliph.

The 140th year of the Hegira is remarkable for an attempt to assassinate the caliph. This attempt was made by the Rawandians; an impious sect, who held the doctrine of metempsychosis or transmigration.—They first offered Al Mansur divine honours, by going in procession round his palace, as the Moslems were wont to do round the Caaba; but the caliph, highly incensed at this impiety, ordered 100 of the principal of them to be imprisoned. These, however, were soon released by their companions; who then went in a body to the palace with an intention to murder their sovereign; but he being a person of uncommon bravery, though he was surprised with very few attendants, mounted a mule, and advanced towards the mutineers, with an intention to sell his life as dear as possible. In the mean time, Maan Ebn Zaidat, one of the chiefs of the Ommiyan faction, who had concealed himself in order to avoid the caliph's resentment, sallied out of his retreat, and putting himself at the head of Al Mansur's attendants, charged the rebels with such fury, that he entirely defeated them. This generosity of Maan was so remarkable, that it afterwards passed into a proverb. On this occasion 6000 of the Rawandians were killed on the spot, and the caliph delivered from instant death: he was, however, so much disgusted with the Arabs on account of this attempt, that he resolved to remove the capital of his empire out of their peninsula; and accordingly founded a new city on the banks of the Tigris, which from that time to this has been known by the name of *Bagdad*. The foundations of it were laid in the 145th year of the Hegira, and finished four years after.

Arabia

185 He removes the seat of empire to Bagdad.

On the removal of the seat of government to Bagdad, the peninsula of the Arabs seems all at once to have lost its consequence, and in a short time the inhabitants seem even to have detached themselves from the jurisdiction of the caliphs: for in the 156th year of the Hegira, while Al Mansur was yet living, they made irruptions into Syria and Mesopotamia, as if they had designed to conquer these countries over again for themselves; and though the Arabs, properly so called, continued nominally subject to the caliphs of Bagdad till the abolition of the caliphate by Hulaku the Tartar, yet they did not become subject to him when he became master of that city. There is even the strongest reason to believe that the Arabs (i. e. the inhabitants of the peninsula properly called *Arabia*) have remained independent, not only of Hulaku, but of every other conqueror that the world hath yet produced.

The perpetual independence of the Arabs, indeed, "has been the theme of praise among strangers and natives. The kingdom of Yemen, it is true, has been successively subdued by the Abyssinians, the Persians, the sultans of Egypt, and the Turks; the holy cities of Mecca and Medina have repeatedly bowed under a Seythian tyrant; and the Roman province of Arabia embraced the peculiar wilderness in which Ismael and his sons must have pitched their tents in the face of their brethren. Yet these exceptions are temporary or local; the body of the nation has escaped the yoke of the most powerful monarchies; the arms of Sesostris and Cyrus, of Pompey and Trajan, could never achieve the conquest of Arabia; the present sovereign of the Turks may exercise a shadow of jurisdiction, but his pride is reduced to solicit the friendship of a people whom it is dangerous to provoke and fruitless to attack. The obvious causes of their freedom are inscribed on the character and country of the Arabs. Many ages before Mahomet, their intrepid valour had been severely felt by their neighbours in offensive and defensive war. The patient and active virtues of a soldier

Gibbon's Hist. vol. p. 178.

186 Nations independence of the Arabs.

Arabia.

dier are insensibly nursed in the habits and discipline of a pastoral life. The care of the sheep and camels is abandoned to the women of the tribe; but the martial youth, under the banner of the emir, is ever on horseback, and in the field, to practise the exercise of the bow, the javelin, and the scimitar. The long memory of their independence is the firmest pledge of its perpetuity; and succeeding generations are animated to prove their descent and to maintain their inheritance. Their domestic feuds are suspended on the approach of a common enemy; and in their last hostilities against the Turks, the caravan of Mecca was attacked and pillaged by fourscore thousand of the confederates. When they advance to battle, the hope of victory is in the front; and in the rear, the assurance of a retreat. Their horses and camels, who in eight or ten days can perform a march of four or five hundred miles, disappear before the conqueror; the secret waters of the desert elude his search; and his victorious troops are consumed with thirst, hunger, and fatigue, in the pursuit of an invisible foe, who scorns his efforts, and safely reposes in the heart of the burning solitude. The arms and deserts of the Bedoweens are not only the safeguards of their own freedom, but the barriers also of the Happy Arabia, whose inhabitants, remote from war, are enervated by the luxury of the soil and climate. The legions of Augustus melted away in disease and lassitude: and it is only by a naval power that the reduction of Yemen has been successfully attempted. When Mahomet erected his holy standard, that kingdom was a province of the Persian empire; yet seven princes of the Homerites still reigned in the mountains; and the vicegerent of Chosroes was tempted to forget his distant country and his unfortunate master. The historians of the age of Justinian represent the state of the independent Arabs, who were divided by interest or affection in the long quarrel of the East: the tribe of Ghassan was allowed to encamp on the Syrian territory; the princes of Hira were permitted to form a city about 40 miles to the southward of the ruins of Babylon. Their service in the field was speedy and vigorous; but their friendship was venal, their faith inconstant, their enmity capricious: it was an easier task to excite than to disarm these roving barbarians: and, in the familiar intercourse of war, they learned to see, and to despise, the splendid weakness both of Rome and of Persia. From Mecca to the Euphrates, the Arabian tribes were confounded by the Greeks and Latins, under the general appellation of Saracens; a name which every Christian mouth has been taught to pronounce with terror and abhorrence.

187 Their domestic freedom and character.

"The slaves of domestic tyranny may vainly exult in their national independence; but the Arab is personally free; and he enjoys, in some degree, the benefits of society, without forfeiting the prerogatives of nature. In every tribe, superstition, or gratitude, or fortune, has exalted a particular family above the heads of their equals. The dignities of sheich and emir invariably descend in this chosen race; but the order of succession is loose and precarious; and the most worthy or aged of the noble kinsmen are preferred to the simple, though important, office of composing disputes by their advice, and guiding valour by their example. The momentary junction of several tribes produces an army: their more lasting union constitutes a nation; and the supreme chief, the emir of emirs, whose banner is displayed at their head, may deserve, in the eyes of strangers, the honours of the kingly name. If the Arabian princes abuse their power, they are quickly punished by the desertion of their subjects, who had been accustomed to a mild and parental jurisdiction. Their spirit is free, their steps are unconfined, the desert is open, and the tribes and families are held together by a mutual and voluntary compact. The softer natives of Yemen supported the pomp and majesty of a monarch; but if he could not leave his palace without endangering his life, the active powers of government must have been devolved on his nobles and magistrates. The cities of Mecca and Medina present, in the heart of Asia, the form or rather the substance of a commonwealth. The grandfather of Mahomet, and his lineal ancestors, appear in foreign and domestic transactions as the princes of their country; but they reigned like Pericles at Athens, or the Medici at Florence, by the opinion of their wisdom and integrity: their influence was divided with their patrimony; and the sceptre was transferred from the uncles of the prophet to a younger branch of the tribe of Koreish. On solemn occasions they convened the assembly of the people; and, since mankind must be either compelled or persuaded to obey, the use and reputation of oratory among the ancient Arabs is the clearest evidence of public freedom. But their simple freedom was of a very different cast from the nice and artificial machinery of the Greek and Roman republics, in which each member possessed an undivided share of the civil and political rights of the community. In the more simple state of the Arabs, the nation is free, because each of her sons disdains a base submission to the will of a master. His breast is fortified with the austere virtues of courage, patience, and sobriety; the love of independence prompts him to exercise the habits of self-command; and the fear of dishonour guards him from the meaner apprehension of pain, of danger, and of death. The gravity and firmness of the mind is conspicuous in its outward demeanour; his speech is slow, weighty, and concise; he is seldom provoked to laughter; his only gesture is that of stroaking his beard, the venerable symbol of manhood; and the sense of his own importance teaches him to accost his equals without levity, and his superiors without awe. The liberty of the Saracens survived their conquests: the first caliphs indulged the bold and familiar language of their subjects: they ascended the pulpit to persuade and edify the congregation; nor was it before the seat of empire was removed to the Tigris, that the Abbassides adopted the proud and pompous ceremonial of the Persian and Byzantine courts.

Arabia.

188 Civil wars and private revenge.

"In the study of nations and men, we may observe the causes that render them hostile or friendly to each other, that tend to narrow or enlarge, to mollify or exasperate the social character. The separation of the Arabs from the rest of mankind has accustomed them to confound the ideas of stranger and enemy; and the poverty of the land has introduced a maxim of jurisprudence, which they believe and practise to the present hour. They pretend, that in the division of the earth the rich and fertile climates were assigned to the other branches of the human family; and that

Arabia. the posterity of the outlaw Ismael might recover, by fraud or force, the portion of inheritance of which he had been unjustly deprived. According to the remark of Pliny, the Arabian tribes are equally addicted to theft and merchandise: the caravans that traverse the desert are ransomed or pillaged; and their neighbours, since the remote times of Job and Sesostris, have been the victims of their rapacious spirit. If a Bedoween discovers from afar a solitary traveller, he rides furiously against him, crying, with a loud voice, "Undress thyself; thy aunt, (*my wife*) is without a garment." A ready submission entitles him to mercy; resistance will provoke the aggressor, and his own blood must expiate the blood which he presumes to shed in legitimate defence. A single robber, or a few associates, are branded with their genuine name; but the exploits of a numerous band assume the character of lawful and honourable war. The temper of a people, thus armed against mankind, was doubly inflamed by the domestic license of rapine, murder, and revenge. In the constitution of Europe, the right of peace and war is now confined to a small, and the actual exercise to a much smaller, list of respectable potentates; but each Arab, with impunity and renown, might point his javelin against the life of his countryman. The union of the nation consisted only in a vague resemblance of language and manners; and in each community the jurisdiction of the magistrate was mute and impotent. Of the time of ignorance which preceded Mahomet, 1700 battles are recorded by tradition: hostility was embittered with the rancour of civil faction; and the recital, in prose or verse, of an obsolete feud was sufficient to rekindle the same passions among the descendants of the hostile tribes. In private life, every man, at least every family, was the judge and avenger of its own cause. The nice sensibility of honour, which weighs the insult rather than the injury, sheds its deadly venom on the quarrels of the Arabs: the honour of their women, and of their *beards*, is most easily wounded; an indecent action, a contemptuous word, can be expiated only by the blood of the offender; and such is their patient inveteracy, that they expect whole months and years the opportunity of revenge. A fine or compensation for murder is familiar to the barbarians of every age: but in Arabia the kinsmen of the dead are at liberty to accept the atonement, or to exercise with their own hands the law of retaliation. The refined malice of the Arabs refuses even the head of the murderer, substitutes an innocent to the guilty person, and transfers the penalty to the best and most considerable of the race by whom they have been injured. If he falls by their hands, they are exposed in their turn to the danger of reprisals; the interest and principal of the bloody debt are accumulated; the individuals of either family lead a life of malice and suspicion, and 50 years may sometimes elapse before the account of vengeance be finally settled. This sanguinary spirit, ignorant of pity or forgiveness, has been moderated, however, by the maxims of honour, which require in every private encounter some decent equality of age and strength, of numbers and weapons.

189 Annual truce. An annual festival of two, perhaps of four months, was observed by the Arabs before the time of Mahomet; during which their swords were religiously sheathed both in foreign and domestic hostility: and this partial truce is more strongly expressive of the habits of anarchy and warfare.

Arabia

190 Their social qualifications and virtues

"But the spirit of rapine and revenge was attempered by the milder influence of trade and literature. The solitary peninsula is encompassed by the most civilized nations of the ancient world; the merchant is the friend of mankind; and the annual caravans imported the first seeds of knowledge and politeness into the cities, and even the camps of the desert. The arts of grammar, of metre, and of rhetoric, were unknown to the freeborn eloquence of the Arabians; but their penetration was sharp, their fancy luxuriant, their wit strong and sententious, and their more elaborate compositions were addressed with energy and effect to the minds of their hearers. The genius and merit of a rising poet was celebrated by the applause of his own and the kindred tribes. A solemn banquet was prepared, and a chorus of women, striking their cymbals, and displaying the pomp of their nuptials, sung in the presence of their sons and husbands the felicity of their native tribe; that a champion had now appeared to vindicate their rights; that a herald had raised his voice to immortalize their renown. The distant or hostile tribes resorted to an annual fair which was abolished by the fanaticism of the first Moslems; a national assembly that must have contributed to refine and harmonize the barbarians. Thirty days were employed in the exchange, not only of corn and wine, but of eloquence and poetry. The prize was disputed by the generous emulation of the bards; the victorious performance was deposited in the archives of princes and emirs; and we may read in our own language the seven original poems which were inscribed in letters of gold, and suspended in the temple of Mecca. The Arabian poets were the historians and moralists of the age; and if they sympathized with the prejudices, they inspired and crowned the virtues of their countrymen. The indissoluble union of generosity and valour was the darling theme of their song: and when they pointed their keenest satire against a despicable race, they affirmed, in the bitterness of reproach, that the men knew not how to give, nor the women to deny. The same hospitality which was practised by Abraham, and celebrated by Homer, is still renewed in the camps of the Arabs. The ferocious Bedoweens, the terror of the desert, embrace, without inquiry or hesitation, the stranger who dares to confide in their honour and to enter their tent. His treatment is kind and respectful: he shares the wealth or the poverty of his host; and, after a needful repose, he is dismissed on his way, with thanks, with blessings, and perhaps with gifts.

191 Love of poetry.

192 Ancient idolatry.

"The religion of the Arabs, as well as of the Indians, consisted in the worship of the sun, the moon, and the fixed stars; a primitive and specious mode of superstition. The bright luminaries of the sky display the visible image of a deity: their number and distance convey to a philosophic, or even a vulgar eye, the idea of boundless space: the character of eternity is marked on these solid globes, that seem incapable of corruption or decay: the regularity of their motions may be ascribed to a principle of reason or instinct; and their real or imaginary influence encourages the vain belief that the earth and its inhabitants are the object of their peculiar care. The science of astronomy was cultivated

Arabia. cultivated at Babylon; but the school of the Arabs was a clear firmament and a naked plain. In their nocturnal marches, they steered by the guidance of the stars: their names, and order, and daily station, were familiar to the curiosity and devotion of the Bedoween; and he was taught by experience to divide in 28 parts the zodiac of the moon, and to bless the constellations who refreshed, with salutary rains, the thirst of the desert. The reign of the heavenly orbs could not be extended beyond the visible sphere; and some metaphysical powers were necessary to sustain the transmigration of souls and the resurrection of bodies; a camel was left to perish on the grave, that he might serve his master in another life; and the invocation of departed spirits implies that they were still endowed with consciousness and power. Each tribe, each family, each independent warrior, created and changed the rites and the object of his fantastic worship; but the nation in every age, has bowed to the religion as well as to the language of Mecca. The genuine antiquity of the Caaba extends beyond the Christian era. In describing the coast of the Red sea, the Greek historian Diodorus has remarked between the Thaumaudites and the Sabæans, a famous temple, whose superior sanctity was revered by *all* the Arabians: the linen or silken veil, which is annually renewed by the Turkish emperor, was first offered by a pious king of the Homerites, who reigned 700 years before the time of Mahomet. A tent or a cavern might suffice for the worship of the savages, but an edifice of stone and clay has been erected in its place; and the art and power of the monarchs of the east have been confined to the simplicity of the original model. A spacious portico encloses the quadrangle of the Caaba; a square chapel, 24 cubits long, 23 broad, and 27 high; a door and a window admit the light; the double roof is supported by three pillars of wood; a spout (now of gold) discharges the rain water, and the well Zemzem is protected by a dome from accidental pollution. The tribe of Koreish, by fraud or force, had acquired the custody of the Caaba; the sacerdotal office devolved through four lineal descents to the grandfather of Mahomet; and the family of the Hashemites, from whence he sprung, was the most respectable and sacred in the eyes of their country. The precincts of Mecca enjoyed the rights of sanctuary; and, in the last month of each year, the city and the temple was crowded with a long train of pilgrims, who presented their vows and offerings in the house of God. The same rites which are now accomplished by the faithful Mussulmans were invented and practised by the superstition of the idolaters. At an awful distance they cast away their garments: seven times, with hasty steps, they encircled the Caaba, and kissed the black stone; seven times they visited and adored the adjacent mountains; seven times they threw stones into the valley of Mina; and the pilgrimage was achieved, as at the present hour, by a sacrifice of sheep and camels, and the burial of their hairs and nails in the consecrated ground. Each tribe either found or introduced into the Caaba their domestic worship; the temple was adorned or defiled with 360 idols of men, eagles, lions, and antelopes; and most conspicuous was the statue of Hebal, of red agate, holding in his hand seven arrows, without heads or feathers, the instruments and symbols of profane divination. But this statue was a monument of Syrian arts; the devotion of the ruder ages was content with a pillar or a tablet; and the rocks of the desert were hewn into gods or altars in imitation of the black stone of Mecca, which is deeply tainted with the reproach of an idolatrous origin. From Japan to Pern, the use of sacrifice has universally prevailed; and the votary has expressed his gratitude or fear by destroying or consuming, in honour of the gods, the dearest and most precious of their gifts. The life of a man is the most precious oblation to deprecate a public calamity; the altars of Phœnicia and Egypt, of Rome and Carthage, have been polluted with human gore, the cruel practice was long preserved among the Arabs; in the third century, a boy was annually sacrificed by the tribe of the Dumatians; and a royal captive was piously slaughtered by the prince of the Saracens, the ally and soldier of the emperor Justinian. The father of Mahomet himself was devoted by a rash vow, and hardly ransomed for the equivalent of 100 camels. The Arabs, like the Jews and Egyptians, abstained from the taste of swine's flesh; and they circumcised their children at the age of puberty: the same customs, without the censure or the precept of the Koran, have been silently transmitted to their posterity and proselytes; and it has been sagaciously conjectured, that the artful legislator indulged the stubborn prejudices of his countrymen.

193 The Caaba or temple of Mecca.

Arabia.

194 Sacrifices and rites.

"Arabia was free: from the adjacent kingdoms, which were shaken by the storms of conquest and tyranny, the persecuted sects fled to the happy land where they might profess what they thought, and practise what they professed; and the religions of the Sabians and Magians, of the Jews and Christians, were disseminated from the Persian gulf to the Red sea. In a remote period of antiquity, Sabianism was diffused over Asia by the science of the Chaldeans and the arms of the Assyrians. From the observations of 2000 years, the priests and astronomers of Babylon deduced the eternal laws of nature and providence. They adored the seven gods or angels who directed the course of the seven planets, and shed their irresistible influence on the earth. The attributes of the seven planets, with the twelve signs of the zodiac and the twenty-four constellations of the northern and southern hemisphere, were represented by images and talismans; and seven days of the week were dedicated to their respective deities; the Sabians prayed thrice each day; and the temple of the moon at Haran was the term of their pilgrimage. But the flexible genius of their faith was always ready either to teach or to learn. The altars of Babylon were overturned by the Magians; but the injuries of the Sabians were revenged by the sword of Alexander. Persia groaned about 500 years under a foreign yoke; and the purest disciples of Zoroaster escaped from the contagion of idolatry, and breathed with their adversaries the freedom of the desert. Seven hundred years before the death of Mahomet the Jews were settled in Arabia: but a far greater multitude was expelled from the holy land in the wars of Titus and Hadrian. The industrious exiles aspired to liberty and power: they erected synagogues in the cities and castles in the wilderness; and their Gentile converts were confounded with the children of Israel, whom they resembled in the outward mark of circumcision.

195 Introduction of the Sabians.

196 The Magians.

197 The Jews.

Arabia.

198 The Christians.

cision. The Christian missionaries were still more active and successful; the Catholics asserted their universal reign; the sects whom they oppressed successivcly retired beyond the limits of the Roman empire; the Marcionites and Manichæans dispersed their *fantastic* opinions and apocryphal gospels; the churches of Yemen, and the princes of Hira and Ghassan, were instructed in a purer creed by the Jacobite and Nestorian bishops." Such was the state of religion in Arabia previous to the appearance of Mahomet. See N° 22. *supra.*

As the Arabs are one of the most ancient nations in the world, having inhabited the country they at present possess almost from the deluge, without intermixing with other nations, or being subjugated by any foreign power, their language must have been formed soon after, if not at, the confusion of Babel. The two principal dialects of it were, that spoken by the Hamyarites and other genuine Arabs, and that of the Koreish, in which Mahomet wrote the Koran. The first is styled by the Oriental writers the *Arabic* of *Hamyar*, and the other *the pure* or *defecated.* As Yarab, grandfather of Hamyar, is supposed by the Oriental writers to have been the first whose tongue deviated from the Syriac to the Arabic, the Hamyaritic dialect according to them must have approached nearer to the purity of the Syriac; and consequently have been more remotc from the true genius of the Arabic than that of any other tribe. The dialect of the Koreish, termed by the Koran *the perspicuous and clear Arabic*, is referred to Ishmael as its author; who, say the above-mentioned writers, first spoke it; and, as Dr Pococke believes, after he had contracted an alliance with the family of Jorham by marriage, formed it of their language and the original Hebrew. As, therefore, the Hamyaritic dialect partook principally of the Syriac, so that of the Koreish was supposed to consist chiefly of the Hebrew. But, according to Jallalo'ddin, the politeness and elegance of the dialect of the Koreish ought rather to be attributed to their having, from the remotest antiquity, the custody of the Caaba, and dwelling in Mecca the centre of Arabia. The Arabs are full of the commendations of their language, which is very harmonious, expressive, and, as they say so immensely copious, that no man uninspired can be a perfect master of it in its utmost extent. How much, in this last article, it is superior to the Greek and Latin tongues, in some measure appears from hence, that sometimes a bare enumeration of the Arabic names of one particular thing, and an explication of them, will make a considerable volume. Notwithstanding this, the Arabs believe the greatest part of their language to be lost; which will not seem improbable, when we consider how late the art of writing became generally practised among them. For though it was known to Job their countryman, to the Edomites, as well as the other Arabian nations bordering upon Egypt and Phœnicia, and to the Hamyarites many centuries before Mahomet, as appears from some ancient monuments said to be remaining in their character: yet the other Arabs, and those of Mecca in particular, unless such of them as were either Jews or Christians, were to the time of Moramer perfectly ignorant of it. It was the ancient Arabic language preceding the reign of Justinian, which so nearly resembled the Ethiopic; for since that time, and especially since the age of Mahomet, all the Arabic dialects have been not a little corrupted. This is now the learned language of the Mahometans, who study it as the European Christians do the Hebrew, Greek, and Latin.

Arabia

199 Letters.

The character used by them, the most ancient of any peculiar to the Arabs, wherein the letters were not distinctly separate, went by the appellation of *Al Mosnad*, from the mutual dependency of its letters or parts upon one another. This was neither publicly taught, nor suffered to be used, without permission first obtained. Could we depend upon what Al Firauzabadius relates from Ebn Hashem, this character must have been of a very high antiquity; since an inscription in it, according to the last author, was found in Yaman as old as the time of Joseph. Be that as it will, Moramer Ebn Morra of Anbar, a city of Irak, who lived not many years before Mahomet, was the inventor of the present Arabic character, which Bashar the Kendian, who married the sister of Abu Sofiàn, is said to have learned from the house of Anbar, and to have introduced at Mecca but a little time before the institution of Mahometanism. Moramer's alphabet the Oriental authors agree to have been very different from the ancient one of the Hamyarites, since they distinguish the Hamyaritic and Arabic pens. In Mahomet's time, the Morameric alphabet had made so small a progress, that no one in Yaman could either write or read it; nay, Mahomet himself was incapable of doing either; for which reason he was called the *illiterate prophet.* The letters of this alphabet were very rude; being either the same with, or very much like, the Cufic, which character is still found in inscriptions and the titles of ancient books; nay, for many years, it was the only one used by the Arabs, the Koran itself being the first written therein. In order to perpetuate the memory of Moramer's invention, some authors call the Arabic letters *Al Moramer*, i. e. *the progeny of Moramer.* The most remarkable specimens of the *Cufic* character (so denominated from Cufa, a city of Irak, where some of the first copies of the Koran were written) are the following: Part of that book in it on vellum, brought from Egypt by Mr Greaves; some other fragments of the same book in it published by Sir John Chardin; certain passages of a MS. in the Bodelian library; the legends on several Saracenic coins dug up not many years ago on the coast of the Baltic, not far from Dantzic; and, according to Mr Professor Hunt, those noble remains of it that are, or were lately, to be seen in Mr Joseph Ames's valuable collection of antique curiosities. As to the true origin of the ancient and modern Arabic alphabets, we must own ourselves pretty much in the dark. See ALPHABET.

200 Learning

The Arabian learning may be divided into two periods, viz. *Ante-Mahometan* and *Mahometan.*

The Arab learning, in this first period, consisted, according to Abulpharagius, in the knowledge of their language, the propriety of discourse, the composition of verse, and the science of the stars: but their chief attention seems to have been directed to oratory and poetry.

The same period is more distinguished, at least from the time of Al-Mamon, the seventh caliph of the family of the Abassides, who flourished about the year 820, and has the honour of being the founder of the

Arabia. the modern Arabian learning. He sent for all the best books out of Chaldea, Greece, Egypt, and Persia, relating to physic, astronomy, cosmography, music, chronology, &c. and pensioned a number of learned men, skilled in the several languages and sciences, to translate them into Arabic. By this means, divers of the Greek authors, lost in their own country and language, have been preserved in Arabic. From that time Arabia became the chief seat of learning; and we find mention by Abulpharagius, Pococke, D'Herbelot, and Hottinger, of learned men, and books without number.

The revival of learning in the tenth century, by Gerbert, known after his elevation to the pontificate by the title of Silvester II. and afterwards among the Europeans in general, may be ascribed to the instructions and writings of the Arabian doctors and philosophers, and to the schools which they founded in several parts of Spain and Italy. And in the 12th century, the inquisitive of different countries frequented the schools of the Saracens in Spain, and disseminated the knowledge which they obtained there after their return. At this time, many of the learned productions of the Arabians were translated into Latin, which facilitated the general progress of science.

The philosophy of the Arabians, before Mahomet, was Sabian, and included the system and ceremonies of that sect of idolaters. This it was that Mahomet set himself to decry; and he is even said by some to have carried his opposition so far, as to prohibit, if not punish, all study of philosophy. But his followers, by degrees, got over this restraint: the love of learning increased; till, under the memorable caliphate of Al Mamon, Aristotle's philosophy was introduced and established among them; and from them propagated with their conquests, through Egypt, Africa, Spain, and other parts. As they chose Aristotle for their master, they chiefly applied themselves to that part of philosophy called *logic*, and thus became proficients in the knowledge of words rather than things. Whence they have been sometimes denominated *Masters of the wisdom of words;* sometimes the *Talking sect*. Their philosophy was involved in quaint arbitrary terms and notions, and their demonstrations drawn from thence as from certain principles, &c. *Walch. Hist. Log.* lib. ii. sec. 2. § 1.

Their physic succeeded the Grecian; and their physicians handed down the art to us, having made considerable improvements, chiefly in the pharmaceutical and chemical parts.

It is certain we owe to them most of our spices and aromatics, as nutmegs, cloves, mace, and other matters of the produce of India. We may add, that most of the gentler purgatives were unknown to the Greeks, and first introduced by the Arabs, as manna, senna, rhubarb, tamarinds, cassia, &c. They likewise brought sugar into use in physic, where, before, only honey was used. They also found the art of preparing waters and oils, of divers simples, by distillation and sublimation. The first notice of the smallpox and the measles is likewise owing to them. Lastly, The restoration of physic in Europe took its rise from their writings. M. le Clerc has given a sketch, and Dr Freind an ample history, of the Arabian physic. We have also a *Notitia* of all the Arabian physicians by Fabricius.

Their poetry may be divided into two ages. The ancient, according to Vossius, was no other than rhyming; was a stranger to all measure and rule; the verses loose and irregular, confined to no feet, number of syllables, or any thing else, so that they rhymed at the end: oftentimes all the verses in the poem ended with the same rhyme. It is in such verse that the Alcoran is said to be written. Arabia.

The modern Arabian poetry takes its date from the caliphate of Al Raschid, who lived toward the close of the eighth century. Under him poetry became an art, and laws of prosody were laid down. Their comparisons, in which they abound, are taken, with little choice, from tents, camels, hunting, and the ancient manners of the Arabs.

201 Mechanical arts. That some of the Arabs had a good degree of knowledge in several mechanical arts, appears from Strabo, who informs us, that the people of Tamna and the adjacent provinces had magnificent temples, and elegant houses, built in the Egyptian taste. The same author likewise relates, that in Arabia Felix, besides the husbandmen, there were many artificers; and amongst others, those who made palm wine, which he intimates, was much used by the Arabs. As for the exercise of arms and horsemanship, they looked upon this as one of their principal accomplishments, being obliged to practise and encourage it by reason of the independency of their tribes, whose frequent jarring made wars almost continual amongst them, which for the most part ended in field battles. Hence it became an usual saying amongst them, that God had bestowed four peculiar things on the Arabs, viz. *turbans instead of diadems, tents instead of walls and houses, swords instead of intrenchments, and poems instead of written laws.* The principal arms used by the ancient Arabs were bows and arrows, darts or javelins, and broadswords or scimitars. The bows and arrows were the most ancient of these; being used by Ishmael himself, according to Scripture. It is probable also, that some of them were acquainted with every branch of the military art cultivated by their neighbours the Egyptians, Syrians, and Phœnicians.

202 Commerce. Before the Portuguese interrupted the navigation of the Red sea, the Arabs were the factors of all the trade that passed through that channel. Aden, which is situated at the most southern extremity of Arabia upon the Indian ocean, was the mart in those parts. The situation of its harbour, which opened an easy communication with Egypt, Ethiopia, India, and Persia, had rendered it, for many ages, one of the most flourishing factories in Asia. Fifteen years after it had repulsed the great Albuquerque, who attempted to demolish it in 1513, it submitted to the Turks, who did not long remain masters of it. The king of Yemen, who possessed the only district in Arabia that merits the title of *Happy*, drove them from thence, and removed the trade to Mocha, a place in his dominions which till then was only a village.

This trade was at first inconsiderable; consisting principally in myrrh, incense, aloes, balm of Mecca, some aromatics, and medicinal drugs. These articles, the exportation of which is continually retarded by exorbitant imposts, and does not exceed at present 30,625l. were at that time more in repute than they have been since; but must have been always of little consequence.

Arabia. consequence. Soon after a great change ensued from the introduction of coffee.

Though this article is generally used in the Arabian entertainments, none but the rich citizens have the pleasure of tasting the berry itself. The generality are obliged to content themselves with the shell and the husk of this valuable production. These remains, so much despised, make a liquor of a pretty clear colour, which has a taste of coffee without its bitterness and strength. These articles may be had at a low price at Betelfagui, which is the general market for them. Here likewise is sold all the coffee which comes out of the country by land. The rest is carried to Mocha, which is 35 leagues distant, or to the nearer ports of Loheia or Hodeida, from whence it is transported in small vessels to Jodda. The Egyptians fetch it from the last-mentioned place, and all other nations from the former.

The quantity of coffee exported may be estimated at twelve millions five hundred and fifty thousand weight. The European companies take off a million and a half; the Persians three millions and a half; the fleet from Suez six millions and a half; Indostan, the Maldives, and the Arabian colonies on the coast of Africa, fifty thousand; and the caravans a million.

As the coffee which is bought up by the caravans and the Europeans is the best that can be procured, it costs about 8½d. a pound. The Persians, who content themselves with that of an inferior quality, pay no more than about 6½d. a pound. The Egyptians purchase it at the rate of about 8d.; their cargoes being composed partly of good and partly of bad coffee. If we estimate coffee at about 7⅜d. a pound, which is the mean price, the profits accruing to Arabia from its annual exportation will amount to 384,343l. 15s. This money does not go into their coffers; but it enables them to purchase the commodities brought from the foreign markets to their ports of Jodda and Mocha.

Mocha receives from Abyssinia, sheep, elephants teeth, musk, and slaves. It is supplied from the eastern coast of Africa with gold, slaves, amber, and ivory; from the Persian gulf, with dates, tobacco, and corn; from Surat, with a vast quantity of coarse, and a few fine linens; from Bombay and Pondicherry, with iron, lead, and copper, which are carried thither from Europe; from Malabar, with rice, ginger, pepper, Indian saffron, with coire, cardamom, and also with planks; from the Maldives, with gum benzoin, aloes wood, and pepper, which these islands take in exchange; from Coromandel, with 400 or 500 bales of cottons, chiefly blue. The greatest part of these commodities, which may fetch 262,500l. are consumed in the interior parts of the country. The rest, particularly the cottons, are disposed of in Abyssinia, Socotora, and the eastern coast of Africa.

None of the branches of business which are managed at Mocha, as well as throughout all the country of Yaman, or even at Sanaa the capital, are in the hands of the natives. The extortions with which they are perpetually threatened by the government deter them from interfering in them. All the warehouses are occupied by the Banians of Surat or Guzerat, who make a point of returning to their own country as soon as they have made their fortunes. They then resign their settlements to merchants of their own nation, who retire in their turn, and are suceeeded by others. Arabia

The European companies, who enjoy the exclusive privilege of trading beyond the Cape of Good Hope, formerly maintained agents at Mocha. Notwithstanding it was stipulated by a solemn capitulation, that the imposts demanded should be rated at two and a quarter per cent. they were subject to frequent extortions: the governor of the place insisting on their making him presents which enabled him to purchase the favour of the courtiers, or even of the prince himself. However, the profits they obtained by the sale of European goods, particularly cloths, made them submit to these repeated humiliations. When these several articles were furnished by Grand Cairo, it was then impossible to withstand the competition, and the fixed settlements were therefore given up.

The trade was carried on by ships that sailed from Europe with iron, lead, copper, and silver, sufficient to pay for the coffee they intended to buy. The supercargoes, who had the care of these transactions, settled the accounts every time they returned. These voyages, which at first were pretty numerous and advantageous, have been successively laid aside. The plantations of coffee, made by the European nations in their colonies, have equally lessened the consumption and the price of that which comes from Arabia. In process of time these voyages did not yield a sufficient profit to answer the high charges of undertaking them on purpose. The companies of England and France then resolved, one of them to send ships from Bombay, and the other from Pondicherry, to Mocha, with the merchandise of Europe and India. They even frequently had recourse to a method that was less expensive. The English and French visit the Red sea every year. Though they dispose of their merchandise there to good advantage, they can never take in cargoes from thence for their return. They carry, for a moderate freight, the coffee belonging to the companies, who lade the vessels with it, which they despatch from Malabar and Coromandel to Europe. The Dutch company, who prohibit their servants from fitting out ships, and who send no vessels themselves to the gulf of Arabia, are deprived of the share they might take in this branch of commerce. They have also given up a much more lucrative branch, that of Jodda.

Jodda is a port situated near the middle of the gulf of Arabia, 20 leagues from Mecca. The government there is of a mixed kind: the grand signior and the xeriff of Mecca share the authority and the revenue of the customs between them. These imposts are levied upon the Europeans at the rate of 8 per cent. and upon other nations at 13. They are always paid in merchandise, which the managers oblige the merchants of the country to buy at a very dear rate. The Turks who have been driven from Aden, Mocha, and every part of Yaman, would long ago have been expelled from Jodda, if there had not been room to apprehend that they might revenge themselves in such a manner as to put an end to their pilgrimages and commerce.

The coins which are current at Mocha, the principal port of the Red sea, are dollars of all kinds; but they abate five per cent. on the pillar dollars, because they are reckoned not to be the purest silver, and the 203 Coins.

dollar,

Arabia || Aracan.

dollar weight with them is 17 drachms 14 grains. All their coins are taken by weight, and valued according to their pureness. The gold coins current here are ducats of Venice, Germany, Turkey, Egypt, &c. The comasses are a small coin, which are taken at such a price as the government sets on them; and they keep their accounts in an imaginary coin, called *cabeers*, of which 80 go to a dollar. For an account of the ancient coins called *dinars* and *dirhems*, see these two articles.

Gum ARABIC. See GUM.

ARABICI, a sect who sprung up in Arabia about the year 207, whose distinguishing tenet was, that the soul died with the body, and also arose again with it.

Eusebius, lib. vi. c. 38. relates that a council was called to stop the progress of this rising sect; and that Origen assisted at it, and convinced them so thoroughly of their error that they abjured it.

ARABIS, BASTARD TOWER MUSTARD. See BOTANY *Index*.

ARABISM, ARABISMUS, an idiom or manner of speaking peculiar to the Arabs or the Arabic language.

ARABIST, a person curious of, and skilled in, the learning and language of the Arabians: such were Erpenius and Golius. The surgeons of the 13th century are called *Arabists* by Severinus.

ARABLE LANDS, those which are fit for tillage, or which have been formerly tilled.

ARACAN, the capital of a small kingdom to the north-east of the bay of Bengal, situated in E. Long. 93. 0. N. Lat. 20. 30. It has the conveniency of a spacious river, and a harbour large enough to hold all the ships in Europe. It is said by Schouten to be as large as Amsterdam; but the houses are slight, being made with palm trees and bamboo canes, and covered with leaves of trees. They are seldom above six feet high, but have many windows or air-holes. But the people of the highest rank are much better accommodated. They have no kitchens, chimneys, or cellars, which obliges the women to dress the victuals out of doors. Some of the streets are on the ridges of rocks, wherein are a great many shops. Their orchards and gardens contain all the fruits common to the Indies, and their trees are green all the year. Their common drink is toddy; which is the sap of the cocoa tree, and when new, will intoxicate like wine, but soon grows sour. Elephants and buffaloes are very numerous here, and are made use of instead of horses. They have plenty of provisions, and but little trade: for when Mr Charnock was here in 1686, with six large ships, there was nothing to be had in the way of commerce; and yet the country produces lead, tin, stick lac, and elephants teeth. The Mogul's subjects come here to purchase these commodities; and sometimes meet with diamonds, rubies, and other precious stones. They were formerly governed by a king of their own, called the king of the *White Elephant;* but this country has been conquered by the king of Pegu. They pay little or no regard to the chastity of their women, and the common sailors take great liberties among them. Their religion is Paganism; and the idols, temples, and priests are very numerous. The dress of the better sort is very slight, for it consists chiefly of a piece of white cotton over their arms, breast, and belly, with an apron before. The complexion of the women is tolerable: they wear thin flowered gauze over their breast and shoulders, and a piece of cotton, which they roll three or four times round their waist, and let it hang as low as their feet. They curl their hair, and put glass rings in their ears, and stretch them of a monstrous length. On their arms and legs they have hoops of copper, ivory, silver, &c. The country produces great quantities of rice, and the water is good. Their flocks of sheep and herds of cattle are also numerous near Aracan; but what they say of the towns and villages, with which the country is pretended to be overspread, may be doubted. Captain Hamilton affirms, that there are but few places inhabited, on account of the great number of wild elephants and buffaloes, which would destroy the fruits of the ground; and that the tigers would destroy the tame animals. There are some villages near the sea, inhabited by a few miserable fishermen, who can just keep themselves from starving, though they are out of the reach of oppression. The rich burn the dead bodies; but the poor, who are not able to buy wood, throw them into the river.

Aracan || Arack.

ARACHIS, See BOTANY *Index*.

ARACHNE, in fabulous history, a young maid of Lydia, said to have been the inventress of spinning. She is fabled to have been so skilful in this art, as to challenge Minerva at it; who tore her work, and struck her, which disgrace driving her to despair, she hanged herself. Minerva from compassion brought her to life, and transformed her into a spider, which still employs itself in spinning.

ARACHNOIDES, in *Anatomy*, an appellation given to several membranes; as the tunic of the crystalline humour of the eye, the external lamina of the pia mater, and one of the coverings of the spinal marrow.

ARACK, ARRACK, or RACK, a spirituous liquor imported from the East Indies, used by way of dram and in punch.

The word *arack*, according to Mr Lockyer, is an Indian name for strong waters of all kinds; for they call our spirits and brandy *English arack*. But what we understand by the name *arack*, he affirms, is really no other than a spirit procured by distillation from a vegetable juice called *toddy*, which flows by incision out of the cocoa-nut tree, like the birch juice procured among us. The toddy is a pleasant drink by itself, when new, and purges those who are not used to it: and, when stale, it is heady, and makes good vinegar. The English at Madras use it as leaven to raise their bread with.

Others are of opinion, that the arack, or arrack, is a vinous spirit obtained by distillation, in the East Indies, from rice or sugar, fermented with the juice of cocoa nuts.

The Goa arrack is said to be made from the toddy, the Batavia arack from rice and sugar; and there is likewise a kind of shrub from which arack is made.

Goa and Batavia are the chief places for arack. At Goa there are divers kinds: single, double, and treble distilled. The double distilled, which is that commonly sent abroad, is but a weak spirit in comparison with Batavia arack; yet, on account of its peculiar and agreeable flavour, is preferred to all the other aracks of India. This flavour is attributed to the earthen ves-

Arack. sels which they use at Goa to draw the spirit; whereas at Batavia they use copper stills.

The Parier araek made at Madras, and the Columbo and Quilone arrack at other places, being fiery hot spirits, are little valued by the Europeans, and therefore rarely imported; though highly prized among the natives. In the best Goa arack, the spirits of the eocoa juice do not make above a sixth or eighth part.

The manner of making the Goa araek is this: The juice of the trees is not procured in the way of tapping as we do; but the operator provides himself with a parcel of earthen pots, with bellies and necks like our ordinary bird bottles: he makes fast a number of these to his girdle, and any way else that he commodiously can about him. Thus equipped, he elimbs up the trunk of a cocoa tree; and when he comes to the boughs, he takes out his knife, and cutting off one of the small knots or buttons, he applies the mouth of the bottle to the wound, fastening it to the bough with a bandage; in the same manner he cuts off other buttons, and fastens on his pots, till the whole number is used: this is done in the evening, and descending from the tree, he leaves them till the next morning; when he takes off the hottles, which are mostly filled, and empties the juice into the proper receptaele. This is repeated every night, till a suffieient quantity is produced; and the whole being then put together, is left to ferment, which it soon does. When the fermentation is over, and the liquor or wash is become a little tart, it is put into the still, and a fire being made, the still is suffered to work as long as that which comes over has any considerable taste of spirit.

The liquor thus procured is the low wine of arack; and this is so poor a liquor, that it will soon corrupt and spoil if not distilled again, to separate some of its phlegm; they therefore immediately after pour back this low wine into the still, and rectify it to that very weak kind of proof spirit, in which state we find it. The araek we meet with, notwithstanding its being of a proof test, according to the way of judging by the crown of bubbles, holds but a sixth, and sometimes but an eighth part of alcohol, or pure spirit; whereas our other spirits, when they show that proof, are generally esteemed to hold one half pure spirit. *Shaw's Essay on Distilling.*

There is a paper of observations on arack, in the *Melanges d'Histoire Natur.* tom. v. p. 302. By fermenting, distilling, and rectifying the juice of the American maple, which has much the same taste as that of the cocoa, the author says, he made arack not in the least inferior to any that comes from the East Indies; and he thinks the juice of the sycamore and of the birch tree would equally answer the end.

Besides the common sorts of Goa and Batavia arack, there are two others less generally known; these are the bitter arack and the black arack.

By stat. 11th Geo. I. c. 30. arack, on board a ship within the limits of any port of Great Britain, may be searched for and seized, together with the package; or if found unshipping or unshipped, before entry, may be seized by the officers of excise, in like manner as by the officers of the customs.—Upon an exeise officer's suspicion of the concealment of araek, and oath made of the grounds of such suspicion before the commissioners or a justice of peace, they may empower him to enter such suspected places, and seize the liquors, with the casks, &c. If the offieers are obstructed, the penalty is 100l.

Arack || Aradus. Arack is not to be sold but in warehouses, entered as directed in the 6th of Geo. I. c. 21. upon forfeiture, and the casks, &c. If permits are not returned which are granted for the removal of arack, or if the goods are not sent away within the time limited, the penalty is treble the value. If the permits are not returned, and the decrease is not found to be sufficient, the like quantity is forfeited. Permits are not to be taken out but by direction in writing of the proprietor of the stock, or his known servant, upon forfeiture of 50l. or three months imprisonment.

By stat. 9th Geo. II. c. 35. if araek is offered to sale without a permit, or by any hawker, pedlar, &c. with a permit, the person to whom it is offered may seize and carry it to the next warehouse belonging to the customs or excise, and bring the person offering the same before any justice of the peace, to be committed to prison, and proseeuted for the penalties ineurred by sueh offenee. The person seizing such goods may prosecute in his own name; and on recovery is entitled to one-third part of the gross produce of the sale; and the commissioners are, if desired, upon a eertifieate from the justice of the offender's being committed to prison, to advance to the seizer 15s. per gallon for the arack so seized.

Arack (except for the use of seamen, two gallons each) found in any ship or vessel arriving from foreign parts, at anchor, or hovering within the limits of any port, or within two leagues of the shore, and not proceeding on her voyage (unless in case of unavoidable neeessity and distress of weather, notice whereof must be given to the collector or ehief offieer of the port upon the ship's arrival), is forfeited, with the boxes, easks, or other package, or the value thereof.

ARACK is also the name of a spiritnous liquor made by the Tartars of Tungusia, of mares milk, left to sour, and afterwards distilled twice or thriee between two earthen pots closely stopped, whence the liquor runs through a small wooden pipe. It is more intoxicating than brandy.

ARAD, in *Ancient Geography*, a city lying to the south of Judah and the land of Canaan, in Arabia Petræa. The Israelites having advanced towards the land of Canaan (Numb. xxi. 1.), the king of Arad opposed their passage, defeated them, and took a great booty from them; but they destroyed his eountry as soon as they beeame masters of the land of Canaan (Numb. xxxiii.). Arad was rebuilt, and Ensebius places it in the neighbourhood of Kades, at the distanee of 20 miles from Hebron. The Israelites in their passage through the wilderness, having departed from Sepher, eame to Arad, and from thence to Makkelath.

ARADUS, in *Ancient Geography*, an island between the borders of Phœnieia and Seleucia, at the distance of 20 stadia from a dangerous coast: all of it a roek surrounded by the sea, in compass seven stadia; and forming a very powerful city and republie. It is now called *Ronad;* but not a single wall is remaining of all that multitude of houses which, according to Strabo, were built with more stories than even those of Rome. The liberty enjoyed by the inhabitants had rendered it very populous; and it subsisted by naval commerce,

Aradus ‖ ræometer.

commerce, manufactures, and arts. At present the island is deserted; nor has tradition even retained the memory of a spring of fresh water in its environs, which the people of Aradus discovered at the bottom of the sea, and from which they drew water in time of war by means of a leaden bell and a leathern pipe fitted to its bottom.

ARÆ PHILÆNON, or PHILÆNORUM (Strabo); to the south of the Syrtis Major; but in Peutinger more westerly, to the south almost of the Syrtis Minor. In Strabo's time, the altars were not extant, but a village of the same name stood on the spot. On a dispute about limits, between the Cyreneans and Carthaginians, it was agreed that two of each people should set out on the same day, and that where they should happen to meet, there the limits of both should be fixed. The Philæni, two brothers, Carthaginians, undertook it for Carthage: these, after having advanced a great many miles into the territory of the Cyreneans, were met by their antagonists; who, enraged at their being beforehand with them so far, gave them the option of either returning back, or of being buried alive on the spot. Like zealous patriots, they chose the latter; and there the Carthaginians raised two altars in honour of the Philæni. (Sallust, Valerius Maximus).

ARÆOMETER, an instrument to measure the density or gravity of fluids.

The aræometer, or waterpoise, is usually made of glass; consisting of a round hollow ball, which terminates in a long slender neck hermetically sealed at top: there being first as much running mercury put into it as will serve to balance or keep it swimming in an erect position.

The stem is divided into degrees (as represented Plate XXXVI. fig. 23.); and by the depth of its descent into any liquor, the lightness of that liquor is concluded: for that fluid in which it sinks least must be heaviest; and that in which it sinks lowest lightest.

Mr Homberg has invented an aræometer, described in Phil. Transact. N° 262. thus: *A* is a glass bottle or matrass, with so slender a neck that a drop of water takes up in it above five or six lines, or half of an inch. Near that neck is a small capillary tube *D*, about six inches long, and parallel to the neck.—To fill the vessel, the liquor is poured in at the mouth *B* (which is widened to receive a tunnel), till it run out at *D*, that is, till it rise in the neck to the mark *C*, by which means you have always the same bulk or quantity of liquor; and consequently, by means of the balance, can easily tell, when different liquors fill it, which weighs most, or is most intensely heavy.

Some regard, however, is to be had in these trials to the season of the year, and degree of heat and cold in the weather; because some liquors rarefy with heat and condense with cold more than others, and accordingly take up more or less room.

By means of this instrument, the ingenious author has made a table to show the different weights of the same bulk of the most considerable chemical liquors both in summer and winter as follows:

	Weighed in summer.	In winter.
The aræometer full of	*oz. dr. gr.*	*oz. dr. gr.*
Quicksilver, -	11 00 06 -	11 00 32
Oil of tartar, -	01 03 08 -	01 03 13
Oil of vitriol, -	01 03 58 -	01 04 03
Spirit of nitre, -	01 01 40 -	01 01 70
Spirit of salt, -	01 00 39 -	01 00 47
Aquafortis, -	01 01 38 -	01 01 57
Vinegar, -	00 07 55 -	00 07 65
Spirit of wine, -	00 06 47 -	00 06 60
River water, -	00 07 53 -	00 07 51
Distilled water -	00 07 50 -	00 07 54

Aræometer ‖ Aral.

The instrument itself weighed, when empty, one drachm twenty-eight grains. See HYDROMETER in this work, and ARÆOMETER in the SUPPLEMENT.

ARÆOPAGUS. See AREOPAGUS.

ARÆOSTYLE, in *Architecture*, a term used by Vitruvius, to signify the greatest interval which can be made between columns.

ARÆOTICS, in *Medicine*, remedies which rarefy the humours, and render them easy to be carried off by the pores of the skin.

ARAF, among the Mahometans. See ALARAF.

ARAFAH, the ninth day of the last month of the Arabic year, named *Dhoulhegiat;* on which the pilgrims of Mecca perform their devotions on a neighbouring mountain called *Arafat*. The Mahometans have a very great veneration for this mountain, because they believe that Adam and Eve, after they were banished out of Paradise, having been separated from each other during 120 years, met afterwards on this mountain.

ARAFAT, or GIBEL EL ORPHAT, *the mountain of knowledge*, a mountain in Arabia near Mecca. The Mahometans say this was the place where Adam first met with and knew his wife Eve after their expulsion from Paradise. This mountain not being large enough to contain all the devotees that come annually in pilgrimage to Mecca, stones are set up all round it to show how far it reaches. The pilgrims are clad in robes of humility and mortification, with their heads uncovered. They seem to be very much affected; for the tears flow down their cheeks, and they sob and sigh most bitterly, begging earnestly for remission of sins, and promising to lead a new life. They continue here about four or five hours, and at half an hour after sunset they all decamp to perform a religious duty called *Asham nomac*. After this, they all receive the honourable title of *hadgees*, which is conferred upon them by the imam or priest. This being pronounced, the trumpet sounds, and they all return to Mecca.

ARAGON. See ARRAGON.

ARAL, a great lake in the kingdom of Khowarazm, lying a little to the eastward of the Caspian sea. Its length from north to south is said to be near 150 miles, and its breadth from east to west about 70. The shore on the west side is high and rocky, and destitute of good water: yet there are abundance of wild horses, asses, antelopes, and wolves; as also a fierce creature called a *jolbart*, which the Tartars say is of such a prodigious strength as to carry off a horse. It is surprising that this lake should be quite unknown to geographers till within these few years. Several great rivers, which were supposed to run into the Caspian sea, are now known to fall into this lake, particularly the Sihun or Sirr, and the Ghihun or Amo, so often

Aral || Aranjuez.

mentioned by the Oriental historians. This lake, like the Caspian sea, has no visible outlet. Its water is also very salt; and for that reason is conveyed by the neighbouring inhabitants by small narrow canals into sandy pits, where the heat of the sun, by exhaling the water, leaves them a sufficient quantity of salt. The same kinds of fish are found in the Aral that are found in the Caspian sea. The former is also called the *Lake of Eagles*.

ARAHUM, or HARAHUM, in ancient writers, denotes a place consecrated or set apart for holy purposes. Hence the phrase *in araho jurare*, or *conjurare*, "to make oath in the church;" because, by the Ripuarian laws, all oaths were to be taken in the church on the relicks of the saints.

ARALIA, the ANGELICA TREE. See BOTANY *Index*.

ARAM, or *Aramæa Regio*, in *Ancient Geography*, the Hebrew name of Syria, so called from Aram the son of Shem, (Moses, Josephus).

ARAM Beth-Rehob, in *Ancient Geography*, was that part of Syria lying to the north of Palestine; because Rehob was its boundary towards that quarter, (Moses); allotted to the tribe of Asher, (Judges); where it joins Sidon, (Joshua).

ARAM-Dammasek, or Syria Damascena, in *Ancient Geography*, a principal part of Syria, and more powerful than the rest (2 Sam.), taking its name from Damascus, the principal city.

ARAM-Maacha, in *Ancient Geography*, a district of Syria, at the foot of Mount Hermon, (2 Samuel, 1 Chronicles); on the borders of the half tribe of Manasseh, on the other side the Jordan, called the coast of *Maachathi*, (Moses, Joshua).

ARAM-Naharaim, in *Ancient Geography*, i. e. Aram or Syria of the Rivers, or Mesopotamia, situated between the Euphrates and Tigris; which is the reason of the name.

ARAM-Soba or *Zoba*, in *Ancient Geography*, which David conquered, was a country near the Euphrates, where afterwards Palmyra stood: the Euphrates bounded it on the east, as the land of Canaan and Syria Damascena did on the west, (2 Samuel).

ARAMONT, a town of Languedoc in France, seated on the river Rhone. E. Long. 4. 52. N. Lat. 43. 54.

ARANEA, the SPIDER. See ENTOMOLOGY *Index*.

ARANJUEZ, a town in the province of New Castile, where the king of Spain has a palace and gardens which are reckoned the most delightful in the world.

This place is 20 miles from Madrid, by a noble road, planted on each side with trees, lately made at the expence of 120,000l. sterling. It is delightfully situated at the conflux of the rivers Tagus and Jarama; which run through the gardens, and add new beauty to this charming spot, where art and nature seem to go hand in hand with the most pleasing and rural simplicity. On one side fine avenues of stately oaks and lofty elms convey the truest ideas of magnificence, while they afford the most reviving shade; on the other, the sudden transitions to lawns and wilderness, the cascades of water breaking through the thickets, the tuneful songs of numberless birds sheltered in these cool recesses, the occasional appearance and passage of the monarch attended by the grandees of his kingdom; all these objects united, and concentred in one point, fill the imagination with pleasing ideas, and impress the mind of a traveller with a thousand agreeable sensations. Aranjuez

The general situation is in a very large plain surrounded with large hills, of a most disagreeable aspect indeed, but seldom appearing, being well hidden by the noble rows of trees that extend across the flat in every direction. The main body of the palace is an old building, to which have been lately added two new wings. The first part of the building was erected by Philip II. who purchased the estate, planted many of the avenues, and, in order to extend his chase, or to indulge his splenetic disposition, had all the vines that grew on the hills rooted up. By that means he drove away the inhabitants, and rendered the environs of his villa a perfect desert.—The apartments are good; but contain nothing very particular to take off from the enjoyment of so many fine objects abroad. In one of the new wings is a playhouse, and in the other a chapel. Part of the ceiling of the former was painted by Mengs, who was also sent to Rome to paint a holy family for the principal altar in the chapel. There are seven fine pictures of Luca Jordano in the apartment called *El Cabinete Antiguo*, and six others in that *De los Mayordomos*. The portraits of the grand duke and duchess of Tuscany, by Mengs, are in a new apartment, called the *king's dressing-room*. In the chapel, over the great altar, there is a fine picture of the Annunciation, by Titian, presented by him to Charles V. and brought from the convent of Juste, after the death of that emperor. The porcelain cabinet, where there are several large pieces of the king's own manufacture, is also an object of curiosity to a traveller.

As to the gardens, the whole of them may be thrown into three grand divisions, distinguished by the names of La Huerta Valenciana, Los Deleites, and El Cortijo. In the Huerta Valenciana, agriculture and gardening are carried on in the same manner as in that fruitful province, and they plough with horses. In the Cortijo they use oxen, as in Andalusia; and in other places they scratch up the ground with mules, as is still practised in some parts of Spain. Whichever way one looks round, a constant variety pleases the eye, and enraptures the mind. At one moment the sturdy buffalo moves before you, drawing his heavy burden; soon after, the slow camel, with his ponderous load; while the swift zebra with his striped garment frisks over the plains. If you approach the farm, every object of convenience is consulted, and in the dairy every degree of neatness. The Dutch cow enjoys a luxuriant pasture, the brood mares greatly enliven the landscape, and the stables are filled with the most excellent horses; and an immense nursery furnishes all manner of trees and plants. The fine avenue, which serves also for a public walk, called *Calle de Reyna*, has nothing equal to it at Versailles. It is three miles long, quite straight from the palace gate, crossing the Tagus twice before it loses itself in the thickets, where some noble spreading elms and weeping poplars hang beautifully over the deep still pool. Near this road is a flower garden for the spring, laid out with great taste by Mr Wall during his ministry. The gay variety of flowers

Aranjuez, Arar.

at this time of year is particularly pleasing to the eye; but its beauty soon fades on the approach of summer. As the weather grows hot, the company that choose to walk retire to a garden in an island of the Tagus, on the north side of the palace. This is a heavenly place, cut into various walks and circular lawns, which in their primitive state may have been very stiff and formal: but in the course of a century, Nature has obliterated the regular forms of art; the trees have swelled out beyond the line traced for them, and destroyed the enfilade by advancing into the walks or retiring from them. The sweet flowering shrubs, instead of being clipped and kept down, have been allowed to shoot up into trees, and hang over the statues and fountains they were originally meant to serve as humble fences to. The jets-d'eau dash up among the trees, and add fresh verdure to the leaves. The terraces and balustrades built along the river, are now overgrown with roses, and other luxuriant bushes, hanging down into the stream, which is darkened by the large trees growing on the opposite banks. Many of the statues, groupes, and fountains, are handsome, some masterly, the works of Algardi: all are placed in charming points of view, either in open circular spots, at a distance from the trees, or else in gloomy arbours, and retired angles of the wood. The banks of this wood, called the Ila, are also enlivened by elegant yachts for the amusement of the royal family.

The town or village formerly consisted of the palace, its offices, and a few miserable huts, where the ambassadors, and the attendants of the court, endeavoured to lodge themselves as well as they could, but always very uncomfortably; many of the habitations were vaults half under ground. What determined the king to build a new town, and to embellish the environs, was an accident that happened at the nuncio's; a coach broke through the ceiling of his dining-room, and fell in upon the table. The court then began to apply very considerable sums to the purpose of erecting proper dwellings for the great number of persons that flock to the place where the sovereign resides; near 10,000 are supposed to live here two or three months in spring; the king keeps 115 sets of mules, which require a legion of men to take care of them. Above a million sterling has been laid out at Aranjuez since the year 1763; and it must be acknowledged, that wonders have been performed: several fine streets drawn in straight lines with broad pavements, a double row of trees before the houses, and a very noble road in the middle; commodious hotels for the ministers and ambassadors; great squares, markets, churches, a theatre, and an amphitheatre for bull feasts, have been raised from the ground; besides the accession of two new wings to the palace. Neatness and convenience have been more studied and sought for than show in the architecture, but altogether the place has something truly magnificent in the coup d'œil.

ARAR, (Cæsar, Strabo); *Araris*, (Dio Cassius); *Saucona*, (Ammian): A river of Celtic Gaul, now the *Saone;* which rises out of Mount Vogesus on the confines of Lorrain, runs through the Franche Comté and Burgundy, and below Lyons falls into the Rhone. It is so incredibly slow, that the eye cannot distinguish which way it moves, (Cæsar); and therefore Pliny calls it the *Sluggish river*. Its course is from north to south. It is famous for a bridge of Cæsar, which was built by the soldiers in one day. It is navigable equally with the Rhone.

Arar, Ararat.

ARARAT, the name of the mountain on which Noah's ark rested, after the abatement of the waters of the universal deluge. Concerning this mountain there are various conjectures; though it is almost universally allowed to be in Armenia Major. Some are of opinion that it is one of the mountains which divide Armenia on the south from Mesopotamia and that part of Assyria inhabited by the *Curds;* from whom these mountains took the name of *Curdu* or *Cardu*, by the Greeks turned into *Gordyæi*, &c. Others, that it lies towards the middle of Armenia, near the river Araxes, above 280 miles distant from the above mentioned mountains, making it belong to Mount Taurus; but the Armenians are positive that Noah's Ararat is no other than a mountain to which they now give the name of *Masis*, which lies about 12 leagues to the east of Erivan, and four leagues from the Aras. It is encompassed by several petty hills: on the tops of them are found many ruins, thought to have been the buildings of the first men, who were, for some time, afraid to descend into the plains. It stands by itself, in form of a sugar-loaf, in the midst of a very large plain, detached, as it were, from the other mountains of Armenia, which make a long chain. It consists, properly speaking, of two hills; the lesser of which is the more sharp and pointed: the higher, on which it is said the ark rested, lies to the north-west of it, and rises far above the neighbouring mountains. It seems so high and big, that, when the air is clear, it may be seen four or five days journey off; yet travellers think the height is not extraordinary. Chardin is of opinion that he passed a part of Mount Caucasus which is higher; and Poullet thinks the height of Mount Masis, or Ararat, not above twice as great as that of Mount Valerian near Paris. They therefore think that its being visible at such a great distance is owing to its lonely situation in a vast plain, and upon the most elevated part of the country, without any mountains before it to obstruct the view. Nor is the snow with which it is always covered from the middle upwards any argument of its height; for in this country, ice hath often been observed in the mornings of the middle of July. (See ARMENIA). Certain it is, however, that this mountain hath never yet been ascended; which the Armenians pretend was owing to the interposition of angels, in order to disappoint the curiosity of those who wanted to advance to such a sacred place as that whereon the ark rested: but the excess of cold may very reasonably be supposed able to frustrate all such attempts, without any supernatural interposition. The most distinct account we have of this mountain is that given by M. Tournefort: which, however, being much swelled with immaterial circumstances, it is needless to trouble our readers with at length. He tells us, that this mountain is one of the most disagreeable sights upon earth, without either houses, convents, trees, or shrubs; and seems as if continually wasting and mouldering away. He divides it into three regions: The lowermost, he says, is the only one which contains any human creatures, and is occupied by a few miserable shepherds that tend scabby flocks; and here are also found some partridges: the second is inhabited by crows and tigers; and all the

Ararat || Aratus.

the rest is covered with snow, which half the year is involved in thick clouds. On the side of the mountain that looks towards Erivan is a prodigious precipice, from whence rocks of an immense size are continually tumbling down with a hideous noise. This precipice seems quite perpendicular; and the extremities are rough and blackish, as if smutted with smoke. The soil of the mountain is loose, and on the sandy parts it is impossible to take a firm step; so that our traveller encountered great difficulties in his ascent and descent of this mountain; being often obliged, in order to avoid the sand, to betake himself to places where great rocks were heaped on one another, under which he passed as through caverns, or to places full of stones, where he was forced to leap from one stone to another. If we may believe Struys, a Dutch writer, however, all these difficulties may be surmounted. He assures us, he went five days journey up Mount Ararat, to see a Romish hermit: that he passed through three regions of clouds; the first dark and thick, the next cold and full of snow, and the third colder still; that he advanced five miles every day; and when he came to the place where the hermit had his cell, he breathed a very serene and temperate air; that the hermit told him, that he perceived neither wind nor rain all the 25 years he had dwelt there; and that on the top of the mountain there reigned a still greater tranquillity, whereby the ark was preserved uncorrupted. He farther pretends, that the hermit gave him a cross made out of the wood of the ark, together with a certificate; a formal copy of which the author has given in his sham relation.

ARASSI, a maritime, populous, and trading town of Italy, in the territory of Genoa. E. Long. 7. 20. N. Lat. 44. 3.

ARATEIA, in antiquity, a yearly festival celebrated at Sicyon, on the birth day of Aratus, wherein divers honours were paid by a priest consecrated to this service, who for distinction's sake wore a ribband bespangled with white and purple spots. The Arateia were solemnized with much pomp of music, the choristers of Bacchus attending.

ARATUS, general of the Achæans, conquered Nicocles tyrant of Sicyon. Two years after he surprised the castle called *Acrocorinthus*, and drove out the king of Macedonia: he delivered Argos from its tyrants, and was poisoned by Philip II. king of Macedonia, whom he had newly restored. He was about 62 when he died, the second year of the 141st Olympiad. He was interred at Sicyon, and received the greatest honours from his countrymen. His son, who had also been prætor, was poisoned by King Philip. Polybius gives us so great a character of Aratus the father's Commentaries or History, that the loss of so valuable a work is highly to be regretted.

ARATUS, a Greek poet, born at Soli, or Solæ, a town in Cilicia, which afterwards changed its name, and was called *Pompeiopolis*, in honour of Pompey the Great. He flourished about the 124th, or according to some, the 126th Olympiad, in the reign of Ptolemy Philadelphus king of Egypt. He discovered in his youth a remarkable poignancy of wit, and capacity for improvement; and having received his education under Dionysius Heracleotes, a Stoic philosopher, he espoused the principles of that sect. Aratus was physician to Antigonus Gonatus, the son of Demetrius Poliorcetes, king of Macedon: this prince being a great encourager of learned men, sent for him to court, admitted him to his intimacy, and encouraged him in his studies. The *Phænomena* of Aratus, which is still extant, gives him a title to the character of an astronomer as well as a poet; in this piece he describes the nature and motion of the stars, and shows the particular influences of the heavenly bodies, with their various dispositions and relations. He wrote this poem in Greek verse: it was translated into Latin by Cicero; who tells us, in his first book *De Oratore*, that the verses of Aratus are very noble. This piece was translated by others as well as Cicero; there being a translation by Germanicus Cæsar, and another into elegant verse by Festus Avienus. An edition of the *Phænomena* was published by Grotius, at Leyden, in quarto, 1600, in Greek and Latin with the fragments of Cicero's version, and the translations of Germanicus and Avienus; all which the editor has illustrated with curious notes. He was certainly much esteemed by the ancients, since we find so great a number of scholiasts and commentators upon him. There are several other works also ascribed to Aratus. Suidas mentions the following: Hymns to Pan; Astrology and Astrothesy; a composition of Antidotes; an Επιθυτικον on Theopropus; an Ηθοποια on Antigonus; an Epigram on Phila, the daughter of Antipater, and wife of Antigonus; an Epicedium of Cleombrotus; a Correction of the Odyssey; and some Epistles in prose. Virgil, in his Georgics, has imitated or translated many passages from this author; and St Paul has quoted a passage of Aratus. It is in his speech to the Athenians (Acts xvii. 28.) wherein he tells them, that some of their own poets have said, Του γαρ και γενος εσμεν: "For we are also his offspring." These words are the beginning of the fifth line of the *Phænomena* of Aratus.

Aratus || Araxes.

ARAVA, a fortress of Upper Hungary, on a river of the same name. E. Long. 20. 0. N. Lat. 47. 20.

ARAUCO, a fortress and town of Chili, in South America; situated in a fine valley, on a river of the same name. The bravery of the natives drove the Spaniards out of their country even without fire arms. W. Long. 73. 20. S. Lat. 38. 10. See ARAUCANIA, SUPPLEMENT.

ARAUSIO, or *Civitas Arausiensis*, or *Arausicorum* (Notitiæ); *Colonia Secundanorum* (Mela, Pliny, Coins); so called, because the veterans of the second legion were there settled: The capital of the Cavares, in Gallia Narbonensis. Now *Orange*, in the west of Provence, on an arm of the rivulet Egue, which soon after falls into the Rhone, from which it is distant a league to the east, at the foot of a mountain. Here is an ancient amphitheatre to be still seen. E. Long. 4. 46. N. Lat. 44. 10.

ARAW, a town of Swisserland, in Argow, seated on the river Aar. It is handsome, large, and remarkable for its church, its fountain, and the fertility of the soil. E. Long. 8. 0. N. Lat. 47. 25.

ARAXES, now the Aras, a river of Armenia Major, which takes its rise in a mountain called *Ablos*, where the Euphrates also hath its origin. From this mountain it runs eastward with a serpentine course, discharging itself into the Caspian sea, after a run of upwards of 500 miles, during which it receives some considerable

Arba. siderable rivers. Some have imagined that it hath its rise in Mount Ararat; but Tournefort assures us that it comes no nearer that mountain than 12 miles. The Araxes is a very rapid river, and is supposed to be the Gihon mentioned by Moses. Besides this extreme rapidity, it is very apt to overflow after rains; so that they have in vain endeavoured to build bridges over it; though some of them appear, from the few arches remaining, to have been built of the best materials, and in the strongest manner. Such is the vehemence of its current after the thawing of the adjacent snows, or some fierce rains, that neither banks nor dikes can resist it; so that nothing can be more terrible than the noise and violence of its waves at such times: but in winter, when its waters are low, it is fordable in some places on camels.

ARBA, in *Ancient Geography*, an island and city of Illyria, now *Arbe*, in the gulf of Quarnaro. Of this island, which has been but slightly noticed by geographers, we have the following description by the abbé Fortis.

In the Roman times, it is probable that there were no other cities in Arbe but that which bears the name of the island, in the neighbourhood of which ancient monuments are frequently dug up.

This city of Arbe, though the capital of a small island, not above thirty miles round, wholly uncultivated, and uninhabitable in the highest part that faces the channel of Morlacca, has always maintained itself with decorum. That it was inhabited by civilized people in the Roman times, is evident, by the inscriptions that have been frequently discovered there, and others still remaining at Arbe. In the lower times it suffered all the calamities to which the neighbouring countries were subjected, but it always recovered itself with honour even after dissolution.

The archives of the community of Arbe contain some ancient papers that are truly valuable, and they are kept with great jealousy; by them it appears, that in the eleventh century, gold and silk were not rare among the inhabitants. Arbe was subject to the kings of Hungary; afterwards it became dependent on Venetian feudatories; and at last was taken under the immediate dominion of the most serene republic, by which a governor is appointed who has the title of count and captain. The number of people on the island does not much exceed three thousand souls, distributed in a few parishes, which might be officiated by a small number of priests: Yet, through a monstrous inconsistency that falls very heavy on the poor inhabitants, they have to maintain no less than three convents of friars, and as many of nuns, besides the considerable charge of near sixty priests, who have a very scanty provision.

The climate of Arbe is none of the happiest; the winter season is horrid, especially when agitated by the violent northerly winds, which sometimes transform the intermediate seasons into winter, and cause the summer itself to disappear. These furious winds do great damage to the island, particularly in the winter and spring. Two years ago, about twelve thousand sheep perished in one night, of cold, in the common pastures of the mountain; where, according to the custom over all Dalmatia, they are left in the open air the whole year round. The salt fog raised by the dreadful commotion of the waves, which often roar between the mountains of Arbe and the opposite Alps, in the narrow channel of Morlacca, consumes all the buds of the plants and corn, if it happens to be driven upon the island by the wind; and it is followed by a cruel scarcity of every kind of product. This calamity communicates its baneful influence even to the flesh of the animals left on the pastures, that becomes ill tasted, in consequence of the bitterness and bad nourishment of the food. Abstracting from these irregularities, the air of Arbe is healthful; nor ought the constant summer fevers among the inhabitants to be attributed to its influence, as they are, more probably, derived from unwholesome food, and a way of life differing little from that of the Hottentots. Arba.

The appearance of the island is exceedingly pleasant. On the east it has a very high mountain, of the same substance as the Morlacca, of which it was once a part. At the foot of this mountain, the rest of the island is extended to the westward, and divided into beautiful and fruitful plains interspersed with little hills fit to bear the richest products. At the extremity that looks to the north, a delightful promontory, called Loparo, stretches into the sea; it is crowned with little hills, which almost quite enclose a fine cultivated plain. Near this promontory are the two small islands of S. Gregorio and Goli, very useful to shepherds and fishers. The coast of Arbe, that faces the Morlacca mountains, is quite steep and inaccessible; and the channel between them is extremely dangerous, being exposed to furious winds, and without a single port on either side. The long and narrow island of Dolin, lying parallel to the island of Arbe, along the coast of Barbado, forms a channel less dangerous, though by no means so secure as it is beautiful to look at. There are several harbours in the neighbourhood of the city of Arbe, by which the trade of the best part of the island is facilitated.

The city stands on a rising ground between two harbours, which form a peninsula; it contains about a thousand inhabitants, among whom are many noble families, but few of them are rich. Among the most remarkable curiosities of the island, the Arbegiani are proud of many egregious relicks, and particularly of the head of S. Christofano their protector; but the lovers of sacred antiquity will find something much more singular in the three heads of Shadrach, Meshech, and Abednego, which are venerated there with great devotion. Four of the principal gentlemen are keepers of the sanctuary, and to their care the precious records of the city are also committed. Among these records there is a transaction of 1018, by which the city of Arbe promises to the doge of Venice, Ottone Orfeolo, a tribute of some pounds *de serta serica*, "of wrought silk," and in case of contravention, pounds *de auro obrizo*, "of pure gold."

In the last age there was a learned bishop of Arbe, named Ottavio Spaderi, who would not permit the relicks of S. Christofano to be exposed to the public veneration, on the solemnity of the saint's day, because he doubted of their authenticity. The mob rose, and was going to throw him down from the top of the hill on which the cathedral stands; nor did the tumult cease after the day was past. The government sent an armed vessel to deliver the prelate from the danger

the

Arba, Arbaces.

he was in: and the pope thought proper to give him a more tractable spouse in Italy.

The nature of the soil of Arbe is not the same in every situation; nay it would be difficult to find a country where there is so great a variety in so little space. There is a very great difference between the ground of the extremity of the mountain above the channel of Barbado, and the sides of it on the one part towards the island, and on the other facing the ridge of Morlacca. Nor is the top of the mountain itself always of the same structure: for in some parts it is extended in a fine level plain, partly woody and partly cultivable; in other places it is quite rocky, and composed of bare marble. The ground at the foot of the mountain, where it stretches towards the shore, opposite to Jablanaz, is nothing but marble; and in the district of Barbado it is gravelly, and a good soil for vines. The wine of Barbado is of excellent quality, and in great estimation; hardly any other product is cultivated along that coast, as the vines succeed so well, notwithstanding the negligent culture. Below the pretended ruins of Colento the land bears vines, olives, mulberry, and other fruit trees, and also corn in the lowest parts. All the lower part of the island is composed alternately of little hills and valleys, and of a substance for the most part very different from that of the mountain and its adjacencies. As the organization of the mountain is wholly of marble, so that of the hills is generally arenaceous. The whetstone forms a large part, and frequently contains *ostracites* and *lenticulares;* the exterior stratum is commonly friable. The valleys, which according to appearances should be full of sand, are provided with an excellent soil, with such a mixture of very minute sand as is requisite to keep it light. Springs of fresh water are by nature well distributed over the island, and maintain a proper humidity when the summer is not excessively dry; so that the dark verdure of the hills covered with wood, the luxuriance of the vines, and freshness of the corn ground, form a spectacle extremely cheerful and agreeable.

The island of Arbe would have every thing requisite for the subsistence of its small population, if the land was cultivated by a people less stupid and lazy.

It produces, however, firewood, of which many cargoes are annually sent to Venice; corn, oil, excellent wine, brandy, and silk, since very ancient times; it also exports hides, wool, sheep, hogs, and horses of a good breed. There is also abundance of good salt made on the island; and the fishing of tunny and mackarel, notwithstanding it is managed in a slovenly and awkward manner, makes no inconsiderable article of trade to the Arbegiani, who like all their neighbours, find their account in selling this commodity to strangers rather than to the Venetians. Yet, with all these natural products, the island is very far from being rich, or even in a tolerably flourishing state; because there is much land left uncultivated, and the peasants are lazy.

ARBACES governed Media under Sardanapalus. Seeing him spinning among a company of his women, he stirred up his people to revolt, and dethroned Sardanapalus: who thereupon burnt himself in his palace. Arbaces being crowned, began the monarchy of the Medes, which lasted 317 years under nine kings, till Astyages was expelled by Cyrus. Arbaces reigned 22 years, and died A. M. 3206. See MEDIA.

ARBALEST, or CROSS BOW. See *CROSS-Bow.*

Arbal Arbe

ARBELA, now IRBIL, a city of Assyria, lying in E. Long. 44. 5. N. Lat. 35. 15. It is famous for the last and decisive battle fought in its neighbourhood between Alexander the Great and Darius Codomannus. This battle was fought 331 years before Christ, and the event of it determined the fate of the Persian empire. Arrian relates, that Darius's army consisted of a million of foot and 40,000 horse; according to Diodorus, there were 200,000 horse and 800,000 foot; Plutarch relates, that the horse and foot together made up a million: and Justin gives us exactly half Diodorus's number. The Macedonian army, according to Arrian consisted of 40,000 foot and 7000 horse.

Upon receiving notice of the vast strength of the enemy, Alexander expressed neither surprise nor apprehension; but having "commanded a halt, he encamped four days, to give his men rest and refreshment. His camp being fortified by a good intrenchment, he left in it the sick and infirm, together with all the baggage; and, on the evening of the fourth day, prepared to march against the enemy with the effective part of his army, which was said to consist of 40,000 infantry and 7000 horse, unencumbered with any thing but their provisions and armour. The march was undertaken at the second watch of the night, that the Macedonians, by joining battle in the morning, might enjoy the important advantage of having an entire day before them, to reap the full fruits of their expected victory. About half way between the hostile camps, some eminences intercepted the view of either army. Having ascended the rising ground, Alexander first beheld the barbarians, drawn up in battle array, and perhaps more skillfully marshalled than he had reason to apprehend. Their appearance, at least, immediately determined him to change his first resolution. He again commanded a halt, summoned a council of war; and different measures being proposed, acceded to the single opinion of Parmenio, who advised that the foot should remain stationary until a detachment of horse had explored the field of battle and carefully examined the disposition of the enemy. Alexander, whose conduct was equalled by his courage, and both surpassed by his activity, performed those important duties in person at the head of his light horse and royal cohort. Having returned with unexampled celerity, he again assembled his captains, and encouraged them by a short speech. Their ardour corresponded with his own; and the soldiers, confident of victory, were commanded to take rest and refreshment. *Gillies' Hist. of Greece.*

"Meanwhile Darius, perceiving the enemy's approach, kept his men prepared for action. Notwithstanding the great length of the plain, he was obliged to contract his front, and form in two lines, each of which was extremely deep. According to the Persian custom, the king occupied the centre of the first line, surrounded by the princes of the blood and the great officers of his court, and defended by his horse and foot guards, amounting to 15,000 chosen men. These splendid troops, who seemed fitter for parade than battle, were flanked on either side by the Greek mercenaries and other warlike battalions, carefully selected from the whole army. The right wing consisted of the Medes, Parthians, Hyrcanians and Sacæ: the left was chiefly occupied by the Bactrians, Persians, and Cardusians.

Arbela. dusians. The various nations composing this immense host were differently armed, with swords, spears, clubs, and hatchets: while the horse and foot of each division were promiscuously blended, rather from the result of accident than by the direction of design. The armed chariots fronted the first line, whose centre was farther defended by the elephants. Chosen squadrons of Scythian, Bactrian, and Cappadocian cavalry advanced before either wing, prepared to bring on the action, or after it began to attack the enemy in flank and rear. The unexpected approach of Alexander within sight of his tents prevented Darius from fortifying the wide extent of his camp; and, as he dreaded a nocturnal assault from enemies who often veiled their designs in darkness, he commanded his men to remain all night under arms. This unusual measure, the gloomy silence, the long and anxious expectation, together with the fatigue of a restless night, discouraged the whole army, but inspired double terror into those who had witnessed the miserable disasters on the banks of the Granicus and the Issus.

"At daybreak Alexander disposed of his troops in a manner suggested by the superior numbers and deep order of the enemy. His main body consisted of two heavy-armed phalanxes, each amounting to above 16,000 men. Of these the greater part formed into one line; behind which he placed the heavy-armed men, reinforced by his targeteers, with orders, that when the outspreading wings of the enemy prepared to attack the flanks and rear of his first line, the second should immediately wheel to receive them. The cavalry and light infantry were so disposed on the wings, that while one part resisted the shock of the Persians in front, another, by only facing to the right or left, might take them in flank. Skilful archers and darters were posted at proper intervals, as affording the best defence against the armed chariots, which (as Alexander well knew) must immediately become useless whenever their conductors or horses were wounded.

"Having thus arranged the several parts, Alexander with equal judgment led the whole in an oblique direction towards the enemy's left; a manœuvre which enabled the Macedonians to avoid contending at once with superior numbers. When his advanced battalions, notwithstanding their nearness to the enemy, still stretched towards the right, Darius also extended his left, till, fearing that by continuing this movement, his men should be drawn gradually off the plain, he commanded the Scythian squadrons to advance, and prevent the farther extension of the hostile line. Alexander immediately detached a body of horse to oppose them. An equestrian combat ensued, in which both parties were reinforced, and the barbarians finally repelled. The armed chariots then issued forth with impetuous violence; but their appearance only was formidable; for the precautions taken by Alexander rendered their assault harmless. Darius next moved his main body, but with so little order, that the horse, mixed with the infantry, advanced, and left a vacuity in the line, which his generals wanted time or vigilance to supply. Alexander seized the decisive moment, and penetrated into the void with a wedge of squadrons. He was followed by the nearest sections of the phalanx, who rushed forward with loud shouts, as if they had already pursued the enemy. In this part of the field, the victory was not long doubtful; after a feeble resistance the barbarians gave way; and the pusillanimous Darius was foremost in the flight. Arbela ‖ Arbitrary.

"The battle, however, was not yet decided. The more remote divisions of the phalanx, upon receiving intelligence that the left wing, commanded by Parmenio, was in danger, had not immediately followed Alexander. A vacant space was thus left in the Macedonian line, through which some squadrons of Persian and Indian horse penetrated with celerity, and advanced to the hostile camp. It was then that Alexander derived signal and well-earned advantages from his judicious order of battle. The heavy-armed troops and targeteers, which he had skillfully posted behind the phalanx, speedily faced about, advanced with a rapid step, and attacked the barbarian cavalry, already entangled among the baggage. The enemy, thus surprised, were destroyed or put to flight. Meanwhile the danger of his left wing recalled Alexander from the pursuit of Darius. In advancing against the enemy's right, he was met by the Parthian, Indian, and Persian horse, who maintained a sharp conflict. Sixty of the *Companions* fell; Hephæstion, Cœnus, and Menidas, were wounded. Having at length dissipated this cloud of cavalry, Alexander prepared to attack the foot in that wing. But the business was already effected, chiefly by the Thessalian horse; and nothing remained to be done, but to pursue the fugitives, and to render the victory as decisive as possible.

"According to the least extravagant accounts, with the loss of 500 men, he destroyed 40,000 of the barbarians, who never thenceforth assembled in sufficient numbers to dispute his dominion in the east. The invaluable provinces of Babylonia, Susiana, and Persis, with their respective capitals of Babylon, Susa, and Persepolis, formed the prize of his skill and valour. The gold and silver found in those cities amounted to thirty millions sterling; the jewels and other precious spoil, belonging to Darius, sufficed, according to Plutarch, to load 20,000 mules, and 5000 camels." The consequences of this victory the reader will find narrated under the article PERSIA.

ARBERG, a town of Swisserland, in the canton of Bern, with a handsome castle, where the bailiff resides. It is seated on the river Aar, in a kind of island. E. Long. 7. 15. N. Lat. 47. 0.

ARBITER, in the *Civil Law*, implies a judge nominated by the magistrate, or chosen voluntarily by the two contending parties, in order to decide their differences.

The civilians make a difference between *arbiter* and *arbitrator*, though both found their power on the compromise of the parties; the former being obliged to judge according to the customs of the law, whereas the latter is at liberty to use his own discretion, and accommodate the differences in the manner that appears to him most just and equitable.

ARBITRARY, that which is left to the choice or arbitration of men, or not fixed by any positive law or injunction.

Arbitrary Punishment, in *Law*, denotes, such punishments as are by statute left to the discretion of the judge. It is a general rule in arbitrary punishments, that the judge cannot inflict death. Hence all punishments that are not capital have acquired the name of *arbitrary*

Arbitrary ‖ Arburg.

arbitrary punishments, even although they be expressly pointed out by statute.

ARBITRATION, is where the parties, injuring and injured, submit all matters in dispute, concerning any personal chattels or personal wrong, to the judgement of two or more arbiters or arbitrators; who are to decide the controversy: and, if they do not agree, it is usual to add, that another person be called in as umpire (*imperator* or *impar*), to whose sole judgment it is then referred; or frequently there is only one arbitrator originally appointed. This decision, in any of these cases, is called an *award*. And thereby the question is as fully determined, and the right transferred or settled, as it would have been by the agreement of the parties or the judgment of a court of justice. See LAW.

ARBITRATOR, a private extraordinary judge, chosen by the mutual consent of parties, to determine controversies between them. See ARBITER and ARBITRATION.

ARBOIS, a small populous town of France, in the department of Jura, formerly Franche Compte, famous for its wines. E. Long. 5. 40. N. Lat. 46. 55.

ARBON, an ancient town in Swisserland, on the south banks of the lake Constance, in Thurgaw. It has a castle built by the Romans, and is under the jurisdiction of the bishop of Constance. In the time of war, the Swiss have a right to put in a garrison. The Popish and Protestant religions are equally tolerated in this town. E. Long. 9. 30. N. Lat. 4. 38.

ARBOR, in *Botany*, a tree. Trees are by Linnæus classed in the seventh family of the vegetable kingdom, and are distinguished from shrubs in that their stems come up with buds on them; but this distinction holds not universally, there being rarely any buds on the large trees in India.

ARBOR, in *Mechanics*, the principal part of a machine, which serves to sustain the rest; also the axis or spindle on which a machine turns, as the *arbor* of a crane, windmill, &c.

ARBOR Dianæ. See CHEMISTRY *Index*.

ARBOR Vitæ. See THUYA, BOTANY *Index*.

ARBORESCENT, an epithet applied to such objects as resemble trees.

ARBORIST, a person skilled in that part of botany which treats of trees.

ARBORESCENT Star-fish, in *Zoology*, a species of asterias. See ASTERIAS.

ARBORIBONSES, in modern history, priests of Japan, who live an erratic life, and subsist on alms. They dwell in caverns, and cover their heads with bonnets made of the bark of trees.

ARBOUR, in *Gardening*, a kind of shady bower, formerly in great esteem; but of late rejected on account of its being damp and unwholesome.

Arbours are generally made of lattice work, either of wood or iron; and covered with elms, limes, hornbeams; or with creepers, as honeysuckles, jasmines, or passion flowers; either of which will answer the purpose very well, if rightly managed.

ARBROATH. See ABERBROTHICK.

ARBURG, a town of Swisserland, in the canton of Bern, on the river Aar. It is small, but very strong, being seated on a rock, and defended by a good fortress cut out of the rock. E. Long. 7. 55. N. Lat. 47. 10.

Arburg ‖ Arbuthnot

ARBUSCULA, is used by Bradley to denote a little or dwarf tree, above the rank of shrubs, but below that of trees; such, e. g. as the elder.

ARBUSTUM, implies a number or multitude of trees planted for the fruit's sake.

The word was more peculiarly applied to a place planted with trees for fastening vines to, which are hence called by Columella *arbustivæ*.

ARBUSTUM is sometimes also used to denote an orchard, or field wherein trees are planted at such distance that there is room for ploughing and growing corn between.

ARBUTHNOT, ALEXANDER, principal of the university of Aberdeen in the reign of James VI. of Scotland, was born in the year 1538. He studied first at Aberdeen; and was afterwards sent over to France, where, under the famous Cujacius, he applied himself to the study of the civil law. In the year 1563, he returned to Scotland, and took orders. Whether he was ordained by a bishop or by presbyters, is a matter of uncertainty. In 1568, he was appointed minister of Arbuthnot and Logie Buchan; and in the following year, Mr Alexander Anderson being deprived, our author was made principal of the king's college at Aberdeen, in his room. In the general assembly which met at Edinburgh in the years 1573 and 1577, he was chosen moderator; and to the end of his life was an active supporter of the reformed religion. He died in 1583, in the 45th year of his age; and was buried in the College church of Aberdeen. We are told in the Biographia, that he was eminent as a poet, a philosopher, a mathematician, a lawyer, a divine, and a physician. He wrote *Orationes de origine et dignitate juris*, printed at Edinburgh, 1572, 4to. His cotemporary Thomas Maitland wrote a copy of Latin verses on the publication of this book: they are printed in the *Delic. Poet. Scot.* He published Buchanan's History of Scotland in the year 1582.

ARBUTHNOT, *John*, M. D. the son of an Episcopal clergyman in Scotland, was born soon after the Restoration at Arbuthnot near Montrose. After acquiring a competent knowledge of the elementary parts of education, he was sent to the college of Aberdeen, where the buddings of those great qualities and those sallies of wit, which contributed so much to his future greatness, soon made their appearance. Having there gone through a course of academical studies, and obtained the degree of doctor of physic, he went to London, in order to reap the fruits both of his natural and acquired abilities. He then began to display his talents, in teaching mathematics, in which he was very expert. "An Examination of Dr Woodward's Account of the Deluge," &c. in 1697, first made him known to the learned world. This performance was received with great applause; and in 1700 a treatise "On the Usefulness of Mathematical Learning" still increased his reputation. A very interesting paper "On the Regularity of the Births of both Sexes," demonstrating from authentic proofs the universal similarity which is observed by nature in this circumstance, and drawing from these several political and moral inferences, which he presented to the Royal Society,

ciety, procured his election in 1704 into that body. Meanwhile, in his own proper profession, he was acquiring considerable eminence, and was appointed, on account of his great medical knowledge, physician extraordinary to Prince George of Denmark, and shortly afterwards one of the physicians in ordinary to Queen Anne. He was admitted in 1710 a fellow of the college. He formed about this period a very intimate acquaintance, which lasted with unabating tenderness and affection during the rest of his life, with these great literary men, Pope, Gay, and Swift. In 1714 he engaged in an extensive design, of making a satire upon all the abuses of science in every branch in co-operation with Pope and Swift, which was to be written under the form of the history of a fictitious character, and in the grave ironical style. The plan was never finished, but the "Memoirs of Martinus Scriblerus," published in Pope's works, form a part; of which, much is the performance of Dr Arbuthnot. It is very probable, that the whole of the first book is of his composition, in which the great profoundness of knowledge that is discerned, and the good-natured pleasantry with which the satire is directed, has gained it the character of one of the most original, learned, and interesting pieces in the English language. Those parts which relate to anatomy, the manners and customs of antiquity, and logic, are particularly his performance. On the death of Queen Anne, he made a visit to Paris, in order to drive away the melancholy, which attended him on account of that circumstance, which was a severe stroke to him, and destrnctive not only to his personal, but also to his political views. Returning from thence, as his medical services were no longer required at St James's, he retired from it, and followed at large the practice of his profession; yet he did not thence give up his literary pursuits, but pursued them with great ardour, although long intervals take place between the times of his publications. A work entitled "Tables of Ancient Coins, Weights, and Measures," explained and exemplified in several dissertations, in a 4to vol. appeared in 1727, which is the chief of his serious performances. Although there are several inaccuracies in it, which could hardly be avoided in so intricate a subject, it is a work of great merit, and has ever since been considered as the standard authority. A treatise "On the Nature and Choice of Aliments," which was published in 1732, and another published in 1733, "On the Effects of Air on Human Bodies," finish the list of his sterling works. Both these were well received by the faculty, and continue to be still esteemed, and are occasionally read and quoted. Respecting his humorous works, which were the productions of his leisure hours, they are so confounded with those of his contemporaries, that it is not easy to distinguish them. But a piece which, independent of any other, would raise him to the character of the first humorous writer in the English language, entitled the "History of John Bull," is confidently ascribed to him. This is conducted with great wit and humour, and all the circumstances and characters are most admirably adapted. Among his several avowed ironical pieces are "A Treatise concerning the Altercation or Scolding of the Ancients," and the "Art of Political Lying."

In the year 1751, there were published two small volumes, entitled "The Miscellaneous Works of Dr Arbuthnot;" but the greatest part of what they contain is denied by his son to be of his composition. As it was customary for him, when any comical occurrence took place, which struck his fancy, to write concerning it in a large folio which lay in his parlour; it is very probable, that many slight and imperfect essays, which had gone out of his remembrance, might get abroad into the world. Through all his pieces of this kind there runs a vein of good-natured pleasantry; and this tends to confirm the character given of him by Swift, to a lady who desired to know his opinion concerning Dr Arbuthnot, "He has more wit than we all have, and his humanity is equal to his wit." Although his writings are free from that gall and rancour, too common among party writers, yet they cannot be said to be altogether free from a party spirit. He, however, cannot be excused in one instance, of allowing his personal dislike to overrule his humanity, viz. in the "Memorandums of the six days preceding the death of a late Right Reverend" (meaning Bishop Burnet). The indignation of a virtuous man towards an infamous character, is sufficient to justify his severity in his bitter "Epitaph on Colonel Chartres:" and this severity was probably aggravated by party spirit. Although he had no proper poetical talent, yet he made an effort to try his genius in that kind of composition. A piece, published in Dodsley's collection, is valuable for its philosophical sentiment, which is entitled ΓΝΩΘΙ ΣΕΑΥΤΟΝ, *Know thyself.* He was also skilled in music; and Sir J. Hawkins mentions an anthem and a burlesque song, which are ascribed to him.

In these occupations he passed his days, amid all the pleasures that can render domestic life happy, in the affection and estimation of his friends, beloved and esteemed by all his literary associates, who have each taken great pains to celebrate their mutual friendship. Swift in one of his poems sincerely laments that he is

> "Far from his kind Arbuthnot's aid,
> Who knows his art, but not his trade."

Pope has dedicated to him an epistle, called a "Prologue to the Satires." He was full of humility and resignation in all the dispensations of Providence. Of his two sons, he witnessed the death of one; and the other, with some daughters, survived him. At length, from an inveterate asthma, he fell into a dropsical disorder; and, in order to try the effect of a change of air, he repaired to Hampstead, but without the least gleam of hope respecting a recovery, as he assured his friends Pope and Swift. Returning to his house in London, he died February 27. 1734-5. His latest letters display a great serenity of mind, an exemplary piety, a contempt of vice, and a glowing desire of virtue. (*Gen. Biog.*).

ARBUTUS, the STRAWBERRY TREE. See BOTANY *Index*.

ARC, JOAN OF, generally called the *Maid of Orleans*, one of the most famed heroines in the annals of history, was born about the beginning of the 15th century at Domremy, near Vaucouleurs in Lorrain, where her father, a peasant, named James d'Arc, resided. When she was able in the least degree to earn a sustenance for herself, her parents, who were but poor, put her to service at a small inn, where she performed

Arc. formed several offices, more properly belonging to the other sex, such as riding the horses to water without a saddle, and attending them in the fields, and many other similar services, which greatly displayed her masculine habit of body. At the time when Charles VII. was reduced to a very low condition, and the greatest part of his country had been overrun by the English, Joan, probably then at the age of 27 or 28, imagined that she saw several visions, and that in one of these she was commanded by St Michael, to go immediately to the relief of Orleans, at that time closely besieged by the English army, and then to procure the consecration of the king at Rheims. In February 1429, her parents took her to the governor of Vaucouleurs, named Baudricourt, who at first held her pretended inspiration to be no more than an idle tale, and treated it with the contempt such a thing would have deserved; but at last induced by her entreaties, he sent her to Chinon, where the king then was, in order that she might be introduced to him. Charles, whether it proceeded from earnest or not, in order to sound her, determined to present her to a company of his nobles, where no mark of dignity tended to distinguish him from them; and, it is asserted, that she immediately recognized him, and informed him of secrets which he had endeavoured to conceal from every person. She boldly engaged to accomplish the two objects of her mission, and required that they should arm her with a consecrated sword, which lay in the church of St Catharine of Fierbois; and although she had never seen it, she accurately described every particular concerning it. The manner in which she acted inspired many with confidence; and certain doctors of the church were appointed to inspect into the nature of her inspiration, and matrons to give proofs of her virginity. The report which they gave was very favourable; but being next put into the hands of the parliament, they treated her as frantick, and demanded that she should shew them a miracle. She answered, that although she had not any at that time to present, she would soon accomplish one at Orleans. At length being fully armed and mounted, she was sent to Orleans along with the army destined for its relief. By displaying a consecrated banner, she soon cleansed the camp of intemperance; and by her whole deportment, animated the soldiers by her exemplary enthusiasm. Entering Orleans, she introduced a convoy, and boldly attacking the English in their forts, she routed them with great slaughter, and struck them with such a panic that they were even obliged to raise the siege with great precipitation. The dignity of a superior mind and a brave heroism reigned through all her actions. Various other successes followed in a short time, and the dismayed English everywhere fled before the hand of a conquering enemy, whom they had but lately contemned. Joan now thinking it proper to perform her other promise of crowning the king at Rheims, proceeded with him through the kingdom, in order to receive submission of the towns as he marched, which he did without any opposition. Arriving at Rheims, the keys of the city were delivered to him, and, entering the town, he was anointed and crowned with the holy oil of Clovis, Joan standing by his side in full armour, and displaying her consecrated banner. Charles filled with gratitude for her important services, ennobled her family, and conferred upon it the title of *the Sys*, with a conformable estate in land. The two objects of her mission being now accomplished, Joan prepared to retire into the country; but Dunois, the general, being sensible of her importance on account of her pretended inspiration, endeavoured to persuade her to remain in arms until the English should be fully driven from the country; which by his persuasions he effected. Advised by him, she cast herself into Compeigne, then closely besieged by the English and the duke of Burgundy. Having there made a sally upon the enemy, she drove them from their entrenchments; but being basely deserted by her followers, she was taken prisoner. Upon her capture, the English enjoyed a malignant gratification, and resolved to shew her no mercy on account of the change she had occasioned in their affairs. The duke of Bedford, the regent, having ransomed her from the captors, appointed a criminal prosecution against her upon the charges of employing sorcery and magic, and of being impious. He was joined in the accusation by the clergy, and by the university of Paris. She was carried in irons before an ecclesiastical commission at Rouen, where several capricious interrogatories were put to her during a trial of about four months, to which she answered with steadiness and gravity. Among several other questions, she was interrogated why she had assisted at the coronation of Charles with her standard in her hand. She boldly replied, "Because the person who shared in the danger, had a right to share in the glory." Her defence was not so strong concerning her pretended inspiration and visions, which were the most dangerous points of the attack. She appealed to the pope upon being accused on these grounds of impiety and heresy; but her appeal was not allowed. At length she was condemned of being a blasphemer and sorceress, and accordingly delivered over to the power of the civil magistrate. A view of the dreadful punishment that awaited her, at last overpowered her resolution; and she endeavoured to escape it, by making a disavowal of her pretended revelations, and a full renunciation of her errors. Her sentence was then changed into perpetual imprisonment, but this punishment did not assuage the fury of her barbarous enemies. They craftily laid a man's dress in her chamber, and she, induced by the sight of an apparel in which she had gained so much honour, put it on; and upon being discovered, her enemies condemned her to the stake, interpreting the action into a relapse of heresy. She suffered her punishment in June 1431, at the market-place of Rouen, with great firmness; and even the English themselves beheld the scene with tears. Her death will for ever cast an indelible stigma on the character of her cruel prosecutors. Charles did nothing towards avenging her cause: but ten years afterwards, contented himself with procuring the restoration of her memory by the pope, and a reversion of the process. She was styled in that act, a "martyr to her religion, her country, and her king." In their enthusiastic admiration, her countrymen were not so slow in honouring her memory. Many marvellous stories were related by them concerning her death. Some supposed that she was not actually dead, and continually expected, that, as formerly, she would come, and at their head lead them on to victory. A consist- Arc.

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Arc || rcangis.

ent and uniform judgment respecting the actions and address of this personage cannot be made by posterity. That she gave herself up to the influence of a heated fancy, and that she was confident in the idea of her divine inspiration, and that this notion was so improved by certain favourites of Charles, as to excite the emotions of the public, seems to be the most probable supposition. That the appearance of the Maid of Orleans tended to give a decisive turn to the contest between the English and the French, has never in the least been questioned.

The praise and exploits of this noble heroine have formed the subject of various works both in prose and verse. In verse, that of Voltaire is very licentious and burlesque, and is an injury to her memory; but it has in a great degree been repaired by that most spirited and sublime poem of Southey, in English, which represents her in the most lively and striking colours of heroism and virtue; and by that of Chapelain, although it did not meet with such success. (*Gen. Biog.*).

ARCADE, in *Architecture*, is used to denote any opening in the wall of a building formed by an arch.

ARCADI, or ARCADIANS, the name of a learned society at Rome. See ACADEMY.

ARCADIA, an inland district in the heart of Peloponnesus (Strabo). It is mountainous, and fitter for pasture than corn; and therefore chiefly celebrated by bucolic or pastoral poets, who feign Pan the god of shepherds, to be the guardian of it (Virgil). It has to the north Achaia, to the east Argos and Laconia, Messenia to the south, and Elis to the west. According to Pliny, the wine of this country cured barrenness in women, and inspired the men with rage; and the berries of the yew gathered there were so strong a poison, that whoever slept or took refreshment under that tree was sure to die. In Strabo's time there were few cities remaining in it, most of them being destroyed in the Grecian wars. Eustathius says, that the country was anciently called *Pelasgia*, from Pelasgos, who brought the people, from roots, herbs, and leaves of trees, to feed on acorns, especially beech mast; as Artemidorus observes, that the Arcadians usually lived on acorns. It was also called *Lycaonia*, *Gigantis* and *Parrhasia* (Stephanus). The Arcadians are greatly commended for their love of, and skill in, music, (Virgil, Polybius). To imitate the Arcadians, is to labour and toil for the benefit of others, never conquering their own, but the enemies of others (Hesychius). This probably took its rise from the ancient Arcadians being accustomed to hire themselves out as mercenaries to foreign nations. Homer commends their martial prowess, their pastures, their sheep, and their country well watered. The gentilitious name is *Arcades;* who boasted of their great antiquity, and that they were older than the sun and moon (Apollonius Rhodius, Nonnius, Plutarch, Ovid, Statius). They were the first who had a year of three months, and therefore called *Proceleni*, because their year was prior to that adjusted in Greece to the course of the moon (Censorinus).

ARCANGIS, in the Turkish armies, an inferior kind of infantry, which serve as *enfans perdus*, and to harass and pillage the enemy's frontiers. The Arcangis are an order inferior to the Janizaries; and when any of them distinguish themselves, are usually preferred into the Janizaries order. They have no pay, but are to subsist on their plunder.

Arcangis || Arch.

ARCANUM, among physicians, any remedy, the preparation of which is industriously concealed, in order to enhance its value.

ARCANUM, in *Ancient Geography*, a villa of Q. Cicero, Tully's brother, in Latium, (Cicero). Now Arce, in the Terra di Lavora, in the kingdom of Naples, on the borders of the Campagna di Roma, on the river Melpis, between Arpinum and Aquinum.

ARCBOUTANT, in building, an arched buttress. See BUTTRESS.

ARCESILAUS, a celebrated Greek philosopher, about 300 years before the Christian era, was born at Pitane, in Eolis. He founded the second academy, which is called the *second school.* He was a man of great erudition, and well versed in the writings of the ancients. He was remarkable for the severity of his criticisms; but nevertheless he knew how to accommodate himself to the age, and pursue the allurements of pleasure. He had a great number of disciples. His doctrines were different in several respects from those of the ancient school: and perhaps he was led into this diversity of opinions by many capital errors in the ancient school, such as the incredible arrogance of the dogmatists, who pretended to assign causes for all things; the mysterious air they had thrown upon the doctrine of ideas; the entirely discarding the testimony of the senses; the objection of the Pyrrhonists, who now began to broach their opinions; the powerful opposition of the Stoics and Peripatetics, who discovered the feeble parts of the Academic philosophy. These might have given cause to reform the ancient school, and to found a new one. The middle school, therefore, laid it down as a principle, that we could know nothing, nor even assure ourselves of the certainty of this position; from whence they inferred, that we should affirm nothing, but always suspend our judgement. They advanced, that a philosopher was able to dispute upon every subject, and bring conviction with him, even upon contrary sides of the same question; for there are always reasons of equal force both in the affirmative and negative of every argument. According to this doctrine, neither our senses nor even our reason, are to have any credit: and therefore, in common affairs, we are to conform ourselves to received opinions. Arcesilaus was succeeded by his disciple Lacydes.

ARCH, in *Geometry*, any part of the circumference of a circle or curved line, lying from one point to another, by which the quantity of the whole circle or line, or some other thing sought after, may be gathered. See BRIDGE and CENTER.

ARCH, a concave or hollowed piece of building, constructed in such a manner that the several stones of which it is composed keep one another in their places. The terms *arch* and *vault* properly differ only in this, that the arch expresses a narrower, and the vault a broader piece of the same kind. The principal difference in the form of arches is, that some are circular, and others elliptical; the former having a larger or smaller part of a circle, the other of an ellipsis. What are called *strait arches*, are those frequently used for doors and windows, the upper and under edges of which are straight and parallel, and the ends and joints

Arch
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Archangel.

joints all pointing toward a centre. The space between two piers of a bridge is called an *arch*, because usually arched over.

Triumphal ARCHES are magnificent entries into cities, erected to adorn a triumph, and perpetuate the memory of the action. The arches of Titus and Constantine make at this time a great figure among the ruins of old Rome.

ARCH, in composition, signifies *chief*, or of the *first* class: as archangel, archbishop, &c.

ARCHÆUS, or ARCHEUS. See ARCHEUS.

ARCHANGEL, an angel occupying the eighth rank in the celestial hierarchy. See ANGEL and HIERARCHY.

ARCHANGEL, a city of Russia, in the province of Dwina, situated on the east side of the river Dwina, about six miles from the White sea, in E. Long. 39. N. Lat. 64. 30. The city extends about three miles in length and one in breadth. It is rich, populous, built in the modern taste, and is a metropolitan see. It rose from a castle built on the spot by Basilowitz II. to protect the increasing trade brought there by the discovery of the White sea by the English, and took its name from a monastery built in honour of the archangel Michael. Before this period the commercial intercourse between Russia and the northern parts of Europe had been long carried on by the Hanseatic towns; which usually sailed to Revel or Narva, and from thence passed through Dorpt or Plescof and Novogorod, where their factories were established. The accidental discovery of Archangel, in 1553, deprived the Hanseatic towns of a great part of this lucrative commerce, and transferred it to the English. On the 11th of May, in the above-mentioned year, three ships sailed from Deptford, in order to explore the northern seas, under the command of Sir Hugh Willoughby. Two of these vessels penetrated as high as the 72d degree of latitude, to the coast of Spitzbergen; and being afterwards forced by stress of weather into the bay of the river Arzina in Russian Lapland, both their crews were frozen to death. Richard Chancellor, who commanded the other ship, called the *Bonaventure*, discovering the country bordering upon the White sea, landed near the mouth of the Dwina, in a bay, which he denominated the *Bay of St Nicholas*, from a convent of that name near the present port of Archangel. The czar Iwan Basilowitz, being informed of his arrival, invited him to his court, where he was hospitably entertained, and the czar indulged the English with a free trade in his dominions: in consequence of this permission, a company of merchants was incorporated in London; and being encouraged by particular privileges from the czar, set on foot a considerable commerce, to the mutual advantage of both nations. This traffic the English for some time enjoyed without competition. The Dutch, however, and other nations, gradually insinuated themselves into this commerce; which they carried on to a very great disadvantage, as not being favoured with those privileges which the czar had granted to the English company. These were at last suddenly annihilated by Alexis Michaelovitch; who in 1648 banished the English merchants from all his dominions. The cause of this expulsion is generally imputed to the resentment which the czar conceived against the English for the execution of Charles I. with whom he was closely connected by leagues of amity and alliance: but in effect he abolished the company's privileges in the year before that event; and his indignation against the English for their rebellion, Mr Coxe affirms, was only a political pretext; the real motive being derived from the offers made by the Dutch to pay duties of export and import to the amount of 15 per cent. if they were indulged with the liberty of carrying on as free a trade as the English throughout his dominions. For not long afterwards, the czar suffered William Prideaux, Cromwell's agent, to reside at Archangel; and permitted the English to renew their commerce in that port upon the same footing with other foreigners. And upon this footing alone our merchants ever after continued to trade.

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The commodities chiefly imported into Archangel, were gold and silver stuffs and laces, gold wire, cochineal, indigo, and other drugs for dyeing; wine, brandy, and other distilled spirits. The customs arising to the czar were computed at 200,000 rubles a-year, and the number of foreign ships at 400 annually. But upon the building of Petersburg, Peter the Great abolished the immunities of Archangel, and removed the commerce of the White sea to the havens of the Baltic. Still, however, its exports of tar were considerable; in 1730, to the amount of 40,000 lasts, of 11 barrels each. It sends, during winter, great quantities of the rawaga, a small species of three-finned cod, to Petersburg frozen.

In 1752 Elizabeth again restored the ancient immunities of Archangel; and its present trade is not inconsiderable. It supplies the government of Archangel, part of those of Nishnei-Novogorod and Casan, with European commodities; and draws in exchange from those parts corn, flax, hemp, coarse linen, cordage, sails, masts and tallow, which are mostly conveyed by the Dwina: it forms also a principal communication with the northern and western parts of Siberia, from whence the merchants procure furs, skins, and iron.

The houses of Archangel are generally of wood, but well contrived; and every chamber is provided with a stove, as a fence against the cold, which is here excessive in the winter. The streets are paved with broken pieces of timber and rubbish, disposed so unskilfully, that one cannot walk over it without running the risk of falling, except when the streets are rendered smooth and equal by the snow that falls and freezes in the winter. Notwithstanding the severity of the cold in this place, there is always plenty of good provisions; butchers meat, poultry, wild fowl: and fish, in a great variety, are sold surprisingly cheap.

The most remarkable edifice in Archangel is a large townhouse, built of square stones in the Italian manner, and divided into three parts. One of these consists of large commodious apartments, for the accommodation of merchants, strangers as well as natives: here they are permitted to reside with their merchandise till the month of October, when all the foreign ships set sail for their respective countries. Then, too, the native traders are obliged to remove their quarters from the townhouse. In 1793 great part of this city and suburbs was destroyed by fire, but has since been elegantly rebuilt.

ARCHBISHOP, the name of a church dignitary of

Archbishop. of the first class. Archbishops were not known in the east till about the year 320; and though there were some soon after this who had the title, yet that was only a personal honour, by which the bishops of considerable cities were distinguished. It was not till of late that archbishops became metropolitans, and had suffragans under them. Athanasius appears to be the first who used the title *Archbishop*, which he gave occasionally to his predecessor; Gregory Nazianzen, in like manner, gave it to Athanasius; not that either of them were entitled to any jurisdiction, nor even any precedence in virtue of it. Among the Latins, Isidore Hispalensis is the first that speaks of archbishops. He distinguishes four orders or degrees in the ecclesiastical hierarchy, viz. patriarchs, archbishops, metropolitans, and bishops.

The archbishop, beside the inspection of the bishops and inferior clergy in the province over which he presides, exercises episcopal jurisdiction in his own diocese. He is guardian of the spiritualties of any vacant see in his province, as the king is of the temporalties; and exercises ecclesiastical jurisdiction in it. He is entitled to present by lapse to all the ecclesiastical livings in the disposal of his diocesan bishop, if not filled within six months. He has likewise a customary prerogative, upon consecrating a bishop, to name a clerk or chaplain to be provided for by such bishop; in lieu of which it is now usual to accept an option. He is said to be enthroned when vested in the archbishopric; whereas bishops are said to be installed.

The ecclesiastical government of England is divided into two provinces, viz. Canterbury and York. Canterbury hath the following suffragan bishoprics appertaining to it, St Asaph, Bangor, Bath and Wells, Bristol, Chichester, Litchfield and Coventry, St David's, Ely, Exeter, Glouccster, Hereford, Landaff, Lincoln, London, Norwich, Oxford, Peterborough, Rochester, Salisbury, Winchester, and Worcester. To York appertaineth the bishoprics of Carlisle, Chester, and Durham; to which may be added the bishopric of Sodor and Man, whose bishop is not a lord of parliament. See CANTERBURY and YORK.

The archbishop of Canterbury had anciently, viz. till the year 1152, jurisdiction over Ireland as well as England, and was styled a *patriarch*, and sometimes *alterius orbis papa*, and *orbis Britannici pontifex*. Matters were done and recorded in his name thus, *Anno pontificatus nostri primo*, &c. The first archbishop of Canterbury was Austin, appointed by King Ethelbert, on his conversion to Christianity, about the year 598. He was also *regatus natus*. He even enjoyed some special marks of royalty; as, to be patron of a bishopric, which he was of Rochester; and to make knights, coin moneys, &c. He is still the first peer of England, and the next to the royal family; having precedence of all dukes and all great officers of the crown. It is his privilege, by custom, to crown the kings and queens of this kingdom. He may retain and qualify eight chaplains; whereas a duke is allowed by statute only six. He has, by common law, the power of probate of wills and testaments, and granting letters of administration. He has also a power to grant licenses and dispensations in all cases formerly sued for in the court of Rome, and not repugnant to the law of God. He accordingly issues special licenses to marry, to hold two livings, &c. and he exercises the right of conferring degrees. He also holds several courts of judicature: as, court of arches, court of audience, prerogative court, and court of peculiars. Archbishop || Archdeacon.

The archbishop of York has the like rights in his province as the archbishop of Canterbury. He has precedence of all dukes not of the royal blood; and of all officers of state, except the lord high chancellor. He has also the rights of a count palatine over Hexamshire. The first archbishop of York was Paulinus, appointed by Pope Gregory about the year 622. He had formerly jurisdiction over all the bishops of Scotland; but in the year 1470, Pope Sextus IV. created the bishop of St Andrew's archibishop and metropolitan of all Scotland.

Scotland, whilst episcopacy prevailed in that country, had two *archbishops*, of St Andrew's and Glasgow; of which the former was accounted the metropolitan; and, even before it arrived at the dignity of an archbishopric, resisted with great spirit all the attempts of the archbishops of York in England to become the metropolitans of Scotland. The sees of Argyll, Galloway, and the Isles, were suffragans to Glasgow; all the others in the kingdom to St Andrew's.

Ireland has four archbishops; of Armagh, Dublin, Cashel, and Tuam; of which the former is primate of all Ireland.

ARCHBISHOPRIC, in *Ecclesiastical Geography*, a province subject to the jurisdiction of an archbishop.

ARCHBUTLER, one of the great officers of the German empire, who presents the cup to the emperor on solemn occasions. This office belongs to the king of Bohemia.

ARCHCHAMBERLAIN, an officer of the empire, much the same with the great chamberlain in England. The elector of Brandenburg was appointed by the golden bull archchamberlain of the empire.

ARCHCHANCELLOR, a high officer, who, in ancient times, presided over the secretaries of the court. Under the two first races of the kings of France, when their territories were divided into Germany, Italy, and Arles, there were three archchancellors: and hence the three archchancellors still subsisting in Germany; the archbishop of Mentz being archchancellor of Germany, the archbishop of Cologn, and the archbishop of Treves.

ARCHCHANTOR, the president of the chantors of a church.

ARCHCOUNT, a title formerly given to the earl of Flanders, on account of his great power and riches.

ARCHDEACON, an ecclesiastical dignitary or officer next to a bishop, whose jurisdiction extends either over the whole diocese or only a part of it. He is usually appointed by the bishop himself; and hath a kind of episcopal authority, originally derived from the bishop, but now independent and distinct from his. He therefore visits the clergy; and has his separate court for punishment of offenders by spiritual censures, and for hearing all other causes of ecclesiastical cognizance. There are 60 archdeacons in England.

ARCHDEACON's Court, is the most inferior court in the whole ecclesiastical polity. It is held in the archdeacon's absence, before a judge appointed by himself and called his *official;* and its jurisdiction is sometimes in

Archdeacon || Archers.

in concurrence with, sometimes in exclusion of, the bishop's court of the diocese. From hence, however, by statute 24 Hen. VIII. c. 12. there lies an appeal to that of the bishop.

ARCHDRUID, the chief or pontiff of the ancient druids of a nation. See DRUID.

ARCHDUKE, a title peculiar to the house of Austria; all the sons of which are archdukes, and the daughters archduchesses. See DUKE.

ARCHELAUS, a celebrated Greek philosopher, the disciple of Anaxagoras, flourished about 440 years before Christ. He read lectures at Athens, and did not depart much from the opinions of his master. He taught that there was a double principle of all things, namely, the *expansion* and *condensation* of the air, which he regarded as infinite. Heat, according to him, was in continual motion. Cold was ever at rest. The earth, which was placed in the midst of the universe, had no motion. It originally resembled a wet marsh, but was afterwards dried up; and its figure, he said, resembled that of an egg. Animals were produced from the heat of the earth, and even men were formed in the same manner. All animals have a soul, which was born with them: but the capacities of which vary according to the structure of the organs of the body in which it resides.—Socrates, the most illustrious of his disciples, was his successor.

ARCHELAUS, the son of Herod the Great, was declared king of Judea the second year after the birth of Christ. He put to death 3000 persons before he went to Rome to be confirmed by Augustus. However, that emperor gave him half of what had been possessed by his father; but at length, on fresh complaints exhibited against him by the Jews, he banished him to Vienne in Gaul, A. D. 6. where he died.

ARCHELAUS, the son of Apollonius, one of the greatest sculptors of antiquity, was a native of Ionia, and is thought to have lived in the time of the emperor Claudius. He executed, in marble, the apotheosis of Homer. This masterpiece in sculpture was found in 1568, in a place named *Fratocchia*, belonging to the princes of Colonna, where, it is said, the emperor Claudius had a pleasure house. Father Kircher, Cupert, Spanheim, and several other learned antiquaries, have given a description and explication of this work.

ARCHERS, a kind of militia or soldiery armed with bows and arrows. The word is formed of *arcus*, "a bow;" whence *arcuarius*, and even *arquis*, and *arquites*, as they are also denominated in the corrupt state of the Latin tongue.

Archers were much employed in former times; but they are now laid aside, excepting in Turkey and some of the eastern countries; where there are companies of archers still subsisting in their armies, and with which they did terrible execution at the battle of Lepanto.—As an exercise, the practice of archery is still kept up in many places. See the article ARCHERY.

In France, the officers who attend the lieutenants de police and provosts, to make captures, seizures, arrests, &c. are called *archers;* though their arms be only halberds or carabines. In this sense they say, the *archers* of the *grand prevot de l'hotel;* of the *prevot des marchands;* the city *archers;* the *archers de guet*, or of the watch, &c.—Small parties of *archers*, called also *gens de marechaussée*, are continually patrolling on the great roads, to secure them against robbers.—The carriages of Lyons, &c. are always escorted by a party of archers. To the diligence of these archers or marshal's men, it is partly owing, that persons now travel in all parts of France in the utmost security; there being fewer robberies on the highway in that whole kingdom in a year than about London in a week.

Archers Archery

ARCHERY, the art or exercise of shooting with a bow and arrow.

In most nations, the bow was anciently the principal implement of war; and by the expertness of the archers alone was often decided the fate of battles and of empires.—In this island archery was greatly encouraged in former times, and many statutes were made for the regulation thereof; whence it was that the English archers in particular became the best in Europe, and procured them many signal victories.

The *Artillery Company* of London, though they have long disused the weapon, are the remains of the ancient fraternity of bowmen or archers. Artillery (*artillérie*) is a French term signifying *archery;* as the *king's bowyer* is in that language styled *artillier du roy:* And from that nation the English seem to have learnt at least the cross-bow archery. We therefore find that William the Conqueror had a considerable number of bowmen in his army at the battle of Hastings, when no mention is made of such troops on the side of Harold: And it is supposed that these Norman archers shot with the arbalet (or cross-bow), in which formerly the arrow was placed in a groove, being termed in French a *quadrel*, and in English a *bolt*.

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Of the time when shooting with the long bow first began among the English, at which exercise they afterwards became so expert, there appear no certain accounts. Their chronicles do not mention the use of archery as expressly applied to the cross bow, or the long bow, till the death of Richard I. who was killed by an arrow at the siege of Limoges in Guienne, which Hemmingford mentions to have issued from a cross bow.—After this, which happened in 1199, there appear not upon record any notices of archery for nearly 150 years, when an order was issued by Edward III. in the 15th year of his reign, to the sherives of most of the English counties for providing 500 white bows and 500 bundles of arrows, for the then intended war against France. Similar orders are repeated in the following years; with this difference only, that the sheriff of Gloucestershire is directed to furnish 500 painted bows as well as the same number of white. The famous battle of Cressy was fought four years afterwards, in which our chroniclers state that we had 2800 archers, who were opposed to about the same number of the French, together with a circumstance which seems to prove, that by this time we used the long bow, whilst the French archers shot with the arbalest. The circumstance alluded to is as follows: Previously to the engagement there fell a very heavy rain, which is said to have much damaged the bows of the French, or perhaps rather the strings of them. Now the long bow (when unstrung) may be most conveniently covered, so as to prevent the rain's injuring it; nor is there scarcely any addition to the weight from a case; whereas the arbalest is of a most inconvenient form to be sheltered from the weather. As therefore, in the year 1342, orders were issued to the sherives of each county

rchery. county to provide 500 bows, with a proper proportion of arrows, it seems probable that these were long bows, and not the arbalest.

At the above-mentioned battle, the English ascribed their victory chiefly to the archers.—The battle of Poictiers was fought A. D. 1356, and gained by the same means.

Sometimes the archers gained great victories without even the least assistance from the men-at-arms; as particularly, the decisive victory over the Scots at Homildon, A. D. 1402. In that bloody battle, the men-at-arms did not strike a stroke, but were mere spectators of the valour and victory of the archers. The earl of Douglas, who commanded the Scotch army in that action, enraged to see his men falling thick around him by showers of arrows, and trusting to the goodness of his armour (which had been three years in making), accompanied by about eighty lords, knights, and gentlemen, in complete armour, rushed forward, and attacked the English archers sword-in-hand. But he soon had reason to repent his rashness. The English arrows were so sharp and strong, and discharged with so much force, that no armour could repel them. The earl of Douglas, after receiving five wounds, was made prisoner; and all his brave companions were either killed or taken. Philip de Comines acdnowledges, what our own writers assert, that the English archers excelled those of every other nation; and Sir John Fortescue says again and again,—"that the might of the realme of England standyth upon archers." The superior dexterity of their archers gave the English a great advantage over their capital enemies the French and Scots. The French depended chiefly on their men-at-arms, and the Scots on their pikemen; but the ranks of both were often thinned and thrown into disorder by flights of arrows before they could reach their enemies.

nry's st. vol. v. 463.

James I. of Scotland, who had seen and admired the dexterity of the English archers, and who was himself an excellent archer, endeavoured to revive the exercise of archery among his own subjects, by whom it had been too much neglected. With this view, he ridiculed their awkward manner of handling their bows, in his humorous poem, of Christ's Kirk on the Green; and procured the following law to be made in his first parliament, A. D. 1424, immediately after his return to Scotland: "That all men might busk thame to be archares fra the be 12 years of age; and that ilk ten punds worth of land thair be made bow markes, and speciallie near paroche kirks, quhairn upon halie dayis men may cum, and at the leist schute thryse about, and have usage of archarie; and whasa usis not archarie, the laird of the land sal rais of him a wedder; and giff the laird raises not the said pane, the king's shiref, or his ministers, sal rais it to the king." But the untimely death of that excellent prince prevented the effectual execution of this law.

There is not found any act of parliament of Henry V. in relation to archery, and all the orders in Rymer till the battle of Agincourt relate to great guns, from which he seems at first to have expected more considerable advantage than from the training of bowmen. It should seem, however, that this sort of artillery, from its unwieldiness, bad and narrow roads, together with other defects, was as yet but of little use in military operations. In the year 1417 this king therefore ascribes his victory at Agincourt to the archers, and directs the sherives of many counties to pluck from every goose six wing-feathers for the purpose of improving arrows, which are to be paid for by the king. Archery.

In 1421, though the French had been defeated both at Cressy, Poictiers, and Agincourt, by the English archers, yet they still continued the use of the cross bow; for which reason, Henry V. as duke of Normandy, confirms the charters and privileges of the balistarii, who had been long established as a fraternity in his city of Rouen. *Archæologia.*

In the fifth of Edward IV. an act passed, that every Englishman, and Irishman dwelling with Englishmen, shall have an English bow of his own height, which is directed to be made of yew, wych, hazel, ash, or awburne, or any other reasonable tree according to their power. The next chapter also directs that butts shall be made in every township, which the inhabitants are obliged to shoot up and down every feast day, under the penalty of a halfpenny when they shall omit this exercise.

In the 14th year, however, of this same king, it appears by Rymer's *Fœdera*, that 1000 archers were to be sent to the duke of Burgundy, whose pay is settled at sixpence a day, which was a considerable sum in these times, when the value of money was so much higher than it is at present. This circumstance seems to prove, very strongly, the great estimation in which archers were still held. In the same year, Edward, preparing for a war with France, directs the sherives to procure bows and arrows, "as most specially requisite and necessary."

On the war taking place with Scotland, eight years after this, Edward provides both ordnance and archers; so that though the use of *artillery* (as we now term it) was then gaining ground, yet that of the bow and arrow was not neglected.

Richard III. by his attention to archery, was able to send 1000 bowmen to the duke of Bretagne, and he availed himself of the same troops at the battle of Bosworth.

During the reign of Henry VII. however, there appears no order relative to gunpowder or artillery; whilst on the other hand, in 1488, he directs a large levy of archers to be sent to Brittany, and that they shall be reviewed before they embark. In the 19th year of his reign, the same king forbids the use of the cross bow, because "the long bow had been much used in this realm, whereby honour and victory had been gotten against outward enemies, the realm greatly defended, and much more the dread of all Christian princes by reason of the same."

During the reign of Henry VIII. several statutes were made for the promotion of archery. The 8th Eliz. c. 10. regulates the price of bows, and the 13th Eliz. c. 14. enacts, that bow staves shall be brought into the realm from the Hanse towns and the Eastward; so that archery still continued to be an object of attention in the legislature.

In Rymer's *Fœdera* there is neither statute or proclamation of James I. on this head; but it appears by Dr Birch's life of his son (Prince Henry), that at eight years of age, he learned to shoot both with the

Archery. bow and gun, whilst at the same time this prince had in his establishment an officer who was styled *bow-bearer*. The king granted a second charter to the Artillery Company, by which the powers they had received from Henry VIII. were considerably extended.

Charles I. appears, from the dedication of a treatise entitled *The Bowman's Glory*, to have been himself an archer; and in the eighth year of his reign he issued a commission to the chancellor, lord mayor, and several of the privy council, to prevent the fields near London being so enclosed as to "interrupt the necessary and profitable exercise of shooting," as also to lower the mounds where they prevented the view from one mark to another.

Catharine of Portugal (queen to Charles II.) seems to have been much pleased with the sight at least of this exercise; for in 1676, by the contribution of Sir Edward Hungerford and others, a silver badge for the marshal of the fraternity was made, weighing 25 ounces, and representing an archer drawing the long bow (in the proper manner) to his ear, with the following inscription: *Reginæ Catharinæ Sagittarii.* The supporters are two bowmen, with the arms of England and Portugal. In 1682 there was a most magnificent cavalcade and entertainment given by the Finsbury archers, when they bestowed the titles of "duke of Shoreditch," "marquis of Islington," &c. upon the most deserving. Charles II. was present upon this occasion; but the day being rainy, he was obliged soon to leave the field.

So lately as the year 1753 targets were erected in the Finsbury fields, during the Easter and Whitsun holidays; when the best shooter was styled Captain for the ensuing year, and the second Lieutenant.

Why this military weapon was so decisive in the battles of former days, the following reasons may be suggested.

Before the introduction of fire arms the enemy could only be struck at a distance by slings, the bow used by the ancients, or the cross bow; to all which the English long bow was infinitely superior. As for slings, they never have been used in the more northern parts of Europe by armies in the field; nor does their use indeed seem to have been at all convenient or extensively practicable, for two principal reasons: In the first place, slingers cannot advance in a compact body, on account of the space to be occupied by this weapon in its rotatory motion; in the next place, the weight of the stones to be carried must necessarily impede the slingers greatly in their movements. The bow of the ancients again, as represented in all their reliefs, was a mere toy compared with that of our ancestors; it was therefore chiefly used by the Parthians, whose attacks (like those of the present Arabs) were desultory. As for the cross bow, it is of a most inconvenient form for carriage, even with the modern improvements; and, in case of rain, could not easily be secured from the weather. After the first shot, moreover, it could not be recharged under a considerable time, whilst the bolts were also heavy and cumbersome. The English long bow, on the other hand, together with the quiver of arrows, was easily carried by the archer, as easily secured from the rain, and recharged almost instantaneously. It is not therefore extraordinary, that troops, who solely used this most effectual weapon, should generally obtain the victory, even when opposed to much more numerous armies. Archery.

It may be urged, that these losses having been experienced by our enemies, must have induced them to practise the same mode of warfare.—But it is thought that the long bow was not commonly used even in England till the time of Edward III. when the victory at Cressy sufficiently proclaimed the superiority of that weapon. It required, however, so much training before the archer could be expert, that we must not be surprised if soon afterwards this military exercise was much neglected, as appears by the preambles of several ancient statutes. Whilst the military tenures subsisted, the sovereign could only call upon his tenants during war, who therefore attended with the weapons they had been used to, and which required no previous practice. On the other hand, the English archers were obliged by acts of parliament, even in time of peace, to erect butts in every parish, and to shoot on every Sunday and holiday, after repairing perhaps to these butts from a considerable distance, whilst the expence of at least a yew bow is represented as being a charge which they were scarcely equal to. The king and parliaments of this country having thus compelled the inhabitants to such training, the English armies had (it should seem) the same advantage over their enemies as the exclusive use of fire-arms would give us at present.

It appears also, by what hath been already stated, that the long bow continued to be in estimation for more than two centuries after gunpowder was introduced, which probably arose from muskets being very cumbersome and unwieldy. It is well known that rapid movements are generally decisive of the campaign; and for such the archers were particularly adapted, because, as they could not be annoyed at the same distance by the weapons of the enemy, they had scarcely any occasion for armour. The flower of ancient armies likewise was the cavalry, against which the long bow never failed to prevail, as man and horse were too large objects to be missed: and hence the great number of French nobility who were prisoners at Cressy, Poictiers, and Agincourt; for being dismounted (if not wounded) whilst they were also clad in heavy armour, they could not make their escape. The same reason accounts for the English obtaining these signal victories with so inferior numbers; for the nobility and gentry thus becoming prisoners, the other parts of the French army made little or no resistance. No wonder, therefore, that in England the greatest anxiety was shown to promote the exercise of this most important weapon, and that so many statutes were made for that purpose.

In Scotland, also, little less attention, though apparently not with equal success, was shown to the encouragement of the art. In both kingdoms, it was provided, that the importers of merchandise should be obliged, along with their articles of commerce, to import a certain proportion of bows, bow staves, and shafts for arrows. In both, every person was enjoined to hold himself provided in bows and arrows, and was prescribed the frequent use of archery. In both, a restraint was imposed upon the exercise of other games and sports, lest they should interfere with the use of the bow; for it was intended, that people should

rchery. be made expert in the use of it as a military weapon, by habituating them to the familiar exercise of it as an instrument of amusement. As there was no material difference between the activity and bodily strength of the two people, it might be supposed that the English and Scots wielded the bow with no unequal vigour and dexterity: but from undoubted historical monuments it appears that the former had the superiority; of which one instance has been already narrated. By the regulations prescribed in their statute book for the practice of archery, we find that the English shot a very long bow, those who were arrived at their full growth and maturity being prohibited from shooting at any mark that was not distant upwards of 220 yards.

In the use of the bow, great dexterity as well as strength seems to have been requisite. Though we hear of arrows at Cheviot Chase which were a yard long, yet it is by no means to be supposed that the whole band made use of such, or could draw them to the head. The regulation of the Irish statute of Edward IV. viz. that the bow should not exceed the height of the man, is allowed by archers to have been well considered; and as the arrow should be half the length of the bow, this would give an arrow of a yard in length to those only who were six feet high. A strong man of this size in the present times cannot easily draw above 27 inches, if the bow is of a proper strength to do execution at a considerable distance. At the same time it must be admitted, that as our ancestors were obliged by some of the old statutes to begin shooting with the long bow at the age of seven, they might have acquired a greater slight in this exercise than their descendants, though the latter should be allowed to be of equal strength.

As the shooting with the long bow was first introduced in England, and practised almost exclusively for nearly two centuries, so it hath occasioned a peculiar method of drawing the arrow to the ear and not to the breast. That this is contrary to the usage of the ancients is very clear from their reliefs, and from the tradition of the Amazons cutting off one of their paps, as it occasioned an impediment to their shooting. The Finsbury archer is therefore represented in this attitude of drawing to the ear, both in the *Bowman's Glory*, and in the silver badge given by Catharine to the Artillery Company. Not many years ago there was a man named Topham, who exhibited surprising feats of strength, and who happened to be at a public house near Islington, to which the Finsbury archers resorted after their exercise. Topham considered the long bow as a plaything, only fit for a child; upon which one of the archers laid him a bowl of punch, that he could not draw the arrow two-thirds of its length. Topham accepted this bet with the greatest confidence of winning; but bringing the arrow to his breast instead of his ear, he was greatly mortified by paying the wager, after many fruitless efforts.

As to the distance to which an arrow can be shot from a long bow with the best elevation of 45 degrees, that must necessarily depend much both upon the strength and slight of the archer; but in general the distance was reckoned from eleven to twelve score yards. The butts for exercise, as above noticed, were directed to be distant upwards of 220 yards. There is indeed a tradition, that an attorney of Wigan in Lancashire (named Leigh) shot a mile in three flights; but the same tradition states, that he placed himself in a very particular attitude, which cannot be used commonly in this exercise. According to Neade, an archer might shoot six arrows in the time of charging and discharging one musket. Archery.

The archers consider an arrow of from 20 to 24 drop weight to be the best for flight or hitting a mark at a considerable distance, and that yew is the best material of which they can be made. As to the feathers, that of a goose is preferred; it is also wished, that the bird should be two or three years old, and that the feather may drop of itself. Two out of three feathers in an arrow are commonly white, being plucked from the gander; but the third is generally brown or gray, being taken from the goose; and, from this difference in point of colour, informs the archer when the arrow is properly placed. From this most distinguished part therefore the whole arrow sometimes receives its name: And this, by-the-by, affords an explanation of the gray goose wing in the ballad of Cheviot Chase. Arrows were armed anciently with flint or metal heads, latterly with heads of iron; of these there were various forms and denominations. By an act of parliament made the 7th of Henry IV. it was enacted. That for the future all the heads for arrows and quarrels should be well boiled or brased, and hardened at the points with steel; and that every arrow head or quarrel should have the mark of the maker; workmen disobeying this order, were to be fined and imprisoned at the king's will, and the arrow heads or quarrels to be forfeited to the crown.

Arrows were reckoned by sheaves, a sheaf consisting of 24 arrows. They were carried in a quiver, called also an *arrow case*, which served for the magazine; arrows for immediate use were worn in the girdle. In ancient times phials of quicklime, or rather combustible matter, for burning houses or ships, were fixed on the heads of arrows, and shot from long bows. This has been also practised since the use of gunpowder. Neade says, he has known by experience, that an archer may shoot an ounce of fireworks upon an arrow twelve score yards. Arrows with wildfire, and arrows for fireworks, are mentioned among the stores at Newhaven and Berwick, in the 1st of Edward VI. *Grose on Ancient Armour.*

The force with which an arrow strikes an object at a moderate distance, may be conceived from the account given by King Edward VI. in his journal; wherein he says, that 100 archers of his guard shot before him two arrows each, and afterwards altogether; and that they shot at an inch board, which some pierced quite through and struck into the other board; divers pierced it quite through with the heads of their arrows, the board being well-seasoned timber; their distance from the mark is not mentioned.

To protect our archers from the attacks of the enemy's horse, they carried long stakes pointed at both ends; these they planted in the earth, sloping before them. In the first of Edward VI. 350 of these were in the stores of the town of Berwick, under the article of archers stakes; there were also at the same time eight bundles of archers stakes in Pontefract castle.

To prevent the bowstring from striking the left

Archery. arm, the arm is covered with a piece of smooth leather, fastened on the outside of the arm; this is called a *bracer;* and to guard the fingers from being cut by the bowstring, archers wore shooting gloves. Chaucer, in his prologue to the Canterbury Tales, thus describes an archer of his day:

And he was clade in cote and hode of grene,
A sheaf of peacock arwes bright and keen,
Under his belt he bare full thriftily:
Wel coude he dresse his takel yewmanly,
His arwes dronped not with fetheres lowe,
And in his hand he bare a mighty bowe,
A not hed hadde he, with broune visage,
Of wood craft coude he wel all the usage;
Upon his arms he had a gai bracer,
And by his side a swerd and a bokeler,
And on the other side a gaie daggere
Harneised wel, and sharpe as pointe of spere:
A cristofre on his breast of silver shene,
A horn he bare, the baudrick was of grene,
A forester was he sothely as I gesse.

Though archery continued to be encouraged by the king and legislature for more than two centuries after the first knowledge of the effects of gunpowder, yet by the latter end of the reign of Henry VIII. it seems to have been partly considered as a pastime. Arthur, the elder brother of Henry, is said to have been fond of this exercise, insomuch that a good shooter was styled Prince Arthur. We are also informed that he pitched his tent at Mile End in order to be present at this recreation, and that Henry his brother also attended. When the latter afterwards became king, he gave a prize at Windsor to those who should excel in this exercise; and a capital shot having been made, Henry said to Barlow (one of his guards), "If you still win, you shall be duke over all archers." Barlow therefore having succeeded, and living in Shoreditch, was created duke thereof. Upon another occasion, Henry and the queen were met by 200 archers on Shooter's hill, which probably took its name from their assembling near it to shoot at marks. This king likewise gave the first charter to the Artillery Company in the 29th year of his reign, by which they are permitted to wear dresses of any colour except purple and scarlet, to shoot not only at marks but birds, if not pheasants or herons, and within two miles of the royal palaces. They are also enjoined by the same charter not to wear furs of a greater price than those of the martin. The most material privilege, however, is, that of indemnification for murder, if any person passing between the shooter and the mark is killed, provided the archers have first called out *fast.*

The following description of an archer, his bow, and accoutrements, is given in a MS. written in the time of Queen Elizabeth. "Captains and officers should be skilful of that most noble weapon, and to see that their soldiers according to their draught and strength have good bowes, well nocked, well strynged, every strynge whippe in their nocke, and in the myddes rubbed with wax, braser and shuting glove, some spare strynges trymed as aforesaid, every man one shefe of arrows, with a case of leather defensible against the rayne, and in the same fower and twentie arrowes, whereof eight of them should be lighter than the residue, to gall or astoyne the enemye with the hailshot of light arrows, before they shall come within the danger of the harquebuss shot. Let every man have a brigandine, or a little cote of plate, a skull or huf kyn, a mawle of leade of five foote in lengthe, and a pike, and the same hanging by his girdle, with a hook and a dagger; being thus furnished, teach them by musters to marche, shoote, and retire, keepinge their faces upon the enemy's. Sumtyme put them into great nowmbers, as to battell apparteyneth, and thus use them often times practised, till they be perfecte; ffor those men in battel ne skirmish can not be spared. None other weapone maye compare with the same noble weapon." Archery.

The long bow, as already observed, maintained its place in our armies long after the invention of firearms. Nor have there been wanting experienced soldiers who were advocates for its continuance, and who in many cases even preferred it to the harquebus or musket. King Charles I. twice granted special commissions under the great seal for enforcing the use of the long bow. The first was in the 4th year of his reign: but this was revoked by proclamation four years afterwards, on account of divers extortions and abuses committed under sanction thereof. The second, anno 1633, in the ninth year of his reign, to William Neade and his son, also named William, wherein the former is styled an ancient archer, who had presented to the king a warlike invention for uniting the use of the pike and bow, seen and approved by him and his council of war; whereof his majesty had granted them a commission to teach and exercise his loving subjects in the said invention, which he particularly recommended the chief officers of his trained bands to learn and practise; and the justices and other chief magistrates throughout England, are therein enjoined to use every means in their power to assist Neade, his son, and all persons authorized by them in the furtherance, propagation, and practice of this useful invention. Both the commissions and proclamation are printed at large in Rymer. At the breaking out of the civil war, the earl of Essex issued a precept, dated in November 1643, for stirring up all well affected people by benevolence, towards the raising a company of archers for the service of the king and parliament.

Archery with the long bow continues to be used as a manly exercise by the inhabitants of Geneva, and in many parts of Flanders; nor is it totally neglected in Great Britain. There are several societies of archers in England; the chief of which are, the *Woodmen of Arden,* and the *Toxopholite.* But the most noted society of this kind, now existing, is

The *Royal Company of Archers* in Scotland.—The ancient records of this Company having been destroyed by fire about the beginning of the last century, no authentic traces of their institution now remain. It is said that they owe their origin to the commissioners appointed in the reign of James I. of Scotland for enforcing and overseeing the exercise of archery in different counties. Those commissioners, who were in general men of rank and power, picking out amongst the better sort of people under their cognizance the most expert archers, formed them into a company, and upon perilous occasions made a present of their services to the king as his chief body guards; in which situation

rchery. tion they often distinguished themselves for their loyalty, their courage, and skill in archery. This rank of the king's principal body guards the Royal Company still claim, within seven miles of the metropolis of Scotland.

Certain it is, that by an act of the privy council of Scotand, in 1677, this company was recognized under the name and title of "His Majesty's Company of Archers:" and by the same act a piece of plate of the value of 20l. sterling was ordered to be given to be shot for by them at their annual parades, called *Weapon-shawings*, and to be called *The King's Prize*.

At this period the Royal Company consisted, as it does at present, of the principal nobility and gentry of Scotland. But their unfortunate attachment to anti-revolution principles, upon that event's taking place, put almost a period to their existence: Their public parades or marches were discontinued, and the royal prize was withheld.

Upon the accession of Queen Anne, their former splendour was revived; and in the year 1703 they obtained a royal charter, confirming in general terms all their former rights and privileges, and conferring others upon them. But their partiality to the family of Stuart was at various after periods the cause of a temporary prosperity and decline.

These unhappy differences of opinion having totally subsided, the Royal Company are now more numerous and flourishing than ever, and perhaps even more dexterous archers. His present Majesty, as a mark of his royal patronage and approbation, has been pleased to revive the royal prize, which for the first time was shot for upon the 28th of July 1788 by a numerous and respectable meeting.

The Woodmen of Arden and the Toxophilite have lately been pleased to admit the members of the Royal Company to the freedom of their societies: these grants have been followed by reciprocal diplomas from the Royal Company; so that the three chief societies of archers in Britain may be said to be now incorporated into one.

The prizes belonging to this Company, and which are annually shot for, are, 1. A silver arrow, given by the town of Musselburgh, which appears to have been shot for as early as the year 1603. The victor in this, as in the other prizes, except the king's prize, has the custody of it for a year, then returns it with a medal appended, on which are engraved any motto and device which the gainer's fancy dictates. 2. A silver arrow given by the town of Peebles, A. D. 1626. 3. A silver arrow given by the city of Edinburgh, A. D. 1709. 4. A silver punch bowl of about the value of 50l. made of Scottish silver at the expence of the Company, A. D. 1720. And, 5. The king's prize above mentioned, which becomes the absolute property of the winner. All these prizes are shot for at what is termed *Rovers*, the marks being placed at the distance of 185 yards.

Besides these, there is another prize annually contended for at butt or point-blank distance, called the *Goose*. The ancient manner of shooting for this prize was, a living goose was built in a turf butt, having the head only exposed to view; and the archer who first hit the goose's head was entitled to the goose as his reward. But this custom, on account of its barbarity, has been long ago laid aside; and in place of the goose head, a mark of about an inch diameter is affixed upon each butt, and the archer who first hits this mark is captain of the butt shooters for a year. Archery || Archeus.

The affairs of the Company are managed by a preses and six counsellors, who are chosen annually by the whole members. The council are vested with the power of receiving or rejecting the candidates for admission, and of appointing the Company's officers civil and military.

The Royal Company now consists of above 1000 members, among whom are most of the Scottish nobility of the first distinction. A number of the Company meet weekly during the summer season at Edinburgh, in the Meadows, where they exercise themselves in shooting at butts or rovers: And in the adjoining ground they have a handsome building, erected within these 12 years, with suitable offices, whither they adjourn after their exercise, and where they hold their elections and other meetings relative to the business of the society.

The uniform of the Royal Company of Archers is tartan, lined with white, and trimmed with green and white fringes; a white sash with green tassels; and a blue bonnet, with a St Andrew's cross and feathers. The Company have two standards. The first of these bears on one side Mars and Venus encircled in a wreath of thistles, with this motto, "*In peace* and war." On the other, a yew tree, with two men dressed and equipped as archers, encircled as the former; motto, *Dat gloria vires*. The other standard displays, on one side, a lion rampant gules, on a field or, encircled with a wreath; on the top, a thistle and crown; motto, *Nemo me impune lacesset*. On the other, St Andrew on the cross, on a field argent; at the top, a crown; motto, *Dulce pro patria periculum*.

ARCHES COURT, in English ecclesiastical polity, is a court of appeal, belonging to the archbishop of each province; whereof the judge is called the *dean of the arches*, because he anciently held his court in the church of St Mary *le bow*, (*Sancta Maria de arcubus*), though all the principal spiritual courts are now holden at Doctors Commons. His proper jurisdiction is only over the 13 peculiar parishes belonging to the archbishop in London; but the office of dean of the arches having been for a long time united with that of the archbishop's principal office, he now, in right of the last-mentioned office, receives and determines appeals from the sentences of all inferior ecclesiastical courts within the province. And from him there lies an appeal to the king in chancery (that is, to a court of delegates appointed under the king's great seal), by statute 25th Hen. VIII. c. 19. as supreme head of the English church, in the place of the bishop of Rome, who formerly exercised this jurisdiction; which circumstance alone will furnish the reason why the Popish clergy were so anxious to separate the spiritual court from the temporal.

ARCHETYPE, the first model of a work, which is copied after to make another like it. Among minters, it is used for the standard weight by which the others are adjusted. The archetypal world, among Platonists, means the world as it existed in the idea of God before the visible creation.

ARCHEUS, from ἀρχή, the principal, chief, or first

Archeus ‖ Archil.

first mover); a sort of primum mobile set up by Helmont, to superintend the animal economy, and preserve it. It is akin to Plato's *anima mundi*. Hippocrates uses the words αρχαιη φυσις, to signify the former healthy state before the attack of the disease.

ARCHIACOLYTHUS (from αρχος, *chief*, and ακολυθος *minister*), an ancient dignity in cathedral churches: the ministers whereof were divided into four orders or degrees, viz. priests, deacons, subdeacons, and acolythi; each of which had their chiefs. The chief of the acolythi was called *archiacolythus*.

ARCHIATER, ARCHIATRUS, properly denotes chief physician of a prince who retains several. The word is formed of αρχη, *principium*, "chief;" and ιατρος, *medicus*, a "physician."

ARCHIDAPIFER, (from αρχος, and *dapifer*, "sewer,") or chief sewer, is a great officer of the empire. The elector of Bavaria is archidapifer. The palatine of the Rhine at one time pretended this office was annexed to his palatinate; but he has since desisted.

ARCHIEROSYNES, in the Grecian antiquity, a high priest vested with authority over the rest of the priests, and appointed to execute the more sacred and mysterious rites of religion.

ARCHIGALLUS, in antiquity, the high priest of Cybele, or the chief of the eunuch priests of that goddess, called *Galli*.

ARCHIGERONTES (from αρχος, and γερων, *old*), in antiquity, the chiefs or masters of the several companies of artificers at Alexandria. Some have mistaken the archigerontes for the arch-priests appointed to take the confession of those who were condemned to the mines.

ARCHIGUBERNUS, ARCHIGUBERNETA, or ARCHIGUBERNITES, in antiquity, the commander of the imperial ship, or that which the emperor was aboard of. Some have confounded the office of archigubernus with that of *præfectus classis*, or admiral, but the former was under the command of the latter. Potter takes the proper office of the archiguberneta to have been, to manage the marine affairs, to provide commodious harbours, and order all things relating to the sailing of the fleet, except what related to war.

ARCHIL, ARCHILLA, ROCELLA, ORSIELLE, is a whitish moss which grows upon rocks, in the Canary and Cape de Verd islands, and yields a rich purple tincture, fugitive, indeed, but extremely beautiful. This weed is imported to us as it is gathered. Those who prepare it for the use of the dyer, grind it betwixt stones, so as to thoroughly bruise, but not to reduce it into powder; and then moisten it occasionally with a strong spirit of urine, or urine itself mixed with quicklime: in a few days it acquires a purplish red, and at length a blue colour. In the first it is called *Archil*; in the latter, *Lacmus* or *Litmase*.

The dyers rarely employ this drug by itself, on account of its dearness and the perishableness of its beauty. The chief use they make of it is, for giving a bloom to other colours, as pinks, &c. This is effected by passing the dyed cloth or silk through hot water lightly impregnated with the archil. The bloom thus communicated soon decays upon exposure to the air. Mr Hellot informs us, that by the addition of a little solution of tin, the drug gives a durable dye; that its colour is at the same time changed towards a scarlet; and that it is the more permanent in proportion as it recedes the more from its natural colour.

Archil ‖ Archilochus.

Prepared archil very readily gives out its colour to water, to volatile spirits, and to spirit of wine; it is the substance principally made use of for colouring the spirits of thermometers. As exposure to the air destroys its colour upon cloth, the exclusion of the air produces a like effect in these hermetically sealed tubes, the spirits of large thermometers becoming in the compass of a few years colourless. M. l'Abbe Nollet observes (in the French Memoirs for the year 1742), that the colourless spirit, upon breaking the tube, soon resumes its colour, and this for a number of times successively; that a watery tincture of archil, included in the tubes of thermometers, lost its colour in three days; and that, in an open deep vessel, it became colourless at the bottom, while the upper part retained its colour. See COLOUR-*Making*.

A solution of archil in water, applied on cold marble, stains it of a beautiful violet or purplish blue colour, far more durable than the colour which it communicates to other bodies. M. du Fay says he has seen pieces of marble stained with it, which in two years had suffered no sensible change. It sinks deep into the marble, sometimes above an inch; and at the same time spreads upon the surface, unless the edges be bounded by wax or other like substances. It seems to make the marble somewhat more brittle.

Linnæus informs us, in the Swedish Transactions for the year 1742, that the true archil moss is to be found on the western coasts of England.

ARCHILOCHIAN, a term in poetry, applied to a sort of verses, of which Archilochus was the inventor, consisting of seven feet; the four first whereof are ordinarily dactyls, though sometimes spondees; the three last trochees, as in Horace,

Solvitur acris hyems, grata vice veris et Favoni.

ARCHILOCHUS, a famous Greek poet and musician, was, according to Herodotus, cotemporary with Candaules and Gyges, kings of Lydia, who flourished about the 14th Olympiad, 724 years before Christ. But he is placed much later by modern chronologists; viz. by Blair 686, and by Priestley 660 years, before Christ.

He was born at Paros, one of the Cyclades. His father Telesicles was of so high a rank, that he was chosen by his countrymen to consult the oracle at Delphos concerning the sending a colony to Thasos: a proof that he was of one of the most distinguished families upon the island. However, he is said to have sullied his birth by an ignoble marriage with a slave called *Enipo*, of which alliance our poet musician was the fruit.

Though Archilochus showed an early genius and attachment to poetry and music, these arts did not prevent his going into the army, like other young men of his birth; but in the first engagement at which he was present, the young poet, like Horace, and like our own Suckling, lost his buckler, though he saved his life by the help of his heels. *It is much easier*, said he, *to get a new buckler than a new existence.* This pleasantry, however, did not save his reputation; nor could his poetry or prayers prevail upon Lycambes, the father

of

rchilo-
chus.

of his mistress, to let him marry his daughter, though she had been long promised to him. After these mortifications, his life seems to have been one continued tissue of disgrace and resentment.

Archilochum proprio rabies armavit iambo.
HOR. Art. Poet. 79.

Archilochus, with fierce resentment warm'd,
Was with his own severe iambics arm'd. FRANCIS.

The *rage of Archilochus* was proverbial in antiquity; which compared the provoking this satirist to the treading upon a serpent: A comparison not very severe, if it be true that Lycambes, and, as some say, his three daughters, were so mortified by his satire, as to be driven to the consolation of a halter.

In this piece, many adventures are mentioned, full of defamation, and out of the knowledge of the public. There were likewise many loose passages in it; and it is said to have been on account of this satire that the Lacedæmonians laid a prohibition on his verses *.

'al.
x. lib.
c. 3.

However, according to Plutarch, there is no bard of antiquity by whom the two arts of poetry and music have been so much advanced as by Archilochus. To him is attributed particularly the sudden transition from one rhythm to another of a different kind, and the manner of accompanying those irregular measures upon the lyre. Heroic poetry, in hexameter verse, seems to have been solely in use among the more ancient poets and musicians; and the transition from one rhythm to another, which lyric poetry required, was unknown to them; so that if Archilochus was the first author of this mixture, he might with propriety be styled the *Inventor of Lyric Poetry*, which, after his time, became a species of versification wholly distinct from heroic.—To him is likewise ascribed the invention of *Epodes*. See EPODE.

Our poet-musician is generally ranked among the first victors at the Pythic games: and we learn from Pindar, that his muse was not always a termagant; for though no mortal escaped her rage, yet she was at times sufficiently tranquil and pious to dictate hymns in praise of the gods and heroes. One in particular, written in honour of Hercules, acquired him the acclamations of all Greece; for he sung it in full assembly at the Olympic games, and had the satisfaction of receiving from the judges the crown of victory consecrated to real merit. This hymn, or ode, was afterwards sung in honour of every victor at Olympia, who had no poet to celebrate his particular exploits.

Archilochus was at last slain by one Callondax Corax, of the island of Naxos; who, though he did it in fight, according to the laws of war, was driven out of the temple of Delphi, by command of the oracle, for having deprived of life a man consecrated to the Muses.

The names of Homer and Archilochus were equally revered and celebrated in Greece, as the two most excellent poets which the nation had ever produced. This appears from an epigram in the Anthologia; and from Cicero, who ranks him with poets of the first class, and in his Epistles tells us, that the grammarian Aristophanes, the most rigid and scrupulous critic of his time, used to say, that the longest poem of Archilochus always appeared to him the most excellent.

Archilochus ‖ Archimedes.

ARCHIMAGUS, the high priest of the Persian Magi or worshippers of fire. He resided in the highest fire temple; which was held in the same veneration with them as the temple of Mecca among the Mahometans. Zoroaster first settled it at Balch; but after the Mahometans had overrun Persia in the 7th century, the Archimagus was forced to remove from thence into Kerman, a province of Persia, lying on the southern ocean, where it hath continued to this day. Darius Hystaspes took upon himself the dignity of Archimagus: for Porphyry tells us, he ordered before his death, that, among the other titles, it should be engraven on his monument, that he had been *Master of the Magi;* which plainly implies that he had borne this office among them, for none but the Archimagus was master of the whole sect. From hence it seems to have proceeded, that the kings of Persia were ever after looked on to be of the sacerdotal tribe, and were always initiated into the sacred order of the Magi, before they took on them the crown, and were inaugurated into the kingdom.

ARCHIMANDRITE, in ecclesiastical history, was a name given by the ancient Christians to what we now call an *abbot*. Father Simon observes, that the word *mandrite* is Syriac, and signifies a solitary monk.

ARCHIMEDES, one of the most eminent of the ancient mathematicians, was born at Syracuse in Sicily, about the year 180 before the Christian era. Hiero, king of Syracuse, deemed it an honour to have this philosopher for his relative and friend. History does not inform us, to whom he was indebted for the rudiments of literature, but he flourished about 50 years after Euclid. It is reported, that he was indebted to Egypt for much of his knowledge; but other accounts indicate, that he conferred more knowledge than he received from that celebrated nation; and, in particular, Diodorus mentions, that Egypt was indebted to him for the invention of the screw-pump, for drawing off water. And the same author narrates, that he was the inventor of several other useful machines, which conveyed his fame to every quarter of the globe. The following passage from Livy, proves, that he was dexterous both for the inventing warlike machines, and also for his accurate observation of the heavenly bodies: "Unicus spectator cæli siderumque, mirabilior tamen inventor ac machinator bellicorum tormentorum," &c. lib. xxiv. It appears also, that in Cicero's time, he had become proverbial for his skill in solving problems. In a letter to Atticus, he informs him, that he is now freed from a difficulty, which he termed an Archimedian problem, lib. xiii. ep. 28.

It may perhaps be impossible distinctly to ascertain the different inventions of this great man; but from the following passage, it appears that he formed a *glass sphere*, or some kind of *planetarium*, which, with no small degree of accuracy, represented the phenomena of the heavenly bodies. Hence says Claudian

Jupiter, in parvo cum cerneret æthera vitro,
Risit, et ad superos talia dicta dedit:

Huccine

Archimedes.

Huccine mortalis progressa potentia curæ?
Jam meus in fragile ludetur orbe labor.
Jura poli, rerumque fidem, legesque deorum,
Ecce Syracosius transtulit arti senex.
Inclusus variis famulatur spiritus astris,
Et verum certis motibus urget opus.
Percurrit proprium mentitus signifer annum.
Et simulata novo Cynthia mense redit.
Jamque suum volvens audax industria mundum
Gaudet, et humana sidera mente regit.
Quid falso insontem tonitru Salmonea miror?
Emula naturæ parva reperta manus.

" When in a glass's narrow sphere confin'd,
Jove saw the fabric of th' Almighty mind;
He smil'd, and said, ' Can mortals art alone
Our heav'nly labours mimic with their own?
The Syracusan's brittle work contains
Th' eternal law that through all nature reigns.
Fram'd by his art, see stars unnumber'd burn,
And in their courses rolling orbs return;
His sun, through various signs describe the year,
And every month his mimic moons appear.
Our rival's laws his little planets bind,
And rule their motions by a human mind:
Salmoneus could our thunder imitate;
But Archimedes can a world create."

In the following lines the same machine is mentioned by Ovid.

Arte Syracosia suspensus in aëre clauso,
Stat globus, immensi parva figura poli.

Ovid, Fast. vi. 277.

Vitruvius mentions a fact, which proves Archimedes's knowledge in the doctrine of specific gravity. Hiero, the king, having given a certain quantity of gold wherewith to make a golden crown, and suspecting that the workmen had stolen part of the gold and substituted silver in its stead, he applied to Archimedes to employ his ingenuity in detecting the fraud. Ruminating upon this subject when he was bathing himself, he observed that he dislodged a quantity of water corresponding to the bulk of his own body; therefore, instantly quitting the bath with all the eagerness natural to an inventive mind upon a new discovery, he run into the streets naked, crying, Ευρηκα! Ευρηκα! *I have found it out! I have found it out!* Then taking one mass of gold and another of silver, each equal in weight to the crown; he carefully observed the quantity of fluid which they alternately displaced, when introduced in the same vessel full of water. Next he ascertained how much water was displaced by the crown when put into the same vessel full of water; and, upon comparing the three quantities together, he ascertained the exact proportions of gold and silver, of which the crown was composed.

Archimedes was well acquainted with the mechanical powers. His celebrated saying with regard to the power of the lever has been often repeated, " Give me a place to stand upon, and I will move the earth." In order to shew Hiero the effect of mechanical powers, it is said, that aided by ropes and pulleys, he drew towards him a galley, which lay on the shore manned and loaded: but the displays of his mechanical skill mentioned by Marcellus at the siege of Syracuse, were long deemed almost incredible; until the after improvements in mechanics have demonstrated them practicable. He harassed the vessels of the besiegers, both when they approached and kept at a distance from the city. When they approached, he sunk them by means of long and huge beams of wood; or, by means of grappling hooks placed at the extremity of levers, he hoisted up the vessels into the air, and dashed them to pieces either against the walls or the rocks. When the enemy kept at a distance, he employed machines which threw from the walls such a quantity of stones as shattered and destroyed their vessels. In short, his mechanical genius supplied strength and courage to the city, and filled the Romans with astonishment and terror. Until Buffon invented and framed a burning glass, composed of about 400 glass panes, capable of setting fire to wood at the distance of 200 feet, and of melting lead and tin at the distance of 120 feet, and silver at the distance of 50; the account of Archimedes's instrument for burning ships at a great distance by means of the rays of the sun, was deemed fabulous and impossible.

Archim des.

But, however eminent for mechanical invention, he was still more eminent for the investigation of abstract truths; and the formation of conclusive demonstrations in the branches of pure geometry. Plutarch also mentions, that Archimedes himself esteemed mechanical invention greatly inferior in value to those speculations which convey irresistible conviction to the mind. His geometrical works afford numerous proofs of his success in this field of science. It is reported, that he was often so deeply engaged in mathematical speculations, as both to neglect his food and the care of his person; and at the bath he would sometimes draw geometrical figures in the ashes, and sometimes upon his own body when it was anointed, according to the custom of that time. He valued himself so much upon the discovery of the ratio between the sphere and the containing cylinder, that, indifferent to all his other inventions, he ordered his friends to engrave upon his tomb a cylinder containing a sphere, with an inscription explanatory of its nature and use.

It must be extremely painful to every humane mind, but particularly to every lover of philosophic merit, to learn, that when Syracuse was taken by storm, he, being ignorant of that fact, was run through the body, when engaged in drawing a geometrical figure upon the sand. As Marcellus had given express orders that both his person and his house should be held sacred; this appears to have happened through ignorance, and therefore removes a great part of the odium from the Roman name. This mournful event happened in the 142d Olympiad, or 212 years before the Christian era. Marcellus, in the midst of his triumphant laurels, lamented the death of Archimedes, conferred upon him an honourable burial, and took his surviving relations under his protection; but greater honour was conferred upon him when the philosopher of Arpinum, 140 years after, went in search of his long-neglected tomb. Hence, says Cicero, " I diligently sought to discover the sepulchre of Archimedes, which the Syracusans had totally neglected, and suffered to be overgrown with thorns and briers. Recollecting some verses, said to be inscribed on the tomb, which mentioned, that on the top was placed a sphere with a cylinder,

Archimedes.

looked round me upon every object at the Agrigentine gate, the common receptacle of the dead. At last I observed a little column which just rose above the thorns, upon which was placed the figure of a sphere and cylinder. 'This,' said I to the Syracusan nobles who were with me, 'This must, I think, be what I am seeking.' Several persons were immediately employed to clear away the weeds, and lay open the spot. As soon as a passage was opened, we drew near, and found on the opposite base the inscription, with nearly half the latter part of the verses worn away. Thus would this most famous, and formerly most learned, city of Greece have remained a stranger to the tomb of one of its most ingenious citizens, had it not been discovered by a man of Arpinum."

Several works of this most celebrated mathematician have escaped the wreck of time. Of abstract geometry we have a treatise "on the Sphere and Cylinder," another "on the Dimension of the Circle, or the Proportion between the Diameter and the Circumference; on Obtuse Conoids and Spheroids; on Spiral Lines; and on the Quadrature of the Parabola." Of his mechanics Archimedes has left a "Treatise on Equiponderants, or Centres of Gravity; and in hydrostatics, a "Treatise concerning Bodies floating on Fluids;" and a geometrical piece, entitled *Assumpta* or *Lemmata*. His other works are either lost or remain unpublished. (*Gen. Biog.*).

ARCHIPELAGO, in *Geography*, a general term signifying a sea interrupted with islands; it is however more especially applied to that lying between Europe and Asia, which contains the islands anciently called *Cyclades* and *Sporades*. See these two words. Archipelago || Architect.

ARCHIPHERACITÆ, ministers in the Jewish synagogues appointed to read and interpret the Perakim, or titles and heads of the law and the prophets.

ARCHPRESBYTER, or ARCHPRIEST, a priest established in some dioceses with a superiority over the rest. He was anciently chosen out of the college of presbyters at the pleasure of the bishop. These archpresbyters were of much the same nature with deans in the cathedral churches, as the college of presbyters answers to the chapter. See PRESBYTER.

ARCHISYNAGOGUES, the chief of the synagogue; the title of an officer among the Jews, who presided in their synagogues and assemblies. The number of these officers was not fixed, nor the same in all places; there being 70 in some, and in others only one. They are sometimes called *princes* of the synagogue, and had a power of excommunicating such as deserved that punishment.

ARCHITECT, a person skilled in architecture, or the art of building; who forms plans and designs for edifices, conducts the work, and directs the several artificers employed in it. The word is derived from αρχος, *princeps*, and τεκτων, *faber*, "workman;" q. d. the principal workman.

ARCHITECTURE,

IN the utmost latitude of the word, signifies the art of building in general; but the term is most frequently applied only to the construction of such buildings as are necessary for the purposes of civil life, such as houses, churches, halls, bridges, porticoes, &c.

History of Architecture.

THE origin of this art, like that of most others, is totally unknown. We are assured, however, that it is as old as Cain: for Moses tells us that he built a city; though what were the materials, or how the buildings were constructed, we are entirely ignorant. It is commonly said, that the first materials employed in building were branches and twigs of trees, wherewith men constructed huts; such as the *wigwams* in use among the American Indians at present. This, however, appears disputable. The natural shelter afforded by hollows in the sides of mountains or rocks, it may be supposed, would much more readily suggest the idea of using stones and earth as materials for building houses. Indeed, considering that tents were not invented before the days of Jabal, Tubal Cain's brother, it is very probable that such temporary houses as the Indian wigwams were not originally known; otherwise the method of covering poles with the skins of beasts, instead of small branches or twigs, must very soon have taken place. These temporary houses seem to have come into use only when men began to lead an idle wandering life, like the Tartars, and could not be at the trouble of constructing durable habitations in every place where they were obliged to wander with their cattle; and Jabal perhaps from them took the hint of making portable houses or tents. Accordingly we see, that no nations, except those who are in a perpetually unsettled state, make use of such wretched materials. Even in America, where the human race has appeared in the rudest form, they were no sooner collected into great bodies under the emperors of Mexico and Peru, than stone buildings began to be erected. 1 Materials first used in building.

We are not, therefore, to look for the origin of architecture in any single nation; but in every nation, when the inhabitants began to leave off their savage way of life, and to become civilized: and if there is any nation to be found which hath been always in a civilized state, we may be assured that architecture hath always had an existence there. But whatever may be in this, the origin of regular buildings hath been deduced from the construction of the meanest huts in a very natural and plausible manner by several authors. "Anciently (says Vitruvius) men lived in woods, and inhabited caves; but in time, taking perhaps example from birds, who with great industry build their nests, they made themselves huts. At first they made these huts, very probably, of a conic figure; because that is a figure of the simplest structure; and, like the birds, whom they imitated, composed them of branches of trees, spreading them wide at the bottom, and join- 2 Primitive huts. Plate XXXVII. fig. 1.

ing them in a point at the top; covering the whole with reeds, leaves, and clay, to screen them from tempests and rain.

3 Their improvement.

"But finding the conic figure inconvenient on account of its inclined sides, they changed both the form and construction of their huts, giving them a cubical figure, and building them in the following manner: Having marked out the space to be occupied by the hut, they fixed in the ground several upright trunks of trees to form the sides, filling the intervals between them with branches closely interwoven and covered with clay. The sides being thus completed, four large beams were placed on the upright trunks; which, being well joined at the angles, kept the sides firm, and likewise served to support the covering or roof of the building, composed of many joists, on which were laid several beds of reeds, leaves, and clay.

Fig. 2.

"Insensibly mankind improved in the art of building, and invented methods to make their huts lasting and handsome as well as convenient. They took off the bark, and other unevennesses, from the trunks of the trees that formed the sides: raised them, probably above the dirt and humidity, on stones; and covered each of them with a flat stone or slate, to keep off the rain. The spaces between the ends of the joists were closed with clay, wax, or some other substance; and the ends of the joists covered with thin boards cut in the manner of triglyphs. The position of the roof was likewise altered: for being, on account of its flatness, unfit to throw off the rains that fell in great abundance during the winter season, they raised it in the middle; giving it the form of a gable roof, by placing rafters on the joists, to support the earth and other materials that composed the covering.

Fig. 3.

"From this simple construction the orders of architecture took their rise. For when buildings of wood were set aside, and men began to erect solid and stately edifices of stone, they imitated the parts which necessity had introduced into the primitive huts; insomuch that the upright trees, with the stones at each end of them, were the origin of columns, bases, and capitals, and the beams, joists, rafters, and strata of materials that formed the covering, gave birth to architraves, frizes, triglyphs, and cornices, with the corona, the mutules, the modillions, and the dentils.

"The first buildings were in all likelihood rough and uncouth; as the men of those times had neither experience nor tools: but when, by long experience and reasoning upon it, the artists had established certain rules, had invented many instruments, and by great practice had acquired a facility in executing their ideas, they made quick advances towards perfection, and at length discovered certain manners of building, which succeeding ages have regarded with the highest veneration."

4 State of architecture among the Egyptians.

Among the ancient Egyptians, Assyrians, and Persians, this art was carried to an incredible length. The pyramids of Egypt are such structures as would exceed the power of the most potent monarch on earth to raise at this day. The largest of these, according to the account of M. Goguet, is near 500 feet high, and contains 313,590 solid fathoms. It is composed of stones enormously large; many of them being 30 feet long, four feet high, and three in breadth; and all this huge mass of building was coated over with sqnare flags of marble.—The structure called the *labyrinth*, in the same country, according to Herodotus, who saw it, excelled every thing which he could have conceived from the imagination either of himself or others. Within the same circuit of walls they had enclosed 3000 halls, 12 of which were of a singular form and beauty; and of these, half were above, and half below ground; and the whole was terminated by a pyramid 40 fathoms high. All this prodigious mass of building was composed of white marble, and the walls were adorned with engravings.—The obelisks were not less astonishing; the largest of them being entire pieces of granite, no less than 180 feet high.—Near Andera, in Upper Egypt, are the ruins of a palace of gray granite, the ceilings of which are supported by columns of such thickness, that four men can scarcely fathom them. The ceilings themselves are composed of stones of the same kind, six or seven feet in breadth and 18 feet in length. The grand hall is 112 feet long, 60 high, and 58 broad. The roof of the whole edifice is a terrace, on which the Arabs formerly built a very large village, the ruins of which are still visible.

5 Among Babylonians and Persians

Among the Babylonians and Persians, too, such immense piles of building have been raised, as appear utterly inconceivable and incredible to many modern authors, where their former grandeur is not demonstrable by ruins visible at this day. The ruins of Persepolis, the ancient capital of Persia, were so stupendous in the time of Avicenna the Arab physician, that his countrymen could not believe such structures possible to be erected but by evil spirits. Of their extraordinary magnificence, indeed, we may have some idea from the account of the staircases belonging to the palace. The remains, some time ago, consisted of 95 steps of white marble, so broad and flat, that 12 horses might conveniently go up abreast.

6 Their buildings more remarkable for greatness than elegance

In these vast structures, however, the nations of whom we speak seem to have regarded the greatness, rather than the elegance or usefulness of their works. In the pyramids and obelisks of Egypt this is exceedingly conspicuous; but whether it was so in the labyrinth or in the palace at Thebes above mentioned, it is impossible to determine, unless the buildings were entire, and we knew for what purpose they had been designed. If the kings who built the pyramids designed to immortalize their memories by building, they certainly could not have fallen upon any thing more proper for this purpose; though even in this they have somehow or other failed, the names of those who erected them not being certainly known even in the time of Herodotus.

7 Ignorant the use of arches,

It is certain, however, that neither the ancient Assyriaus nor Babylonians knew the method of constructing arches. The roofs of all their halls were flat, and covered with prodigiously large stones, some of them so big as to cover a whole room singly. Their manner of building was also quite destitute of what is now called *taste;* the columns were ill proportioned, and their capitals executed in the poorest manner imaginable. This was observed by the Greeks, who improved upon the proportions formerly used, and were the inventors of three of the five orders of architecture, viz. the Doric, Ionic, and Corinthian. "Anciently (says Vitruvius) they were ignorant of the art of proportioning the various parts of a building: they used columns; but they cut them at hazard, without rules,

8 and of proportioning columns.

without

without principles, and without having any attention to the proportions which they ought to give them: they placed them likewise without any regard to the other parts of the edifice. Dorus, son of Helen and grandson of Deucalion, having caused a temple to be built at Argos in honour of Juno, that edifice was found by chance to be constructed according to the taste and proportions of the order which afterwards they called *Doric*. The form of this building having appeared agreeable, they conformed to it in the construction of edifices which they afterwards had to build.

9 Origin of the Doric order.

"About the same time, the Athenians sent into Asia a colony under the conduct of Ion, nephew of Dorus: this undertaking had very good success. Ion seized on Caria, and there founded many cities. These new inhabitants thought to build temples. They proposed for a model that of Juno at Argos: but, ignorant of the proportion which they ought to give to the columns, and in general to the whole edifice, they sought for rules capable of regulating their operation. These people wanted, in making their columns sufficiently strong to support the whole edifice, to render them at the same time agreeable to the sight. For this purpose, they thought to have given it the same proportion that they found between the foot of a man and the rest of his body. According to their ideas, the foot made a sixth part of the human height: in consequence, they gave at first to a Doric column, taking in its chapiter, six of its diameters; that is to say, they made it six times as high as it was thick: afterwards they added to it a seventh diameter.

10 the Io-

"This new order of architecture was not long in giving birth to a second: they would immediately go beyond the first invention. The Ionians tried to throw still more delicacy and elegance into their edifices. They employed the same method which they had before put in practice for the composition of the Doric order: but instead of taking for a model the body of a man, the Ionians were regulated by that of a woman. With a view to make the columns of this new order more agreeable and more pleasing, they gave them eight times as much height as they had diameter. They also made channellings all along the trunk, to imitate the folds of the robes of women: the volutes of the chapiter represented that part of the hair which hung in curls on each side of the face. The Ionians added, lastly, to these columns a base, which was not in use in the Doric order." According to Vitruvius, these bases were made in the manner of twisted cords, as a kind of case for the columns. This order of architecture was called *Ionic*, from the name of the people who had invented it.

Such is the account given by Vitruvius of the origin of improvements in the proportion of columns. Had these improvements, however, existed in such early times, Homer, who was greatly posterior to them, would certainly have made mention of something of that kind; but in all his writings he gives us no account of any thing like a column of stone, but uses a word which would rather incline us to think that his columns were nothing more than bare posts.

11 nts of improvement bably en from omon's ple.

It is remarkable, that improvements in architecture did not take place in any nation till after, or about, the time that Jerusalem was taken by Nebuchadnezzar. The grandest buildings erected among the Assyrians seem to have owed their existence to this monarch; and it can scarce be imagined that he would not endeavour to imitate the architecture of Solomon's temple, to which, by his conquest of Jerusalem, he had full access. It is also remarkable, that the dimensions of the two pillars, Jachin and Boaz, set up by Solomon, very nearly correspond with those of the Doric order, first invented by the Greeks, and which originally came from their colonies settled in Asia Minor. The height of Solomon's pillars, without the chapiter, was 18 cubits; that of the chapiter itself was five cubits; the circumference was 12 cubits; from whence, according to the Scripture language, we may reckon the diameter to have been exactly four cubits. Had they been a single cubit higher, they would have been precisely of the same height with columns of the original Doric order. We do not indeed mean to assert, that this famous temple gave a model of architecture to the whole world; although it is scarce conceivable but imitations of it, as far as it could be known, must have taken place among many nations.

12 Egyptian banqueting room described.

Notwithstanding all their defects, however, the Egyptian buildings undoubtedly had an air of vast grandeur and magnificence, if we may credit the description given of one of their banqueting rooms by Vitruvius. The usal size of one of these rooms was from 100 to 150 feet in length, and its breadth somewhat more than half its length. At the upper end, and along the two sides, they placed rows of pillars tolerably well proportioned to one another, though not of any regular order; and at the lower part they made a magnificent and spacious entrance: this, with its ornaments seems to have taken up one end of the building entire. We are not told that there were any pillars there; though perhaps they placed two or more toward the angles on each side, for uniformity, the central space being enough for an entrance in the grandest and most august manner. Those rows of columns were set at a distance from the wall, forming a noble portico along the two sides and upper end of the building. Upon the pillars was laid an architrave; and from this was carried up a continued wall with three quarter columns, answering directly to those below, and in proportion one-fourth smaller in all their parts. Between these three quarter columns were placed the windows for enlightening the building. From the tops of the lower pillars to the wall was laid a floor; this covered the portico overhead within, and made on the outside a platform, which was surrounded by a corridor with rails and ballusters. This was terraced, and served as a plain for people to walk on; and from this they could look through the windows down into the room. To this terrace there was no covering required, as the Egyptians were in no fear of rain. The Egyptians decorated this sort of building with statues; and no kind of ornament could answer it so well, as the light cannot fall upon statues to such advantage in any direction, as when it comes from above, in such a regular, proportioned, and uninterrupted manner.

13 Ancient architecture superior in grandeur to the modern.

We have already taken notice, that among the ancient Egyptians, Persians, and Babylonians, the vast strength and extent of their buildings seems to have been what they chiefly valued; and in this they certainly as much excelled the Greeks and modern nations,

as the latter excel them in the beautiful proportion and elegance of their structures. There are not wanting, however, some modern authors, who endeavour to deprive the ancients of what is justly their due, and will have every thing to be exaggerated which seems beyond the power of modern princes to accomplish. In this way M. Goguet remarkably distinguishes himself; and that without giving any reason at all, but merely that he takes it into his head. Speaking of the wonders of ancient Babylon, "All these works (says he), so marvellous in the judgment of antiquity, appear to me to have been extremely exaggerated by the authors who have spoken of them. How can we conceive, in effect, that the walls of Babylon could have been 318 feet high, and 81 in thickness, in a compass of near ten leagues?" To this we may easily reply, that the pyramids of Egypt, and the immense wall which divides China from Tartary, show us, that even such a work as the wall of ancient Babylon is said to have been is not altogether incredible. The lowest computation of the dimensions of the Chinese wall is, that it extends in length 1200 miles, is 18 feet high at a medium and as many thick; according to which computation, it must contain 9,504,000 solid fathoms; and yet, if we may credit the Chinese historians, this immense mass of building was finished in five years. If therefore we can suppose Nebuchadnezzar, or whoever fortified the city of Babylon, to have been capable of employing as many men for ten years as were employed in raising the Chinese wall, we may suppose him able to have fortified the city of Babylon as strongly as it is said to have been; for the mass of building is not quite double that of the Chinese wall, though nearly so, amounting to 18,189,600 solid fathoms. When our author afterwards gasconades about the works of the French king, it is difficult to avoid laughter at hearing him declare, that "infinitely more money has been expended, and much more genius required, as well as more power, taste, and time, to finish Versailles, with all its defects, than to construct a pyramid, or erect an obelisk." The genius, taste, and time, we shall not dispute; but as the same author confesses that 100,000 men were employed for 30 years together in the construction of the largest pyramid, we think the power may justly be doubted. This doubt will appear still the more reasonable, when we consider what time the above-mentioned number of men would have taken to accomplish some of the works of which M. Goguet boasts so much. The canal of Languedoc, he tells us, extends in length upwards of 70 leagues, and required the removal of two millions of cubic fathoms of earth. This was no doubt a great work; but had 100,000 men been employed upon it at once, they must have removed this quantity of earth in three weeks, supposing each to have removed only a single fathom a-day. Nor can we imagine, that any modern work will at all stand in competition with the works of the ancients as to greatness, whatever they may do in other respects.

14 Architecture improved by the Greeks.

As to the improvements in architecture, the Greeks were undoubtedly the first European nation who began to distinguish themselves in this way. Whence they took the first hint of improvement, we have no means of knowing; though, as we have already hinted, it is scarce credible but that Solomon's temple must have somewhat contributed thereto; especially as we learn from Scripture, that the capitals of the columns there were ornamented in the richest manner. The origin of the Doric and Ionic orders we have already given an account of from Vitruvius; to which we may add, that the volutes, which are the peculiar ornament of the Ionic capital, are by some said to represent the natural curling down of a piece of bark from the top of a beam, which is supposed to have been the first kind of column. The Corinthian order was not invented till long after the others, and is said to have taken its rise from the following accident: A basket had been set upon the ground, and covered with a square tile; there grew near it a plant of acanthus or bear's breech; the leaves shot up and covered the outer surface of the basket; and, as the stalks rose up among them, they soon reached the tile which overhung the edges of the basket at the top; this stopping their course upwards, they curled and twisted themselves into a kind of volutes. In this situation a sculptor, Callimachus, saw it; the twisted part of the stalk represented to him the volutes of the Ionic capital, which, as they were here smaller, and more numerous, appeared in a new form: he saw the beauty of raising them among leaves, and was struck with the representation of a noble and lofty capital; which being afterwards put into execution, has been universally admired.

15 Origin of the Corinthian order

In their private houses the Greeks had greater conveniences, but much less magnificence, than the Romans, as the former reserved the use of their grandest architecture for their temples and public buildings. The entrance to their private houses, however large they were, was always small, narrow and plain. The whole edifice usually consisted of two courts, and several ranges of buildings. The porter's lodge, if such a phrase may be allowed, was usually on the right hand of this narrow entrance, and opposite to this were the stables. From this entrance one came into the first or smaller court. This had piazzas on three sides; and on the fourth, which was usually the south side, there were butments of pilasters, which supported the more inward parts of the ceiling. A space being thus left between the one and the other, they had places for the lodgings of men and maid servants, and such as had the principal care of the house. Upon the same floor with these butments they had several regular apartments, consisting of an antichamber, a chamber, and closets; and about the piazzas, rooms for eating and other common purposes. Opposite to the entrance was a lobby, or vestibule, through which lay the passage into the several rooms; and through this, in front, one entered a large passage, which led into the larger or principal square. Round this they had four piazzas, which, in the common way of building, were all of one height; but in more magnificent houses, they made that which faced the great entrance loftier, and every way nobler, than the other three. A nobleman of Rhodes added this to the common method of building; and it was thence called the *Rhodian* manner. In this more noble part of the building were the apartments of the family. These were adorned with lofty galleries, and here were the best rooms: they were called the *men's apartments;* for, in rude times, the Greeks lodged their wives and female relations in the best rooms of the first court, where they had also their separate and detached place.

16 Private houses of the Greeks

The two sides of this larger court were kept for the reception of visitors; and servants were appointed to wait upon them. The master of the house entertained his guests the first day in his own apartments; but after this, how long soever they staid, they lived without restraint in one of those separate piazzas, and joined the family only when they chose it. Thus was the upper end and two sides of the great court disposed of; and its lower end, being the same range of building that was the upper end of the first court, held the lady of the house and her female friends.

17 the Romans.

The Romans borrowed their architecture from the Greeks, but did not imitate them in the modesty of their private dwellings. They placed the principal front of their house towards the south, and on this they bestowed all the decoration of expensive ornament. They had here lofty galleries and spacious rooms, and every thing carried an air of greatness and show. In their country houses, they preserved the same situation and the same front, but the inner distribution was different. At the entrance they placed the meaner and more offensive offices, after the manner of the Greeks. The first gallery, which received the stranger at his entrance, had on one side a passage to the kitchen, and on the other to the stalls where they kept cattle, that their noise or smell might not be offensive within, while yet they were in readiness for all services. These stalls were placed to the left, as in the Greek houses; on the right was the kitchen, which had its light from above, and its chimney in the middle. Farther within the building were placed on one side bathing rooms, and on the other family conveniences, in the manner of our butteries and store rooms; the bathing rooms were on the left, and the others on the right. Backwards, and full to the north, they placed their cellars, for fear of the sun, and over these were other store rooms. From this part of the structure one came into the court: for in these there generally was only one court: this was taken up by servants, and those who had the care of the cattle; and on each side there were stalls for the cattle. In front from the entrance, but very far from all these annoyances, stood the nobler apartments for the master of the family.

18 Decline of the art among the Romans.

How magnificent the Romans were in their temples and public buildings, is yet to be seen in what remains of them, and which are not only models for all moderm architects, but have never been surpassed or even equalled to this day. But though the art of architecture continued almost at its highest pitch among the Romans for two centuries, it declined exceedingly as the empire began to fail. Tacitus relates, that after the battle of Actium no men of genius appeared; and after the reign of Alexander Severus, a manner of building altogether confused and irregular was introduced, wherein nothing of the true graces and majesty of the former was preserved. When the empire was entirely overrun by the Goths, the conquerors naturally introduced their own method of building. Like the ancient Egyptians, the Goths seem to have been more studious to amaze people with the greatness of their buildings, than to please the eye with the regularity of their structure, or the propriety of their ornaments. They corrected themselves, however, a little by the models of the Roman edifices which they saw before them: but these models themselves were faulty; and the Goths being totally destitute of genius, neither architecture nor any other art could be improved by them.

19 Gothic manner of building.

Most writers who mention the ancient buildings in this island, particularly the religious ones, notwithstanding the striking difference in the styles of their construction, class them all under the common denomination of *Gothic;* a general appellation by them applied to buildings not exactly conformable to some one of the five orders of architecture. Our modern antiquaries, more accurately, divide them into Saxon, Norman, and Saracenic, or that species vulgarly, though improperly, called *modern Gothic.*

20 Of the Saxon and Norman styles.

It has been maintained by some, that the Saxon churches, after they began to be built with stone, consisted only of upright walls, without pillars or arches, the construction of which, it is alleged, they were entirely ignorant of. But this opinion is not only contradicted by the testimony of several cotemporary or very ancient writers, who expressly mention them both, but also by the remains of some edifices universally allowed to be of Saxon workmanship, one of them the ancient conventual church of Ely. Indeed, it is highly improbable that the Saxons could be ignorant of so useful a contrivance as the arch. Many of them, built by the Romans, they must have had before their eyes; some of which have reached our days: two particularly are now remaining in Canterbury only; one in the castle yard, the other at Riding gate. And it is not to be believed, that once knowing them and their convenience, they would neglect to make use of them; or having used, would relinquish them. Besides, as it appears from undoubted authorities they procured workmen from the continent to construct their capital buildings "according to the Roman manner," this alone would be sufficient to confute that ill-grounded opinion; and at the same time proves, that what we commonly call *Saxon*, is in reality Roman architecture.

This was the style of building practised all over Europe; and it continued to be used by the Normans, after their arrival here, till the introduction of what is called the *modern Gothic*, which was not till about the end of the reign of Henry II. so that there seems to be little or no grounds for a distinction between the Saxon and Norman architecture. Indeed it is said, the buildings of the latter were of larger dimensions both in height and area; and they were constructed with a stone brought from Caen in Normandy, of which their workmen were peculiarly fond: but this was simply an alteration in the scale and materials, and not in the manner of the building. The ancient parts of most of our cathedrals are of this early Norman work.—The characteristic marks of this style are these: the walls are very thick, generally without buttresses; the arches, both within and without, as well as those over the doors and windows, semicircular, and supported by very solid, or rather clumsy, columns, with a kind of regular base and capital: in short, plainness and solidity constitute the striking features of this method of building. Nevertheless, the architects of those days sometimes deviated from this rule: their capitals were adorned with carvings of foliage, and even animals; and their massive columns decorated with small half columns united to them, and their

their surfaces ornamented with spirals, squares, lozenge net-work, and other figures, either engraven or in relievo. Various instances of these may be seen in the cathedral of Canterbury, particularly the under croft, the monastery at Lindisfarn or Holy island, the cathedral at Durham, and the ruined choir at Orford in Suffolk. The columns 1, 1, 1, 1, (Plate XXXVIII.), are at the monastery of Lindisfarn or Holy island. Those 2, 2, 2, belong to the ruined chancel at Orford in Suffolk. N° 3 is at Christ church, Canterbury. N° 4, a column with two remarkable projections like claws, in the south aisle of Romney church, Hampshire.

21 Of the modern Gothic or Saracenic style.

To what country or people the *modern Gothic*, or the style of building with pointed arches so called, owes its origin, seems by no means satisfactorily determined. Some have imagined it may possibly have taken its rise from those arches we see in the early Norman or Saxon buildings or walls, where the wide semicircular arches cross and intersect each other, and form at their intersection a narrow and sharp-pointed arch: But it is more generally conjectured to be of Arabian extraction, and to have been introduced into Europe by some persons returning from the Crusades in the Holy Land. Sir Christopher Wren was of that opinion, and it has been subscribed to by most writers who have treated on this subject.

"Modern Gothic, as it is called (says Rious), is distinguished by the lightness of its work, by the excessive boldness of its elevations and of its sections; by the delicacy, profusion, and extravagant fancy of its ornaments. The pillars of this kind are as slender as those of the ancient Gothic are massive; such productions, so airy, cannot admit the heavy Goths for their author. How can be attributed to them a style of architecture, which was only introduced in the tenth century of our era, several years after the destruction of all those kingdoms which the Goths had raised upon the ruins of the Roman empire, and at a time when the very name of Goth was entirely forgotten? From all the marks of the new architecture, it can only be attributed to the Moors; or, what is the same thing, to the Arabians or Saracens, who have expressed, in their architecture, the same taste as in their poetry; both the one and the other falsely delicate, crowded with superfluous ornaments, and often very unnatural: the imagination is highly worked up in both; but it is an extravagant imagination; and this has rendered the edifices of the Arabians (we may include the other orientals) as extraordinary as their thoughts. If any one doubts of this assertion, let us appeal to any one who has seen the mosques and palaces of Fez, or some of the cathedrals in Spain built by the Moors; one model of this sort is the church at Burgos; and even in this island there are not wanting several examples of the same. Such buildings have been vulgarly called modern Gothic, but their true appellation is Arabic, Saracenic, or Moresque.—This manner was introduced into Europe through Spain. Learning flourished among the Arabians all the time that their dominion was in full power; they studied philosophy, mathematics, physic, and poetry. The love of learning was at once excited; in all places that were not at too great a distance from Spain, these authors were read: and such of the Greek authors as they had translated into Arabic, were from thence turned into Latin. The physic and philosophy of the Arabians spread themselves in Europe, and with these their architecture: many churches were built after the Saracenic mode; and others with a mixture of heavy and light proportions: the alteration that the difference of the climate might require, was little, if at all considered. In most southern parts of Europe, and in Africa, the windows (before the use of glass), made with narrow apertures, and placed very high in the walls of the building, occasioned a shade and darkness within side, and were well contrived to guard against the fierce rays of the sun; yet were ill suited to latitudes where that glorious luminary sheds its feebler influence, and is rarely seen but through a watery cloud."

Mr Grose, however, thinks the above opinion is not sufficiently favoured by the observations of several learned travellers who have accurately surveyed the ancient mode of building in those parts of the world. Thus Cornelius le Brun, an indefatigable and inquisitive traveller, has published many views of eastern buildings, particularly about the Holy Land: in all these, only one Gothic ruin, the church near Acre, and a few pointed arches, occur; and those built by the Christians when in possession of the country. Near Ispahan, in Persia, he gives several buildings with pointed arches: but these are bridges and caravanseras, whose age cannot be ascertained; consequently are as likely to have been built after, as before the introduction of this style into Europe. At Ispahan itself, the mey doen, or grand market place, is surrounded by divers magnificent Gothic buildings; particularly the royal mosque, and the Talael Ali-kapie, or theatre. The magnificent bridge of Alla-werdie-chan, over the river Zenderoet, 540 paces long and 17 broad, having 33 pointed arches, is also a Gothic structure; but no mention is made when or by whom these were built. The Chiaer Baeg, a royal garden, is decorated with Gothic buildings; but these were, it is said, built only in the reign of Schah Abbas, who died anno 1629. One building indeed, Mr Grose admits, seems at first as if it would corroborate this assertion, and that the time when it was erected might be in some degree fixed; it is the tomb of Abdallah, one of the apostles of Mahomet, probably him surnamed Abu Becr. "If this tomb (says he) is supposed to have been built soon after his death, estimating that even to have happened according to the common course of nature, it will place its erection about the middle of the seventh century: but this is by far too conjectural to be much depended on. It also seems as if this was not the common style of building at that time, from the temple of Mecca; where, if any credit is to be given to the print of it in Sale's Koran, the arches are semicircular. The tomb here mentioned has one evidence to prove its antiquity; that of being damaged by the injuries of time and weather. Its general appearance much resembles the east end of the chapel belonging to Ely House, London, except that which is filled up there by the great window, in the tomb is an open pointed arch, where also the columns or pinnacles on each side are higher in proportion.

As to the supposition that this kind of architecture was brought into Spain by the Moors (who possessed themselves

themselves of a great part of that country in the beginning of the eighth century, which they held till the latter end of the fifteenth), and that from thence, by way of France, it was introduced into Britain; this at first seems plausible; though, according to Mr Grose, the only instance which seems to corroborate this hypothesis, or at least the only one proved by authentic drawings, is the mosque at Cordova in Spain; where, if we may judge from the views published by Mr Swinburne, although most of the arches are circular or horse-shoe fashion, there are some pointed arches formed by the intersection of two segments of a circle. This mosque was, as it is there said, begun by Abdoulrahman I. who laid the foundation two years before his death, and was finished by his son Hissem or Iscan about the year 800. If these arches were part of the original structure, it would be much in favour of the supposition; but as it is also said that edifice has been more than once altered and enlarged by the Mahometans, before any well-grounded conclusion can be drawn, it is necessary to ascertain the date of the present building.

There are also several pointed arches in the Moorish palace at Granada, called the *Alhambra;* but as that was not built till the year 1273, long after the introduction of pointed arches into Europe, they are as likely to be borrowed by the Moors from the Christians, as by the Christians from the Moors. The greatest peculiarity in the Moorish architecture is the horse-shoe arch, which containing more than a semicircle, contracts towards its base, by which it is rendered unfit to bear any considerable weight, being solely calculated for ornament. In Romsey church, Hampshire, there are several arches of this form.

In the drawings of the Moorish buildings given in *Les Delices de l'Espagne*, said to be faithful representations, there are no traces of the style called Gothic architecture: there, as well as in the Moorish castle at Gibraltar, the arches are all represented circular. Perhaps a more general knolwedge of these buildings would throw some light on the subject; possibly the Moors may, like us, at different periods, have used different manners of building.

The marks which constitute the character of Gothic or Saracenical architecture, are its numerous and prominent buttresses, its lofty spires and pinnacles, its large and ramified windows, its ornamental niches or canopies, its sculptured saints, the delicate lace-work of its fretted roofs, and the profusion of ornaments lavished indiscriminately over the whole building: but its peculiar distinguishing characteristics are, the small clustered pillars and pointed arches formed by the segments of two intersecting circles; which arches, though last brought into use, are evidently of more simple and obvious construction than the semicircular ones; two flat stones, with their tops inclined to each other, and touching, form its rudiments; a number of boughs stuck into the ground opposite each other, and tied together at the top, in order to form a bower, exactly describe it: whereas a semicircular arch appears the result of deeper contrivance, as consisting of more parts; and it seems less probable chance, from whence all these inventions were first derived, should throw several wedge-like stones between two set perpendicular, so as exactly to fit and fill up the interval.

Bishop Warburton, in his notes on Pope's Epistles, in the octavo edition, has the following ingenious observations on this subject:—"Our Gothic ancestors had juster and manlier notions of magnificence, on Greek and Roman ideas, than these mimics of taste who profess to study only classic elegance; and because the thing does honour to the genius of those barbarians, I shall endeavour to explain it. All our ancient churches are called without distinction Gothic, but erroneously. They are of two sorts; the one built in the Saxon times, the other in the Norman. Several cathedral and collegiate churches of the first sort are yet remaining, either in whole or in part; of which this was the original: When the Saxon kings became Christians, their piety (which was the piety of the times), consisted chiefly in building churches at home, and performing pilgrimages abroad, especially to the Holy Land: and these spiritual exercises assisted and supported one another; for the most venerable as well as most elegant models of religious edifices were then in Palestine. From these the Saxon builders took the whole of their ideas, as may be seen by comparing the drawings which travellers have given us of the churches yet standing in that country, with the Saxon remains of what we find at home; and particularly in the sameness of style in the latter religious edifices of the knights templars (professedly built upon the model of the church of the Holy Sepulchre at Jerusalem), with the earlier remains of our Saxon edifices. Now the architecture of the Holy Land was Grecian, but greatly fallen from its ancient elegance. Our Saxon performance was indeed a bad copy of it, and as much inferior to the works of St Helena and Justinian, as theirs were to the Grecian models they had followed; yet still the footsteps of ancient art appeared in the circular arches, the entire columns, the division of the entablature into a sort of architrave, frize, and cornice, and a solidity equally diffused over the whole mass. This, by way of distinction, I would call the Saxon architecture. But our Norman works had a very different original. When the Goths had conquered Spain, and the genial warmth of the climate and the religion of the old inhabitants had ripened their wits and inflamed their mistaken piety, both kept in exercise by the neighbourhood of the Saracens, through emulation of their service, and aversion to their superstition, they struck out a new species of architecture, unknown to Greece and Rome, upon original principles, and ideas much nobler than what had given birth even to classical magnificence. For this northern people having been accustomed, during the gloom of Paganism, to worship the deity in groves (a practice common to all nations); when their new religion required covered edifices, they ingeniously projected to make them resemble groves, as nearly as the distance of architecture would permit; at once indulging their old prejudices, and providing for their present conveniences, by a cool receptacle in a sultry climate: and with what skill and success they executed the project by the assistance of Saracen architects, whose exotic style of building very luckily suited their purpose, appears from hence, that no attentive observer ever viewed a regular avenue of well-grown trees intermixing their branches overhead, but it presenly put him in mind of the long visto through the Gothic cathedral;

or ever entered one of the larger and more elegant edifices of this kind, but it presented to his imagination an avenue of trees; and this alone is what can be truly called the Gothic style of building. Under this idea of so extraordinary a species of architecture, all the irregular transgressions against art, all the monstrous offences against nature, disappear; every thing has its reason, every thing is in order, and an harmonious whole arises from the studious application of means proper and proportionate to the end. For could the arches be otherwise than pointed, when the workmen were to imitate that curve which branches of two opposite trees make by their insertion with one another? or could the columns be otherwise than split into distinct shafts, when they were to represent the stems of a clump of trees growing close together? On the same principles they formed the spreading ramification of the stone work in the windows, and the stained glass in the interstices; the one to represent the branches, and the other the leaves of an opening grove, and both concurred to preserve that gloomy light which inspires religious reverence and dread. Lastly, We see the reason of their studied aversion to apparent solidity in these stupendous masses, deemed so absurd by men accustomed to the apparent as well as real strength of Grecian architecture. Had it been only a wanton exercise of the artist's skill, to show he could give real strength without the appearance of any, we might indeed admire his superior science, but we must needs condemn his ill judgment. But when one considers, that this surprising lightness was necessary to complete the execution of his idea of a sylvan place of worship, one cannot sufficiently admire the ingenuity of the contrivance. This, too, will account for the contrary qualities in what I call the Saxon architecture. These artists copied, as has been said, from the churches in the Holy Land, which were built on the models of the Grecian architecture, but corrupted by prevailing barbarism; and still farther depraved by a religious idea. The first places of Christian worship were sepulchres and subterraneous caverns, low and heavy from necessity. When Christianity became the religion of the state, and sumptuous temples began to be erected, they yet, in regard to the first pious ages, preserved the massive style, made still more venerable by the church of the Holy Sepulchre; where this style was, on a double account, followed and aggravated."

22 Ancient rise and progress of architecture in Britain.

In Britain, before the Roman invasion, the natives appear to have had no better lodgings than thickets, dens, and caves. Some of these caves, which were their winter habitations, and places of retreat in time of war, were formed and rendered secure and warm by art, like those of the ancient Germans, which are thus described by Tacitus: "They are used to dig deep caves in the ground, and cover them with earth, where they lay up their provisions, and dwell in winter for the sake of warmth. Into these they retire also from their enemies, who plunder the open country, but cannot discover these subterranean recesses." Some of these subterraneous, or *earth houses*, as they are called, are still remaining in the Western isles of Scotland and in Cornwall. The summer habitations of the most ancient Britons were very slight; and, like those of the Finnians, consisted only of a few stakes driven into the ground, interwoven with wattles, and covered over with the boughs of trees."

When Julius Cæsar invaded Britain, the inhabitants of Cantium (Kent), and of some other parts in the south, had learned to build houses a little more substantial and convenient. "The country (says Cæsar) abounds in houses, which very much resemble those of Gaul." The first step towards this improvement seems to have been that of daubing the wattled walls of their houses with clay, to fill up the chinks and make them warmer. "The Germans used for this purpose a kind of pure resplendent earth of different colours, which had an appearance of painting at a distance;" but the Gauls and Britons chose rather to whitewash the clay after it was dry with chalk. Instead of the boughs of trees, they thatched these houses with straw, as a much better security against the weather. They next proceeded to form the walls of large beams of wood, instead of stakes and wattles. This seems to have been the mode of building in Britain, when it was first invaded by the Romans. "The Britons (says Diodorus Siculus, who was cotemporary with Cæsar) dwell in wretched cottages, which are constructed of wood, covered with straw." These wooden houses of the ancient Gauls and Britons were not square but circular, with high tapering roofs, at the top or centre of which was an aperture for the admission of light and emission of smoke. Those of Gaul are thus described by Strabo: "They build their houses of wood, in the form of a circle, with lofty tapering roofs." The foundations of some of the most magnificent of these circular houses were of stone, of which there are some vestiges still remaining in Anglesey and other places. It was probably in imitation of these wooden houses, that the most ancient stone edifices, of which there are still some remains in the Western islands of Scotland, were built circular, and have a large aperture at the top.

When the Britons were invaded by the Romans, they had nothing among them answering to our ideas of a city or town, consisting of a great number of contiguous houses disposed into regular streets, lanes, and courts. Their dwellings, like those of the ancient Germans, were scattered about the country, and generally situated on the brink of some rivulet for the sake of water, and on the skirt of some wood or forest for the convenience of hunting and pasture for their cattle. As these inviting circumstances were more conspicuous in some parts of the country than others, the princes and chiefs made choice of these places for their residence; and a number of their friends and followers, for various reasons, built their houses as near to them as they could with convenience. This naturally produced an ancient British town, which is described by Cæsar and Strabo in the following manner: "From the Cassi he learnt that the town of Cassivelaun was at no great distance; a place defended by woods and marshes, in which very great numbers of men and cattle were collected. For what the Britons call a town is a tract of woody country surrounded by a mound and ditch, for the security of themselves and their cattle against the incursions of their enemies." "The forests of the Britons are their cities; for when they have enclosed a very large circuit with felled trees, they build within it houses for themselves and hovels for their cattle. These buildings are very slight, and not

not designed for long duration." The palaces of the British princes were probably built of the same materials, and on the same plan, with the houses of their subjects, and differed from them only in solidity and magnitude.

Though the communication between this island and the continent was more free and open after the first Roman invasion than it had been before, and some of the British princes and chieftains even visited Rome, then in its greatest glory; it doth not appear that the people of Britain made any considerable improvements in their manner of building for at least a hundred years after that invasion. For when the renowned Caractacus was carried prisoner to Rome, A. D. 52, and observed the beauty and magnificence of the buildings in that proud metropolis of the world, he is said to have expressed great surprise, "That the Romans, who had such magnificent palaces of their own, should envy the wretched cabins of the Britons."

It must appear very surprising that the ancient Britons, when they were so ignorant of architecture, were capable of erecting (if indeed it was erected by them) so stupendous a fabric as that of Stonehenge on Salisbury plain: A fabric which hath been the admiration of all succeeding ages, and hath outlasted all the solid and noble structures which were erected by the Romans in this island. See the article STONEHENGE.

Of another very extraordinary species of building several remains are found in the Highlands of Scotland. They consist of ruins; the walls of which, instead of being cemented with lime or some other similar substance, or of being raised with dry stones as was the method before cement came into use, are described as having been vitrified, or the stones run and compacted together by the force of fire. Concerning the origin, use, &c. of these buildings, different opinions have been formed; and even the reality of them as works of contrivance has been called in question: of all which particulars the reader will find an account under the article *FORTS, Vitrified.*

But for whatever purposes, or by whatever means, the above and other similar structures of a peculiar nature were erected, we have sufficient evidence that the people of Britain, before they were subdued and instructed by the Romans, had but a rude knowledge of architecture, and were very meanly lodged. As soon, however, as the Romans began to form settlements and plant colonies in this island, a sudden and surprising change ensued in the state of architecture. For that wonderful people were as industrious as they were brave, and made haste to adorn every country that they conquered. The first Roman colony was planted at Camelodunum, A. D. 50; and when it was destroyed by the Britons in their great revolt under Boadicea, only eleven years after, it appears to have been a large and well-built town, adorned with statues, temples, theatres, and other public edifices.

The Romans not only built a prodigious number of solid, convenient, and magnificent structures for their own accommodation, but they exhorted, encouraged, and instructed the Britons to imitate their example. This was one of the arts which Agricola, the most excellent of the Roman governors, employed to civilize the Britons, and reconcile them to the Roman government. "The following winter (says Tacitus) was spent by Agricola in very salutary measures. That the Britons who led a roaming and unsettled life, and were easily instigated to war, might contract a love of peace and tranquillity, by being accustomed to a more pleasant way of living, he exhorted and assisted them to build houses, temples, courts, and market-places. By praising the diligent and reproaching the indolent, he excited so great an emulation among the Britons, that after they had erected all those necessary edifices in their towns, they proceeded to build others merely for ornament and pleasure, as porticoes, galleries, baths, banqueting houses, &c." From this time, which was A. D. 80, to the middle of the fourth century, architecture and all the arts immediately connected with it greatly flourished in this island; and the same taste for erecting solid, convenient, and beautiful buildings, which had long prevailed in Italy, was introduced into Britain. Every Roman colony and free city (of which there was a great number in this country) was a little Rome, encompassed with strong walls, adorned with temples, palaces, courts, halls, basilics, baths, markets, aqueducts, and many other fine buildings, both for use and ornament. The country everywhere abounded with well-built villages, towns, forts, and stations; and the whole was defended by that high and strong wall, with its many towers and castles, which reached from the mouth of the river Tyne on the east to the Solway frith on the west. This spirit of building, which was introduced and encouraged by the Romans, so much improved the taste and increased the number of the British builders, that in the third century this island was famous for the great number and excellence of its architects and artificers. When the emperor Constantius, father of Constantine the Great, rebuilt the city of Autun in Gaul, A. D. 296, he was chiefly furnished with workmen from Britain, "which (says Eumenius) very much abounded with the best artificers."

Not very long after this period, architecture and all the arts connected with it began to decline very sensibly in Britain, and in all the provinces of the western empire. This was partly owing to the building of Constantinople, which drew many of the most famous architects and other artificers into the east, and partly to the irruptions and depredations of the barbarous nations.

The final departure of the Romans was followed by the almost total destruction of architecture in this island. For the unhappy and unwarlike people whom they left behind, having neither skill nor courage to defend the numerous towns, forts, and cities which they possessed, they were seized by their ferocious invaders, who first plundered and then destroyed them. By this means, the many noble structures, with which Provincial Britain had been adorned by the art and industry of the Romans, were ruined or defaced in a very little time; and the unfortunate Britons were quite incapable of repairing them, or of building others in their room. That long succession of miseries in which they were involved by the Scots, Picts, and Saxons, deprived them of the many useful arts which they had learned from their former masters, and lodged them once more in forests, dens, and caves, like their savage ancestors.

The most wanton and extensive devastations were those committed by the Anglo-Saxons; among whom it

it seems to have been a maxim to destroy all the towns and castles which they took from their enemies, instead of preserving them for their own use.

It cannot be supposed that a people who wantonly demolished so many beautiful and useful structures had any taste for the arts by which they had been erected. The truth is, that the Anglo-Saxons at their arrival in this island were almost totally ignorant of these arts; and, like all the other nations in Germany, had been accustomed to live in wretched hovels, built of wood or earth, and covered with straw or the branches of trees: nor did they much improve in the knowledge of architecture for 200 years after their arrival. During that period, masonry was quite unknown and unpractised in this island; and the walls even of cathedral churches were built of wood. "There was a time (says venerable Bede) when there was not a stone church in all the land; but the custom was to build them all of wood. Finan, the second bishop of Lindisfarne, or Holy island, built a church in that island, A. D. 652, for a cathedral, which yet was not of stone, but of wood, and covered with reeds: and so it continued till Eadbert, the successor of St Cuthbert, and seventh bishop of Lindisfarne, took away the reeds, and covered it all over, both roof and walls, with sheets of lead." The first cathedral of York was built of the same materials; and a church of stone was esteemed a kind of prodigy in those times that merited a place in history. "Paulinus, the first bishop of York, built a church of stone in the city of Lincoln, whose walls (says Bede) are still standing, though the roof is fallen down; and some healing miracles are wrought in it every year, for the benefit of those who have the faith to seek them."

There does not seem to have been so much as one church of stone, nor any artists who could build one, in all Scotland, at the beginning of the eighth century. For Naitan king of the Picts, in his famous letter to Ceolfred abbot of Weremouth, A. D. 710, earnestly entreats him to send him some masons to build a church of stone in his kingdom, in imitation of the Romans; which he promises to dedicate to the honour of the apostle Peter, to whom the abbey of Weremouth was dedicated: and we are told by Bede, who was then living in that abbey, that the reverend abbot Ceolfred granted this pious request, and sent masons according to his desire.

Masonry was restored, and some other arts connected with it introduced into England, towards the end of the seventh century, by two clergymen, who were great travellers, and had often visited Rome, where they had acquired some taste for these arts. These were, the famous Wilfrid bishop of York, and afterwards of Hexham, and Benedict Biscop, founder of the abbey of Weremouth. Wilfrid, who was one of the most ingenious, active, and magnificent prelates of the seventh century, was a great builder, and erected several structures at York, Rippon, and Hexham, which were the admiration of the age in which he flourished. The cathedral of Hexham, which was one of these structures, is thus described by his biographer: "Having obtained a piece of ground at Hexham from Queen Etheldreda, he there founded a most magnificent church, which he dedicated to the blessed apostle St Andrew. As the plan of this sacred structure seems to have been inspired by the Spirit of God, it would require a genius much superior to mine to describe it properly. How large and strong were the subterraneous buildings, constructed of the finest polished stones! How magnificent the superstructure, with its lofty roof, supported by many pillars, its long and high walls, its sublime towers, and winding stairs! In one word, there is no church on this side of the Alps so great and beautiful." This admired edifice, of which some vestiges are still remaining, was built by masons and other artificers brought from Rome by the munificence of its generous founder. Benedict Biscop was the cotemporary and companion of Wilfrid in some of his journeys, and had the same taste for the arts. He made no fewer than six journeys to Rome, chiefly with a view of collecting books, pictures, statues, and other curiosities, and of persuading artificers of various kinds to come from Italy and France and settle in England. Having obtained a grant of a considerable estate from Egfrid king of Northumberland, near the mouth of the river Were, he there founded a monastery, A. D. 674. "About a year after the foundations of this monastery were laid, Benedict crossed the sea into France, where he collected a number of masons, and brought them over with him, in order to build the church of his monastery of stone after the Roman manner, of which he was a great admirer. His love to the apostle Peter, to whom he designed to dedicate his church, made him urge these workmen to labour so hard, that mass was celebrated in it about a year after it was founded. When the work was far advanced, he sent agents into France to procure if possible some glass-makers, a kind of artificers quite unknown in England, and to bring them over to glaze the windows of his church and monastery. These agents were successful, and brought several glass-makers with them; who not only performed the work required by Benedict, but instructed the English in the art of making glass for windows, lamps, drinking vessels, and other uses."

Eddi Vita Wilfridi, c. 22.

Bedæ Hist. Abbat.

But though these arts of building edifices of stone, with windows of glass and other ornaments, were thus introduced by these two prelates in the latter part of the seventh century, they do not seem to have flourished much for several centuries. It appears from many incidental hints in our ancient historians, that stone buildings were still very rare in the eighth and ninth ages; and that when any such buildings were erected, they were the objects of much admiration. When Alfred the Great, towards the end of the ninth century, formed the design of rebuilding his ruined cities, churches, and monasteries, and of adorning his dominions with more magnificent structures, he was obliged to bring many of his artificers from foreign countries. "Of these (as we are told by his friend and companion Asserius) he had an almost innumerable multitude collected from different nations; many of them the most excellent in their several arts."

In the other parts of this island architecture was, as might naturally be imagined, in a still less flourishing state. It appears indeed to have been almost entirely lost among the posterity of the ancient Britons after they retired to the mountains of Wales. The chief palace of the kings of Wales, where the nobility and wise men assembled for making laws, was called the *white palace*, because

because the walls of it were woven with white wands, which had the bark peeled off. By the laws of Wales, whoever burnt or destroyed the king's hall or palace was obliged to pay one pound and eighty pence, besides one hundred and twenty pence for each of the adjacent buildings, which were eight in number; viz. the dormitory, the kitchen, the chapel, the granary, the bakehouse, the storehouse, the stable, and the doghouse. From hence it appears, that a royal residence in Wales, with all its offices, when these laws were made, was valued at five pounds and eighty pence of the money of that age, equal in quantity of silver to sixteen pounds of our money, and in efficacy to one hundred and sixty. This is certainly a sufficient proof of the meanness of those buildings which were only of wood. Even the castles in Wales, in this period, that were built for the security of the country, appear to have been constructed of the same materials; for the laws required the king's vassals to come to the building of these castles with no other tools but an axe.

The arts of building do not seem to have been much better understood by the Scots and Picts than by the ancient Britons in the former part of this period. When Finan, the second bishop of Lindisfarne, built a church of wood in that island, A. D. 652, he is said to have done it *more Scotorum*, after the manner of his countrymen the Scots; and it hath been already observed, that Naitan king of the Picts was obliged to bring masons from Northumberland, when he resolved to build a church of stone in his dominions, A. D. 710. After this last period, it is probable that the Picts, and perhaps the Scots, began to learn and practise the art of masonry; because there are still some stone buildings of a very singular construction, and great antiquity, to be seen in Scotland. These buildings are all circular; though of two kinds so different from each other, that they seem to be the work of different ages and of different nations. The largest of these structures are in a very extraordinary taste of architecture; and are thus described by a modern antiquary, who viewed them with no little attention: "Having arrived at the barrack of Glenelg, I was conducted to the remains of those stupendous fabrics, seated about two miles from thence, in a valley called *Glenbeg*, in which four of them anciently stood. Two of these are now almost quite demolished, the third is half fallen down, the fourth is almost entire. The first I met with lies towards the north side of the valley, and is called *Castle Chalamine*, or *Malcolm's Castle*. It stands upon a considerable eminence, and affords us a fine prospect of the island of Skye, and a good part of the sea coast. The foundation of this only appears; as also of that other, on the east end of the valley, called *Castle Chonel*. About a quarter of a mile further, upon the bank of a rivulet which passes through the middle of the glen, stands the third fabric, called *Castle Tellve*. I found it composed of stones without cement; not laid in regular courses, after the manner of elegant buildings, but rudely and without order. Those toward the base were pretty large, but ascending higher they were thin and flat, some of them scarce exceeding the thickness of an ordinary brick. I was surprised to find no windows on the outside, nor any manner of entrance into the fabric, except a hole towards the west, at the base, so very low and narrow, that I was forced to creep in upon hands and knees, and found that it carried me down four or five steps below the surface of the ground. When I was got within I was environed betwixt two walls, having a cavity or void space which led me round the whole building. Opposite to the little entry, on the ontside, was a pretty large door in the second or inner wall, which led me into the area or inner court. When I was there, I perceived that one half of the building was fallen down, and thereby had the opportunity of seeing a complete section thereof. The two walls join together at the top, round about, and have formed a large void space or area in the middle. But to give a more complete idea of these buildings, I shall describe the fourth called *Castle Troddan*, which is by far the most entire of any in that country, and from whence I had a very clear notion how these fabrics were originally contrived. On the outside were no windows, nor were the materials of this castle anywise different from those of the other already described, only the entry on the ontside was somewhat larger; but this might be occasioned by the falling of the stones from above. The area of this makes a complete circle; and there are four doors in the inner wall, which face the four cardinal points of the compass. These doors are each eight feet and a half high, and five feet wide, and lead from the area into the cavity between the two walls, which runs round the whole building. The perpendicular height of this fabric is exactly 33 feet; the thickness of both walls, including the cavity between, no more than 12 feet; and the cavity itself is hardly wide enough for two men to walk abreast; the external circumference is 178 feet. The whole height of the fabric is divided into four parts or stories, separated from each other by thin floorings of flat stones, which knit the two walls together, and run quite round the building: and there have been winding stairs of the same flat stones ascending betwixt wall and wall up to the top. The undermost partition is somewhat below the surface of the ground, and is the widest; the others grow narrower by degrees till the walls close at the top. Over each door are nine square windows, in a direct line above each other, for the admission of light: and between every row of windows are three others in the uppermost story, rising above a cornice which projects out from the inner wall and runs round the fabric." From this description of these singular edifices it plainly appears that they were designed both for lodging and defence; and considering the state of the times in which they were built, they were certainly very well contrived for answering both these purposes.

ordon's Itinerarium ptentrionale, 165.

The stone edifices of the other kind which were probably erected in this period, and of which some few are still to be seen in Scotland, are not so large as the former, but more artificial. They are slender, lofty, circular towers, of cut stone, laid in regular rows, between 40 and 50 feet in external circumference, and from 70 to 100 feet high, with one door some feet from the ground. They are exactly similar to the round tower of Ardmore, and several others, in Ireland; and therefore were probably built about the same time, which was in the tenth century, and for the same purposes; which are believed by some to have been for the confinement of penitents while they were performing penance. On this account these towers are always

found in the neighbourhood of churches both in Scotland and Ireland; and are said to have been used in this manner: "The penitents were placed in the uppermost story of the tower (which commonly consisted of five or six stories); where having made probation, or done penance, such a limited time, according to the heinousness of their crime, they then were permitted to descend to the next floor, and so on by degrees, until they came to the door, which always faced the entrance of the church, where they stood to receive absolution from the clergy, and the blessings of the people. A tedious process, to which few penitents in the present age would willingly submit. Other writers are of opinion, that the design of these circular towers (of which one is still remaining at Abernethy and another at Brechin) was to be places from whence the people were called to public worship by the sound of a horn or trumpet, before the introduction of bells.

Archæologia, vol. i. p. 307.

This art received very great improvements in the 12th century; which indeed may be called *the age of architecture;* when the rage for building was more violent in England than at any other time. The great and general improvements that were made in the fabrics of houses and churches in the first years of this century, are thus described by a cotemporary writer. "The new cathedrals and innumerable churches that were built in all parts, together with the many magnificent cloisters and monasteries, and other apartments of monks, that were then erected, afford a suffieient proof of the great felicity of England in the reign of Henry I. The religious of every order, enjoying peace and prosperity, displayed the most astonishing ardour in every thing that might increase the splendour of divine worship. The fervent zeal of the faithful prompted them to pull down houses and churches everywhere, and rebuild them in a better manner. By this means the ancient edifices that had been raised in the days of Edgar, Edward, and other Christian kings, were demolished, and others of greater magnitude and magnificence, and of more elegant workmanship, were erected in their room, to the glory of God."

Orasrio Vital. Hist. Eccles. p. 878.

As the prodigious power of religious zeal, whatever turn it happens to take, when it is thoroughly heated, is well known, it may not be improper to give one example of the arts employed by the clergy and monks of this period, to inflame the pious ardour of the kings, nobles, and people, for building and adorning churches. When Joffred abbot of Croyland resolved to rebuild the church of his monastery in a most magnificent manner, A. D. 1106, he obtained from the archbishops of Canterbury and York, a bull dispensing with the third part of all penances for sin to those who contributed any thing towards the building of that church. This bull was directed not only to the king and people of England, but to the kings of France and Scotland, and to all other kings, earls, barons, archbishops, bishops, abbots, priors, rectors, presbyters, and clerks, and to all true believers in Christ, rich and poor, in all Christian kingdoms. To make the best use of this bull, he sent two of his most eloquent monks to proclaim it over all France and Flanders, two other monks into Scotland, two into Denmark and Norway, two into Wales, Cornwall, and Ireland, and others into different parts of England. "By this means (says the historian) the wonderful benefits granted to all the contributors to the building of this church were published to the very ends of the earth; and great heaps of treasure and masses of yellow metal flowed in from all countries upon the venerable Abbot Joffred, and encouraged him to lay the foundations of his church." Having spent about four years in collecting mountains of different kinds of marble from quarries both at home and abroad, together with great quantities of lime, iron, brass, and other materials for building, he fixed a day for the great ceremony of laying the foundation, which he contrived to make a very effectual mean of raising the superstructure! For on the long-expected day, the feast of the holy virgins Felicitas and Perpetua, an immense multitude of earls, barons, and knights, with their ladies and families, of abbots, priors, monks, nuns, clerks, and persons of all ranks, arrived at Croyland, to assist at this ceremony. The pious Abbot Joffred began by saying certain prayers, and shedding a flood of tears on the foundation. Then each of the earls, barons, knights, with their ladies, sons, and daughters, the abbots, clerks, and others, laid a stone, and upon it deposited a sum of money, a grant of lands, tithes, or patronages, or a promise of stone, lime, wood, labour, or carriages, for building the church. After this the abbot entertained the whole company, amounting to 5000 persons, at dinner. To this entertainment they were all entitled; for the money, and grants of different kinds, which they had deposted on the foundation stones, were alone sufficient to have raised a very noble fabric. By such arts as these the clergy inspired kings, nobles, and people of all ranks, with so ardent a spirit for these pious works, that in the course of this period almost all the sacred edifices in England were rebuilt, and many hundreds of new ones raised from the foundation. Nor was this spirit confined to England, but prevailed as much in Scotland in proportion to its extent and riches. King David I. alone, besides several cathedrals and other churches, built no fewer than thirteen abbeys and priories, some of which were very magnificent structures.

The sacred architecture of the Anglo-Normans in the beginning of this period did not differ much in its style and manner from that of the Anglo-Saxons; their churches being in general plain, low, strong, and dark; the arches both of the doors and windows semicircular, with few or no ornaments. By degrees, through much practice, our architects, who were all monks or clergymen, improved their taste and skill, and ventured to form plans of more noble, light, and elevated structures, with a great variety of ornaments; which led to that bold magnificent style of building, commonly, though perhaps not very properly, called *the later Gothic*. It is not improbable that our monkish architects were assisted in attaining this style of building by models from foreign countries, or by instructions from such of their own number as had visited Italy, France, Spain, or the East. But the origin of this style of architecture has been already considered, and the characters by which it is distinguished from the ancient Gothic have also been described: (See N° 21. *supra*). Its first appearance in England was towards the latter end of the reign of King Henry II. But it was not at once thoroughly adopted; some

some short solid columns and semicircular arches being retained and mixed with the pointed ones; as for example, in the west end of the Old Temple church; and at York, where, under the choir, there remains much of the ancient work, the arches of which are but just pointed, and rise on short round pillars. In the reign of Henry III. however, this manner of building seems to have gained a complete footing; the circular giving place to the pointed arch, and the massive column yielding to the slender pillar. Indeed, like all novelties, when once admitted, the rage of fashion made it become so prevalent, that many of the ancient and solid buildings, erected in former ages, were taken down in order to be re-edified in the new taste, or had additions patched to them, of this mode of architecture. The present cathedral church of Salisbury was begun early in this reign, and finished in the year 1258. It is entirely in the Saracenic style; and, according to Sir Christopher Wren, may be justly accounted one of the best patterns of architecture of the age in which it was built. Its excellency is undoubtedly in a great measure owing to its being constructed on one plan; whence arises that symmetry and agreement of parts, not to be met with in many of our other cathedral churches; which have mostly been built at different times, and in a variety of styles. From this time till the reign of Henry VIII. the fashionable pillars in churches were of Purbeck marble, very slender and round, encompassed with marble shafts a little detached, having each a capital adorned with foliage, which joining, formed one elegant capital for the whole pillar. The windows were long and narrow, with pointed arches and painted glass, which was introduced about that time, or at least became more common. In this century also they began to delight in lofty steeples, with spires and pinnacles. In the fourteenth century, the pillars consisted of an assemblage of shafts not detached, but united, forming one solid and elegant column; the windows, especially those in the east and west ends, were greatly enlarged, divided into several lights by stone mullions running into ramifications above, and forming numerous compartments in various fanciful shapes. Those windows, filled with stained glass of the most lively colours, representing kings, saints, and martyrs, and their histories, made a most solemn and glorious appearance. There were several other variations, especially in the taste of the carvings and other ornaments, which are too minute for general history.

As to the state of civil architecture during the same period: The houses of the common people in the country, and of the lower burgesses in towns and cities, were very little improved in their structure, that most numerous and useful order of men being much depressed in the times we are now delineating. Even in the capital city of London, all the houses of mechanics and common burgesses were built of wood, and covered with straw or reeds, towards the end of the twelfth century. But the palaces, or rather castles, of the Anglo-Norman kings, barons, and prelates, were very different from the residences of persons of the same rank in the Anglo-Saxon times. For this we have the testimony of a person of undoubted credit, who was well acquainted with them both. "The Anglo-Saxon nobles (says William of Malmsbury) squandered away their ample revenues in low and mean houses; but the French and Norman barons are very different from them, living at less expence, but in great and magnificent palaces." The truth is, that the rage of building fortified castles, was no less violent among the Norman princes, prelates, and barons, than that of building churches. To this they were prompted not only by the custom of their native country, but also by their dangerous situation in this island. Surrounded by multitudes, whom they had depressed and plundered, and by whom they were abhorred, they could not think themselves safe without the protection of deep ditches and strong walls. The Conqueror himself was sensible, that the want of fortified places in England had greatly facilitated his conquest, and might facilitate his expulsion; and therefore he made all possible haste to remedy this defect, by building very magnificent and strong castles in all the towns within the royal demesnes. "William (says Matthew Paris) excelled all his predecessors in building castles, and greatly harassed his subjects and vassals with these works." All his earls, barons, and even prelates, imitated his example; and it was the first care of every one who received the grant of an estate from the crown to build a castle upon it for his defence and residence. The disputes about the succession in the following reigns, kept up this spirit for building great and strong castles. William Rufus was still a greater builder than his father. "This William (says Henry Knyghton), was much addicted to building royal castles and palaces, as the castles of Dover, Windsor, Norwich, Exeter, the palace of Westminster, and many others, testify; nor was there any king of England before him that erected so many and such noble edifices." Henry I. was also a great builder both of castles and monasteries. But this rage for building never prevailed so much in any period of the English history as in the turbulent reign of King Stephen, from A. D. 1135 to A. D. 1154. "In this reign (as we are told by the author of the Saxon Chronicle) every one who was able built a castle; so that the poor people were worn out with the toil of these buildings, and the whole kingdom was covered with castles." This last expression will hardly appear too strong, when we are informed, that besides all the castles before that time in England, no fewer than 1115 were raised from the foundation in the short space of 19 years. See the article CASTLE.

The castles, monasteries, and greater churches of this period, were generally covered with lead, the windows glazed; and when the walls were not of ashler, they were neatly plastered and whitewashed on both sides. The doors, floors, and roof, were commonly made of oak planks and beams, exactly smoothed and jointed, and frequently carved. It is hardly necessary to observe, that the building one of these great and magnificent castles, monasteries, or churches, of which there were many in England, must have been a work of prodigious expence and labour; and that the architects and artificers, by whom that work was planned and executed, must have attained considerable dexterity in their respective arts. Several of these architects have obtained a place in history, and are highly celebrated for their superior skill. William of Sens, architect to Archbishop Lanfranc in building his cathedral, is said by Gervase of Canterbury, to have been a most exquisite artist both in stone and wood. He made

made not only a model of the whole cathedral, but of every particular piece of sculpture and carving, for the direction of the workmen; and invented many curious machines for loading and unloading ships, and conveying heavy weights by land, because all the stones were brought from Normandy. Matthew Paris speaks even in a higher strain of Walter of Coventry, who flourished towards the end of this period, when he says, that "so excellent an architect had never yet appeared, and probably never would appear, in the world." This encomium was undoubtedly too high; but it is impossible to view the remains of many magnificent fabrics, both sacred and civil, that were erected in this period, without admiring the genius of the architects by whom they were planned, and the dexterity of the workmen by whom they were executed.

In the beginning of the reign of Henry VIII. or rather towards the latter end of that of Henry VII. when brick building became common, a new kind of low pointed arch grew much in use; it was described from four centres, was very round at the haunches, and the angle at the top was very obtuse. This sort of arch is to be found in every one of Cardinal Wolsey's buildings; also at West Sheen; an ancient brick gate at Mile End, called *King John's Gate;* and in the great gate of the palace of Lambeth. From this time Gothic architecture began to decline; and was soon after supplanted by a mixed style, if one may venture to call it one; wherein the Grecian and Gothic, however discordant and irreconcileable, are jumbled together. Concerning this mode of building, Mr Warton, in his observations on Spencer's Faery Queene, has the following anecdotes and remarks:

"Although the Roman or Grecian architecture did not begin to prevail in England till the time of Inigo Jones, yet our communication with the Italians, and our imitation of their manners, produced some specimens of that style much earlier. Perhaps the earliest was Somerset House in the Strand, built about the year 1549, by the duke of Somerset, uncle to Edward VI. The monument of Bishop Gardiner, in Winchester cathedral, made in the reign of Mary, about 1555, is decorated with Ionic pillars. These verses of Spenser,

——————————— Did rise
On stately pillars, fram'd after the Doric guise—

bear an allusion to some of the fashionable improvements in building, which at this time were growing more and more into esteem. Thus also Bishop Hall, who wrote about the same time, viz. 1598:

There findest thou some stately Doric frame,
Or neat Ionicke work.———————

But these ornaments were often absurdly introduced into the old Gothic style: as in the magnificent portico of the schools at Oxford, erected about the year 1613; where the builder, in a Gothic edifice, has affectedly displayed his universal skill in the modern architecture, by giving us all the five orders together. However, most of the great buildings of Queen Elizabeth's reign have a style peculiar to themselves both in form and finishing; where, though much of the old Gothic is retained, and great part of the new taste is adopted, yet neither predominates; while both, thus distinctly blended, compose a fantastic species, hardly reducible to any class or name. One of its characteristics is the affectation of large and lofty windows: where, says Bacon, "you shall have sometimes fair houses so full of glass, that one cannot tell where to come to be out of the sun."

To return now to our general history, and to conclude: In the 15th and 16th centuries, when learning of all kinds began to revive, the chaste architecture of the Greeks and Romans seemed as it were to be recalled into life. The first improvements in it began in Italy, and owed their existence to the many ruins of the ancient Roman structures that were to be found in that country; from whence an improved method of building was gradually brought into the other countries of Europe; and though the Italians for a long time retained the superiority as architects over the other European nations; yet, as men of genius travelled from all quarters into Italy, where they had an opportunity of seeing the originals from whence the Italians copied, architects have arisen in other nations equal, if not superior, to any that ever appeared in Italy. Of this we have a recent instance in our own countryman Mr Mylne, who lately gained the prize in architecture at Rome, where it would no doubt be disputed by such natives of Italy as were best skilled in that art.

PART I. PRINCIPLES OF ARCHITECTURE.

MANY ages must have elapsed before architecture came to be considered as a fine art. Utility was its original destination, and still continues to be its principal end. Experience, however, has taught us, that architecture is capable of exciting a variety of agreeable feelings. Of these, utility, grandeur, regularity, order, and proportion are the chief.

13 Distinction of buildings.

Architecture, being an useful as well as a fine art, leads us to distinguish buildings, and parts of buildings, into three kinds, viz. what are intended for use solely, what for ornament solely, and what for both. Buildings intended for utility solely, ought in every part to correspond precisely to that intention: the least deviation from use, though contributing to ornament, will be disagreeable; for every work of use being considered as a mean to an end, its perfection as a mean is the capital circumstance, and every other beauty in opposition is neglected as improper. On the other hand, in such things as are intended solely for ornament, as columns, obelisks, triumphal arches, &c. beauty alone ought to be regarded. The principal difficulty in architecture lies in combining use and ornament. In order to accomplish these ends, different and even opposite means must be employed; which is the reason why they are so seldom united in perfection; and hence, in buildings of this kind, the only practicable method is,

Principles. to prefer utility to ornament according to the character of the building: in palaces, and such buildings as admit of a variety of useful contrivances, regularity ought to be preferred; but in dwelling houses that are too small for variety of contrivance, utility ought to prevail, neglecting regularity as far as it stands in opposition to convenience.

24 Intrinsic and relative beauty. In considering attentively the beauty of visible objects, we discover two kinds. The first may be termed *intrinsic* beauty, because it is discovered in a single object, without relation to any other. The second may be termed *relative* beauty, being founded on a combination of relative objects. Architecture admits of both kinds. We shall first give a few examples of *relative* beauty.

The proportions of a door are determined by the use to which it is destined. The door of a dwelling house, which ought to correspond to the human size, is confined to seven or eight feet in height and three or four in breadth. The proportions proper for a stable or coachhouse are different. The door of a church ought to be wide, in order to afford an easy passage for a multitude; and its height must be regulated by its wideness, that the proportion may please the eye. The size of the windows ought always to be proportioned to that of the room they are destined to illuminate; for if the apertures be not large enough to convey light to every corner, the room must be unequally lighted, which is a great deformity. Steps of stairs should likewise be accommodated to the human figure, without regarding any other proportion; they are accordingly the same in large and in small buildings, because both are inhabited by men of the same size.

We shall next consider *intrinsic* beauty blended with that which is *relative*. A cube itself is more agreeable than a parallelopipedon; this constantly holds in small figures: but a large building in the form of a cube is lumpish and heavy; while a parallelopipedon, set on its smaller base, is more agreeable on account of its elevation: Hence the beauty of Gothic towers. But if this figure were to be used in a dwelling house, to make way for relative beauty, we should immediately perceive that utility ought chiefly to be regarded; and this figure, inconvenient by its height, ought to be set on its larger base: the loftiness in this case would be lost; but that loss will be more than sufficiently compensated by the additional convenience. Hence the form of buildings spread more upon the ground than raised in height, is always preferred for a dwelling house.

25 Internal divisions of rooms. With regard to the internal divisions, utility requires that the rooms be rectangular, to avoid useless spaces. An hexagonal figure leaves no void spaces; but it determines the rooms to be all of one size, which is both inconvenient and disagreeable for want of variety. Though a cube be the most agreeable figure, and may answer for a room of a moderate size: yet, in a very large room, utility requires a different figure. Unconfined motion is the chief convenience of a great room; to obtain this the greatest length that can be had is necessary. But a square room of large size is inconvenient. It removes chairs, tables, &c. at too great a distance from the hand, which, when unemployed, must be ranged along the sides of the room. Utility, therefore, requires a large room to be a parallelogram. This figure is likewise best calculated for the admission of light; because, to avoid cross lights, all the windows ought to be in one wall; and if the opposite wall be at such a distance as not to be fully lighted, the room must be obscure. The height of a room exceeding nine or ten feet has little relation to utility; therefore proportion is the only rule for determining the height when above that number of feet. Principles.

26 Utility and beauty often incompatible. Artists who deal in the beautiful, love to entertain the eye: palaces and sumptuous buildings, in which intrinsic beauty may be fully displayed, give them an opportunity of exerting their taste. But such a propensity is peculiarly unhappy with regard to private dwelling houses; because, in these, relative beauty cannot be displayed to perfection without hurting intrinsic beauty. There is no opportunity for great variety of form in a small house; and in edifices of this kind, internal convenience has not hitherto been happily adjusted to external regularity. Perhaps an accurate coincidence in this respect is beyond the reach of art. Architects, however, constantly split upon this rock; for they never can be persuaded to give over attempting to reconcile these two incompatibles: how otherwise should it happen, that of the endless variety of private dwelling houses, there should not be one found that is generally agreed upon as a good pattern? the unwearied propensity to make a house regular as well as convenient obliges the architect, in some articles, to sacrifice convenience to regularity, and, in others regularity to convenience; and accordingly the house, which turns out neither regular nor convenient, never fails to displease.

Nothing can be more evident, than that the form of a dwelling house ought to be suited to the climate; yet no error is more common than to copy in Britain the form of Italian houses, not forgetting even those parts that are purposely contrived for collecting air, and for excluding the sun; witness our colonnades and logios, designed by the Italians to gather cool air, and exclude the beams of the sun, conveniences which the climate of this country does not require.

27 Architecture considered as a fine art. We shall next view architecture as one of the fine arts; which will lead us to the examination of such buildings, and parts of buildings, as are calculated solely to please the eye. Variety prevails in the works of nature; but art requires to be guided by rule and compass. Hence it is, that in such works of art as imitate nature, the great art is, to hide every appearance of art; which is done by avoiding regularity and indulging variety. But in works of art that are original and not imitative, such as architecture, strict regularity and uniformity ought to be studied, so far as consistent with utility.

28 Difference between proportions of number and quantity. Proportion is not less agreeable than regularity and uniformity; and therefore, in buildings intended to please the eye, they are all equally essential. It is taken for granted by many writers, that in all the parts of a building there are certain strict proportions which please the eye, in the same manner as in sound there are certain strict proportions which please the ear; and that, in both, the slightest deviation is equally disagreeable. Others seem to relish more a comparison between proportion in numbers and proportion in quantity; and maintain, that the same proportions are agreeable in both. The proportion, for example, of the numbers

Principles. bers 16, 24, and 36, are agreeable; and so, say they, are the proportions of a room, whose height is 16 feet, the breadth 24, and the length 36. But it ought to be considered, that there is no resemblance or relation between the objects of different senses. What pleases the ear in harmony, is not the proportion of the strings of the instrument, but of the sound which these strings produce. In architecture, on the contrary, it is the proportion of different quantities that pleases the eye, without the least relation to sound. The same thing may be said of numbers. Quantity is a real quality of every body; number is not a real quality, but merely an idea that arises upon viewing a plurality of things in succession. An arithmetical proportion is agreeable in numbers; but have we from this any reason to conclude, that it must also be agreeable in quantity? At this rate, a geometrical proportion, and many others, ought also to be agreeable in both. A certain proportion may coincide in quantity and number; and among an endless variety of proportions, it would be wonderful if there never should be a coincidence. One example is given of this coincidence in the numbers 16, 24, and 36; but to be convinced that it is merely accidental, we need but reflect, that the same proportions are not applicable to the external figure of a house, and far less to a column.

It is ludicrous to observe writers acknowledging the necessity of accurate proportions, and yet differing widely about them. Laying aside reasoning and philosophy, one fact universally agreed on ought to have undeceived them, that the same proportions which please in a model are not agreeable in a large building: a room 48 feet in length, and 24 in breadth and height, is well proportioned: but a room 12 feet wide and high, and 24 long, approaches to a gallery.

29 Beauty arising from proportion. Perrault, in his comparison of the ancients and moderns, goes to the opposite extreme; maintaining, that the different proportions assigned to each order of columns are arbitrary, and that the beauty of these proportions is entirely the effect of custom. But he should have considered, that if these proportions had not originally been agreeable, they could never have been established by custom.

For illustrating this point, we shall add a few examples of the agreeableness of different proportions. In a sumptuous edifice, the capital rooms ought to be large, otherwise they will not be proportioned to the size of the building; for the same reason, a very large room is improper in a small house. But in things thus related, the mind requires not a precise or single proportion, rejecting all others; on the contrary, many different proportions are equally agreeable. It is only when a proportion becomes loose and distant, that the agreeableness abates, and at last vanishes. Accordingly, in buildings, rooms of different proportions are found to be equally agreeable, even where the proportion is not influenced by utility. With regard to the proportion the height of a room should bear to the length and breadth, it must be extremely arbitrary, considering the uncertainty of the eye as to the height of a room when it exceeds 16 or 17 feet. In columns, again, every architect must confess, that the proportion of height and thickness varies betwixt eight diameters and 10, and that every proportion between these two extremes is agreeable. Besides, there must certainly be a further variation of proportion, depending on the size of the column. A row of columns 10 feet high, and a row twice that height, require different proportions: The intercolumniations must also differ in proportion according to the height of the row. Principl

Proportion of parts is not only itself a beauty, but is inseparably connected with a beauty of the highest relish, that of concord and harmony; which will be plain from what follows: A room, the parts of which are all finely adjusted to each other, strikes us not only with the beauty of proportion, but with a pleasure far superior. The length, the breadth, the height, the windows, raise each of them a separate emotion: These emotions are similar; and, though faint when separately felt, they produce in conjunction the emotion of concord or harmony, which is very pleasant. On the other hand, where the length of a room far exceeds the breadth, the mind, comparing together parts so intimately connected, immediately perceives a disagreement or disproportion which disgusts. Hence a long gallery, however convenient for exercise, is not an agreeable figure of a room.

30 Form of structure to be suited to the purposes for which they are intended. In buildings destined chiefly or solely to please the eye, regularity and proportion are essentially necessary, because they are the means of producing intrinsic beauty. But a skilful artist will not confine his view to regularity and proportion; he will also study congruity, which is perceived when the form and ornaments of a structure are suited to the purpose for which it is appointed. Hence every building ought to have an expression suited to its destination. A palace ought to be sumptuous and grand; a private dwelling, neat and modest; a playhouse, gay and splendid; and a monument gloomy and melancholy. A heathen temple has a double destination: It is considered as a house dedicated to some divinity; therefore it ought to be grand, elevated, and magnificent: It is also considered as a place of worship; and therefore ought to be somewhat dark and gloomy, because dimness or obscurity produces that tone of mind which is favourable to humility and devotion. Columns, besides their chief destination of being supports, contribute to that peculiar expression which the destination of a building requires. Columns of different proportions serve to express loftiness, lightness, &c. as well as strength. Situation may also contribute to expression: Conveniency regulates the situation of a private dwelling-house; and the situation of a palace ought to be lofty. This leads to a question, Whether the situation, where there happens to be no choice, ought, in any measure, to regulate the form of the edifice? The connection between a great house and a neighbouring field, though not extremely intimate, demands, however, some congruity. It would, for example, displease us to find an elegant building thrown away upon a wild uncultivated country: congruity requires a polished field for such a building. The old Gothic form of building was well suited to the rough uncultivated regions where it was invented; but was very ill adapted to the fine plains of France and Italy.

31 Internal divisions of houses. The external structure of a house leads naturally to its internal structure. A large and spacious room, which is the first that commonly receives us, is a bad contrivance in several respects. In the first place, when immediately from the open air we step into such

a

inciples. a room, its size in appearance is diminished by contrast; it looks little, compared with the great canopy of the sky. In the next place, when it recovers its grandeur, as it soon doth, it gives a diminutive appearance to the rest of the house; passing from it, every apartment looks little. In the third place, by its situation it serves only for a waiting room, and a passage to the principal apartments. Rejecting therefore this form, a hint may be taken from the climax in writing for another that appears more suitable: A handsome portico, proportioned to the size and fashion of the front, leads into a waiting room of a larger size, and this to the great room, all by a progression of small to great.

Grandeur is the principal emotion that architecture is capable of raising in the mind: it might therefore be the chief study of the artist, in great buildings destined to please the eye. But as grandeur depends partly on size, it is unlucky for architecture that it is governed by regularity and proportion, which never deceive the eye by making objects appear larger than they are in reality. But though regularity and proportion contribute nothing to grandeur, so far as that emotion depends on size; yet they contribute greatly to it by confining the size within such bounds that it can be taken in and examined at one view; for when objects are so large as not to be comprehended but in parts, they tend rather to distract than satisfy the mind.

We shall next pass to such ornaments as contribute to give buildings a peculiar expression. It has been doubted, whether a building can regularly admit any ornament but what is useful, or at least has that appearance. But, considering the double aim of architecture, as a fine as well as an useful art, there is no reason why ornaments may not be added to please the eye, without any relation to utility. A private dwelling house, it is true, and other edifices, where use is the chief aim, admit not regularly any ornament but what has at least the appearance of use; but temples, triumphal arches, and other buildings, intended chiefly or solely for show, may be highly ornamented.

32 ferent ds of or- nents. This suggests a division of ornaments into three kinds, viz. 1. Ornaments that are beautiful without relation to use; such as statues, vases, basso or alto relievo: 2. Things in themselves not beautiful, but possessing the beauty of utility, by imposing on the spectator, and appearing to be useful; such as blind windows: 3. Where things are beautiful in themselves, and at the same time take on the appearance of use; such as pilasters.

With regard to the *first*, we naturally require that a statue be so placed, as to be seen in every direction, and examined at different distances. Statues, therefore, are properly introduced to adorn the great stair that leads to the principal door of a palace, or to lessen the void between pillars. But a niche in the external front is an improper place for a statue. There is an additional reason against placing them upon the roof or top of the walls: their ticklish situation gives pain, as they have the appearance of being in danger of tumbling down; besides we are inclined to feel from their being too much exposed to the inclemencies of the weather. To adorn the top of the wall with a row of vases, is an unhappy conceit, by placing a thing whose natural destination is utility, where it cannot have even the appearance of use. As to carvings upon the external surface of a building, termed *basso relievo* when flat, and *alto relievo* when prominent, all contradictory expressions ought to be avoided. Now, firmness and solidity being the proper expressions of a pedestal, and, on the contrary, lightness and delicacy of carved work, the pedestal, whether of a column or of a statue, ought to be sparingly ornamented. The ancients never ventured any bolder ornament than the basso relievo. Principles.

With respect to ornaments of the *second* kind, it is a great blunder to contrive them so as to make them appear useless. A blind window, therefore, when necessary for regularity, ought to be so disguised as to appear a real window: when it appears without disguise, it is disgustful, as a vain attempt to supply the want of invention; it shows the irregularity in a stronger light, by signifying that a window ought to be there in point of regularity, but that the architect had not skill sufficient to connect external regularity with internal convenience.

As to the *third*, it is an error to sink pilasters so far into the wall, as to remove totally, or mostly, the appearance of use. They should always project so much from the wall, as to have the appearance of supporting the entablature over them.

From ornaments in general, we descend to a pillar, the chief ornament in great buildings. The destination of a pillar is to support, really, or in appearance, another part, termed the *entablature*. With regard to the form of a pillar, it must be observed, that a circle is a more agreeable figure than a square, a globe than a cube, and a cylinder than a parallelopipedon. This last, in the language of architecture, is saying, that a column is a more agreeable figure than a pilaster; and for that reason it ought to be preferred, when all other circumstances are equal. Another reason concurs, that a column annexed to a wall, which is a plain surface, makes a greater variety than a pilaster. Besides, pilasters at a distance are apt to be mistaken for pillars; and the spectator is disappointed, when, on a nearer approach, he discovers them to be only pilasters. 33 Columns.

As to the parts of a column, a bare uniform cylinder, without a capital, appears naked; and without a base, appears too ticklishly placed to stand firm; it ought therefore to have some finishing at the top and bottom: Hence the three chief parts of a column, the shaft, the base, and the capital. Nature undoubtedly requires proportion among these parts, but it admits of variety of proportion. Vitruvius and some of the elder writers seem to think, that the proportions of columns were derived from the human figure, the capital representing the head, the base the feet, and the shaft the body. The Tuscan has been accordingly denominated the *Gigantic;* the Doric, the *Herculean;* the Ionic, the *Matronal;* and the Corinthian, the *Virginal:*—The Composite is a mixture of the Corinthian and Ionic. As to the base, the principle of utility interposes to vary it from the human figure, and to proportion it so to the whole, as to give the column the appearance of stability.

34 Whether new orders can be invented.

Among the Greeks, we find only three orders of columns, the Doric, the Ionic, and the Corinthian, distinguished

Principles. stinguished from each other by their destination as well as by their ornaments. It has been disputed, whether any new order can be added to these: some hold the affirmative, and give for instances the Tuscan and Composite: others maintain, that these properly are not distinct orders, but only the original orders with some slight variation. The only circumstances that can serve to distinguish one order from another, are the form of the column, and its destination. To make the first a distinguishing mark, without regard to the other, would multiply orders without end. Destination is more limited; and it leads us to distinguish three kinds of orders; one plain and strong for the purpose of supporting plain and massy buildings; one delicate and graceful, for supporting buildings of that character; and between these, a third, for supporting buildings of a mixed nature. So that, if destination alone is to be regarded, the Tuscan is of the same order with the Doric, and the Composite with the Corinthian.

The ornaments of these three orders ought to be suited to the purposes for which they are intended. Plain and rustic ornaments would not be a little discordant with the elegance of the Corinthian order, and sweet and delicate ornaments not less with the strength of the Doric.

35 Rules regarding buildings in general. With respect to buildings of every kind, one rule, dictated by utility, is, that they be firm and stable. Another, dictated by beauty, is, that they also appear so to the eye: for every thing that appears tottering, and in hazard of tumbling down, produceth in the spectator the painful emotion of fear, instead of the pleasing emotion of beauty; and accordingly it should be the great care of the artist, that every part of his edifice appear to be well supported. Some have introduced a kind of conceit in architecture, by giving parts of buildings the appearance of falling; of this kind is the church of St Sophia in Constantinople: the round towers in the uppermost stories of Gothic buildings are in the same false taste.

The most considerable ornaments used in architecture are five orders of columns, pediments, arches, ballusters, &c. of which in the following chapters.

Chap. I. *Of the Orders of Architecture.*

An order consists of two principal members, the Column and the Entablature; each of which is composed of three principal parts. Those of the columns are, the *Base*, the *Shaft*, and the *Capital;* and those of the entablature are, the *Architrave*, the *Frize*, and the *Cornice*. All these are subdivided into many lesser parts, whose number, form, and dimensions, characterize each order, and express the degree of strength, delicacy, richness, or simplicity peculiar to it.

36 Parts of an order divided into two classes. The parts that compose an order may be distributed into two different classes. In the *first* may be ranged all that have any analogy to the primitive huts, and represent some part that was necessary in their construction. Such are the shaft of the column, with the plinth of its base, and the abacus of its capital; likewise the architrave and triglyphs, the mutules, modilions, or dentiles, which all of them represent the rafters, or some other pieces of timber used to support the covering; and the corona, representing the beds of materials that composed the covering. All these may properly be distinguished by the name of *essential members*. The subservient parts, contrived for the use or ornaments of the former, and commonly called *mouldings*, may constitute the *second* class. Princip

There are eight regular mouldings in ornamenting columns: the fillet, listel, or square; the astragal, or bead; the torus, or tore; the scotia, mouth, or casement; the echinus, ovolo, or quarter-round; the inverted cyma, talon, or ogee; the cyma, cyma recta, or cymation; the cavetto, or hollow. The names of these allude to their forms, and their forms are adapted to the purposes for which they are intended. See Plate XLII.

The ovolo and talon, as they are strong at the extremities, are fit for supports; the cyma and cavetto, though improper for supports, serve for coverings to shelter other members; the torus and astragal, being shaped like ropes, are intended to bind and fortify the parts with which they are connected: But the use of the scotia and fillet is only to separate and distingnish the other mouldings, to give a graceful turn to the profile, and to prevent the confusion which would arise from joining several curved members together.

There are various methods of describing the contours of mouldings; but the simplest and best is to form them of quadrants of circles.

37 Profile, what. An assemblage of what are called essential parts and mouldings is termed a *profile*. The most perfect profiles are such as are composed of few mouldings, varied in form and size; and so disposed, that the straight and curved ones succeed each other alternately. When ornaments are employed in mouldings, some of them should be left plain, in order to give a proper repose: For when all are ornamented, the figure of the profile is lost.

38 Diminution of columns. Columns, in imitation of trees, from which they drew their origin, are tapered in their shafts. In the antiques the diminution is variously performed: beginning sometimes from the foot of the shaft, and at others from one quarter, or one-third of its height; the lower part being perfectly cylindrical. The former of these was most in use among the ancients, and being the most natural and graceful, ought to have the preference, though the latter hath been more universally practised by modern artists.

The first architects, says M. Auzoult, probably made their columns in straight lines, in imitation of trees; so that their shaft was a frustum of a cone; but finding this form abrupt and disagreeable, they made use of some curve, which, springing from the extremities of the superior and inferior diameters of the column, swelled beyond the sides of the cone, and by that means gave a more pleasing figure to the contour.

Vitruvius, in the second chapter of his third book, mentions this practice, but in so obscure and cursory a manner, that his meaning hath not been understood; and several of the modern architects, intending to conform themselves to his doctrine, have made the diameters of their columns greater in the middle than at the foot of the shaft. Leon Baptista, Alberti, and others of the Florentine and Roman architects, have carried

inciples. carried this to a very great excess; for which they have been justly blamed, as it is neither natural, reasonable, nor beautiful.

Monsieur Auzoult observes, that a column, supposing its shaft to be the frustum of a cone, may have an additional thickness in the middle, without being swelled there beyond the bulk of its inferior parts; and supposes the addition mentioned by Vitruvius to signify nothing but the increase towards the middle of the column, occasioned by changing the straight line, which at first was in use, for a curve.

The supposition is extremely just, and founded on what is observed in the works of antiquity; where there is no instance of columns thicker in the middle than at the bottom, though all have the swelling hinted at by Vitruvius, all of them being terminated by curves; some granite columns excepted, which are bounded by straight lines; a proof, perhaps, of their antiquity, or of their having been wrought in the quarries of Egypt, by bungling and unskilful workmen.

Monsieur Blondel, in his book entitled *Resolution des quatre principaux problemes d'Architecture*, teaches various manners of diminishing columns; the best and simplest of which is by means of the instrument which Nicomedes invented to describe the first conchoid: for this, being applied at the bottom of the shaft, performs at one sweep both the swelling and the diminution; giving such a graceful form to the column, that it is universally allowed to be the most perfect practice hitherto discovered. The columns in the Pantheon, accounted the most beautiful among the antiques, are made in this manner; as appears by the exact measures of one of them, to be found in Desgodet's Antiquities of Rome.

39 gnola's thod. To give an accurate idea of the operation, it will be necessary first to describe Vignola's method of diminution, on which it is grounded. "As to this second method, says Vignola, it is a discovery of my own, and although it be less known than the former, it will be easily comprehended by the figure. Having therefore determined the measures of your column, (that is to say, the height of the shaft, and its inferior and superior diameters), draw a line indefinitely from C through D, perpendicular to the axis of the column: this done, set off the distance CD, which is the inferior semidiameter, from A, the extreme point of the superior semidiameter, to B, a point in the axis; then from A, through B, draw the line ABE, which will cut the indefinite line CD in E; and, from this point of intersection E, draw through the axis of the column any number of rays, as E b a, on each of which, from the axis towards the circumference, setting off the interval CD, you may find any number of points, a, a, a, a, through which if a curve be drawn, it will describe the swelling and diminution of the column."

Plate XXVII.

40 come- s's in- rument. Though this method be sufficiently accurate for practice, especially if a considerable number of points be found, yet, strictly speaking, it is defective; as the curve must either be drawn by hand, or by applying a flexible ruler to all the points; both of which are liable to variations. Blondel, therefore, to obviate this objection, (after having proved the curve passing from A to C through the points a, a, to be of the same nature with the first conchoid of the ancients), employed the instrument of Nicomedes to describe it; the construction of which is as follows:

Principles.

Having determined, as above, the length of the shaft, with the inferior and superior diameters of the column, and having likewise found the length of the line CDE, take three rulers, either of wood or metal, as FG, ID, and AH; of which let FG and ID be fastened together at right angles in G. Cut a dovetail groove in the middle of FG, from top to bottom; and at the point E on the ruler ID (whose distance, from the middle of the groove in FG, is the same as that of the point of intersection from the axis of the column) fix a pin: then on the ruler AH set off the distance AB, equal to CD the inferior semidiameter of the column, and at the point fix a button, whose head must exactly be fitted to the groove made in FG, in which it is to slide; and, at the other extremity of the ruler AH, cut a slit or canal from H to K, whose length must not be less than the difference of length between EB and ED, and whose breadth must be sufficient to admit the pin fixed at E, which must pass through the slit, that the ruler may slide thereon.

The instrument being thus completed, if the middle of the groove, in the ruler FG, be placed exactly over the axis of the column, it is evident that the ruler AH, in moving along the groove, will with the extremity A describe the curve A a a C; which curve is the same as that produced by Vignola's method of diminution, supposing it done with the utmost accuracy; for the interval AB, a b, is always the same; and the point E is the origin of an infinity of lines, of which the parts BA, b a, b a, extending from the axis to the circumference, are equal to each other and to DC. And if the rulers be of an indefinite size, and the pins at E and B be made to move along their respective rulers so that the intervals AB and DE may be augmented or diminished at pleasure, it is likewise evident that the same instrument may be thus applied to columns of any size.

41 Quantity of diminution. In the remains of antiquity the quantity of the diminution is various; but seldom less than one-eighth of the inferior diameter of the column, nor more than one-sixth of it. The last of these is by Vitruvius esteemed the most perfect.

Of the Tuscan Order.

42 Plate XXXIX. This is the most solid and simple of all the orders. It is composed of few parts, devoid of ornaments, and so massy, that it seems capable of supporting the heaviest burden. There are no remains of a regular Tuscan order among the antiques: the doctrine of Vitruvius concerning it is obscure; and the profiles of Palladio, Scamozzi, Serlio, de l'Orme and Vignola, are all imperfect.

The height of the Tuscan order is 14 modules, or semidiameters, each consisting of 30 minutes; and that of the whole entablature $3\frac{1}{2}$ modules; which being divided into ten equal parts, three of them are for the height of the architrave, three for the frize, and the remaining four for the cornice. The capital is one module; the base, including the lower cincture of the shaft is likewise one module; and the shaft, with its upper cincture and astragal, 12 modules.

These are the general dimensions of the order; the

Principles. particular dimensions may be learned by inspection of the plates.

In the remains of antiquity, the quantity of diminution at the top of the Tuscan column is various; but seldom less than one-eighth, nor more than one-sixth, of the inferior diameter of the column. The last of these is generally preferred; and Chalmers and others make the same diminution in all columns, without regard to their order.

Of the Doric Order.

43
Plate XL. This order is next in strength to the Tuscan; and being of a grave, robust, and masculine aspect, is, by Scamozzi, called the *Herculean*. As it is the most ancient of all the orders, it retains more of the structure of the primitive huts than any of the rest; the triglyphs in its frize representing the ends of the joists, and the mutules in its cornice representing the rafters.

The height of the Doric column, including its capital and base is 16 modules, and the height of the entablature 4; the latter of which being divided into eight parts, two of them are for the architrave, three for the frize, and three for the cornice.

In most of the antiques, the Doric column is executed without a base. Vitruvius likewise makes it without one; the base, according to him, having been first employed in the Ionic order, in imitation of the sandal of a woman's foot. Scamozzi blames this practice, and most of the modern architects are of his opinion.

44
Ornaments of the frize. In the profile of the theatre of Marcellus, the frize is enriched with husks and roses; the architrave consits only of one fascia and a fillet; the drops are conical; the metope is enriched with a bull's skull, adorned with a garland of beads, in imitation of those on the temple of Jupiter Tonans, at the foot of the Capitol. In some antique fragments, and in a great many modern buildings, the metopes are alternately adorned with ox skulls and pateras. But they may be filled with any other ornaments, according to the destination of the building.

The Ionic Order

45
Plate XLI. Is of a more slender make than the Doric or Tuscan; its appearance is simple, yet graceful and majestic; its ornaments are few; so that it has been compared to a sedate matron, in decent, rather than magnificent attire.

Among the ancients, the form of the Ionic profile appears to have been more positively determined than that of any other order: for in all the antiques at Rome (the temple of Concord excepted), it is exactly the same.

The modern artists have likewise been unanimous in their opinions; all of them, excepting Palladio and his imitators, having employed the dentil, cornice, and the other parts of the profile, nearly as they are found in the Coliseum, the temple of Fortune, and the theatre of Marcellus.

The height of the Ionic column is 18 modules, and that of the entablature $4\frac{1}{2}$, or one quarter of the height of the column, as in the other orders, which is a trifle less than in any of the antique Ionics. In all the antiques, the base is Attic; and the shaft of the column may either be plain, or fluted with 24 flutings, or 20 only, as in the temple of Fortune. The plan of the flutings may be a trifle more than a semicircle, as in the forum of Nerva, because they then appear more distinct. The fillets, or intervals between them, must not be broader than one-third of the breadth of a fluting, nor narrower than one-fourth. The ornaments of the capital must correspond with the flutings of the shaft; and there must be an ove above the middle of each fluting. The volutes ought to be traced according to Mr Goldman's method, which is as follows: Principle

46
Method of drawing volutes. Plate XLII. fig. 9. Draw the cathetus, FC, whose length must be 15 minutes, or one-fourth of a module: and from the point C, describe the eye of the volute AEBD, of which the diameter is to be $6\frac{2}{3}$ minutes; divide it into four equal sectors by the diameters AB, DE. Bisect the radii CA, CB, in 1 and 4; and on the line, 1, 4, construct a square, 1, 2, 3, 4. From the centre C, to the angles 2, 3, draw the diagonals C 2, C 3, and divide the side of the square 1, 4, into six equal parts, at 5, 9, C, 12, 8. Then through the points, 5, 9, 12, 8, draw the lines 5, 6, 9, 10, 12, 11, 8, 7, parallel to the diameter ED, which will cut the diagonals in 6, 7, 10, 11; and the points 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, will be the centres of the volute. From the first centre 1, with the distance 1 F, describe the quadrant FG; from the second centre 2, with the distance 2 G, describe the quadrant GH; and continuing the same operation from all the 12 centres, the contour of the volute will be completed.

Fig. 10. The centres for describing the fillet are found in this manner. Construct a triangle, of which the side AF is equal to the part of the cathetus contained between AF, and the side FV equal to C 1; place the distance FS from F towards A, equal to FS the breadth of the fillet, and through the point S draw the line ST, which will be to C 1 in the same proportion as AS is to AF; place this line on the diameter of the eye AB: divide it into three equal parts; and through the points of division, draw lines parallel to the diameter ED, which will cut the diagonals C 2, C 3, and you will have twelve new centres, from whence the interior contour of the fillet may be described in the same manner as the exterior one was from the first centres.

Of the Corinthian Order.

47
Plate XLIII. The proportions of this order are extremely delicate. It is divided into a great variety of members, and enriched with a profusion of ornaments. Scamozzi calls it the *virginal order*; and indeed it has all the delicacy in its make, and all the delicacy in its dress, peculiar to young girls.

The most perfect model of the Corinthian order is generally allowed to be in the three columns in the Campo Vaccino at Rome, the remains, as it is thought, of the temple of Jupiter Stator.

The Corinthian column should be 20 modules high, and the entablature 5; which proportions are a medium between those of the Pantheon and the three columns. The base of the column may be either Attic or Corinthian: They are both beautiful. If the entablature be enriched, the shaft may be fluted. The flutings may be filled, to one-third of their height, with cabblings, as the inside of the Pantheon; which will strengthen

inciples. strengthen the lower part of the column, and make it less liable to injury.

In most of the antiques at Rome, the capital of this order is enriched with olive leaves; the acanthus being seldom employed but in the Composite. De Cordemoy, however, prefers the acanthus.

The divisions of the entablature bear the same proportions to each other, as the Tuscan, Ionic, and Composite orders.

The Composite

48 Plate XLIV. Is, strictly speaking, only a species of the Corinthian; and therefore retains, in a great measure, the same character.

49 ferent ds of or- nents. It does not appear that the ancients affected any particular form of entablature to this order. Sometimes the cornice is entirely plain, as in the temple of Bacchus; at others, as in the arch of Septimius Severus, it is enriched with dentiles differing very little from the Ionic; and in the arch of Titus, there are both dentils and modilions; the whole form of the profile being the same with the Corinthian, as executed in the antiques at Rome.

The modern architects have varied more in this than in any other order, each following the bent of his own fancy.

The height of the Composite column, and parts of the entablature, is the same with that of the Corinthian. The foot of the leaves of the capital ought not to project beyond the upper part of the shaft. The different bunches of leaves should be strongly marked; the sprigs which arise between the upper ones should be kept flat upon the vase; and the ornaments of the volutes must not project beyond the fillets that enclose them.

Chap. II. *Of Pilasters.*

50 These differ from columns only in their plan; which is a square, as that of columns is round. Their bases, capitals and entablatures, have the same parts, with the same heights and projections, as those of columns: they are also distinguished in the same manner, by the names of Tuscan, Doric, Ionic, Corinthian, and Composite.

The column is undoubtedly more perfect than the pilaster. However, they may be employed with great propriety on many occasions. Some authors declaim against pilasters, because, according to them, they do not admit of diminution. But this is a mistake; there are many instances in the remains of antiquity, of their being diminished. Scamozzi always gave his pilasters the same diminution as his columns: Palladio and Inigo Jones have likewise diminished them in many of their buildings.

51 asters re use. Pilasters are employed in churches, galleries, halls, and other interior decorations, to save room; for, as they seldom project beyond the solid wall above one quarter of their diameter, they do not occupy near so much space as columns. They are likewise used in exterior decorations; sometimes alone, instead of columns, on account of their being less expensive; and sometimes they accompany columns, being placed behind them to support the architraves where they enter the building, as in the Pantheon at Rome; or, in the same line with them, to fortify the angles, as in the portico of Septimius. Principles.

When pilasters are used alone, they should project one quarter of their diameter beyond the walls. When placed behind columns, especially if they be very near them, they need not project above one-eighth of their diameter. But, when placed on a line with columns, their projection must be regulated by that of the columns; and consequently, it can never be less than a semidiameter, even when the columns are engaged as much as possible.

The shafts of pilasters are frequently adorned with flutings, in the same manner as those of columns; the plan of which may be a trifle more than a semicircle; their number must be seven on each face, which makes them nearly of the same size with those of columns. The intervals, or fillets, must either be one-third or one-fourth of the fluting in breadth. 52 How ornamented.

The capitals of pilasters are profiled nearly in the same manner as those of columns. Plate XLV.

Chap. III. *Of Attics.*

53 These very properly follow the pilasters; being nothing more than square pillars with their cornices. They had their origin in Athens, where it was for many ages a rule in building to conceal the roof. For this purpose, nothing served so well as a kind of low or little order ranged in a continued line, singly, or with the interruption of ballusters; which, rising above the rest of the work and before the roof, hid it perfectly, and placed something agreeable in view. The place of attics, therefore, is at the uppermost extremity of a building, to which they serve as a crown, or very properly make a finishing for the other orders when they have been used in the structure. They must never stand under any thing except such ornaments as are placed at the very top. These attics should never exceed in height one-third of the height of the order on which they are placed, nor be less than one quarter of it. The base, dye, and cornice, of which they are composed, may bear the same proportions to each other as those of pedestals do; and the base and cornice may be composed of the same mouldings as those of pedestals. Sometimes the attic is continued throughout; at others, it projects, and forms a pilaster over each column of the order. The breadth of this pilaster is seldom made narrower than the upper diameter of the column below it, and never broader. Its projection may be equal to one quarter of its breadth.

Chap. IV. *Of Persians, Caryatides, and Termini.*

54 Besides columns and pilasters, it is sometimes customary to employ representations of the human figure, to support entablatures in buildings. The male figures are called *Persians;* and the female, *Carians* or *Caryatides.*

55 Origin of Persians. The *Persians* are so called from a victory gained over the Persians by Pausanias, who having brought home spoils and trophies to the Athenians, they fixed upon Persian figures for those which should support entablatures, and thus kept in mind that there were once Persian slaves in Athens. To represent these conquered

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quered people in the lowest state possible, they loaded them with the heaviest entablature, viz. that of the Doric order. In process of time, however, other figures besides those of Persians were introduced, and other entablatures put over them; but the name was still retained.

56 Of Caryatides.

The proper Caryatides are women dressed in long robes, after the Asiatic manner; and the origin of the device was as follows:—The Carians had been long at war with the Athenians; but being at length totally vanquished, their wives were led away captives; and, to perpetuate the memory of this event, trophies were erected, in which figures of women dressed in the Caryatic manner, were used to support entablatures like the Persians; and though other female figures were afterwards used in the same manner, the name of *Caryatides* was always retained.

57 Their proportions, &c.

The ancients made frequent use of Persians and Caryatides, and delighted in diversifying them a thousand ways. The modern artists have followed their examples; and there is a great variety of compositions of this kind to be met with in different parts of Enrope.

Indecent attitudes, distorted features, and all monstrous productions, ought to be avoided, of which there are many examples in Gothic buildings. On the contrary, the attitudes should be simple and graceful, the countenance always pleasing, though varied and strongly marked agreeable to the nature of the object represented.

The Caryatides, or female figures, should never much exceed the human size. But the Persians, or male figures, may be of any size; and the larger the better, as they will strike the beholder with the greater awe and astonishment. Persians may be used with propriety in arsenals, galleries of armeur, &c. under the figures of captives, heroic virtues, &c. Their entablature ought to be Doric, and bear the same proportion to them as to columns of the same height. The entablature for Caryatides ought to be either Ionic or Corinthian, according as the character of the figures is more or less delicate.

58 Termini.

Termini are sometimes employed, instead of Persians or Caryatides, to support the entablatures of monuments, chimney-pieces, and such like compositions. These figures owe their origin to the stones used by the ancients to mark the limits of particular possessions. Numa Pompilius, to render these inviolable, consecrated the terminus into a deity, and instituted festivals and sacrifices to his honour. In a short time, what were formerly only large upright stones, were represented in human shape; and afterwards introduced as ornaments to temples and other buildings. The termini are now principally used as ornaments for gardens and fields.

Chap. V. *Of Pedestals.*

59

Most writers consider the *pedestal* as a necessary part of the order, without which it is not complete. It is indeed a matter of little importance whether it be considered in that light, or as a distinct composition: we shall therefore treat of a pedestal as a distinct body, having no more connexion with the order than an attic, a basement, or any other part with which it may on some occasions be associated.

Princip

A pedestal consists of three principal parts: the base, the dye, and the cornice. The dye is always nearly of the same figure; being constantly either a cube or a parallelopipedon: but the base and cornice are varied and adorned with more or fewer mouldings, according to the simplicity or richness of the composition in which the pedestal is employed. Hence pedestals are, like columns, distinguished by the names of *Tuscan*, *Doric*, *Ionic*, *Corinthian*, and *Composite*.

60 Pedestal where pr per.

Some authors are averse to pedestals, and compare a column raised on a pedestal to a man mounted on stilts; imagining that they were introduced merely from necessity, and for want of columns of a sufficient length. It is indeed true, that the ancients often made use of artifices to lengthen their columns; as appears by some that are in the Baptistery of Constantine at Rome; the shafts of which, being too short for the building, were lengthened and joined to their bases by an undulated sweep, adorned with acanthus leaves. Nevertheless, there are many occasions where pedestals are evidently necessary; and some in which the order, were it not so raised, would lose much of its beautiful appearance. Thus, in the insides of churches, if the columns that support the vault were placed immediately on the ground, the seats would hide their bases and a good part of their shafts; and in the theatres of the ancients, if the columns of the scene had been placed immediately on the stage, the actors would have hid a part of them from the audience. In anterior decorations, a pedestal diminishes the parts of the order, which otherwise might perhaps appear too clumsy, and hath the advantage of placing the column in a more favourable view, by raising its base nearer the level of the spectator's eye. In a second order of arcades, there is no avoiding pedestals: as without them it is impossible to give the arches any tolerable proportion.

61 Their pr portions.

With regard to the proportion that pedestals ought to bear to that of the columns they support, it is by no means fixed. Both the ancients and moderns vary greatly on this head. Vignola's proportions are generally reckoned the best. He makes his pedestals in all the orders of the same height, viz. one-third of the column; and as their breadth of course increases or diminishes in the same degree as the diameters of their respective columns do, the character of the order is always preserved, which, according to any other method, is impossible.

As to the divisions of the pedestals; if the whole height be divided into nine parts, one of them may be given to the height of the cornice, two to the base, and the six remaining to the dye. The breadth of the dye is always made equal to that of the plinth of the column. The projection of the cornice may be made equal to its height; and the base being divided into three parts, two of them will be for the height of the plinth, and one for the mouldings, whose projection must be less than that of the cornice. These measures are common to all pedestals. See Plate XLV.

Chap. VI. *Of Intercolumniations.*

Columns are either engaged, or insulated; and, when insulated, are either very near the wall, or at a considerable distance from it. Engaged columns, or such as are near the walls of a building, are not limited

62

in

nciples. in their intercolumniations, as these depend on the breadths of the arches, windows, niches, or other decorations placed between the columns. But columns that are entirely detached, and perform alone the office of supporting the entablature, as in peristyles, porches and galleries, must be near each other, for the sake both of real and apparent solidity.

63 erent rco- nia- s used he an- ts.

The intercolumniations among the ancients were various. Those used in the Ionic and Corinthian orders were the pycnostyle, of which the interval was equal to one diameter and a half of the column; the systyle, whose interval was equal to two diameters: the eustyle, to two and a quarter; the diastyle to three, and the aræostyle to four. In the Doric order, they used other intercolumniations, regulating them by the triglyphs, one of which was always placed directly over the middle of each column; so that they were either systyle, monotriglyph, of one diameter and a half; diastyle, of two diameters and three quarters; or aræostyle, of four diameters; and the Tuscan intervals were very wide, some of them being above seven diameters, which was very practicable, as the architraves were of wood.

Among these different intercolumniations, the pycnostyle and systyle are too narrow; for although the ancients made frequent use of them, that ought rather to be ascribed to necessity than choice. For as the architraves were composed of single stones, extending from the middle of one column to the middle of another, it would have been difficult, especially in large buildings, to find blocks of a sufficient length for diastyle intervals. With regard to the aræostyle and Tuscan intercolumniations, they are by much too wide, and can only be used in rustic buildings, where the architraves are of wood; neither is the diastyle sufficiently solid in large compositions. The eustyle is a medium between the narrow and broad intervals; and being at the same time both spacious and solid, hath been preferred to any of the rest by the ancients as well as the moderns.

64 d by nola.

Vignola observed nearly the same proportion in all his intercolumniations: which practice, though condemned by several writers, is certainly preferable to any other; as it preserves the character of each order, and maintains in all of them an equal degree of real solidity. Setting aside therefore the pycnostyle and systyle dispositions on account of their want of space, and the aræostyle for its deficiency in point of strength, it may be established, that the diastyle and eustyle intercolumniations (the latter of which, on most occasions, ought to have the preference) may be employed in all the orders without distinction, excepting the Doric; in which the most perfect interval is ditriglyph; neither the monotriglyph, nor the aræostyle being to be suffered but in cases of necessity.

Sometimes, on account of the windows, doors, niches, and other decorations, which correspond with the intercolumniations of the peristyle, or gallery, it is not possible to make the interval so narrow as eustyle, or even as diastyle: wherefore the moderns, authorised by some few examples of the ancients, where grouped columns are employed, have invented a manner of disposing them, called by Perrault *aræostyle*, which admits of a larger interval, without any detriment to the apparent solidity of the building. This kind of composition is composed of two systyle intercolumniations; the column that separates them being approached towards one of those at the extremities, sufficient room only being left between them for the projection of the capitals; so that the great space is three diameters and a half wide, and the little one half a diameter. Principles.

In peristyles, galleries, or porticoes, all the intercolumniations must be equal; but in a logio, or porch, the middle interval may be broader than the others, by a triglyph or modilion, or three or four dentils; unless the columns at the angles be coupled or grouped with pilasters: in which case, all the intervals should be of the same dimensions.

When buildings are very small, as is frequently the case in temples and other inventions used for ornamenting gardens, the intercolumniations may be broader, in proportion to the diameter of the columns, than usual; because, when they are nearer each other than three feet, there is hardly room for a bulky person to pass between them.

Chap. VII. *Of Arches.*

65 Arches, where proper.

Arches are not so magnificent as colonnades; but they are more solid and less expensive. They are proper for triumphal entrances, gates of cities, of palaces, of gardens, and of parks, and, in general, for all openings that require an extraordinary breadth.

66 How adorned.

There are various manners of adorning arches. Sometimes their piers are rusticated; sometimes they are adorned with pilasters, termini, or caryatides; and sometimes they are made sufficiently broad to admit niches or windows. The circular part of the arch is either surrounded with rustic key-stones, or with an archivolt enriched with mouldings; which, in the middle, is sometimes interrupted by a console, a mask, serving at the same time as a key to the arch, and as a support to the architrave of the order. The archivolt is sometimes supported by an impost, at the head of the pier; and at others by columns placed on each side of it, with a regular entablature, or architrave and cornice. There are likewise instances of arcades without piers, the arches being turned on single columns, as in the temple of Faunus at Rome, &c. This practice, however, ought to be seldom imitated, as it is neither solid nor handsome.

When arches are large, the key-stone should never be omitted, but cut in the form of a console, and carried close under the soffit of the architrave, which on account of its extraordinary length, requires a support in the middle. The imposts of arches should never be omitted: at least, if they be, a platform ought to supply their place. If columns are employed without pedestals in arcades, they should always be raised on a plinth. In all arches, the circular part ought not to spring immediately from the impost, but take its rise at such a distance above it as is necessary in order to have the whole curve seen at the proper point of view.

67 Proportions.

The void or aperture of arches should never be higher nor much lower, than double their breadth; the breadth of the pier should seldom exceed two-thirds, nor be less than one-third, of the breadth of the arch; and the angular pier ought to be broader than

Principles. than the others, by one-half, one-third, or one-fourth; the impost should not be more than one-seventh, nor less than one-ninth of the aperture; and the archivolt must not be more than one-eighth, nor less than one-tenth of it. The breadth of the console must, at the bottom, be equal to that of the archivolt; and its sides must be drawn from the centre of the arch; the length of it must not be less than one and a half of its smallest breadth, nor more than double. The thickness of the pier depends on the breadth of the portico; for it must be strong enough to resist the pressure of its vault. But with regard to the beauty of the building, it should not be less than one quarter of the breadth of the arch, nor more than one-third. These are the general dimensions of arches.

Chap. VIII. *Of Orders above Orders.*

68 When, in a building, two or more orders are employed, one above another, the laws of solidity require the strongest should be placed lowermost. Hence the Tuscan must support the Doric, the Doric the Ionic, the Ionic the Composite or Corinthian, and the Composite the Corinthian.

This rule, however, is not always strictly adhered to. Most authors place the Composite above the Corinthian. There are likewise examples where the same order is repeated, as in the theatre of Statilius Taurus, and the Coliseum; and others, where an intermediate order is omitted, and the Ionic placed on the Tuscan, or the Corinthian on the Doric. But none of these practices ought to be imitated.

In placing columns above one another, the axis of all the columns ought to correspond, or be in the same perpendicular line, at least in front.

69 Proportions of columns placed above each other. With regard to the proportions of columns placed above each other, Scamozzi's rule, That the lower diameter of the superior column should constantly be equal to the upper diameter of the inferior one, is universally esteemed the best, and gives all the columns the appearance of one long tapering tree, cut into several pieces. According to this rule, the Doric column will be to the Tuscan, as $13\frac{1}{3}$ to 14; the Ionic to the Doric, as 15 to 16; the Composite or Corinthian to the Ionic, as $16\frac{2}{3}$ to 18; and the Corinthian to the Composite, as $16\frac{2}{3}$ to 20.

In Britain there are few examples of more than two stories of columns in the same aspect; and though in Italy, and other parts of Europe, we frequently meet with three, and sometimes more; yet it is a practice by no means to be imitated; for there is no possibility of avoiding many striking inconsistencies, or of preserving the character of each order in its intercolumnal decorations.

Chap. IX. *Of Basements.*

70 Instead of employing several orders one above the other in a composition, the ground floor is sometimes made in the form of a *basement*, on which the order that decorates the principal story is placed. The proportion of these basements is not fixed, but depends on the nature of the rooms on the ground floor. In the palace of the Porti in Vicenza, the height of the basement is equal to that of the order. In some buildings, its height exceeds two-thirds of that of the order; and, in others, only half the height of the order. It is not, however, advisable to make the basement higher than the order it supports; neither should it be lower than one half of the order. Principl

71 Decorations, & of basements. The usual method of decorating basements is with rustics of different kinds. The best, where neatness and finishing is aimed at, are such as have a smooth surface. Their height, including the joint, should never be less, nor much more, than half a module of the order placed on the basement. Their figure may be from a square to a sesquialtera; and their joints may be either square or chamfered. The square ones should not be broader than one-eighth of the height of the rustic, nor narrower than one-tenth; and their depth must be equal to their breadth; those that are chamfered must form a rectangle; and the breadth of the whole joint may be from one-fourth to one-third of the height of the flat surface of the rustic.

Chap. X. *Of Pediments.*

72 Pediments, among the Romans, were used only as coverings to their sacred buildings, till Cæsar obtained leave to cover his house with a pointed roof, after the manner of temples. In the remains of antiquity we meet with two kinds of pediments, the triangular and the circular. The former of these are promiscuously applied to cover small or large bodies: But the latter, being of a heavier figure, are never used but as coverings to doors, niches, windows, or gates.

As a pediment represents the roof, it should never be employed but as a finishing to the whole composition.

The ancients introduced but few pediments into their buildings, usually contenting themselves with a single one to adorn the middle or principal part. But some of the moderns, and particularly the Italians, have been so immoderately fond of them, that their buildings frequently consist of almost nothing else.

The girder being a necessary part in the construction of a roof, it is an impropriety to intermit the horizontal entablature of a pediment, by which it is represented, to make room for a niche, an arch, or a window.

73 Forms, & of pediments. In regular architecture, no other form of pediments can be admitted, besides the triangular and circular. Both of them are beautiful; and when a considerable number of pediments are introduced, as when a range of windows are adorned with them, these two figures may be used alternately, as in the niches of the Pantheon, and in those of the temple of Diana at Nismes.

The proportion of pediments depends upon their size; for the same proportions will not do in all cases.

When the base of the pediment is short, its height must be increased; and when the pediment is long, the height must be diminished. The best proportion for the height is from one-fifth to one-fourth of the base, according to the extent of the pediment, and the character of the body it covers. The materials of the roof must also be attended to; for if it be covered with tiles,

nciples. tiles, it will be necessary to raise it more than one quarter of the base, as was the custom of the ancients in their Tuscan temples.

The tympan is always on a line with the front of the frize; and when large, admits of various ornaments.

Chap. XI. *Of Ballustrades.*

74 Ballustrades are sometimes of real use in buildings; and at other times they are only ornamental. Such as are intended for use, as when they are employed in staircases, before windows, or to enclose terraces, &c. must always be nearly of the same height; never exceeding three feet and a half, nor ever less than three. But those that are principally designed for ornament, as when they finish a building, should be proportioned to the architecture they accompany: and their height ought never to exceed four-fifths of the height of the entablature on which they are placed; nor should it ever be less than two-thirds thereof, without counting the zocholo, or plinth, the height of which must be sufficient to leave the whole ballustrade exposed to view.

75 portion, of balers. The best proportion for ballustrades is to divide the whole given height into thirteen equal parts; eight of these for the height of the balluster, three for the base, and two for the cornice or rail; or into fourteen, (if it be required to make the balluster less), giving eight parts to the balluster, four to the base, and two to the rail. One of these parts may be called a *module;* and being divided into nine minutes, may serve to determine the dimensions of the particular members.

In ballustrades, the distance between two ballusters should not exceed half the diameter of the balluster measured in its thickest part, nor be less than one-third of it.

The breadth of the pedestals, when they are placed on columns or pilasters, is regulated by them; the dye never being made broader than the top of the shaft, nor much narrower; and when there are neither columns nor pilasters on the front, the dye should not be much lower than a square, and seldom higher. On stairs, or any other inclined planes, the same proportions are to be observed as on horizontal ones.

Chap. XII. *Of Gates, Doors, and Piers.*

76 rs and es. There are two kinds of entrances, viz. doors and gates. The former serve only for the passage of persons on foot; but the latter likewise admit horsemen and carriages. Doors are used as entrances to churches and other public buildings, to common dwelling-houses and apartments: And gates serve for inlets to cities, fortresses, parks, gardens, palaces, &c. The apertures of gates being always wide, they are generally made in the form of an arch, that figure being the strongest. But doors, which are generally of small dimensions, are commonly parallelograms, and closed horizontally.

The general proportion for the apertures, both of gates and doors, whether arched or square, is, that the height be about double the breadth.

The most common, and indeed almost the only ornaments for gates are the piers by which they are supported, and which were originally no more than bare posts into which the hinges of the gate were driven. Though this, however, is the only proper use of piers, it must be concealed as much as possible, and they must seem as if placed there only for ornament. As they are to be fixed to the wall before the house, so they must also be proportioned to it; and as they are to be seen in the same view with the front of the house, their correspondence with it is equally necessary. They are to be placed on a plinth, and something must be allowed by way of ornament and finishing at the top, All the luxuriance of fancy may be employed in the decoration of piers: but it will be proper to observe this general rule, that the pier being an inferior building, it must never be richer than the front of the house. If, for instance, the front of the house is ornamented with columns of the Doric order, the Ionic must not be used in the piers; and it will be found better to omit columns altogether, than to make use of the Tuscan order for piers in any case. If the Ionic or Corinthian orders are employed in the front of the house, the Doric or Ionic may be used with propriety in the piers. One piece of ornament is almost universal in piers, namely, a niche with its seat, made as if for the conveniency of weary travellers. On this account, it will be proper to raise the columns on pedestals, because the continued moulding from their cap will be a good ornament under the niche. The base of the columns ought always to be the Attic. Principles. 77 Piers.

Inside doors, however small the building may be, should never be narrower than two feet nine inches; nor should they ever, in private houses, exceed three feet six inches in breadth, which is more than sufficient to admit the bulkiest person. Their height should at least be six feet three or four inches; otherwise a tall person cannot pass without stooping. In churches, palaces, &c. where there is a constant ingress and egress of people, the apertures must be larger. The smallest breadth that can be given to a gate is eight and a half or nine feet, which is but just sufficient for the passage of a coach.

Plate XLVI. fig. 1. is a rustic door, composed by the celebrated Vignola, in which the aperture occupies two-thirds of the whole height, and one-half of the whole breadth; the figure of it being a double square. The rustics may be either smoothed or hatched; their joints must form a rectangle, and the breadth of each joint may be one-third, or two-sevenths, of the vertical surface of a rustic. The joints of the claveaux, or keystones, must be drawn to the summit of an equilateral triangle, whose base is the top of the aperture. The architrave surrounding the aperture may be composed either of a large ogee and fillet, or of a platband and fillet. Its whole breadth must be one-tenth of the breadth of the aperture: the remaining part of each pier being for the rustics. The entablature is Tuscan: the cornice is to be one-fifteenth of the whole height of the door; and what remains below it being divided into 21 equal parts, the two uppermost of them will be for the frize and architrave, and the remaining 19 for the rustics and plinth at the foot of the door.

Fig. 2. is a disposition of Michael Angelo's. The windows of the Capitol at Rome are of this kind; and Sir Christopher Wren has executed doors of the same kind

Principles. kind under the semicircular porches in the flanks of St Paul's. The figure of the aperture may be a double square; the architrave one-sixth of the breadth of the aperture; and the whole entablature one quarter of its height. The front of the pilasters or columns, on each side, must be on a line with the fascia of the architrave; and their breadth must be a semidiameter.

Fig. 3. is likewise a design of Vignola's. It is of the Corinthian order, and executed in the Cancellaria at Rome. The height is equal to double its breadth; and the whole ornament at the top is equal to one-third of the height of the aperture. The architrave is in breadth one-fifth of the breadth of the aperture; and the pilasters, that support the consoles, are half as broad as the architrave. The whole is well imagined, but rather heavy; and it will be best to reduce the architrave to one-sixth of the aperture, diminishing the entablature proportionally.

Fig. 4. is a design of Serlio's. The aperture may be either twice as high as broad, or a trifle less. The diameter of the columns may be equal to one quarter of the breadth of the aperture; and their height may be from eight diameters to eight and a half. The entablature must be somewhat less than one quarter of the height of the columns; and the height of the pediment may be one quarter of its base.

Fig. 5. is a door in the saloon of the Farnese in Rome designed by Vignola. The aperture forms a double square. The entablature is equal to three-elevenths of its height, the architrave being one of these elevenths; and the whole ornaments on the sides, consisting of the architrave and pilasters, are equal to two-sevenths of the breadth of the aperture: the cornice is Composite, enriched with mutules and dentils; and the frize is adorned with a festoon of laurel.

Fig. 6, is copied from a door at Florence, said to be a design of Cigoli's. The height of the aperture is a trifle more than twice its breadth. It is arched; and the impost is equal to half a diameter. The columns are Ionic, somewhat above nine diameters high; and their shafts are garnished each with five rustic cinctures. The entablature is less than one quarter of the column; and the breadth of the tablet, in which there is an inscription, is equal to the breadth of the aperture.

Plate LVI. fig. 1. is a pier invented by Mr Chambers. Its diameter may be one quarter of its height, exclusive of the plinth and vase; and the height of both these may be equal to one diameter of the pier, or a trifle less. The rustics may either be plain, hatched, or vermiculated: the height of each course may be one-eleventh part of the height of the pier, counting to the top of the entablature; the entablature two-elevenths; and the base of the pier one-eleventh part.

Fig. 2. is likewise a composition of Mr Chambers, imitated from M. Angelo Buonaroti's design for Cardinal Sermonetti. The height of the aperture is somewhat more than twice its breadth; which breadth occupies one-third of the breadth of the whole composition. The order is Composite; and the height of the entablature is equal to one quarter of the height of the column. He has made a break in it over each column: but, unless the column project considerably, it will be as well to carry the entablature on in a straight line. The dimensions of the particular parts may be measured on the design. Princi

Fig. 3. is also a composition of Mr Chambers, executed at Goodwood, the seat of his grace the duke of Richmond, in Sussex. The diameter is one quarter of the height, exclusive of the finishing, which is equal to one diameter; and the height of the pier, from the top of the entablature downwards, being divided into eleven and a half parts, one of these parts is given to the base, one to each rustic, and one and a half to the astragal, frize, and cornice.

Fig. 4. is a composition of the late earl of Burlington's, that great architect and patron of the fine arts, which is executed at Chiswick, and at Bedford-house in Bloomsbury square, with some little difference.

Fig. 5. is an invention of Mr Chambers.

Fig. 6. is one of Inigo Jones's; of which kind he hath executed a couple at Aimsbury in Wiltshire, the seat of his grace the duke of Queensberry.

Chap. XIII. *Of Windows.*

78 Propor of wind

The first consideration with regard to windows is their size, which varies according to the climate, the destination of the building, &c. In Britain, the windows of the smallest private houses are commonly from 3 to $3\frac{1}{2}$ feet broad: and being generally twice their breadth in height, or somewhat more, in the principal apartments, they generally rise to within a foot or two of the ceilings of the rooms, which are frequently no higher than 10 feet, and at most 12 or 13. But, in more considerable houses, the apartments are from 15 to 20 feet high, and sometimes more; and in these the windows are from 4 to 5 and $5\frac{1}{2}$ feet broad, and high in proportion. These dimensions are sufficient for dwelling houses of any size in this country; when they are larger, they admit too much of the cold air in winter. But churches, and other buildings of that kind, may have larger windows, proportioned to the size of the structures.

The proportions of the apertures of windows depend upon their situation. Their breadth in all the stories must be the same; but the different heights of the apartments make it necessary to vary the height of the windows likewise. In the principal floor, it may be from $2\frac{1}{8}$ of the breadth to $2\frac{1}{3}$, according as the rooms have more or less elevation. In the ground story, where the apartments are lower, the apertures of the windows seldom exceed a double square, and, when they are in a rustic basement, they are frequently made much lower. The height of the windows of the second floor may be from $1\frac{7}{8}$ of their breadth to $1\frac{4}{5}$; and attics and mezzanines may be either a perfect square, or somewhat lower.

79 How o mented

The windows of the principal floor are generally most enriched. The simplest method of adorning them is, with an architrave surrounding the aperture and crowned with a frize and cornice. The windows of the ground floor are sometimes left entirely plain, without any ornament: and at others they are surrounded with rustics, or a regular architrave with a frize and cornice. Those of the second floor have generally an architrave carried entirely round the aperture;

nciples. ture; and the same is the method of adorning attic and mezzanine windows, but the two last have seldom either frize or cornice; whereas the second floor windows are often crowned with both.

The breasts of all the windows on the same floor should be on the same level, and raised above the floor from two feet nine inches to three feet six inches at the very most. When the walls are thick, the breasts should be reduced under the apertures, for the conveniency of looking out. In France, the windows are frequently carried quite down to the floor. When the building is surrounded with gardens, or other beautiful objects, this method renders the rooms exceeding pleasant.

The interval between the apertures of windows depends in a great measure on their enrichments. The breadth of the aperture is the least distance that can be between them; and twice that breadth should be the largest in dwelling houses; otherwise the rooms will not be sufficiently lighted. The windows in all the stories of the same aspect must be placed exactly above one another.

Plate XLVII. fig. 1. is a design of P. Lescot, abbot of Clagny, executed in the old Louvre at Paris. The apertures may be a double square, or a trifle more; the architrave from one-sixth to one-seventh of the breadth of the aperture: the pilaster is equal to that breadth, when the architrave is narrow; or less by one quarter, or one-fifth, when it is broad. The whole entablature should not exceed one quarter of the height of the aperture, nor be much lower. The consoles may be equal in length to half the breadth of the aperture at most, and to one-third of it at least.

Fig. 2. is a design of Palladio's executed at the Chiericato in Vicenza: its proportions are not much different from the following. The plat-band that supports the window is equal to the breadth of the architrave.

Fig. 3. is likewise a design of Palladio's, executed by him in many of his buildings. The aperture is a double square. The breadth of the architrave is one-sixth of the breadth of the aperture; and the frize and cornice together are double the height of the architrave. The breadth of the consoles is two-thirds of the breadth of the architrave.

Fig. 4. is a design of Ludovico da Cigoli; and executed in the ground floor of the Ranunchini palace at Florence.

Fig. 5. is a design of Inigo Jones, executed at the Banqueting House. The aperture may be a double square; the architrave may be one-sixth of its breadth; the whole entablature one quarter of its height; and the breadth of the consoles two-thirds of the breadth of the architrave.

Fig. 6. is a design of M. Angelo Buonaroti, executed at the Farnese.

Chap. XIV. *Of Niches and Statues.*

80 It has been customary, in all ages, to enrich different parts of buildings with representations of the human body. Thus the ancients adorned their temples, baths, theatres, &c. with statues of their deities, heroes, and legislators. The moderns still preserve the same custom, placing in their churches, palaces, &c. statues of illustrious persons, and even groups composed of various figures, representing occurrences collected from history, fables, &c. Sometimes these statues or groups are detached, raised on pedestals, and placed contiguous to the walls of a building, or in the middle of a room, court, or public square. But they are most frequently placed in cavities made in the walls, called *niches*. Of these there are two sorts; the one formed like an arch in its elevation, and semicircular or semi-elliptical in its plan; the other is a parallelogram both in its plan and elevation. Principles. 81 Different kinds of niches;

The proportion of both these niches depends on the characters of the statues, or the general form of the groups placed in them. The lowest are at least a double square in height; and the highest never exceed $2\frac{1}{2}$ of their breadth.

With regard to the manner of decorating them when they are alone in a composition, they are generally enclosed in a pannel, formed and proportioned like the aperture of a window, and adorned in the same manner. In this case the niche is carried quite down to the bottom; but on the sides and at the top, a small space is left between the niche and the architrave of the pannel. And when niches are intermixed with windows, they may be adorned in the same manner with the windows, provided the ornaments be of the same figure and dimensions with those of the windows. 82 how decorated.

The size of the statues depends on the dimensions of the niches. They should be neither so large as to have the appearance of being rammed into the niches, as in Santa Maria Majora at Rome; nor so narrow as to seem lost in them, as in the Pantheon. The distance between the outline of the statue and side of the niche should never be less than one-third of a head, nor more than one-half, whether the niche be square or arched: and when it is square, the distance from the top of the head to the ceiling of the niche should not be greater than the distance on the sides. Statues are generally raised on a plinth, the height of which may be from one-third to one-half of a head; and sometimes, where the niches are large, the statues may be raised on small pedestals. 83 Statues.

The character of the statue should always correspond with the character of the architecture with which it is surrounded. Thus, if the order be Doric, Hercules, Jupiter, Mars, Æsculapius, and all male statues, representing beings of a robust and grave nature, may be introduced; if Ionic, then Apollo, Bacchus, &c.; and if Corinthian, Venus, Flora, and others of a delicate nature, should be employed.

Chap. XV. *Of Chimney-pieces.*

Among the ancients there are very few examples of chimney-pieces to be met with. Neither the Italians nor French have excelled in compositions of this kind. Britain, by being possessed of many able sculptors at different times, has surpassed all other nations, both in taste of design, and workmanship. 84

The size of the chimney must be regulated by the dimensions of the room where it is placed. In the smallest apartments, the breadth of the aperture should never be less than three feet, or three feet six inches. 85 Proportions and situations.

Principles. In rooms, from 20 to 24 feet square, or of equal superficial dimensions, it may be from 4 to $4\frac{1}{2}$ feet broad; in those of 24 to 27, from $4\frac{1}{2}$ to 5; and in such as exceed these dimensions, the aperture may even be extended to $5\frac{1}{2}$ or 6 feet.

The chimney should always be situated so as to be immediately seen by those who enter the room. The middle of the partition wall is the most proper place in halls, saloons, and other rooms of passage; but in drawing-rooms, dressing-rooms, and the like, the middle of the back wall is the best situation. In bed-rooms, the chimney is always in the middle of one of the partition walls; and in closets and other very small places, to save room, it is put in a corner. Wherever two chimneys are used in the same room, they should be placed either directly facing each other, if in different walls, or at equal distances from the centre of the wall in which both are.

The proportion of the apertures of chimney-pieces of a moderate size is generally a perfect square; in small ones, it is a trifle higher; and in large ones, a trifle lower. Their ornaments consist in architraves, frizes, cornices, columns, pilasters, termini, caryatides, consoles, and all kinds of ornaments of sculpture, representing animals, vegetables, &c. likewise vases, chalices, trophies of arms, &c. In designing them, regard must be had to the nature of the place where they are to be employed. Such as are intended for halls, saloons, guard-rooms, galleries, and other large places, must be composed of large parts, few in number, of distinct and simple forms, and having a bold relief; but chimney-pieces for drawing-rooms, dressing-rooms, &c. may be of a more delicate and complicated nature.

Chimney-pieces are composed of wood, stone, or marble; the last of which ought to be preferred, as figures or profiles are best represented in a pure white.

Plate XLVIII. exhibits different designs for chimney-pieces by Palladio and Inigo Jones. Their proportion may be gathered from the designs, which are accurately executed.

Chap. XVI. *Of the Proportions of Rooms.*

86 The proportions of rooms depend in a great measure on their use and actual dimensions; but, with regard to beauty, all figures, from a square to a sesquilateral, may be employed for the plan.

The height of rooms depends on their figure. Flat-ceiled ones may be lower than those that are coved. If their plan be a square, their height should not exceed five-sixths of the side, nor be less than four-fifths; and when it is oblong, their height may be equal to their breadth. But coved rooms, if square, must be as high as broad; and when oblong, they may have their height equal to their breadth, more one-fifth, one quarter, or even one-third of the difference between the length and breadth: and galleries should at least be in height one and one-third of their breadth, and at most one and a half, or one and three-fifths.

87 High rooms improper in Britain. The coldness of the British climate is a strong objection to high rooms; so that it is not uncommon to see the most magnificent apartments not above 15, 16, or at most 18 feet high; though the extent of the rooms would require a much more considerable elevation. But where beauty is aimed at, this practice ought not to be imitated. Princip

When rooms are adorned with an entire order, the entablature should never exceed one-sixth of the whole height in flat-ceiled rooms, and one-sixth of the upright part in coved ones; and when there are neither columns nor pilasters, but only an entablature, its height should not be above one-seventh of these heights. If the rooms be finished with a simple cornice, it should never exceed one-fourteenth, nor ever be less than one-fifteenth part of the above-mentioned height.

Chap. XVII. *Of Ceilings.*

88 Ceilings are either flat, or coved in different manners. The simplest of the flat kind are those adorned with large compartments, surrounded with one or several mouldings, either let into the ceiling, or projecting beyond its surface; and when the mouldings that form the compartments are enriched, and some of the compartments adorned with well executed ornaments, such ceilings have a good effect, and are very proper for common dwelling-houses, and all low apartments. Their ornaments and mouldings do not require a bold relief; but, being near the eye, they must be finished with taste and neatness. For higher rooms, a flat ceiling, which has the appearance of being composed of various joists framed into each other, and forming compartments of various geometrical figures, should be employed. The sides of the joists forming the compartments are generally adorned with mouldings, and represent either a simple architrave, or an architrave cornice, according to the size of the compartments and the height of the room.

Coved ceilings are more expensive; but they are likewise more beautiful. They are used promiscuously in large and small rooms, and occupy from one-fifth to one-third of the height of the room. If the room be low in proportion to its breadth, the cove must likewise be low; and when it is high, the cove must be so likewise; by which means the excess of the height will be rendered less perceptible. But where the architect is at liberty to proportion the height of the room to its superficial dimensions, the most eligible proportion for the cove is one-fourth of the whole height. In parallelogram-figured rooms, the middle of the ceiling is generally formed into a large flat pannel. This pannel, with the border that surrounds it, may occupy from one half to three-fifths of the breadth of the room. The figure of the cove is commonly either a quadrant of a circle or of an ellipse, taking its rise a little above the cornice, and finishing at the border round the great pannel in the centre. The border projects somewhat beyond the coves on the outside; and, on the side towards the pannel, it is generally made of sufficient depth to admit the ornaments of an architrave, or architrave and cornice.

In Britain circular rooms are not much in use; but they are very beautiful. Their height must be the same with that of square rooms; their ceilings may be flat; but they are handsomer when coved, or of a concave form.

Arcs doublaux, or soffits of arches, when narrow,

are

inciples. are ornamented with *guillochs*, or frets; but when broad, they may be adorned in a different manner.

When the profiles of the room are gilt, the ceilings ought likewise to be gilt. The usual method is to gild all the ornaments, and to leave the grounds white, pearl colour, light blue, or of any other tint proper to set off the gilding to advantage. Painted ceilings, so common in France and Italy, are but little used in Britain.

Chap. XVII. *Of Stairs and Staircases.*

89 There are many kinds of staircases: for, in some, the steps are made straight; in others winding; in others, mixed of both. Of straight stairs, some fly directly forward, others are square, others triangular. Others are called *French flights;* or *winding stairs*, (which in general are called *spiral*, or *cockle stairs*); of which some are square, some circular or round, and some elliptical or oval; and these again are various, some winding about a solid, others about an open newel. Stairs mixed of straight and winding steps are also of various kinds; some are called *dog-legged;* some there are that wind about a solid newel, and others that fly about a square open newel.

90 Staircases where to be placed. Great care ought to be taken in placing of the staircase in any building; and therefore staircases ought to be described and accounted for justly when the plan of a building is made. For want of this, sometimes unpardonable errors have been committed: such as having a little blind staircase to a large house, or, on the other hand, a large spacious staircase to a little one.

Palladio says, in placing staircases, the utmost care ought to be taken; it being difficult to find a place convenient for them, that will not at the same time prejudice the rest of the building. But commonly the stairs are placed in the angle, wing, or middle of the front.

To every staircase are required three openings.

First, The door leading thereto.

Secondly, The window, or windows, that give light to it:

And, Thirdly, The landing.

First, The door leading to the staircase should be so placed, that most of the building may be seen before you come at the stairs, and in such a manner that it may be easy for any person to find out.

Secondly, For the windows; if there be but one, it must be placed in the middle of the staircase, that thereby the whole may be enlightened.

Thirdly, The landing of stairs should be large and spacious, for the convenient entering into rooms; in a word, staircases should be spacious, light, and easy in ascent. The height of large steps must never be less than six inches, nor more than seven inches and a half.

The breadth of steps should never be less than 10 inches, nor more than 18 inches; and the length of them not less than three feet, nor more than 12.

91 Plate XLIX. fig. 1. A staircase of two flights.—*A* shows the manner of drawing the *ramp*, which is to rise equal to the height of the first step of the next flight, and as much as its *kneeling;* as is shown by the *ramp* intersecting the rail of the second flight.

Fig. 2. shows the straight rail intersecting a circular cap. Principles.

Fig. 3. section of two different hand rails.

Fig. 4. shows the manner of dove-tailing the riser into the step.

Plate L. fig. 1. represents a staircase, with flights, and its landing rail. 92

Fig. 2. shows the solid part of the step out of which the scroll is formed; where *a* represents the *oversail* of the step; *b*, The thickness of the bracket, with its *mitring* to the *riser;* and *c*, The *string board*.

Fig. 4. shows the scale for drawing the scroll of fig. 3.—To perform which, take the distance from 1 to the centre, in fig. 3. and set it from 1 to the centre in fig. 4.; divide that extent into three parts, then set four such parts on the upper side of the scale, and draw the line from 4 to 1; set one foot of your compasses at 4, and strike the circular line; let that be divided into 12 equal parts, and then draw lines from 4 through those divisions to the upright line.

The scale being thus made, draw the scroll of fig. 3. by it in the following manner.

Set one foot of your compasses in 1, and describe a stroke at *c;* take the same distance, and with one foot in 2, cross the stroke at *c;* then from *c*, turn the part from 1 to 2, and proceed in the same manner: for if the distance were taken in the scale from 1 to the centre, it would strike the circle too flat; and if taken from 2, it would strike the circle too quick.

When this is well understood, there will be little difficulty in drawing the scroll below fig. 2.; which throws itself out farther in proportion than that in fig. 3.; for this will always be the case when the upper line of the scale, which consists of four divisions in fig. 4. is made but with three divisions or less; whence it appears, that the upper line of the scale may be drawn at what length you please, according as you would bring in or keep out the scroll.

Plate LI. shows the manner of squaring twist rails. 93

Fig. 2. exhibits the pitch board, to show what part of the step the twisted part of the rails contains; the three doated lines drawn from the rail to the pitch board represent the width of the rail, which is to be kept level. The dotted lines *a* and *b* show how much half the width of the rail turns up from its first beginning to 3.

Fig. 3. shows the same pitch board, with the manner of the rail's turning up. If the sides of the twisted part of the rail be shaped by the rail mould, so that they direct down to its ground plan, that is, the upper side of the rail being first struck by the mould, then apply the mould to the under side, as much back as the level of the pitch board shows, by being struck on the side of the rail, and then fig. 3. being applied to the outside of the rail, from its first twisting part to 3, will show how much wood is to be taken off.

Fig. 5. exhibits the square of the rail, with the raking line of the pitch board drawn through the middle on the upper side; then draw the depths of the side of the rail parallel to this, and the dotted lines from the diagonal of the rail; these lines show what quantity of wood will be wanting on the upper and lower sides of the rail. Set your compasses at *c*, and draw the circular stroke from the raking part of the pitch board to *b;* take the distance *a b* and transfer it from *a* to

Practice.

a to *b*, in fig. 7. The several distances thus found may be set at any number of places, ranging with the straight part of the rail; and it then forms the width of the mould for the twisting part of the rail.

Fig. 7. shows the sweep of the rail. The rail cannot be fixed less than one-fourth part from the *nosing* or front of the step.

The remaining part of the pitch board may be divided into any number of parts, as here into four; from these divisions draw lines across the pitch board to the raking line; then take the distances from the ground line of the pitch board to the plan of the rail, and set them perpendicular from the raking line of the pitch board; and these divisions, when the rail is in its proper position, lie directly over the divisions on the ground plan.

In this figure *l*, *m*, and *n*, rise as much above *o* as the dotted line in fig. 5. does above the width of the rail: and they sink as much below *o* as the other dotted line in fig. 5. falls below the width of the rail; the same thicknesses must be glued upon *o*, though the greatest part will come off in squaring. The reason of placing the letters *l*, *m*, and *n*, where they are, is that they might not obstruct the small divisions of the rail mould.

Fig. 4. shows how to find the rail when it takes more than one step. The remaining part of the pitch board is divided into four parts, as before in fig. 7. and it takes in two such parts of the next step. Draw lines from these divisions to the diagonal of the pitch board as in fig. 7. then take the distance *a b*, and set it from *c* to *d*, and so proceed with the other divisions.

Another way to find the outside of the rail mould is, to draw all the divisions across the plan of the rail; then take the distance from the ground line of the pitch board to 4, transfer it from the diagonal of the pitch board to 4 on the rail; and so proceed with the other distances. Now, when the rail is put in its proper situation, *c* will be perpendicular to *b*, and all the divisions, as 1, 2, 3, 4, &c. in the rail, will be perpendicular to 1, 2, 3, 4, &c. in the ground plan.

Fig. 6. shows the plan of a rail of five steps.

To find the rail.—Set five divisions, as from *e* to *h*, which is the height of the five steps; draw the diagonal *h* to the plan of the rail; then take the distance *e f*, and transfer it to *g h*, and proceed in the same manner with the other seven distances. Practice.

To find the width of the rail mould.—Draw the lines across the plan of the rail, as at *k*; set that distance from the diagonal to *i*; and so proceed with the rest, as shown in fig. 4.

Having formed the sides of the rail perpendicular to its ground plan, and having squared the lower end of the rail, then take a thin lath, and bend it with the rail, as is represented by *m*, fig. 1.

This is the readiest method of squaring a solid rail; but if the rail be bent in the thicknesses, the nosing of the steps must be drawn upon a cylinder, or some other solid body of a sufficient width to contain the width of the rail or string board.

r Represents the depth of the rail, touching the nose of each step. Take a sufficient number of thicknesses of this width, to make the thickness of your rail, glue them altogether upon your cylinder or templet; confine them till they are dry, and the rail taken off is ready squared. Proceed in the same manner with the architrave, marked *a*.

Chap. XIX. *Of Roofs.*

Plate LII. fig. 1. shows the form of a trussed roof, 94
with three ring posts, that may carry 70 feet or upwards.

Fig. 2. exhibits an M roof, capable of carrying as great an extent as the former. Indeed both these designs are capable of carrying almost any extent.

Fig. 3. represents two different sorts of trusses.

Fig. 4. shows the manner of piecing timber. Sometimes the joint may be extended as far as *a*, with another bolt through it. To the right is shown a different sort of joint.

Fig. 5. shows the manner of trussing a girder. If the trusses are full long, with the pieces *b* and *c*, you may make them as light as you please.

Fig. 6. represents the manner of trussing partitions.

PART II. PRACTICE OF ARCHITECTURE.

HAVING thus described and given rules for the most generally received proportions of the different parts of buildings, both of the useful and ornamental kind, we must next give an account of the method of erecting different kinds of edifices; and here the judgement of the architect must necessarily be very much employed, as no fixed rules have been laid down by which he can be directed in all cases. As a necessary preliminary, however, to the construction, we must first consider,

Chap. I. *The Situations of Houses.*

95 Though it must be, in many cases, impossible to choose such a situation as might be agreeable either to the architect or the proprietor, yet where a choice can be made, there are certainly a great many circumstances that will determine one situation to be preferable to another. These circumstances depend entirely on the person who is to inhabit the house. A farmer, for instance, ought to dwell in the most centrical part of his farm; an independent gentleman must regard the healthiness, the neighbours with whom he can converse, the prospect from his house, and also the aspect of the ground near it. To answer these purposes of health and pleasure, an open elevated situation is the best, as the air is there pure, and the prospect extensive: but too elevated a situation is disagreeable, as being both difficult of access, and exposed to cold and bleak winds. To build in bottoms between hills is both unhealthful and unpleasant, the house being in a manner buried, and the ground near it generally marshy from the

ractice. the rain water which runs down from the hills, which renders the air unwholesome. As a garden also is a very necessary article to a country habitation, the soil is by no means a matter of indifference; and therefore it may be concluded, that an elevated situation on a gravelly loam, near some running water, is the best situation for a country house.

Chap. II. *Of the Construction of Edifices in general.*

The proper situation of a house, or any other building, being chosen, according to its intended nature, the next thing to be considered is to lay the foundation in a proper manner. The only security in a house or any other building whatever, is in having a good foundation, and no error is so dangerous as that which is committed here; as the shrinking of the foundation but the breadth of a straw may cause a rent of five or six inches wide in the superstructure. To guard against errors of this kind, the qualities of the ground for a considerable depth must be carefully observed.

96 ıalities of e ground cessary be ex- ined.

The best foundation is that which consists of gravel or stone; but, in order to know whether the inferior strata are sufficient for the support of the building, it will be advisable to sink wells at some little distance. By attending to what is thrown up in digging these, the architect will be acquainted with what lies under the stony or gravelly bed which on the surface promises so much security, and will know what measures to take.

97 ›cky ›und metimes ngerous.

But though a stony or gravelly bottom is undoubtedly the most sure and firm, where all is sound beneath, there is no kind of ground which may prove more fallacious, or occasion such terrible accidents. The reason of this is, that such kind of ground often contains absolute vacuities; nor is rock itself, though a foundation upon a rock is strong even to a proverb, free from dangers of the same kind. Caverns are very frequent in rocky places: and should a heavy building be erected over one of these, it might suddenly fall down altogether. To guard against accidents of this kind, Palladio advises the throwing down great weights forcibly on the ground, and observing whether it sounds hollow, or shakes; and the beating of a drum upon it, by the sound of which an accustomed ear will know whether the earth is hollow or not.

Where the foundation is gravel, it will be proper to examine the thickness of the stratum, and the qualities of those that lie under it, as they have appeared in digging. If the bed of gravel is thick, and the under strata of a sound and firm kind, there needs no assistance; if otherwise, we must have recourse to various methods in order to supply the defect.

98 ıdy or gy und how naged.

The other matters which may occur for a foundation are clay, sand, common earth, or rotten boggy ground. Clay will often both raise and sink a foundation; yet it has a solidity which, with proper management, is very useful. The marshy, rotten, or boggy ground is of all others the worst; yet even upon this great buildings may be raised with perfect safety, provided proper care be taken. In case of boggy earths, or unfirm sand, piling is one of the most common methods of securing a foundation; and, notwithstanding the natural disadvantage of the earth, piles, when properly executed, are one of the firmest and most secure foundations. Practice.

99 Foundations near waters dangerous.

In foundations near the edge of waters, we should always be careful to sound to the very bottom; as many terrible accidents have happened from the ground being undermined by rivers. The same method is to be followed when the ground on which we build has been dug or wrought before. It ought never to be trusted in the condition in which it is left: but we must dig through it into the solid and unmoved ground, and some way into that, according to the weight and bigness of the intended edifice. The church of St Peter's at Rome is an instance of the importance of this last observation. That church is in great part built upon the old circus of Nero; and the builders having neglected to dig through the old foundation, the structure is consequently so much the weaker. The walls were judged of strength enough to bear two steeples upon the corners of the frontispiece; but the foundation was found too weak, when it was impossible to remedy the defect perfectly.

100 Defect in St Peter's at Rome.

Before the architect, however, begins to lay the foundation of the building, it will be proper to construct such drains as may be necessary for carrying off the rain, or other refuse water that would otherwise be collected and lodged about the house. In making of drains for carrying off this water, it will be necessary to make large allowances for the different quantities that may be collected at different times. It must also be considered, that water of this kind is always loaded with a vast quantity of sediment, which, by its continual falling to the bottom will be very apt to choke up the drain, especially at those places where there happen to be angles or corners in its course. The only method of preventing this is by means of certain cavities disposed at proper distances from one another. In these the sediment will be collected, and they are for that reason called *sesspools*. With regard to these, the only directions necessary are, that they be placed at proper distances, be sufficiently large, and placed so as to be easily cleaned. It is a good rule to make a sesspool at each place where the water enters the drain: as by this means a considerable quantity of sediment will be prevented from entering the channel at all. Others are to be made at proper distances, especially where there are any angles. They must be made sufficiently large; the bigger, in moderation, the better; and they must also be covered in such a manner as to be easily got at in order to be cleaned. But, as putrid water is exceedingly noxious, it will be necessary to carry up a brick funnel over every sesspool, in order to prevent the collection of the putrid effluvia, which would otherwise occasion the death of the person who cleaned it.

101 Drains how made.

102 Sesspools.

All drains ought to be arched over at top, and may be most conveniently built of brick. According to their different sizes, the following proportions of height and thickness may be observed. If the drain is 18 inches wide, the height of the walls may be one foot, and their thickness nine inches; the bottom may be paved with brick, laid flatwise, and the arch turned four inches. If the drain is 22 inches wide, the side walls are then to be one foot three inches in height, and the rest constructed as before. If it is 14 inches wide,

103 Proportions of drains.

Practice. wide, the height of the walls may be nine inches, and the sweep of the arch four. A drain of a yard wide should have the same height, and the arch turned over it ought to be nine inches thick. Upon the same principles and proportions may other drains of any size be constructed.

104 Foundation of buildings how laid. The sewers and drains being constructed in a manner proportioned to the size of the intended building, the architect may next proceed to lay the foundation of the walls. Here the first care must be, that the floor of the foundation be perfectly smooth and level. The Italians begin with laying over it an even covering of strong oak plank; and upon that they lay, with the most exact care, the first course of the materials. Whether we take this method, or begin upon the naked floor, all must be laid with the most exact truth by rule and line. When the board plat is laid, a course of stone is the best first bed, and this is to be laid without mortar; for lime would make the wood decay, which otherwise, in a tolerably good soil, will last for ages. After this, all the courses should follow with the same perfect evenness and regularity. If the materials are brick, they should be laid on with an equal, and not too great quantity of mortar: if stone, they ought to be placed regularly, and in the same situation in which they lay in the quarry: for many stones which will bear any weight flatwise, and in their natural position, are of such a grain, that they will split otherwise. The joinings of the under course must be covered by the solid of the next course all the way up; and the utmost care must be taken that there be no vacuity left in the wall, for the weight will most certainly crush it in. The less mortar there is in a foundation, the better. Its use is to cement the bricks and stones together; and the evener they are, the less will be required for that purpose. Where mortar is used to fill up cavities, it becomes part of the wall; and not being of equal strength with the solid materials, it takes from the firmness of the building. For the same reason nothing can be more absurd than to fill up a foundation with loose stones or bricks thrown in at random; and where this is done, the ruin of the building is inevitable. Where the foundation of a principal wall is laid upon piles, it will be necessary also to pile the foundations of the partitions, though not so strongly.

105 Thickness and diminutions of walls, &c. The thickness of foundation walls in general ought to be double that of the walls which they are to support. The looser the ground, the thicker the foundation wall ought to be: and it will require the same addition also in proportion of what is to be raised upon it. The plane of the ground must be perfectly level, that the weight may press equally everywhere: for when it inclines more to one side than another, the wall will split. The foundations must diminish as they rise, but the perpendicular is to be exactly kept in the upper and lower parts of the wall; and this caution ought to be observed all the way up with the same strictness. In some ground, the foundation may be arched; which will save materials and labour, at the same time that the superstructure has an equal security. This practice is peculiarly serviceable where the foundation is piled.

As the foundation walls are to diminish in thickness, so are those which are built upon them. This is necessary in order to save expence, but is not absolutely so to strengthen the wall; for this would be no less strong though it was continued all the way to the top of an equal thickness, provided the perpendicular was exactly kept. In this the ancients were very expert; for we see, in the remains of their works, walls thus carried up to an exorbitant height. It is to be observed, however, that, besides perfect truth in their perpendiculars, they never grudged ironwork, which contributed greatly to the strength of their buildings. The thickness and diminution of walls is in a great measure arbitrary. In common houses built of brick, the general diminution from the bottom to the top is one half the thickness at the bottom; the beginning is two bricks, then a brick and a half, and lastly one brick thickness. In larger edifices, the walls must be made proportionally thicker; but the diminution is preserved much in the same manner. Where stones are used, regard must be had to their nature, and the propriety of their figures for holding one another. Where the wall is to be composed of two materials, as stone and brick, the heaviest ought always to be placed undermost.

Practice. 106 Diminution of the thickness of walls.

107 Angles how fortified. There is one farther particular regarding the strength of a plain wall, and that is, the fortifying its angles. This is best done with good stone on each side, which gives not only a great deal of strength, but a great deal of beauty. Pilasters properly applied are a great strengthening to walls. Their best distance is about every 20 feet, and they should rise five or six inches from the naked of the wall. A much slighter wall of brick with this assistance, is stronger than a heavier and massier one built plain. In brick walls of every kind, it is also a great addition to their strength to lay some chief courses of a larger and harder matter; for these serve like sinews to keep all the rest firmly together, and are of great use where a wall happens to sink more on one side than another.

108 Windows improperly near the corners. As the openings in a wall are all weakenings, and as the corners require to be the strongest parts, there should never be a window very near a corner. Properly, there should always be the breadth of the opening firm to the corner. In the most perfect way of forming the diminution of walls, the middle of the thinnest part being directly over the middle of the thickest, the whole is of a pyramidal form: but where one side of the wall must be perpendicular and plain, it ought to be the inner, for the sake of the floors and cross walls. The diminished side, in this case, may be covered with a fascia or cornice, which will at once be a strength and ornament.

109 Chimneys. Along with the construction of walls, that of the chimneys must also be considered; for errors in the construction of these, will render the most elegant building extremely disagreeable. The common causes of smoking are either that the wind is too much let in above at the mouth of the shaft, or the smoke is stifled below; and sometimes a higher building, or a great elevation of the ground behind, is the source of the mischief: or, lastly, the room in which the chimney is may be so small or close, that there is not a sufficient current of air to drive up the smoke. Almost all that can be done, while the walls are constructing, to prevent smoke, is, to make the chimney vent narrower at bottom than top: yet this must not be carried to an extreme;

Practice. extreme; because the smoke will then linger in the upper part, and all the force of the draught will not be able to send it up. As for the methods of curing smoky chimneys in houses already built, see the article CHIMNEY.

110 Roofs. After the walls are finished, the roof is the next consideration: but concerning it very little can be said; only that its weight must be proportioned to the strength of the walls. It must also be contrived so as to press equally upon the building; and the inner walls must bear their share of the load as well as the outer ones. A roof ought neither to be too massy nor too light; as being necessary for keeping the walls together by its pressure, which it is incapable of doing while too light; and if too heavy, it is in danger of throwing them down. Of these two extremes, however, the last is to be accounted the worst.

111 Floors. With regard to the floors, they are most commonly made of wood; in which case it will be necessary that it should be well seasoned by being kept a considerable time before it is used. The floors of the same story should be all perfectly on a level: not even a threshold rising above the rest; and if in any part there is a room or closet whose floor is not perfectly level, it ought not to be left so, but raised to an equality with the rest; what is wanting of the true floor being supplied by a false one.

In mean houses, the floors may be made of clay, ox blood, and a moderate portion of sharp sand. These three ingredients, beaten thoroughly together and well spread, make a firm good floor, and of a beautiful colour. In elegant houses, the floors of this kind are made of plaster of Paris, beaten and sifted, and mixed with other ingredients. This may be coloured to any hue by the addition of proper substances; and, when well worked and laid, makes a very beautiful floor. Besides these, halls, and some other ground rooms, are paved or floored with marble or stone; and this either plain or dotted, or of a variety of colours; but the universal practice of carpeting has, in a great measure, set aside the bestowing any ornamental workmanship upon floors. In country buildings, also, floors are frequently made of bricks and tiles. These, according to their shapes, may be laid in a variety of figures; and they are also capable of some variation in colour, according to the nature of the earth from which they were made. They may be laid at any time; but for those of earth or plaster, they are best made in the beginning of summer, for the sake of their drying.

CHAP. III. *Of the Distribution of the Apartments of Houses, with other conveniences.*

112 Plan of a house. As houses are built only for the sake of their inhabitants, the distribution of the apartments must of necessity be directed by the way of life in which the inhabitants are engaged. In the country, this is commonly farming; and here, besides the house for the family, there is also necessary a barn for the reception of the produce of the ground, a stable for cattle, a cart-house for keeping the utensils under cover, and sheds for other uses.—To accomplish these purposes, let a piece of ground be taken of five times the extent of the front of the house, and enclosed in the least expensive manner. Back in the centre of this let the house be placed, and in the front of the ground the barn and the stable, with the adjoining sheds. These are to be set one on each side, to the extreme measure of the enclosed ground; they will thus fill up a part of the entrance, and will leave all about the house some enclosed ground by way of yard. From the barn to the stable may be extended a fence with a gate in the middle, and this gate ought to front the door of the house. Practice.

This much being settled, the plan of the house and out buildings may be made as follows. The door may open into a plain brick passage, at the end of which may be carried up a small staircase. On one side of the passage may be a common kitchen; and on the other side a better or larger room, which will serve the family by way of parlour. Beyond this may stand on one side the pantry, and on the other the dairy room, the last being twice the size of the former. They are placed on the same side with the parlour, on account of the heat of the kitchen, which renders it improper to be near them. On the kitchen side, a brewhouse may very conveniently be placed. More rooms may be added on the ground floor as occasion requires; and the upper story is to be divided into bedchambers for the family, with garrets over them for the servants.—A house of this kind is represented Plate LIII. fig. 1.; and one of a somewhat better kind, fig. 2. where a private gentleman who has a small family may find conveniency.

113 Of an elegant country seat. On Plate LIV. is represented a gentleman's country-seat, built on a more elegant plan. Here the front may extend 65 feet in length, the depth in the centre being 40 feet, and in each of the wings 45. The offices may be disposed in wings; the kitchen in the one, and the stables in the other; both of which, however, may correspond in their front with the rest of the building, which they ought also to do with one another. These wings may have a projection of 13 feet from the dwelling house, to which they ought to be connected, not by straight lines, but by curves as represented fig. 2.

The best proportion of these offices to a house extending 65 feet in front, is 35 feet. If they are smaller, the house will look gigantic; if larger, they will lessen its aspect. To a front of 35 feet, a depth of 48 is a very good proportion. There ought also to be a covered communication between the dwelling house and offices, which must not appear only to be a plain blank wall, but must be ornamented with gates, as in the figure. The arch by which the offices are joined to the dwelling house must be proportioned to the extent of the buildings; and there cannot be a better proportion than five feet within the angles of the buildings. By this means the wings, which have only a projection of 13 feet, will appear to have one of 18, and the light will be agreeably broken.

With regard to the internal distribution of a house of this kind, the under story may be conveniently divided into three rooms. The hall, which is in the centre, will occupy the whole of the projecting part, having a room on each side. The length of the hall must be 24 feet and its breadth 12: the rooms on each side of it must be 16 feet long, and 11 wide. Of these two front rooms, that on the right hand may be conveniently

Practice. conveniently made a waiting room for persons of better rank, and that on the left hand a dressing room for the master of the house. Behind the hall may run a passage of four feet and a half, leading to the apartments in the hinder part of the house and the staircase. These may be disposed as follows: Directly behind the hall and this passage the space may be occupied by a saloon, whose length is 23 feet and its breadth 17. On the left hand of the passage, behind the hall, is to be placed the grand staircase; and as it will not fill the whole depth, a pleasant common parlour may terminate on that side of the house. On the other side, the passage is to lead to the door of the great dining parlour, which may occupy the whole space.

114 Another. A plan of a house of the same kind, but somewhat different in the distribution, is represented below in the same plate. The front here extends 68 feet, and the wings project 28 feet; their depth is 48, and their breadth 36. The hall may be 26 feet long and 17 broad. On the left hand of the hall may be a waiting room 16 feet long and 10 broad; behind which may be a handsome dining room. The passage into this waiting room should be at the lower end of the hall; and it must have another opening into the room behind it. On the right hand of the hall is the place of the great staircase, for which a breadth of 16 feet three inches is to be allowed. In the centre of the building, behind the hall, may be a drawing room 26 feet long and 16 broad; and behind the staircase will be room for a common parlour of 16 feet square. The passage of communication between the house and wings may be formed into colonnades in a cheap manner behind: a flight of steps, raised with a sweep, occupying the centre of each, and leading up to a door, and the covering being no more than a shed supported by the plainest and cheapest columns.

The two wings now remain to be disposed of. That on the right hand may contain the kitchen, and offices belonging to it, and the other the stables. The front of the right-hand wing may be occupied by a kitchen entirely, which will then be 30 feet long and $16\frac{1}{2}$ wide: or it may be made smaller by setting off a small room to the right. Twenty-two feet by 16 will then be a good bigness. The other room will then have the same depth of 16 feet, and the width to the front may be $7\frac{1}{2}$. Beyond the kitchen may stand the staircase, for which $7\frac{1}{2}$ feet will be a proper allowance; and to the right of this may be a scullery 12 feet 10 inches deep from the back front by seven in breadth. To the left of the stair may be a servants hall 16 feet square, and behind that a larder 12 feet 10 by 14 feet 6. In the centre of the other wing may be a double coach-house: for which there should be allowed the whole breadth of the wing, with 10 feet 6 inches in the clear; and on each side of this may be the stables. The external decorations of the front and wings will be better understood from the figure than they can be by any description.

115 Of the earl of Wemyss's house. Plate LV. shows the plan and elevation of the house of the earl of Wemyss at Newmills. The proportions of the rooms are marked in the plan; and the front, being decorated with columns of the Ionic order, will sufficiently show in what manner any of the five orders may be introduced with propriety and elegance. Practice

Chap. IV. *Of Aquatic Buildings.*

1. Of Bridges.

These are constructed either of wood or stone; of which the last are evidently the strongest and most durable, and therefore, in all cases, to be preferred where the expence of erecting them can be borne. The proper situation for them is easily known, and requires no explanation; the only thing to be observed is, to make them cross the stream at right angles, for the sake of boats that pass through the arches with the current of the river; and to prevent the continual striking of the stream against the piers, which in a long course may endanger their being damaged and destroyed in the end. 116

Bridges built for a communication of high roads, ought to be so strong and substantial as to be proof against all accidents that may happen, to have a free entrance for carriages, afford an easy passage to the waters, and be properly adapted for navigation, if the river admits of it. Therefore the bridge ought to be at least as long as the river is wide in the time of its greatest flood; because the stopping of the waters above may cause too great a fall, which may prove dangerous to the vessels, and occasion the under gravelling the foundation of the piers and abutments; or, by reducing the passage of the water too much in time of a great flood, it might break through the banks of the river, and overflow the adjacent country, which would cause very great damages; or if this should not happen, the water might rise above the arches, and endanger the bridge to be overset, as has happened in many places.

When the length of the bridge is equal to the breadth of the river, which is commonly the case, the current is lessened by the space taken up by the piers; for which reason this thickness should be no more than is necessary to support the arches; and it depends, as well as that of the abutments, on the width of the arches, their thickness, and the height of the piers.

117 Proper form of arches. The form of the arch is commonly semicircular; but when they are of any great width, they are made elliptical, because they would otherwise become too high. This has been done at the Pont Royal at Paris, where the middle arch is 75 feet, and its height would have been 37.5 feet, instead of which it is only 24 by being made elliptical.

Another advantage of much more importance arises from the oval figure, which is, that the quantity of masonry of the arches is reduced in the same proportion as the radius of the arch is to its height. That is, if the radius is 36 feet, and the height of the arch 24, or three-fourths of the radius, the quantity of masonry of the arches is likewise reduced to three-fourths; which must lessen the expence of the bridge considerably. Notwithstanding these advantages, however, the latest experiments have determined segments of circles to be preferable to curves of any other kind; and of these the semicircle is undoubtedly the best, as pressing most perpendicularly on the piers.

When

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When the height of the piers is about six feet, and the arches are circular, experience has shown, says Mr Belidor, that it is sufficient to make the thickness of the piers the sixth part of the width of the arch, and two feet more; that is, the thickness of the piers of an arch of 36 feet, ought to be eight feet; those of an arch of 48 feet, to be 10.

118 Thickness of the piers.

When the arches are of a great width, the thickness of the piers may be reduced to the sixth part of that width; but the depression of the two feet is not done at once; that is, in an arch of above 48 feet, 3 inches are taken off for every 6 feet of increase of the width of the arch. For instance, the thickness of the piers supporting an arch of 72 feet wide, should be 14 feet, according to the preceding rule; but by taking off 3 inches for every 6 feet, above an arch of 48 wide, the thickness of the piers is reduced to 13 feet; consequently, by following the same rule, the thickness of the piers supporting an arch of 16 fathoms wide, will be 16 feet; all the others above that width are the sixth part of the width.

After this, Mr Belidor gives a rule for finding the thickness of the piers which support elliptic arches, and makes them stronger than the former; the abutments he makes one-sixth part more than the piers of the largest arch. But it is plain that these rules are insufficient, being merely guess-work, determined from some works that have been executed.

119 The thickness of the arch-stones.

The thickness of the arch-stones is not to be determined by theory, nor do those authors who have written on the subject agree amongst themselves. Mr Gautier, an experienced engineer, in his works, makes the length of the arch-stones, of an arch 24 feet wide, two feet; of an arch 45, 60, 75, 90 wide, to be 3, 4, 5, 6, feet long respectively, when they are hard and durable, and something longer when they are of a soft nature: on the contrary, Mr Belidor says, they ought to be always one twenty-fourth part of the width of the arch, whether the stones be hard or soft; because, if they are soft, they weigh not so much.

But that the length of the arch-stones should be but a foot in an arch of 24 feet wide, 2, 3, 4, in arches of 48, 72, 96 feet, seems incredible; because the great weight of the arches would crush them to pieces, by the pressure against one another: and therefore Mr Gautier's rule appears preferable. As he made the length of the arch-stones to increase in a slower proportion, from 10 to 45 feet wide, than in those above that width, we imagine that the latter will be sufficient for all widths, whether they are great or little; therefore we shall suppose the length of the arch-stones of 30 feet in width to be two feet, and to increase one foot in 15; that is, 3 feet in an arch of 45 feet; 4, 5, 6, in an arch of 60, 75, and 90 feet; and so the rest in the same proportion.

Table containing the thickness of piers of bridges.

	6	9	12	15	18	21	24
20	4.574	4.918	5.165	5.350	5.492	5.610	5.698
25	5.490	5.913	6.216	6.455	6.645	6.801	7.930
30	6.386	6.816	7.225	7.513	7.746	7.939	8.102
35	7.258	7.786	8.200	8.532	8.807	9.037	9.233
40	8.404	8.691	9.148	9.523	9.835	10.101	10.328
45	8.965	9.579	10.077	10.489	10.837	11.136	11.394
50	9.805	10.454	10.987	11.435	11.817	12.146	12.434
55	10.640	11.245	11.882	12.364	13.019	13.149	13.218
60	11.400	12.110	12.718	13.281	13.723	14.109	14.314
65	12.265	13.025	13.648	14.185	14.654	15.082	15.433
70	13.114	13.869	14.517	15.049	15.573	16.011	16.400
75	14.000	14.705	15.336	15.965	16.480	16.940	17.354
80	14.747	15.542	16.234	16.842	17.381	17.864	18.298
85	15.513	16.328	17.041	17.674	18.237	18.742	19.198
90	16.373	17.201	17.929	18.578	19.157	19.679	20.152
95	17.184	17.826	18.772	19.438	20.036	20.577	21.068
100	17.991	18.848	19.610	20.293	20.908	21.466	21.976

120 Explanation of the table.

The first horizontal line expresses the height of the piers in feet, from 6 to 24 feet, each increasing by three; the first vertical column, the width of arches from 20 to 100 feet, for every five feet.

The other columns express the thickness of piers in feet and decimals, according to the respective height at the head of the column, and the width of the arch against it in the first column.

Thus, for example, let the width of the arch be 60 feet, and the height of the piers 12; then the number 12.718, under 12, and against 60, expresses the thickness of the piers, that is 12 feet and 8.6 inches: we must observe again, that the length of the key-stone is two feet in an arch of 30 feet wide; 3, 4, 5, 6, in an arch of 45, 60, 75, 90; that of 20 feet wide, one foot four inches; and the length of any other width is found by adding four inches for every five feet in width.

As this table contains the thicknesses of piers in respect to arches that are commonly used in practice, we imagined, that to carry it farther would be needless; because the difference between the thickness of the piers of any contiguous arches being but small, those between any two marked here, may be made equal to half the sum of the next below and above it: thus the thickness of the piers of an arch 52 or 53 feet wide is nearly equal to 10.222, half the sum of the thicknesses 9.085 and 10.64 of the arches 50 and 55 feet wide when the height of the piers is six feet.

121 Form of piers.

Rectangular piers are seldom used but in bridges over small rivers. In all others they project the bridge by a triangular prism, which presents an edge to the stream, in order to divide the water more easily, and to

Practice. prevent the ice from sheltering there, as well as vessels from running foul against them: the edge is terminated by the adjacent surfaces at right angles to each other at Westminster bridge, and makes an acute angle at the Pont Royal of about 60 degrees; but of late the French terminate this angle by two cylindric surfaces, whose bases are arcs of 60 degrees, in all their new bridges.

122 Slope of the bridge on each side. When the banks of the rivers are pretty high, the bridge is made quite level above, and all the arches of an equal width; but where they are low, or for the sake of navigation, a large arch is made in the middle of the stream, then the bridge is made higher in the middle than at the ends: in this case, the slope must be made easy and gradual on both sides, so as to form above one continued curve line, otherwise it appears disagreeable to the eye. Mr Belidor will have the descent of that slope to be one twenty-fourth part of the length; but this is undoubtedly too much, as one-fiftieth part of the length is quite sufficient for the descent.

123 Width, &c. The width commonly allowed to small bridges is 30 feet: but in large ones near great towns, these 30 feet are allowed clear for horses and carriages, besides a banquette at each side for foot passengers of 6 to 9 feet each, raised about a foot above the common road; the parapet walls on each side are about 18 inches thick, and 4 feet high; they generally project the bridge with a cornice underneath: sometimes ballustrades of stone or iron are placed upon the parapet, as at Westminster; but this is only practised where a bridge of a great length is made near the capital of a country.

The ends of bridges open from the middle of the two large arches with two wings, making an angle of 45 degrees with the rest, in order to make their entrance more free and easy: these wings are supported by the same arches of the bridge next to them, being continued in the manner of an arch, of which one pier is much longer than the other.

How the work is to be carried on.

124 Methods of laying the foundation. As the laying the foundation of the piers is the most difficult part of the whole work, it is necessary we should begin with an easy case, that is, when the depth of the water does not exceed 6 or 8 feet; and then proceed to those which may happen in a greater depth of water.

125 By batardeaus. One of the abutments, with the adjacent piers, is enclosed by a dyke called *batardeau* by the French, of a sufficient width for the work, and room for the workmen. This batardeau is made by driving a double row of piles, whose distance is equal to the depth of water, and the piles in each row are 3 feet from each other: they are fastened together on the outside by bonds of 6 by 4 inches: this being done, frames of about 9 feet wide are placed on the inside to receive the boards which are to form the enclosure: the two uprights of these frames are two boards of an inch and a half thick, sharpened below to be driven into the ground, and fastened together by double bonds, one below and the other above, each separated by the thickness of the uprights; these bonds serve to slide the boards between: after these frames have been driven into the ground as hard as can be, then the boards themselves are likewise driven in till they reach the firm ground underneath.

Between every two piles tie-beams are fastened to the bonds of the piles, to fasten the inside wall to the outside one; these tie-beams are let into the bonds and bolted to the adjacent piles: this being done, the bottom is cleared from the loose sand and gravel, by a machine like those used by ballast-heavers; and then well prepared clay is rammed into the coffer very tight and firm, to prevent the water from oozing through. Practic

Sometimes these enclosures are made with piles only driven close to each other; at others, the piles are notched or dove-tailed one into the other; but the most usual method is to drive piles with grooves in them, 5 or 6 feet distant from each other, and boards are let down between them.

This being done, pumps and other engines are used to draw the water out of the enclosures, so as to be quite dry; then the foundation is dug, and the stones are laid with the usual precautions, observing to keep some of the engines always standing, in order to draw out the water that may ooze through the batardeau.

The foundation being cleared, and every thing ready to begin the work, a course of stones is laid; the outside all round with the largest stretchers and headers that can be had, and the inside filled with ashlers well jointed, the whole laid in terrass mortar: the facings are crampt together, and set in lead; and some cramps are also used to fasten the facings with the inside. The same manner is to be observed throughout all the courses to the height of low water mark; after which the facings alone are laid in terrass mortar, and the inside with the best of the common sort. When the foundation is carried to the height of low water mark, or to the height where the arches begin, then the shaft or middle wall is to be carried up nearly to the height of the arches, and there left standing till all the piers are finished, in order that the masonry may be sufficiently dry and settled before the arches are begun.

126 Proper form of the base. As the piers end generally with an arch at each end, it is customary to lay the foundation in the same manner: which is not so well as to continue the base rectangular quite to the ends of the piers, and as high as low water mark; both because the foundation becomes then so much broader, and also because the water will not be able to get under it: for when the current sets against a flat surface, it drives the sand and mud against it so as to cover it entirely; whereas if a sharp edge be presented to the stream, it carries every thing away, and exposes the foundation to the continual action of the water, which in course of time must destroy it.

After the intervals between the arches are filled up with stones laid in a regular manner without mortar, and the gravel is laid over them; two drains or gutters are to be made lengthwise over the bridge, one on each side next to the footpath, about six feet wide and a foot deep; which being filled with small pebble stones, serve to carry off the rain water that falls on the bridge, and to prevent its filtering through the joints of the arches, as often happens.

127 Method of building with coffers, as we practised at Westminster bridge. The former method of laying the foundation by means of batardeaus is very expensive, and often meets with great difficulties: for when the depth of water is 8 feet or more, it is scarcely possible to make the batardeaus so tight as to prevent the water from oozing through them; and in that case the number of engines required, as well as the hands to work them, becomes very

Practice. very extensive; and if part of the batardeau should break by some extraordinary wind or tide, the workmen would be exposed to very great danger.

The next and best method therefore is to build with coffers, when it is practicable, such as were used at Westminster bridge. Here the height of water was 6 feet at a medium when lowest, and the tide rose about 10 feet at a medium also; so that the greatest depth of water was about 16 feet. At the place where one of the piers of the middle or great arch was to be, the workmen began to drive piles of about 13 or 14 inches square, and 34 feet long, shod with iron, so as to enter into the gravel with more ease, and hooped above to prevent their splitting in driving them: these piles were driven as deep as could be done, which was 13 or 14 feet below the surface of the bed of the river, and 7 feet distant from each other, parallel to the short ends of the pier, and about 30 feet distant from them: the number of these piles was 34, and their intent to prevent any vessels or barges from approaching the work; and in order to hinder boats from passing between them, booms were placed so as to rise and fall with the water.

This being done, the ballast-men began to dig the foundation under the water of about 6 feet deep, and 5 wider all round than the intended coffer was to be, with an easy slope to prevent the ground from falling in: in order to prevent the current from washing the sand into the pit, short-grooved piles were driven before the two ends and part of the sides, not above 4 feet higher than low water mark, and about 15 feet distant from the coffer: between these piles rows of boards were let into the grooves down to the bed of the river, and fixed there.

The bottom of the coffer was made of a strong grate, consisting of two rows of large timbers, the one longways, and the other crossways, bolted together with wooden trunnels ten feet wider than the intended foundation. The sides of the coffer were made with fir timbers laid horizontally close one over another, pinned with oaken trunnels, and framed together at the corners, excepting at the two salient angles, where they were secured with proper irons, so that the one half might be loosened from the other if it should be thought necessary; these sides were lined on the inside as well as on the outside with three inch planks placed vertically; the thickness of those sides was 18 inches at the bottom, reduced to 15 above, and they were 16 feet high; besides, knee timbers were bolted at the angles, in order to secure them in the strongest manner. The sides were fastened to the bottom by 20 pieces of timber on the outside, and 18 within, called *straps*, about 8 inches broad, and 3 or 4 inches thick, reaching and lapping over the ends of the sides: the lower part of these straps had one side cut dove-tail fashion, in order to fit the mortises made near the edge of the bottom to receive them, and were kept in their places by iron wedges; which being drawn out when the sides were to be taken away, gave liberty to clear the straps from the mortises.

Before the coffer was launched, the foundation was examined, in order to know whether it was level; for which purpose several gauges were made, each of which consisted of a stone of about 15 inches square and three thick, with a wooden pole in the middle of about 18 feet long. The foundation being levelled and the coffer fixed directly over the place with cables fastened to the adjacent piles, the masons laid the first course of the stones for the foundation within it; which being finished, a sluice made in the side was opened near the time of low water; on which the coffer sunk to the bottom; and if it did not set level, the sluice was shut, and the water pumped out, so as to make it float till such time as the foundation was levelled: then the masons crampt the stones of the first course, and laid a second; which being likewise crampt, a third course was laid: then the sluice being opened again, proper care was taken that the coffer should settle in its due place. The stone work being thus raised to within two feet of the common low water mark, about two hours before low water the sluice was shut, and the water pumped out so far as that the masons could lay the next course of stone, which they continued to do till the water was risen so high as to make it unsafe to proceed any further: then they left off the work, and opened the sluice to let in the water. Thus they continued to work night and day at low water till they had carried their work some feet higher than the low water mark: after this, the sides of the coffer were loosened from the bottom, which made them float; and then were carried ashore to be fixed to another bottom, in order to serve for the next pier. Practice.

It must be observed, that the coffer being no higher than 16 feet, which is equal to the greatest depth of water, and the foundation being 6 feet under the bed of the river; the coffer was therefore 6 feet under water when the tide was in; but being loaded with three courses of stones, and well secured with ropes fastened to the piles, it could not move from its place. By making it no higher, much labour and expence were saved; yet it answered the intent fully as well as if it had been high enough to reach above the highest flood.

The pier being this carried on above low water mark, the masons finished the rest of it during the intervals of the tides in the usual way; and after all the piers and abutments were finished in a like manner, the arches were begun and completed as mentioned before: the whole bridge was built in about seven years, without any accidents happening either in the work or to the workmen, which is seldom the case in works of this nature.

128 Materials employed.

It may be observed, that all the piers were built with solid Portland stone, some of which weighed four tons. The arch stones were likewise of the same sort: but the rest of the masonry was finished with Kentish *rag-stones*; and the paths for foot passengers were paved with *Purbec*, which is the hardest stone to be had in England, excepting Plymouth marble.

129 This method sometimes impracticable.

This method of building bridges is certainly the easiest and cheapest that can be thought of, but cannot be used in many cases: when the foundation is so bad as not to be depended upon without being piled, or the depth of water is very great, with a strong current and no tide, it cannot then be practised. For if piles are to be used, it will be next to impossible to cut them off in the same level five or six feet below the bed of the river, notwithstanding that saws have been invented for that purpose: because if they are cut off separately, it will be a hard matter to do it so nicely that the one shall not exceed the other in height; and if this is not done,

Practice. done, the grating or bottom of the coffer will not be equally supported, whereby the foundation becomes precarious: neither can they be cut off altogether; for piles are to be driven as far as the bottom of the coffer extends, which at Westminster bridge was 27 feet; the saw must have three feet play, which makes the total length of the saw 30 feet; now, if either the water is deeper than it is there, or the arches are wider, the saw must still be longer, so that this method is impracticable in any such cases.

In a great depth of water that has a strong current and no tide, the coffers must reach above the water, which makes them very expensive, and unwieldy to manage, as well as very difficult to be secured in their places, and kept steady: so that there is no probability of using them in such a case.

130 Russian method. In some cases, where there is a great depth of water, and the bed of the river is tolerably level, or where it can be made so by any contrivance, a very strong frame of timber, about four times as large as the base of the piers may be let down with stones upon it round the edges to make it sink: after fixing it level, piles must be driven about it to keep it in its place; and then the foundation may be laid in coffers as before, which are to be kept steady by means of ropes tied to the piles.

This method has frequently been used in Russia; and though the bed of the river is not very solid, yet such a grate, when once well settled with the weight of the pier upon it, will be as firm as if piles had been driven under the foundation, but to prevent the water from gulling under the foundation; and to secure it against all accidents, a row of dove-tail piles must be driven quite round the grating; this precaution being taken, the foundation will be as secure as any that can be made.

131 French method. The French engineers make use of another method in raising the foundations of masonry under water; which is, to drive a row of piles round the intended place, nearer to, or farther from, each other, according as the water is more deep or shallow: these piles being strongly bound together in several places with horizontal tie-beams, serve to support a row of dove-tail piles driven within them: when this is done, and all well secured according to the nature of the situation and circumstances, they dig the foundation by means of a machine with scoops, invented for that purpose, until they come to a solid bed of gravel or clay; or if the bed of the river is of a soft consistence to a great depth, it is dug only to about six feet, and a grate of timber is laid upon it, which is well secured with piles driven into the opposite corners of each square, not minding whether they exceed the upper surface of the grate much or little.

When the foundation is thus prepared, they make a kind of mortar called *beton*, which consists of twelve parts of pozolano or Dutch terrass, six of good sand, nine of unslaked lime, the best that can be had, thirteen of stone splinters not exceeding the bigness of an egg, and three parts of tile dust, or cinders, or else scales of iron out of a forge: this being well worked together must be left standing for about 24 hours, or till it becomes so hard as not to be separated without a pick-axe.

This mortar being thus prepared, they throw into the coffer a bed of ruble stones, not very large, and spread them all over the bottom as nearly level as they can; they then sink a box full of this hard mortar, broken into pieces, till it come within a little of the bottom; the box is so contrived as to be overset or turned upside down at any depth; which being done, the pieces of mortar soften, and so fill up the vacant spaces between the stones; by these means they sink as much of it as will form a bed of about 12 inches deep all over; then they throw in another bed of stone, and continue alternately to throw one of mortar and one of stone till the work approaches near the surface of the water, where it is levelled, and then the rest is finished with stones in the usual manner.

Practi

Mr Belidor says, in the second part of his Hydraulics, vol. ii. p. 188. that Mr Millet de Montville having filled a coffer containing 27 cubic feet, with masonry made of this mortar, and sunk it into the sea, it was there left standing for two months, and when it was taken out again it was harder than stone itself.

132 Impossibility of building bridges in some cases. We have hitherto mentioned such situations only where the ground is of a soft nature; but where it is rocky and uneven, all the former methods prove ineffectual; nor indeed has there yet been any one proposed which can be always used upon such occasions, especially in a great depth of water. When the water is not so deep but that the unevenness of the rock can be perceived by the eye, piles strongly shod with iron may be raised and let fall down, by means of a machine, upon the higher parts, so as to break them off piece by piece, till the foundation is tolerably even, especially when the rock is not very hard; which being done either this or any other way that can be thought of, a coffer is made without any bottom, which is let down and well secured, so as not to move from its place: to make it sink, heavy stones should be fixed on the outside; then strong mortar and stones must be thrown into it; and if the foundation is once brought to a level, large hewn stones may be let down so as to lie flat and even: by these means the work may be carried on quite up to the surface of the water. But when the water is so deep, or the rock so hard as not to be levelled, the foundation must be sounded, so as to get nearly the risings and fallings; then the lower part of the coffer must be cut nearly in the same manner, and the rest finished as before. It must however be observed, that we suppose a possibility of sinking a coffer; but where this cannot be done, no method that we know of will answer.

133 Trajan's bridge o the Dan described Among the aquatic buildings of the ancients none appears to have been more magnificent than Trajan's bridge. Dion Cassius gives the following account of it: "Trajan built a bridge over the Danube, which in truth one cannot sufficiently admire; for though all the works of Trajan are very magnificent, yet this far exceeds all the others: the piers were 20 in number, of square stone: each of them 150 feet high above the foundation, 60 feet in breadth, and distant from one another 170 feet. Though the expence of this work must have been exceeding great, yet it becomes more extraordinary by the river's being very rapid, and its bottom of a soft nature: where the bridge was built, was the narrowest part of the river thereabout, for in most others it is double or treble this breadth; and although on this account it became so much the deeper and the more rapid, yet no other place was so suitable for

Practice. for this undertaking. The arches were afterwards broken down by Adrian; but the piers are still remaining, which seems as it were to testify that there is nothing which human ingenuity is not able to effect." The whole length then of this bridge was 1590 yards.; some authors add, that it was built in one summer, and that Apollodorus of Damascus was the architect, who left behind him a description of this great work.

134 Wooden bridges. Where stone bridges cannot be erected on account of the expence, very strong and durable ones may be constructed of wood: in which case they ought to be so framed, as that all the parts may press upon one another like the arch of a stone bridge; and thus, instead of being weakened by great weights passing over them, they will become the stronger. How this is to be accomplished, will be better understood from the figure at bottom of Plate LIV. which represents a wooden bridge constructed after this manner, than it can be by any description.

2. Of Harbours.

135 Situation proper for harbours. In these, the first thing to be considered is the situation; which may be some large creek or bason of water, in or near the place where the harbour is intended to be made, or at the entrance of a large river, or near the sea: for a harbour should never be dug entirely out of dry land, unless upon some extraordinary occasions, where it is impossible to do otherwise, and yet a harbour is absolutely necessary. When a proper place is found, before it is fixed upon, it must be considered whether ships can lie there safe in stormy weather, especially when those winds blow which are most dangerous upon that coast; whether there be any hills, rising ground, or high buildings, that will cover it; in these cases, the situation is very proper: but if there be nothing already that will cover the ships, it must be observed whether any covering can be made at a moderate expence, otherwise it would be useless to build a harbour there.

The next thing to be considered is, whether there be a sufficient depth of water for large ships to enter with safety, and lie there without touching the ground; and if not, whether the entrance and inside might not be made deeper at a moderate expence: or, in case a sufficient depth of water is not to be had for large ships, whether the harbour would not be useful for small merchantmen; for such a one is often of great advantage, when situated upon a coast much frequented by small coasting vessels.

The form of the harbour must be determined in such a manner, that the ships which come in when it is stormy weather may lie safe, and so as there may be sufficient room for as many as pass that way: the depths of water where the piers are to be built must be taken at every 10, 15, or 20 feet distance, and marked upon piles driven here and there, in order that the workmen may be directed in laying the foundation.

136 Materials. This being done, it must be considered what kind of materials are to be used, whether stone, brick, or wood. When stones are to be had at a moderate price, they ought to be preferred, because the work will be much stronger, more lasting, and need fewer repairs, than if made with any other materials: but when stones are scarce, and the expence becomes greater than what is allowed for building the harbour, the foundation may be made of stone as high as low water mark, and the rest finished with brick. If this manner of building should still be too expensive, wood must be used; that is, piles are driven as close as it is thought necessary; which being fastened together by cross bars, and covered with strong oaken planks, form a kind of coffer, which is filled with all kinds of stones, chalk, and shingles. Practice.

137 French method of building. The manner of laying the foundation in different depths of water, and in various soils, requires particular methods to be followed. When the water is very deep, the French throw in a great quantity of stones at random, so as to form a much larger base than would be required upon dry land; this they continue to within 3 or 4 feet of the surface of the water, where they lay the stones in a regular manner, till the foundation is raised above the water: then they lay a great weight of stones upon it, and let it stand during the winter to settle; as likewise to see whether it is firm, and resists the force of waves and winds: after that, they finish the superstructure with large stones in the usual manner.

138 A preferable one. As this method requires a great quantity of stones, it can be practised only in places where stones are in plenty: and therefore the following one is much preferable. A coffer is made with dove-tail piles, of about 30 yards long, and as wide as the thickness of the foundation is to be; then the ground is dug and levelled, and the wall is built with the best mortar.

As soon as the mortar is tolerably dry, those piles at the end of the wall are drawn out, the side rows are continued to about 30 yards farther, and the end enclosed; then the foundation is cleared, and the stones laid as before. But it must be observed, that the end of the foundation finished is left rough, in order that the part next to it may incorporate with it in a proper manner; but if it is not very dry, it will incline that way of itself, and bind with the mortar that is thrown in next to it; this method is continued till the whole pier is entirely finished.

It must likewise be observed, that the piers are not made of one continued solid wall; because in deep water it would be too expensive: for which reason, two walls are built parallel to each other, and the interval between them is filled up with shingle, chalk, and stone As these walls are in danger of being thrust out or overset by the corps in the middle, together with the great weight laid at times on the pier, they are tied or bound together by cross walls at every 30 or 40 yards distance, by which they support each other in a firm and strong manner.

In a country where there is great plenty of stones, piles may be driven in as deep as they will go, at about two or three feet distance; and when the foundation is sunk and levelled, large stones may be let down, which will bed themselves: but care must be taken to lay them close, and so as to have no two joints over each other; and when the wall is come within reach, the stones must be crampt together.

139 Another method with coffers. Another method practised is to build in coffers much after the same manner as has been done in building the piers of Westminster bridge; but as in this case the ends of the coffers are left in the wall, and prevent their joining

Practice. joining so well as to be water tight, the water that penetrates through and enters into the corps may occasion the wall to burst and to tumble down. Another inconveniency arising from this manner of building is, that as there are but few places without worms, which will destroy wood wherever they can find it; by their means the water is let into the pier, and consequently makes the work liable to the same accident as has been mentioned above.

140 Russian method. To prevent these inconveniences, the best method is to take the wood away, and joggle the ends of the walls together with large stones, pouring terrass mortar into the joints; when this is done, the water between the two walls may be pumped out, and the void space filled up with stone and shingle as usual; or if these joggles cannot be made water tight, some dove-tail piles must be driven at each end as close to the wall as can be done, and a strong sailcloth put on the outside of them, which, when the water is pumped out, will stick so close to the piles and wall, that no water can come in. This method is commonly used in Russia.

141 Thickness of piers. The thickness of a pier depends on two considerations: it ought to be both such as may be able to resist the shock of the waves in stormy weather; and also to be of a sufficient breadth above, that ships may be laden or unladen whenever it is though necessary. Now, because the specific gravity of sea water is about one half that of brick, and as 2 to 5 in comparison of stone; and since the pressure of stagnated water against any surface is equal to the weight of a prism of water whose altitude is the length of that surface, and whose base is a right-angled isosceles triangle, each of the equal sides being equal to the depth of the water; therefore a pier built with bricks, whose thickness is equal to the depth of the water, will weigh about four times as much as the pressure of the water against it; and one of stone of the same breadth, about six times and a quarter as much. Now this is not the force to be considered, since this pressure is the same within as without the pier: but it is that force with which the waves strike against the piers, and that depends on the weight and velocity of the waves, which can hardly be determined; because they vary according to the different depths of water, the distance from the shore, and according to the tides, winds, and other causes. Consequently the proper thickness of the piers cannot be determined by any other means than by experience. Practi

Practitioners suppose, that if the thickness of a pier is equal to the depth of the water, it is sufficient; but for a greater security they allow 2, 3, or 4 feet more. This might probably do, if piers were built with solid stones crampt together; but as this is hardly ever the case, and on the contrary, as the inside is filled up with shingle, chalk, or other loose materials, their rule is not to be depended upon; besides it makes the space above too narrow for lading and unlading the ships, unless in a great depth of water; so that it does not appear that their method can be followed, excepting in a very few cases where the water has but very little motion.

When stone can be had, no other materials should be used, because they being of a larger bulk than brick, will better resist the waves by their own weight, till such time as the mortar is grown hard; for after this is effected, brick will resist better against the action of sea water than soft stones.

The wall must be built with terrass mortar from the bottom to the height of low water mark, and the rest finished with cinder or tile-dust mortar, which has been found sufficiently good in those places where the wall is wet and dry alternately. The upper part of the pier should be paved with flat hewn stones laid in strong mortar, in order to prevent any water from penetrating into it: iron rings ought also to be fixed here and there at proper distances, to fasten the ships, and prevent them from striking against the pier when agitated by the waves.

Wooden fenders or piles should be driven at the inside close to the wall, and crampt to it with iron, to prevent the ships from touching them, and from being worn by the continual motion. Where the sea breaks against the piers with great violence, breakers should be made at proper distances; that is, two rows of piles are driven nearly at right angles to the piers for the length of about 12 or 15 feet, and at about 8 or 10 feet distant from each other; and then another to join the two former: these piles being covered with planks, and the inside being filled with shingles and ruble stones, then the top is paved with stones of about a foot in length, set longwise to prevent the waves from tearing them up. This precaution is absolutely necessary where the water rushes in very strongly.

A R C

Architecture ‖ Architriclinus. *Military* ARCHITECTURE, the same with what is otherwise called *fortification*. See FORTIFICATION.

Naval ARCHITECTURE, the art of building ships. See *SHIP-Building*.

ARCHITRAVE, in *Architecture*, that part of a column which lies immediately upon the capital, being the lowest member of the entablature. See Plate XXXIX.

Over a chimney, this member is called the *mantle-piece*; and over doors or windows, the *hyperthyron*.

ARCHITRICLINUS, in antiquity, the master or director of a feast, charged with the order and economy of it, the covering and uncovering of the tables, the command of the servants, and the like.

The architriclinus was sometimes called *servus triclinarcha*, and by the Greeks προγευστης, i. e. *prægustator*, or *foretaster*. Potter also takes the architriclinus for the same with the symposiarcha.

ARCHIVAULT, in *Architecture*, implies the interior contour of an arch, or a band adorned with mouldings, running over the faces of the arch-stones, and bearing upon the imposts. It has only a single face in the Tuscan order, two faces crowned in the Doric and Ionic, and the same mouldings as the architrave in the Corinthian and Composite.

A R C

Architriclinus. Archivault

ARCHIVE,

Fig. 1.
The first sort of Huts.

Fig. 2.
The second sort of Huts.

Fig. 3. *The third sort of Huts which gave raise to the Doric Order.*

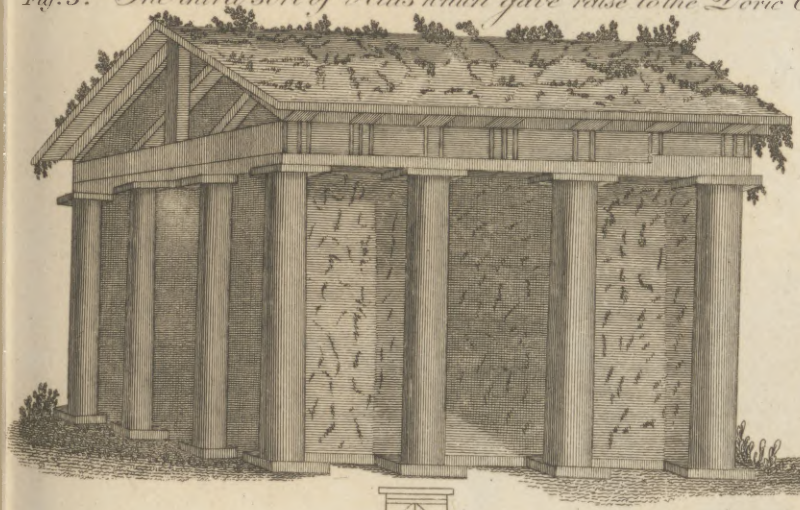
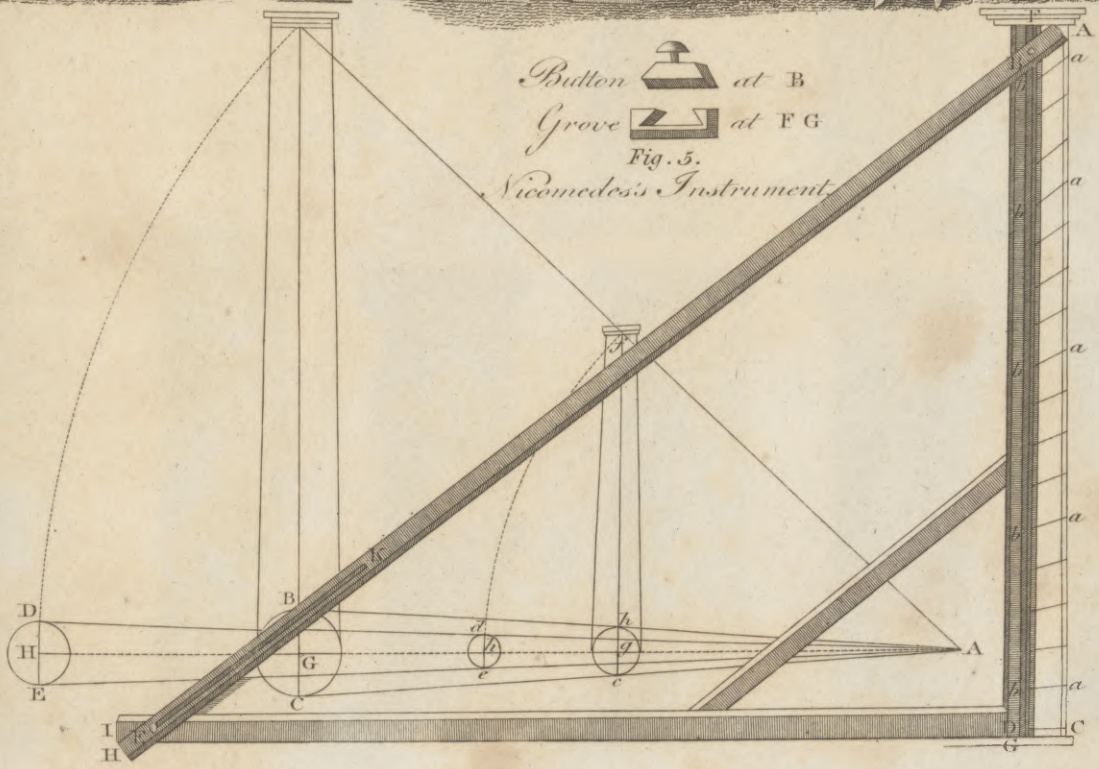


Fig. 4.
Origin of the Corinthian Order.

Button *at* B

Grove *at* F G

Fig. 5.
Nicomedes's Instrument.



W. Train Sculp.

ARCHITECTURE.

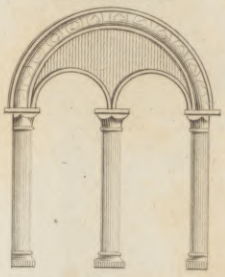
PLATE XXXVIII.

SAXON CAPITALS.

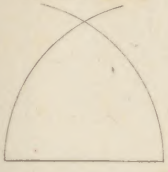
SAXON ARCHES.

SAXON ARCH.

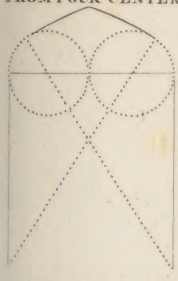
SAXON ARCH.



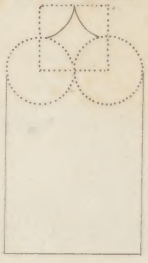
METHOD OF DESCRIBING A GOTHIC ARCH.



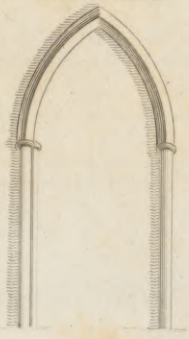
GOTHIC ARCH FROM FOUR CENTERS.



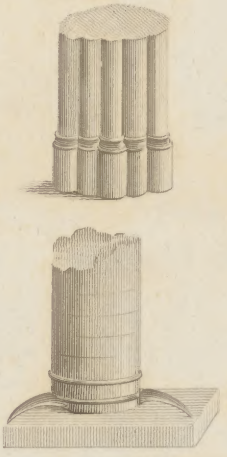
CONTRASTED GOTHIC ARCH.

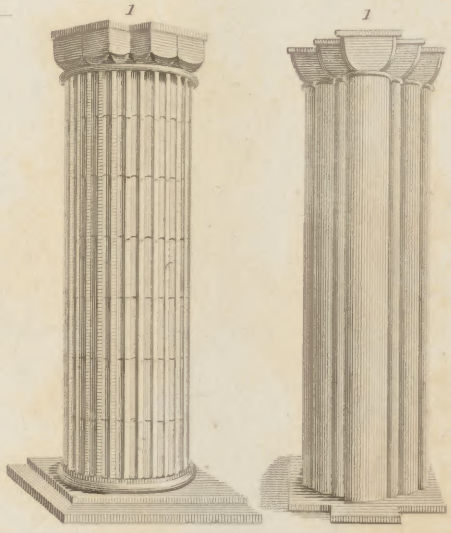


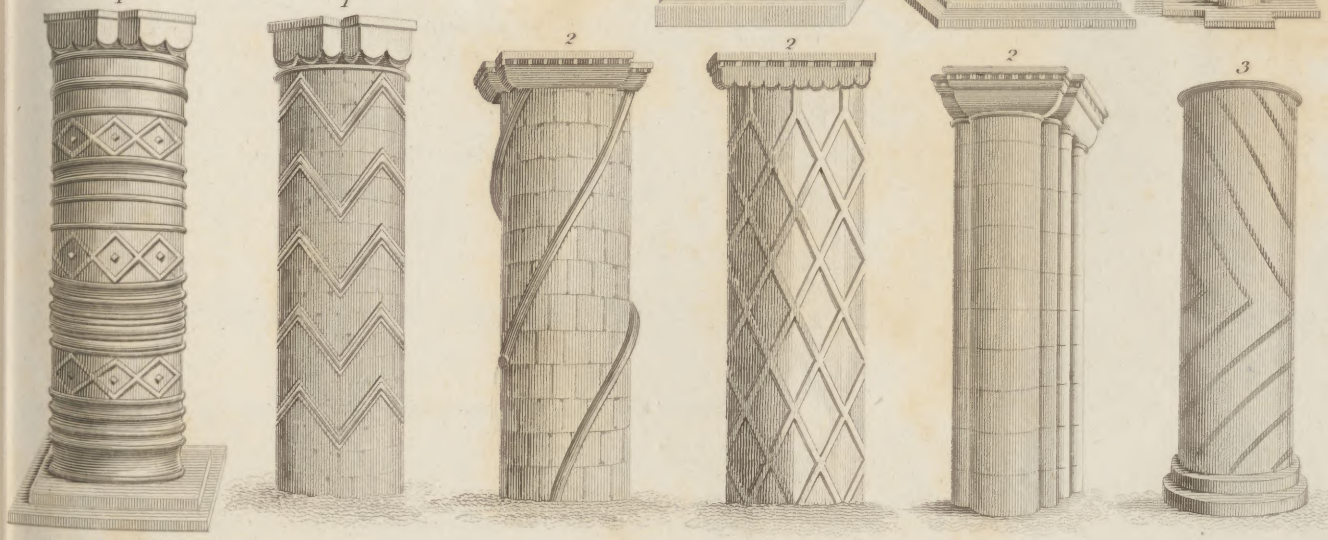
COMMON GOTHIC ARCH.



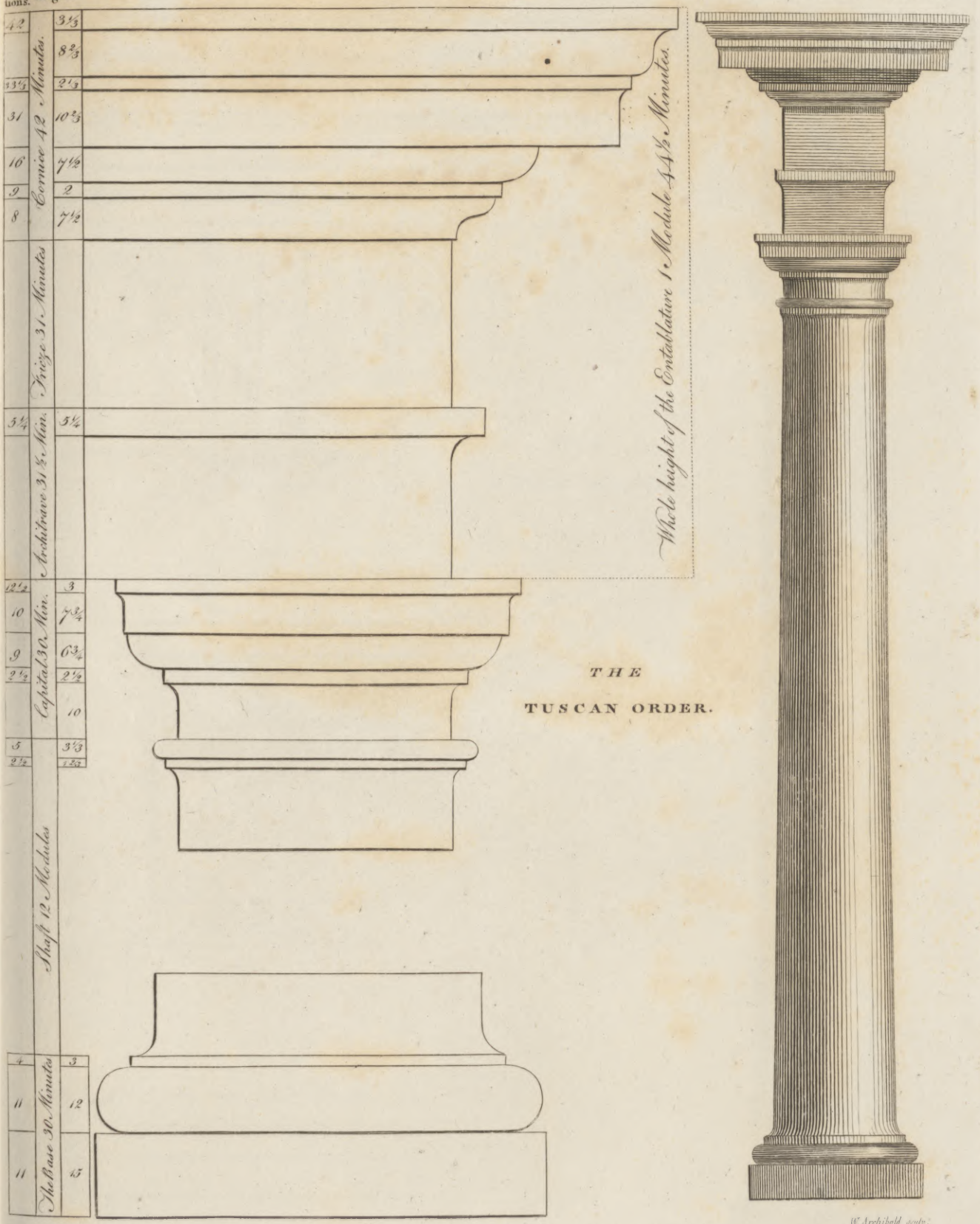
GOTHIC COLUM







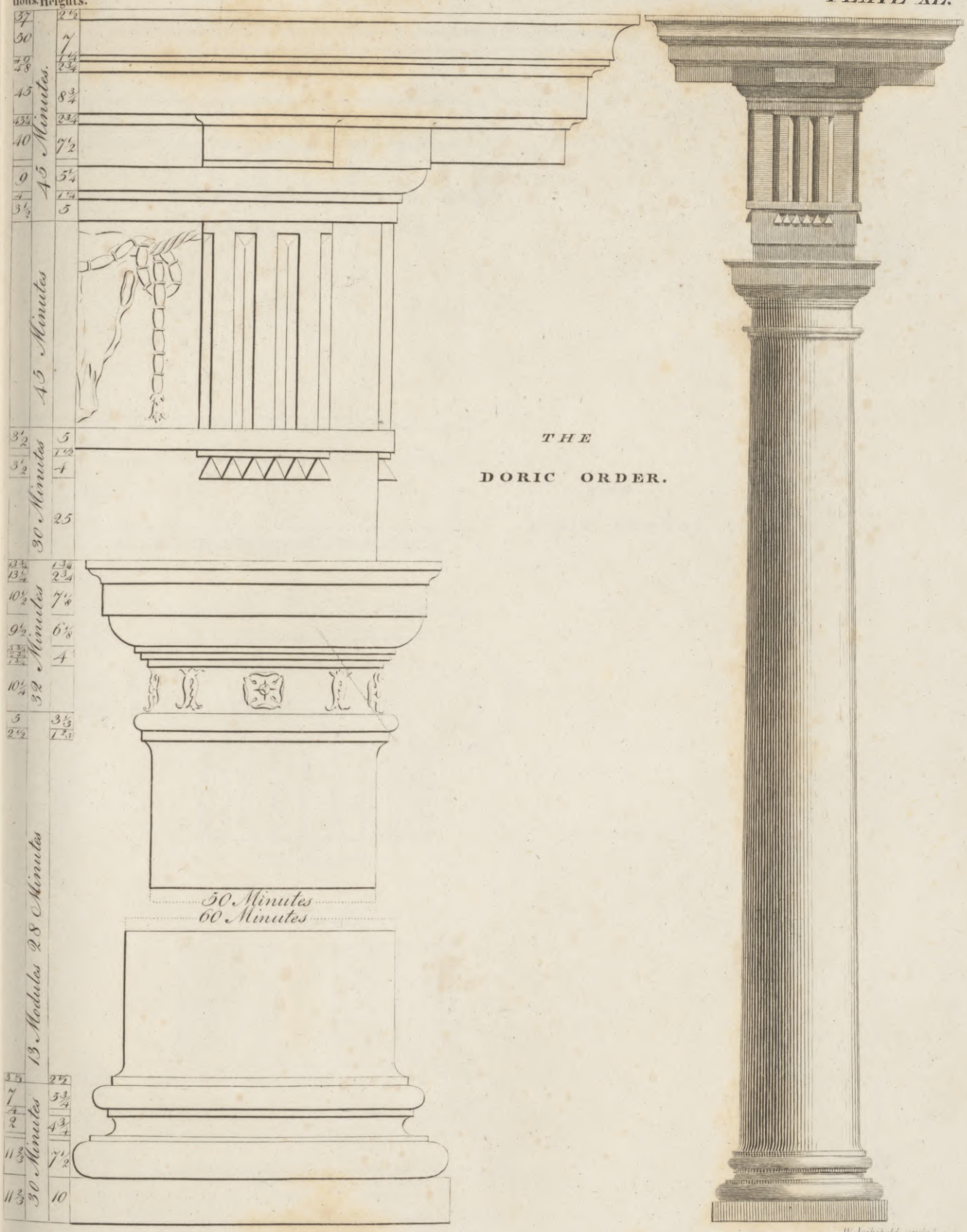
W. Archibald Sculpt



THE

TUSCAN ORDER.

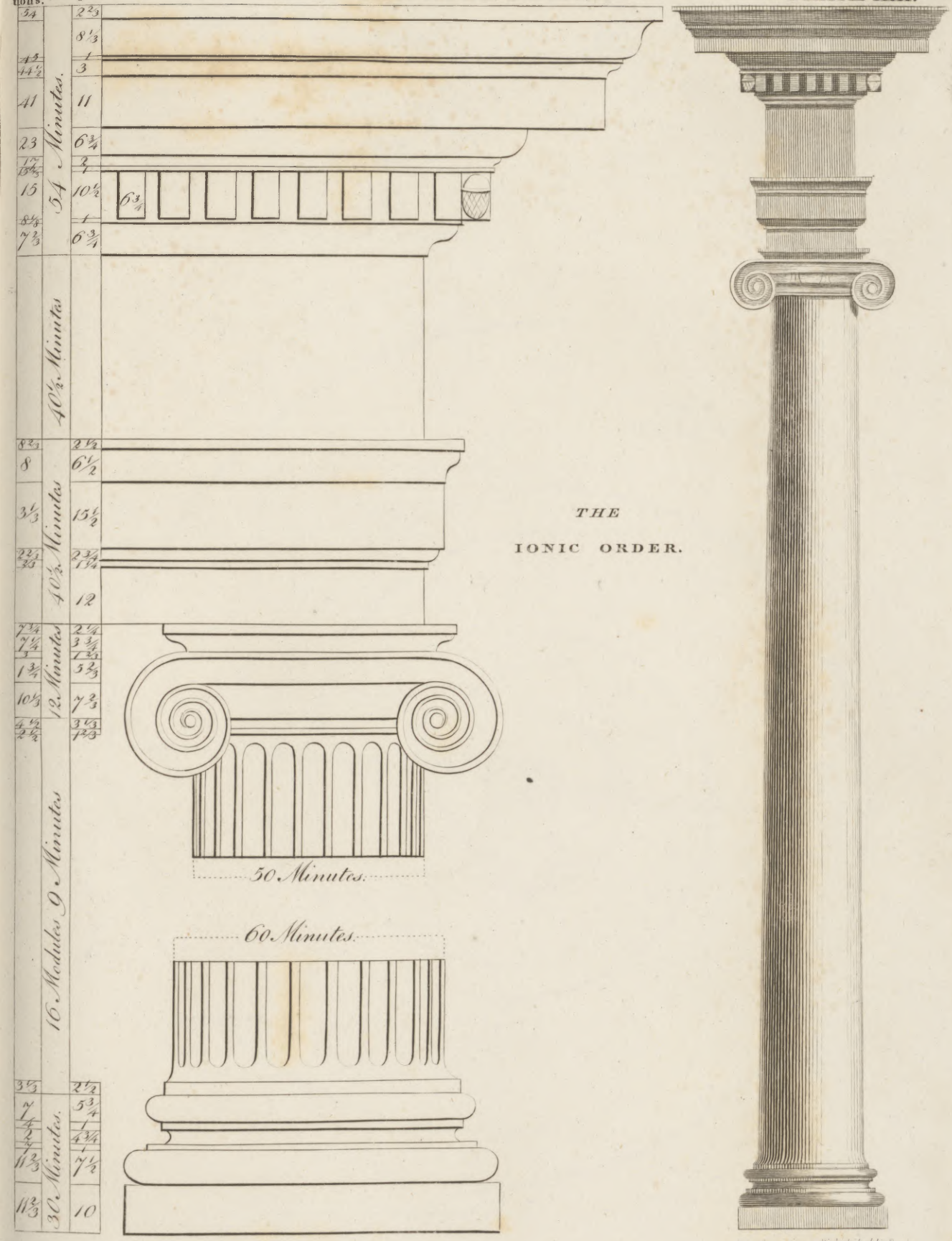
W. Archibald sculp.



THE

DORIC ORDER.

W. Archibald sculp.



THE

IONIC ORDER.

Fig. 1.
FILLET LIST

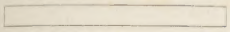


Fig. 2.
ASTRAGAL

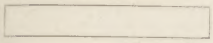


Fig. 3.
FORUS

Fig. 4.
SCOTIA MOUTH

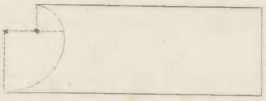


Fig. 5.
OVOLO

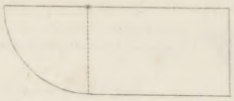


Fig. 6.
OGEE

Fig. 7.
CYMA RECTA

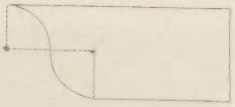


Fig. 8.
CAVETTO

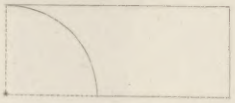
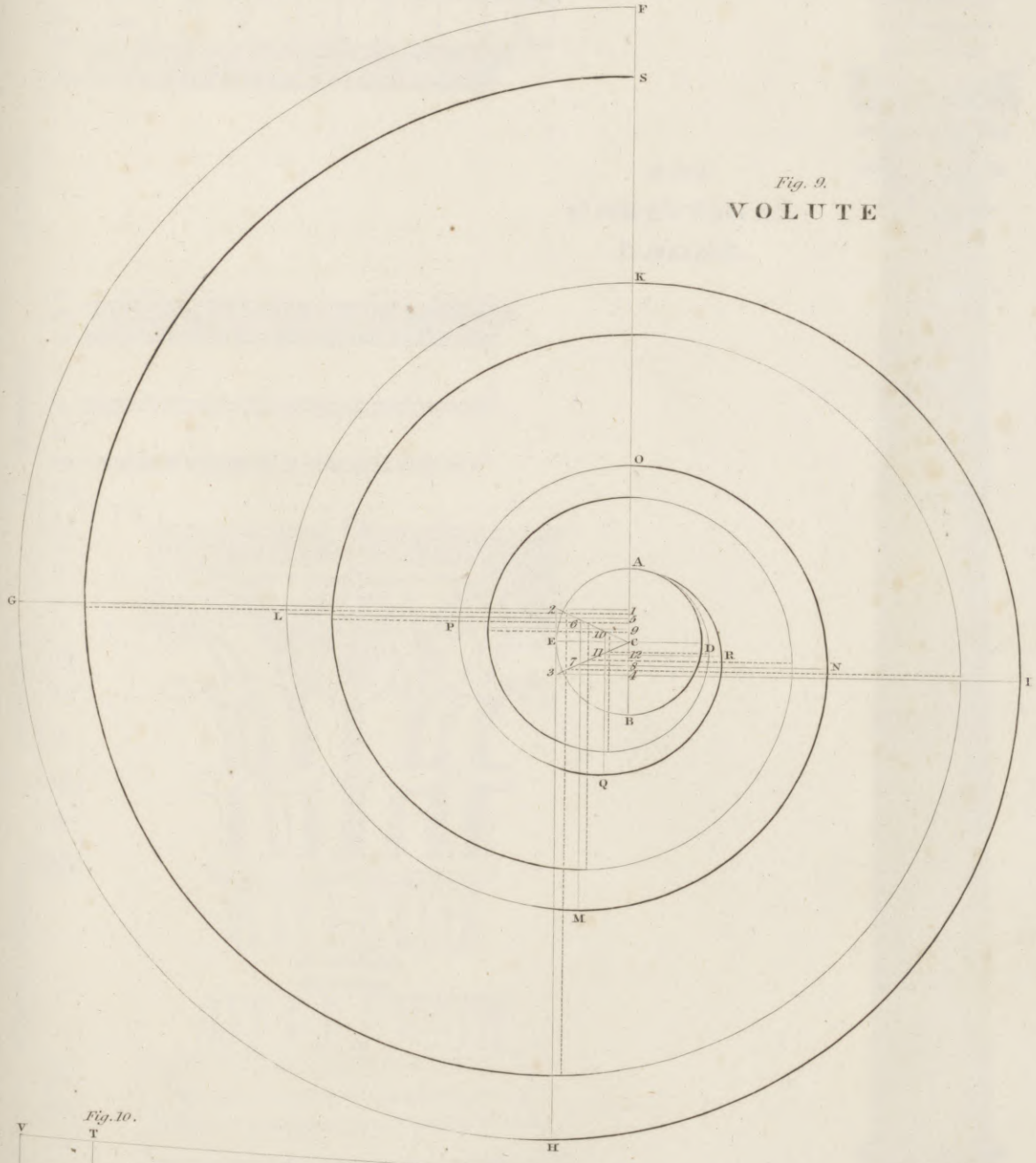


Fig. 9.
VOLUTE



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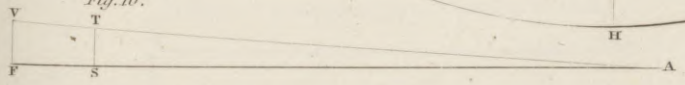
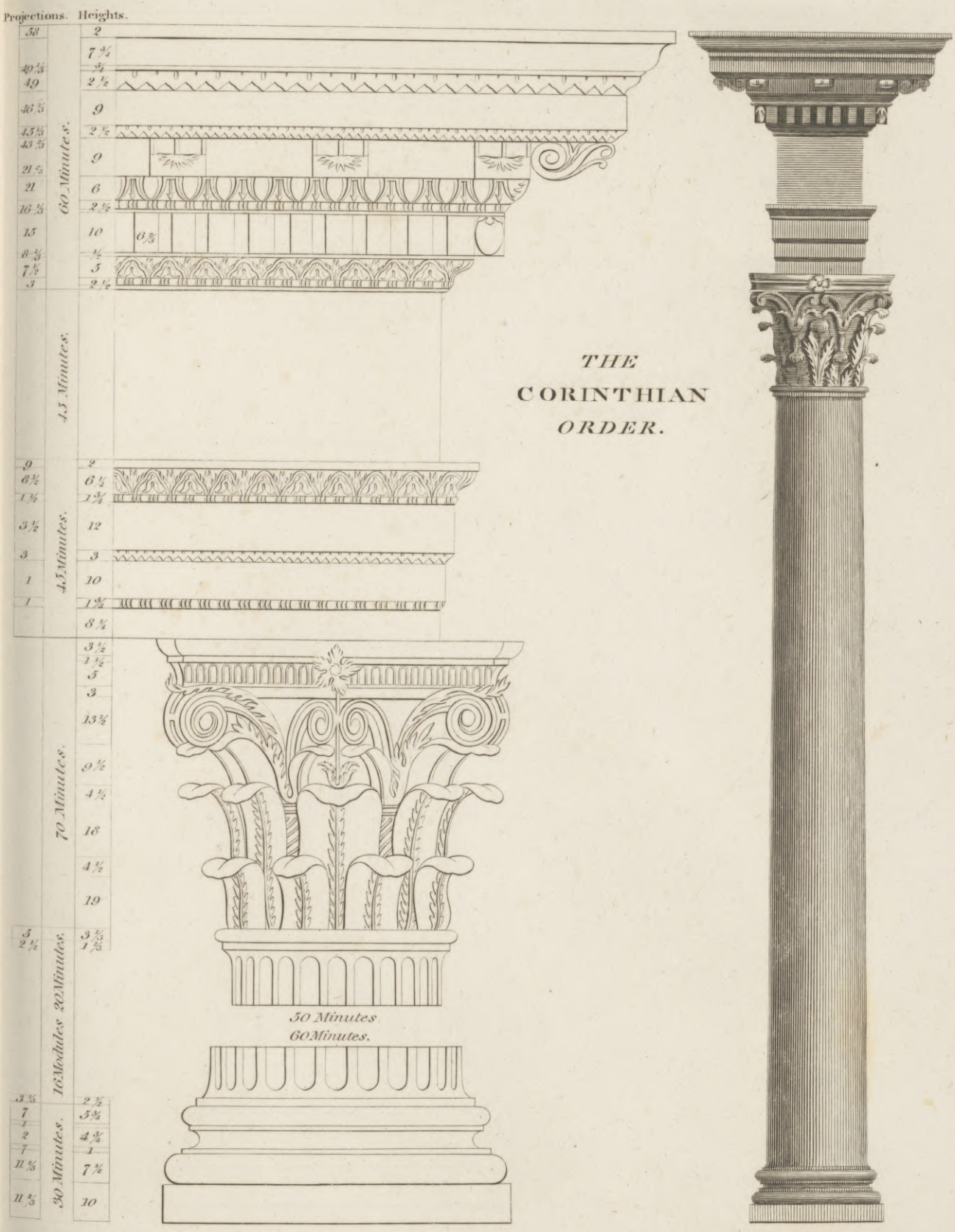
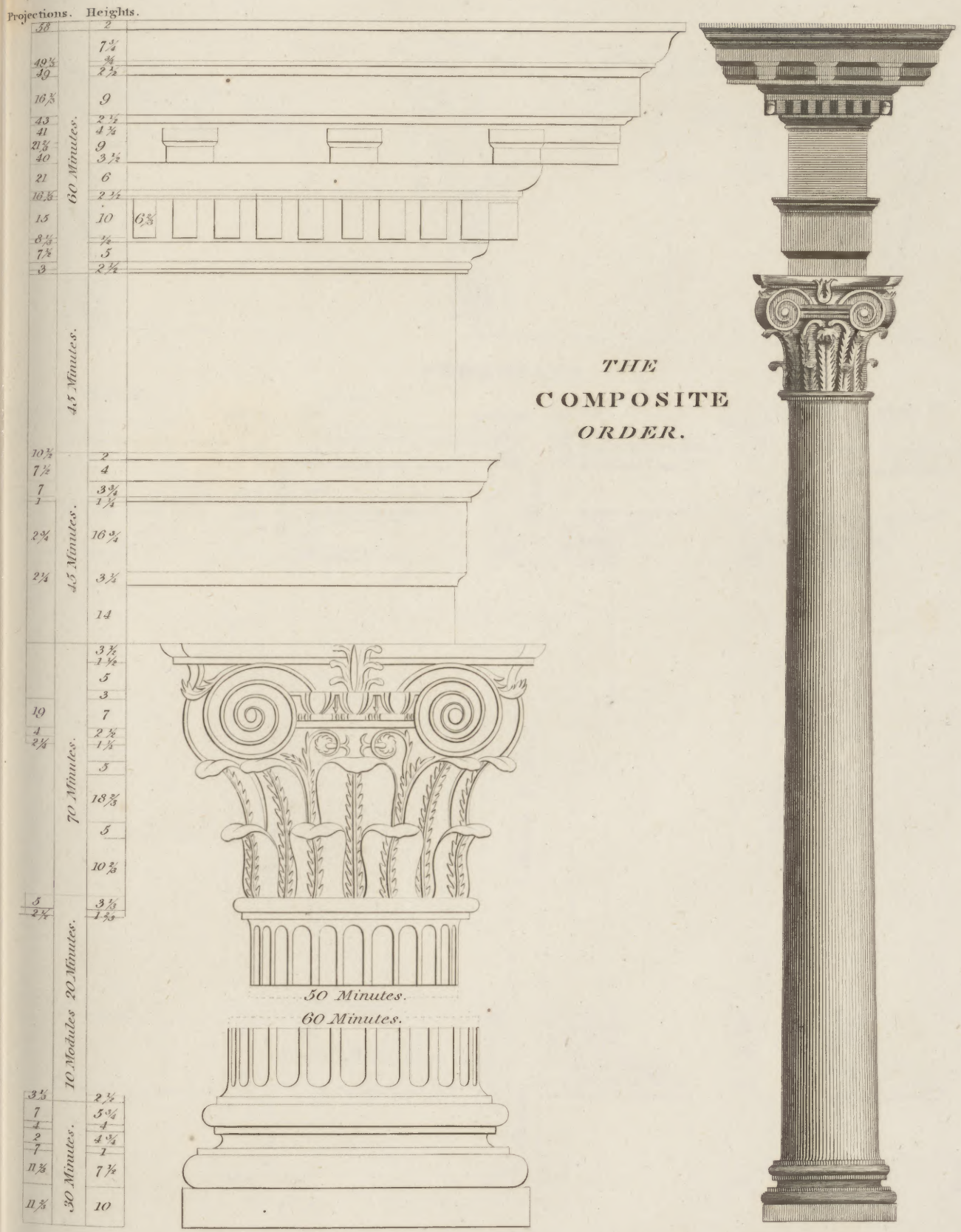


Ferrier sculp.



THE
CORINTHIAN
ORDER.

W. Archibald Sculpt



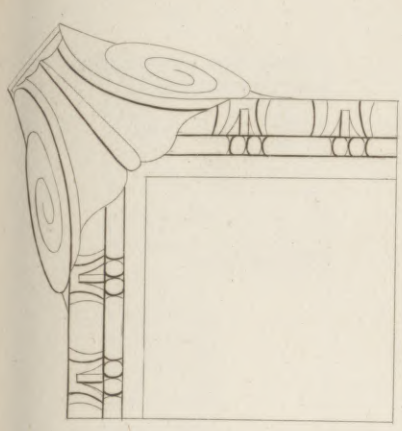
THE
COMPOSITE
ORDER.

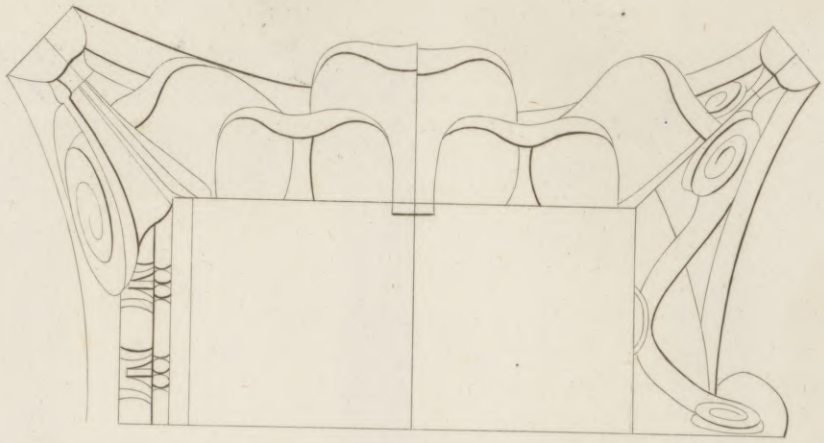
W. Archibald Sculpt

ARCHITECTURE.

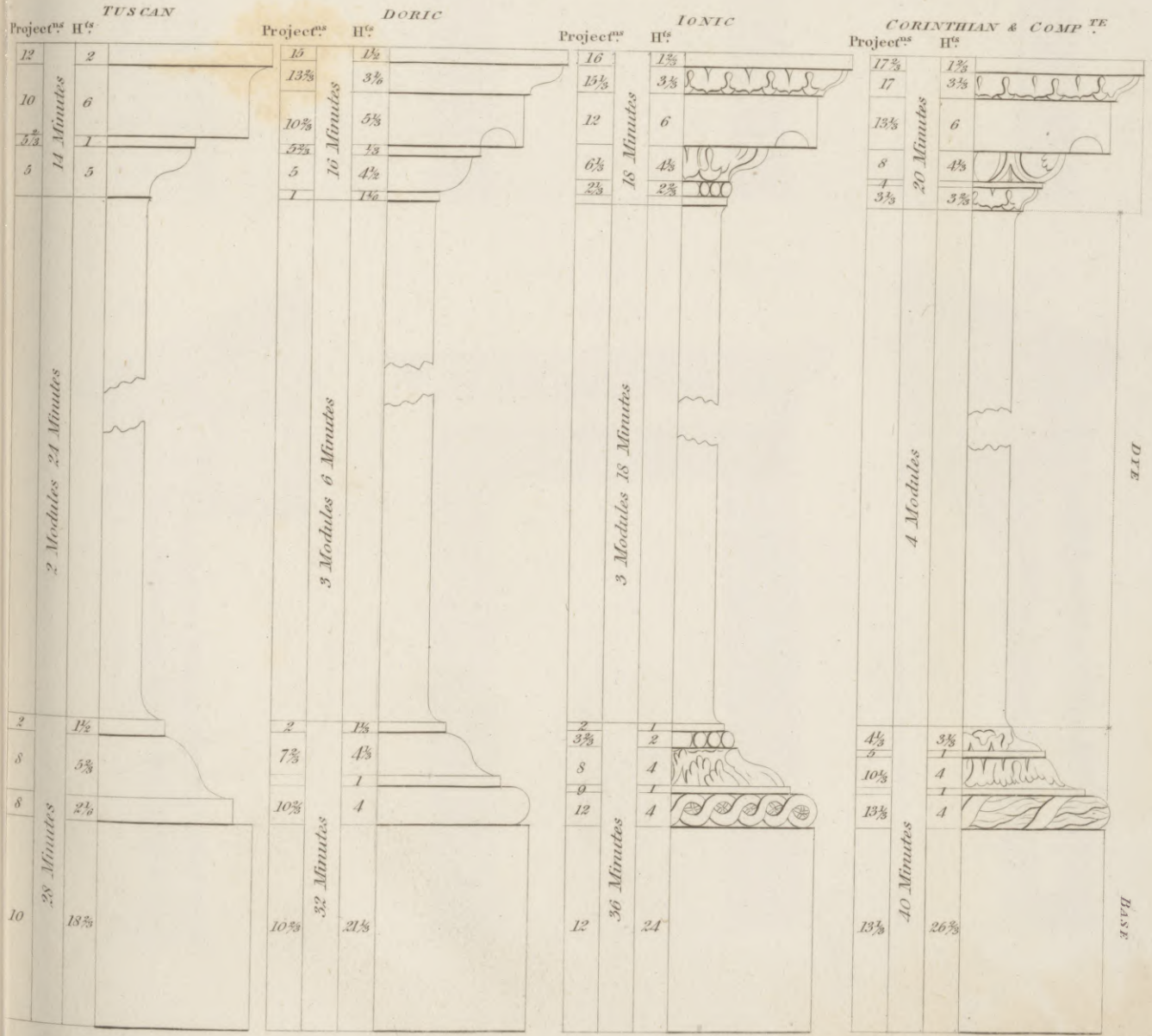
PLANS OF PILASTER CAPITALS.

PLATE XLV.



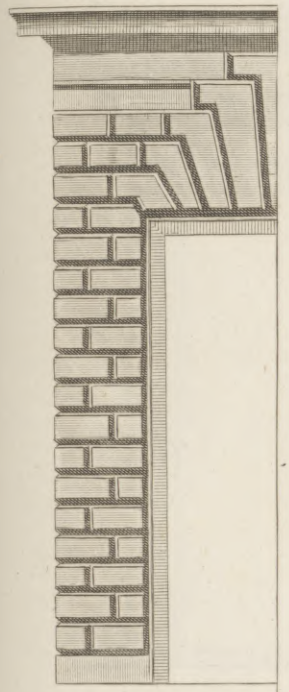


PEDESTALS



Ferrier sculpt

Fig. 1.



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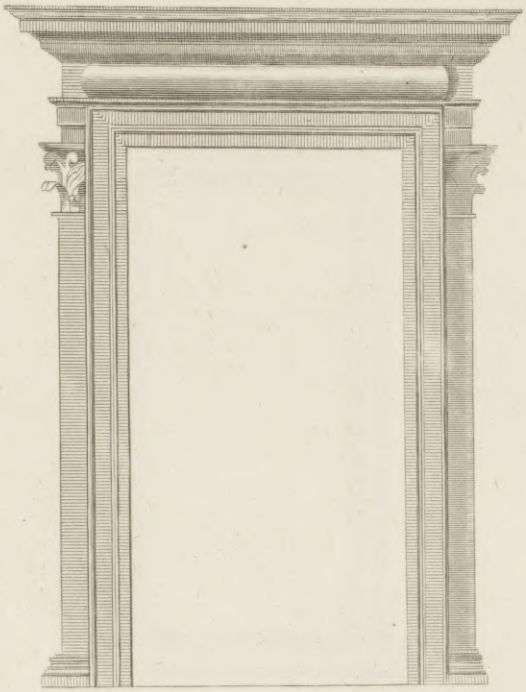

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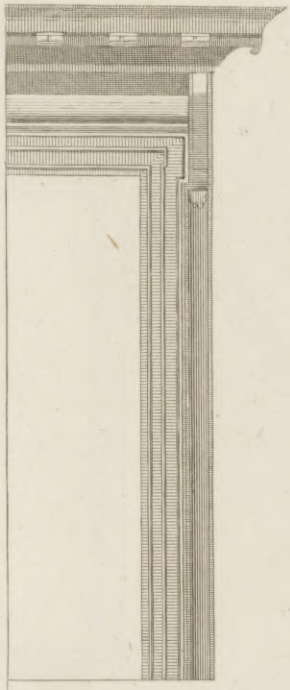
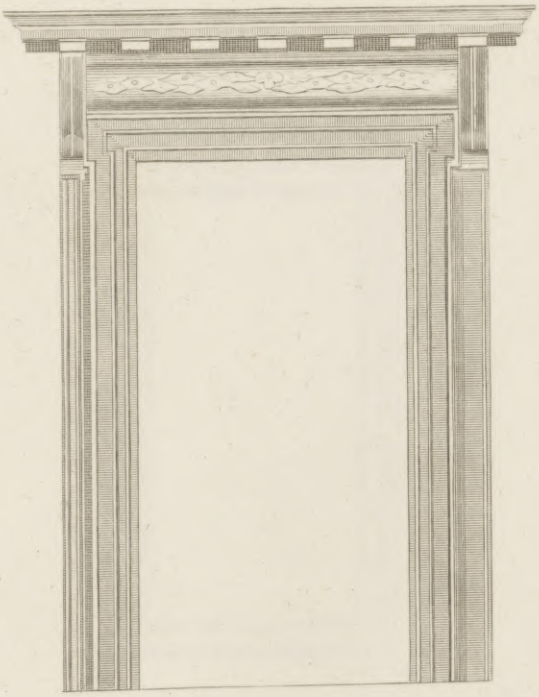


Fig. 4.

Fig. 5.



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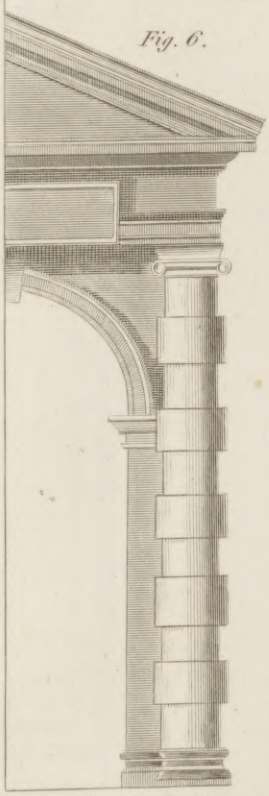
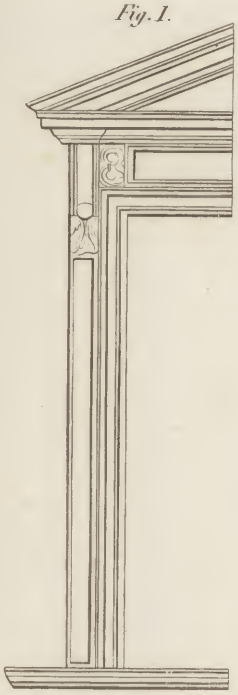


E. Mitchell Sculp.

Fig. 1.



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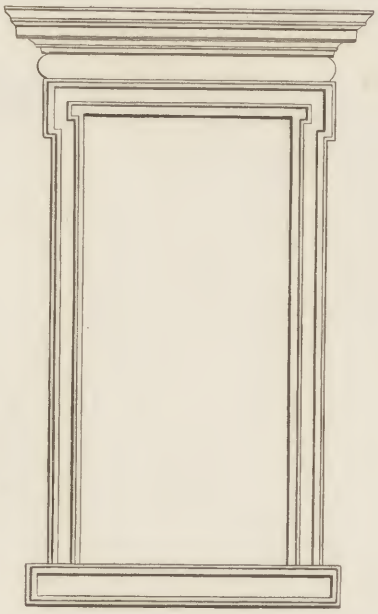

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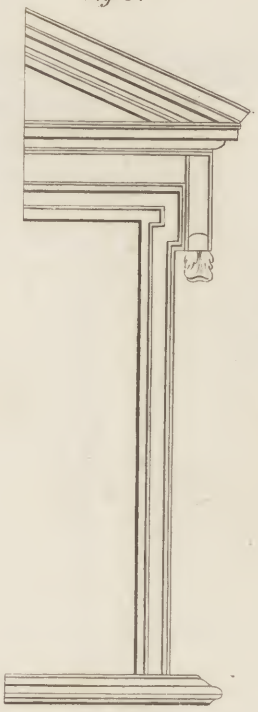

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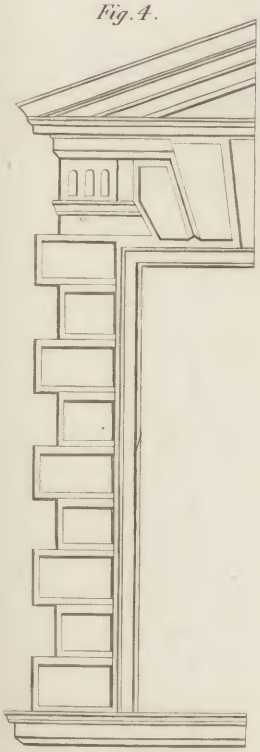

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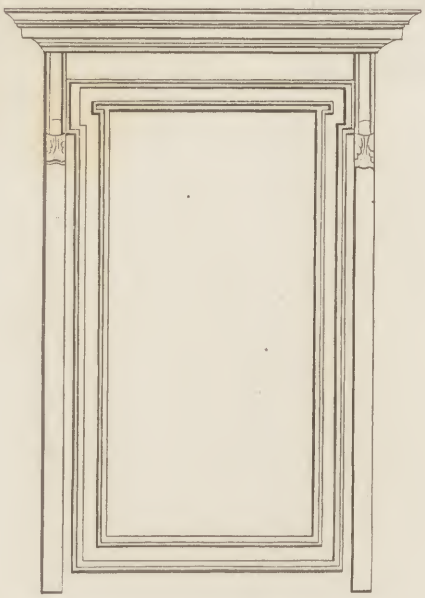

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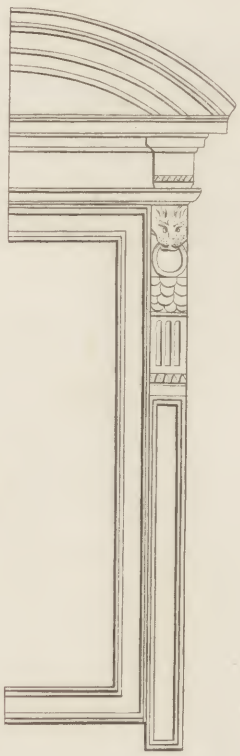

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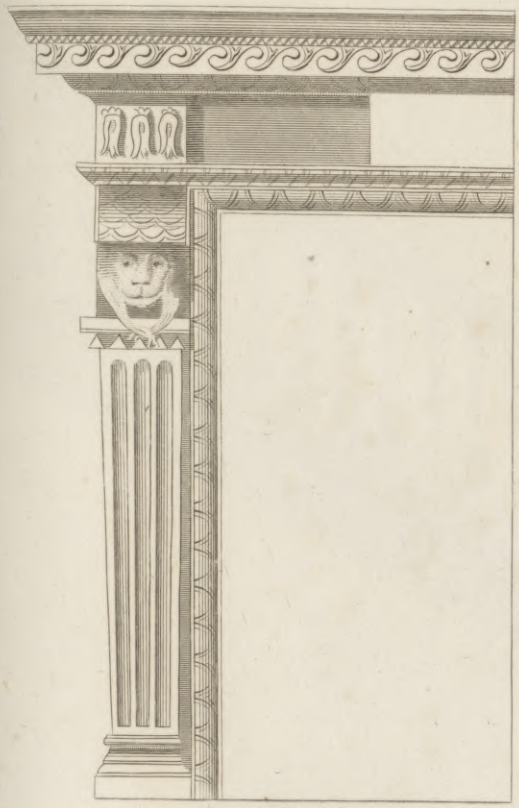

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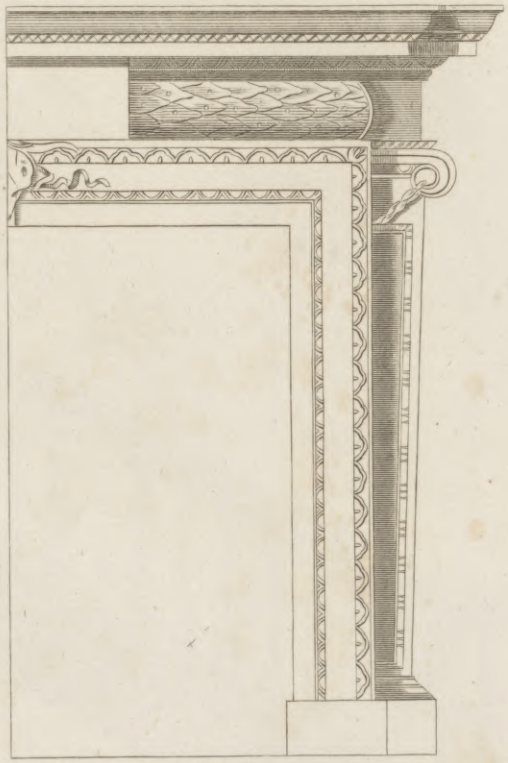
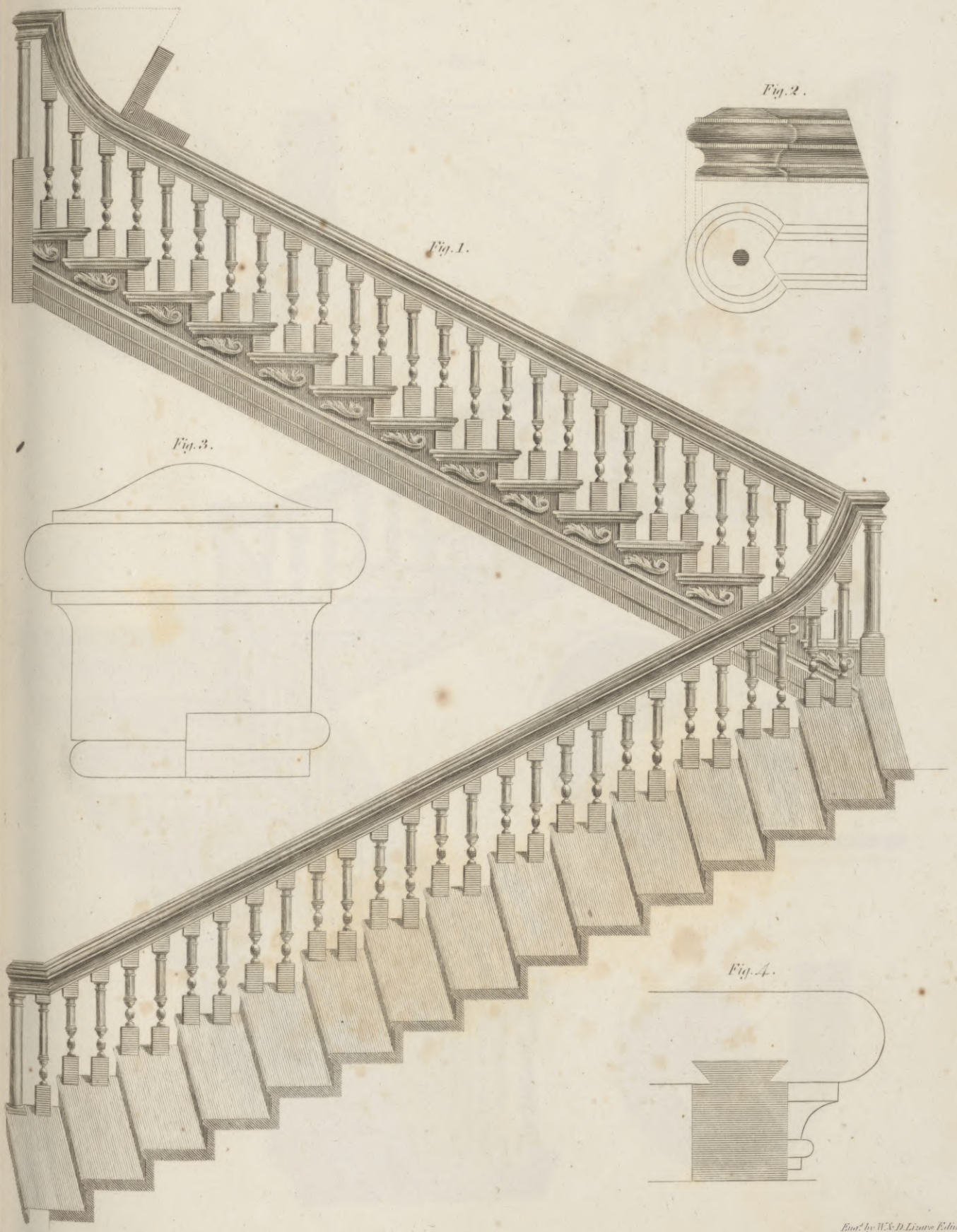


Fig. 3.

Fig. 4.

E. Mitchell sculp.t



Engd. by W.N. D. Lizars Edinr.

Fig. 1.

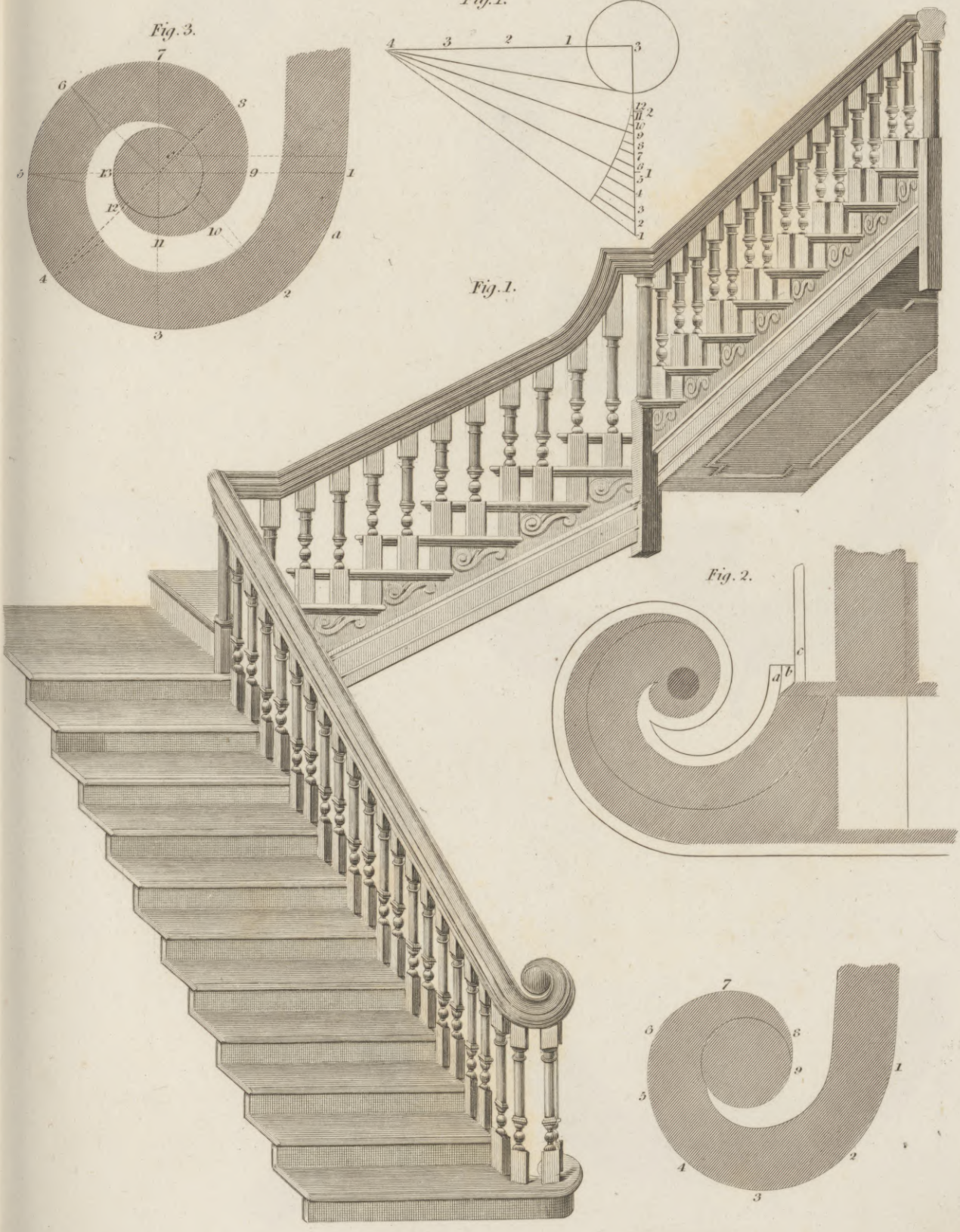


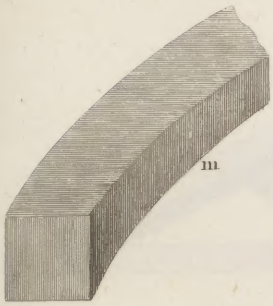
Fig. 2.

Fig. 3.

Fig. I.

Engraved by W. & D. Lizars Edin.r

Fig. 1.



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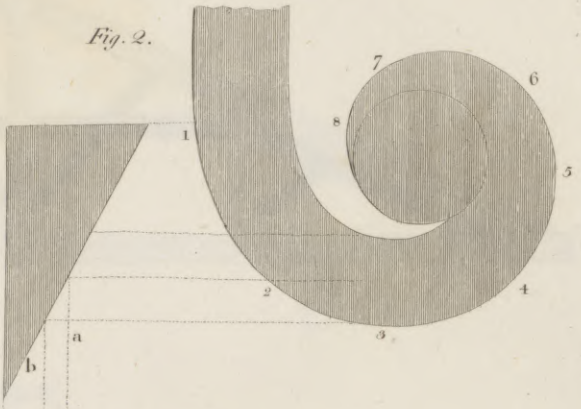

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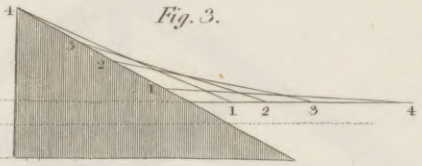

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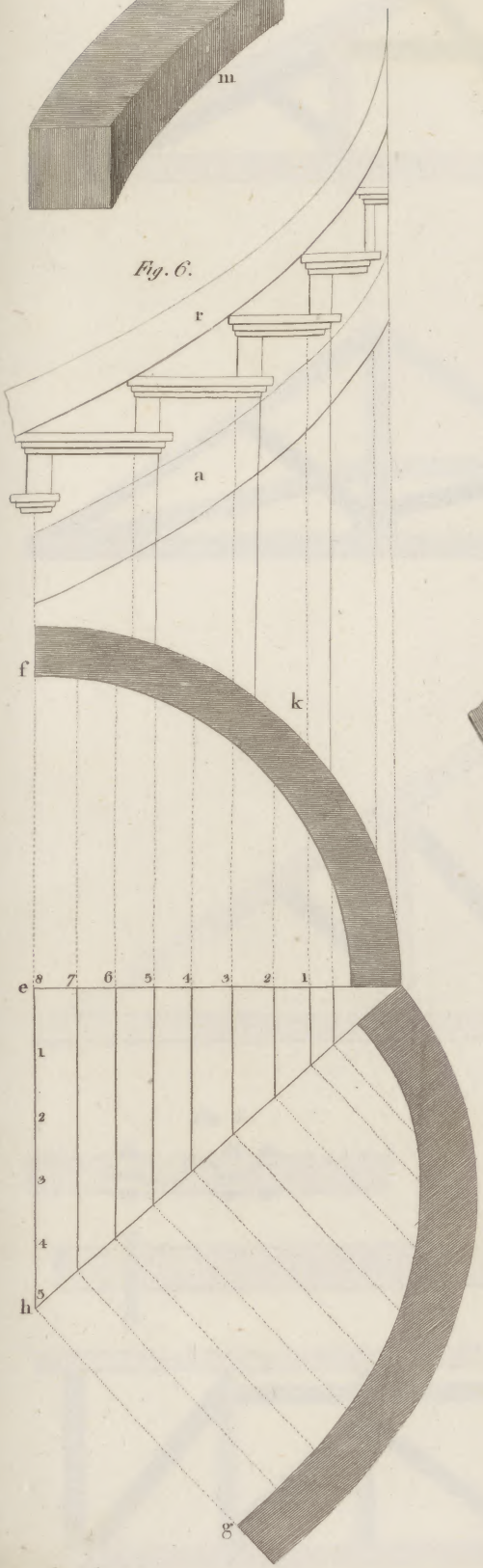

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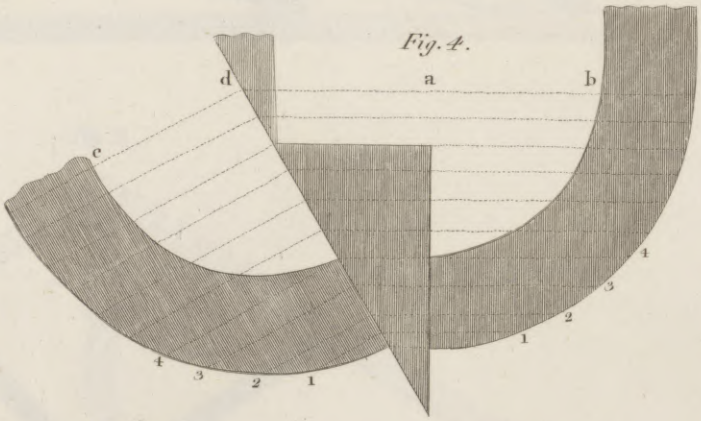

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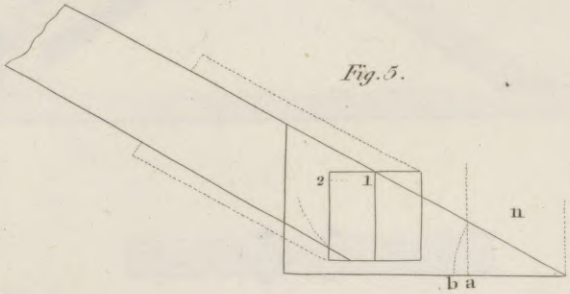

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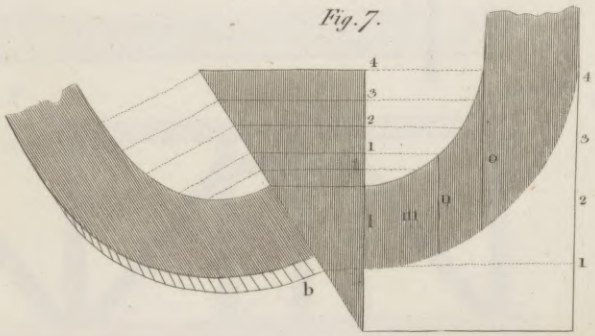

E. Mitchell, Sculp.t

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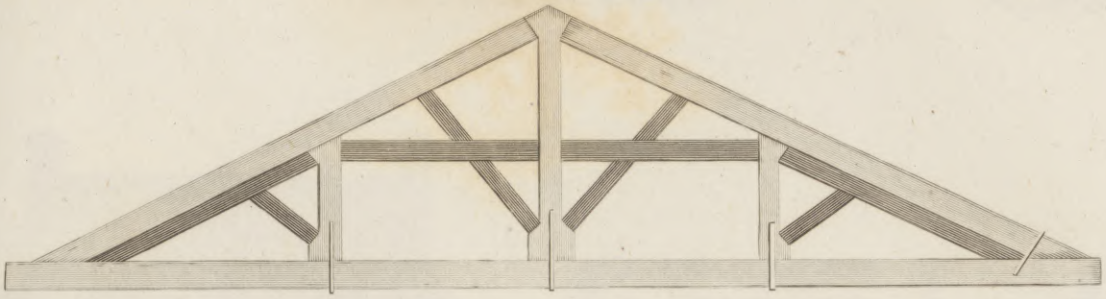

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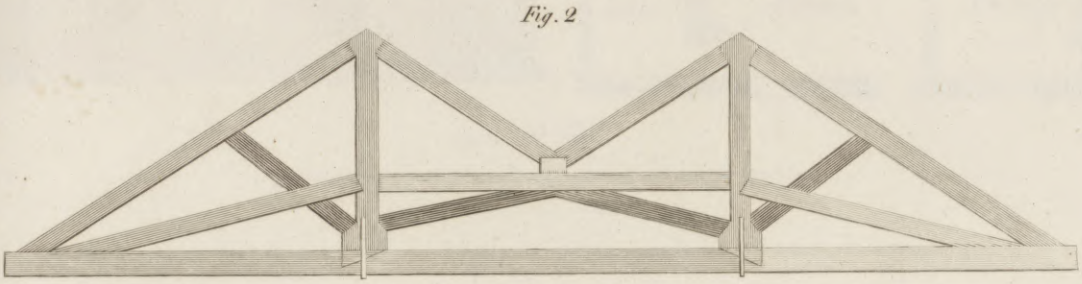

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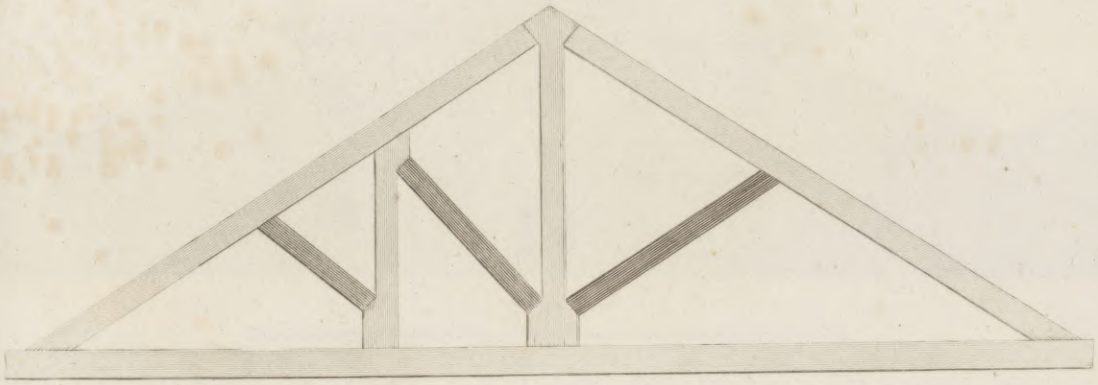

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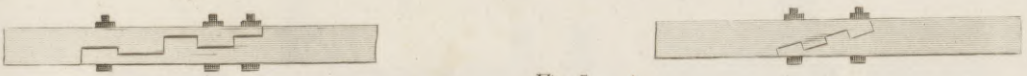

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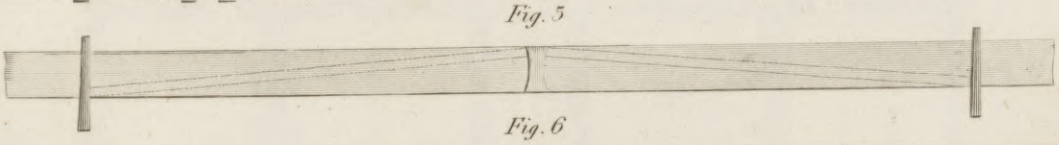

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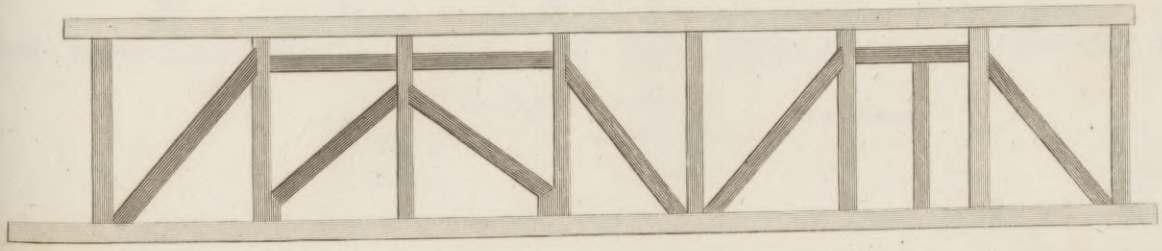
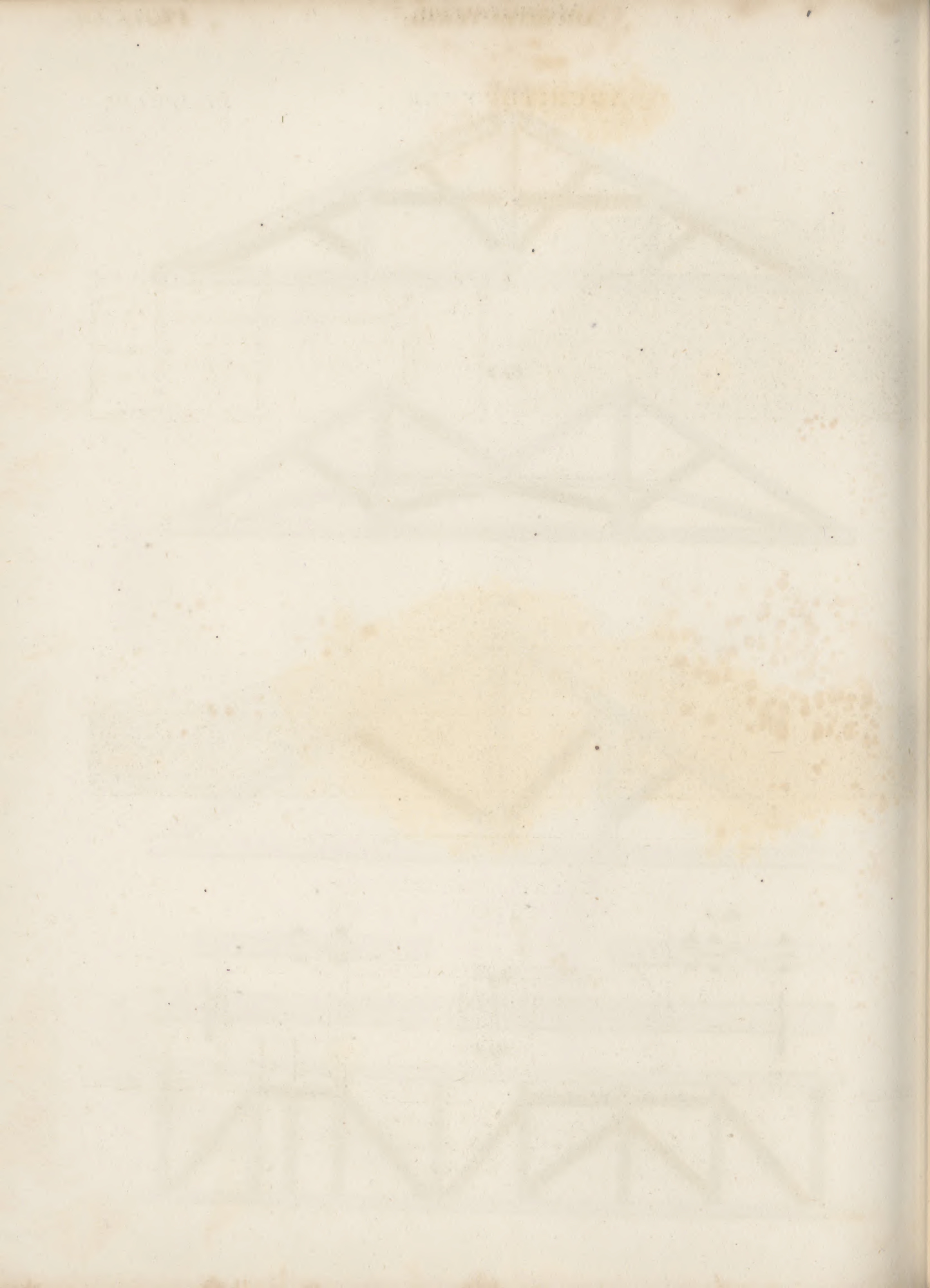


E. Mitchell, sculp.



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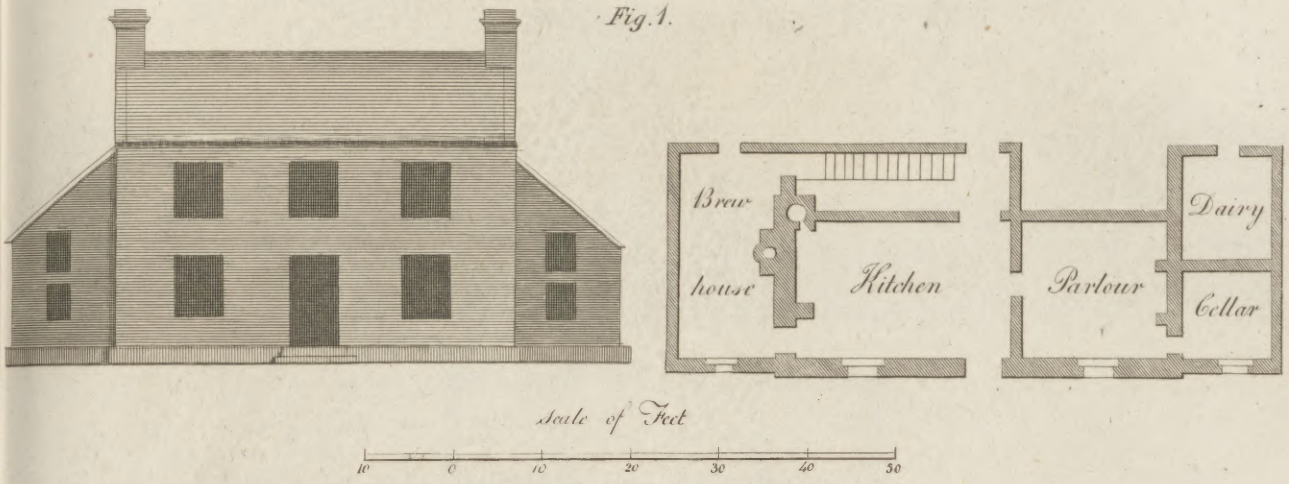

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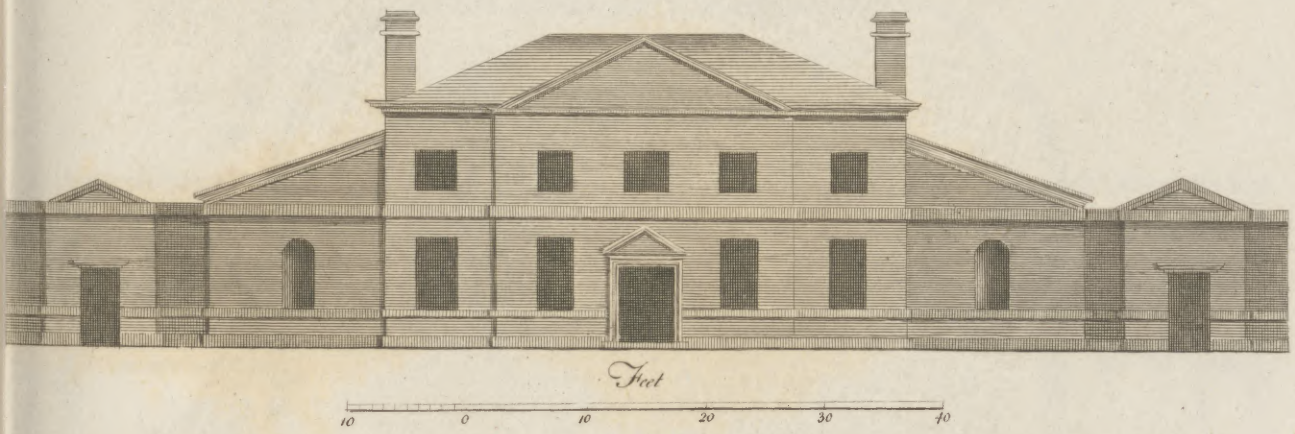
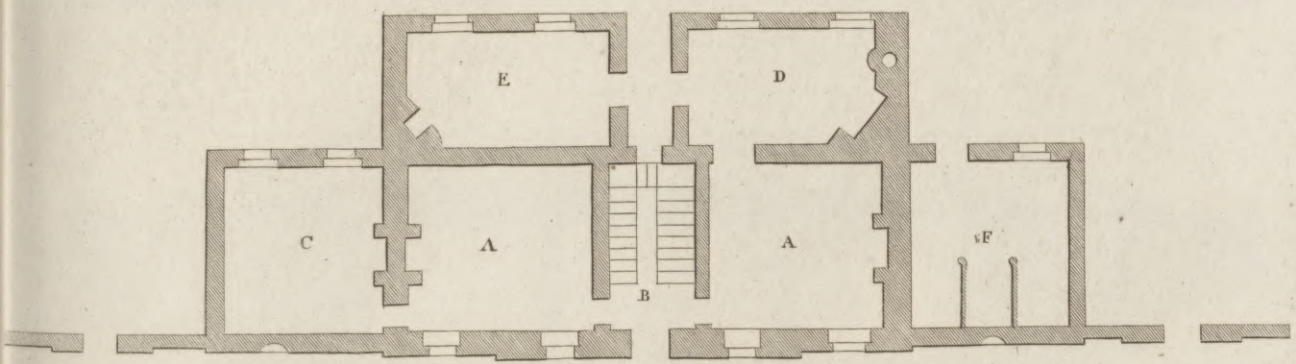
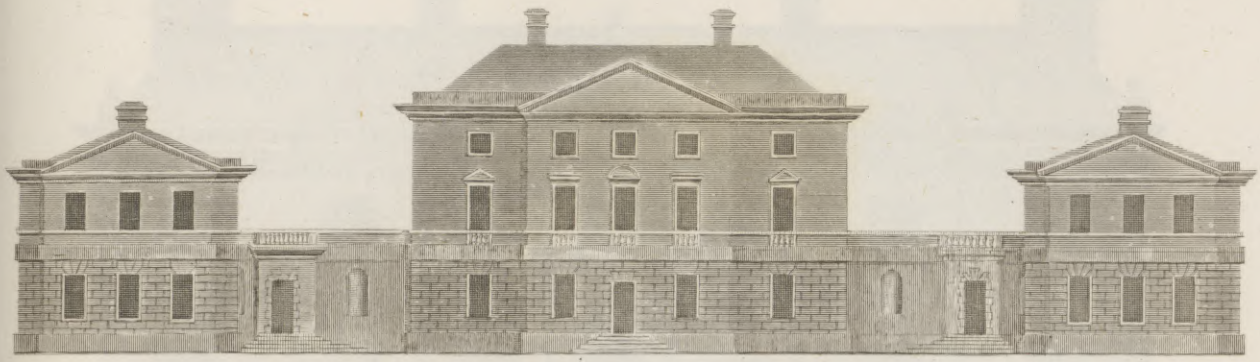
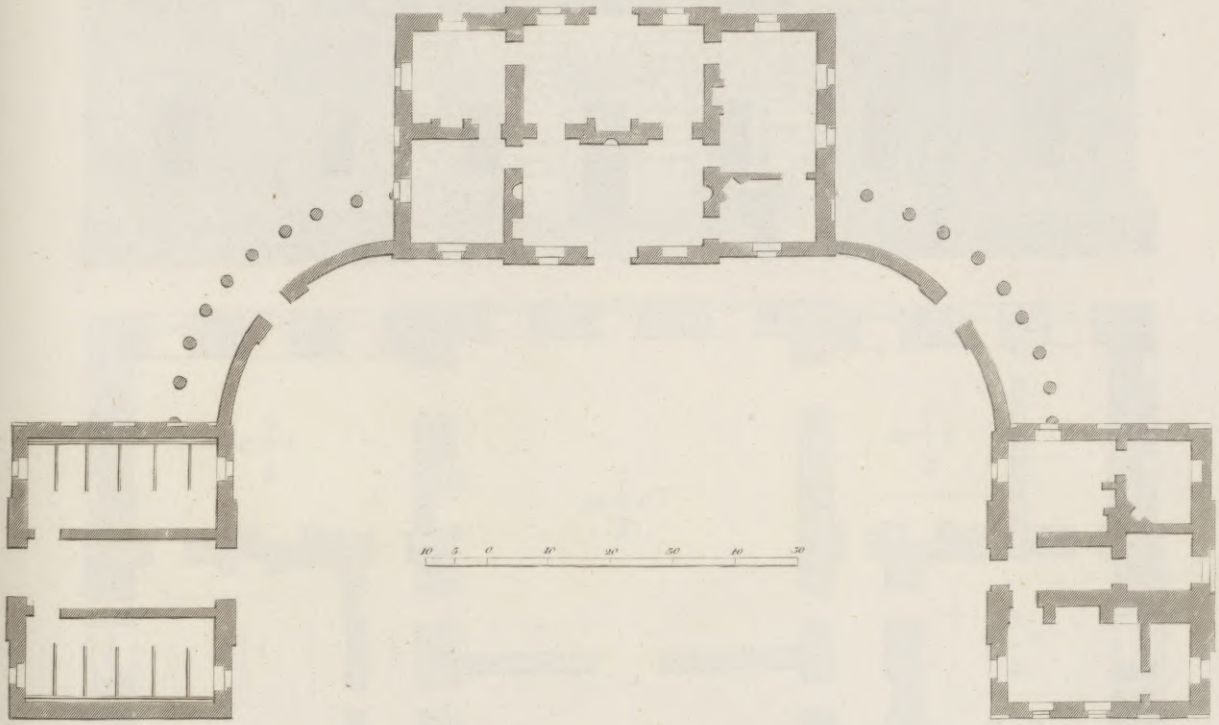




AA are two Parlours 15 feet square
B Stair Case
C Study
D Kitchen
E Wash house
F Stable
are Shades

W. Archibald Sculp.

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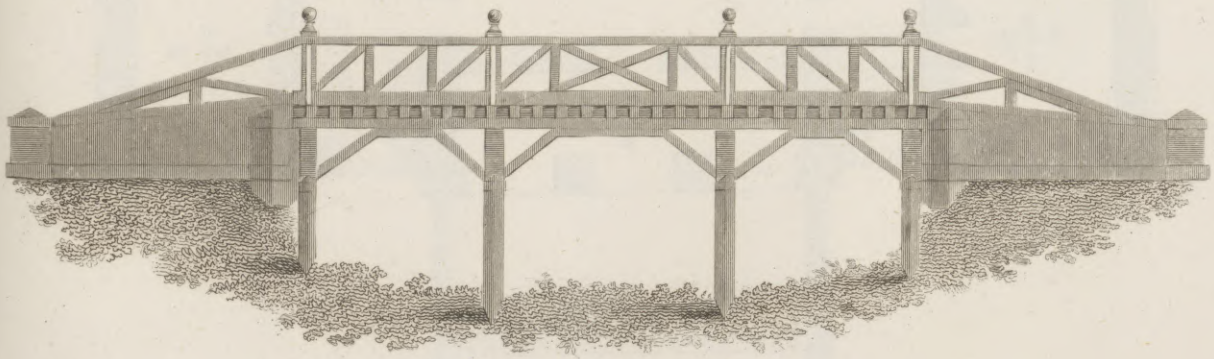
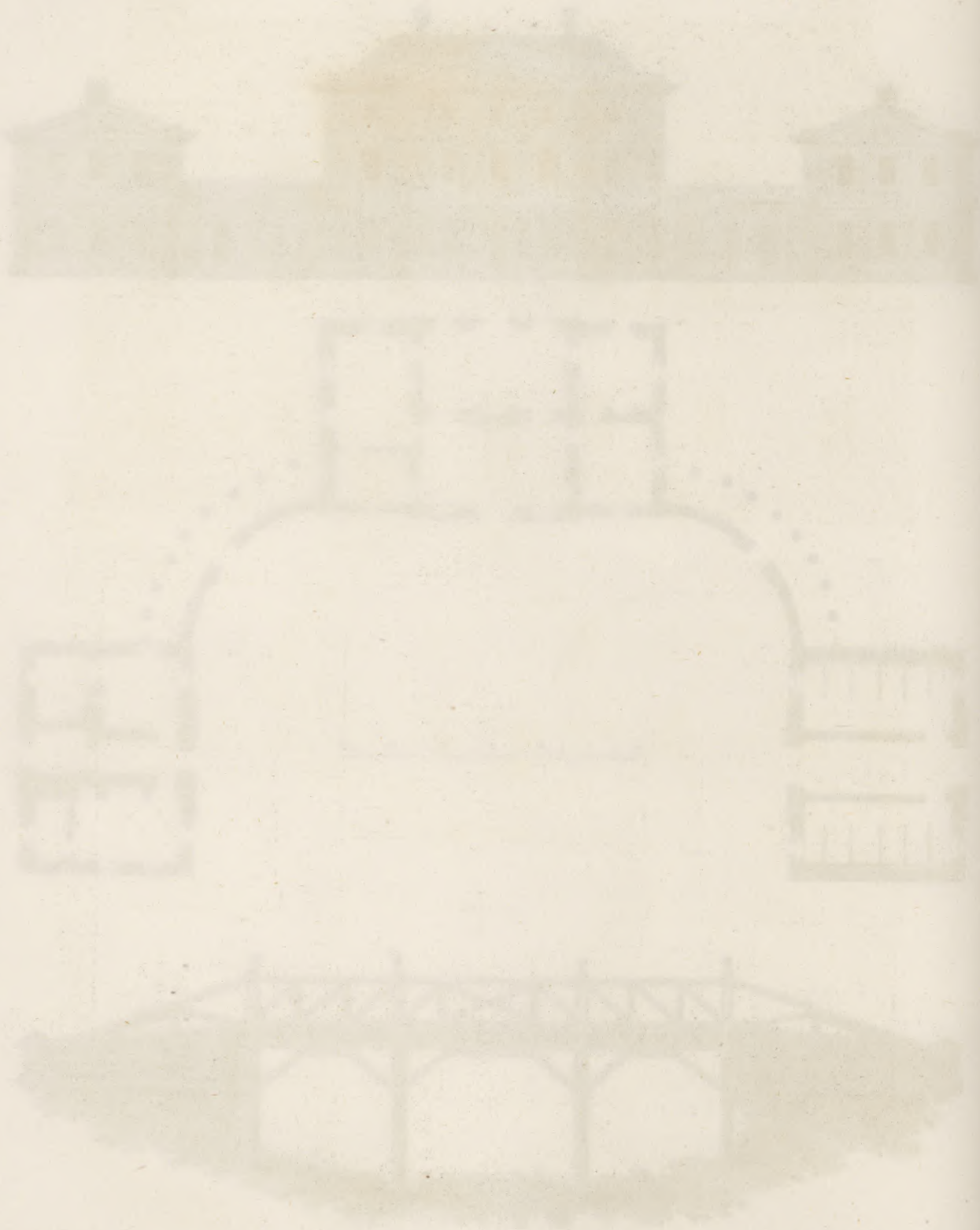
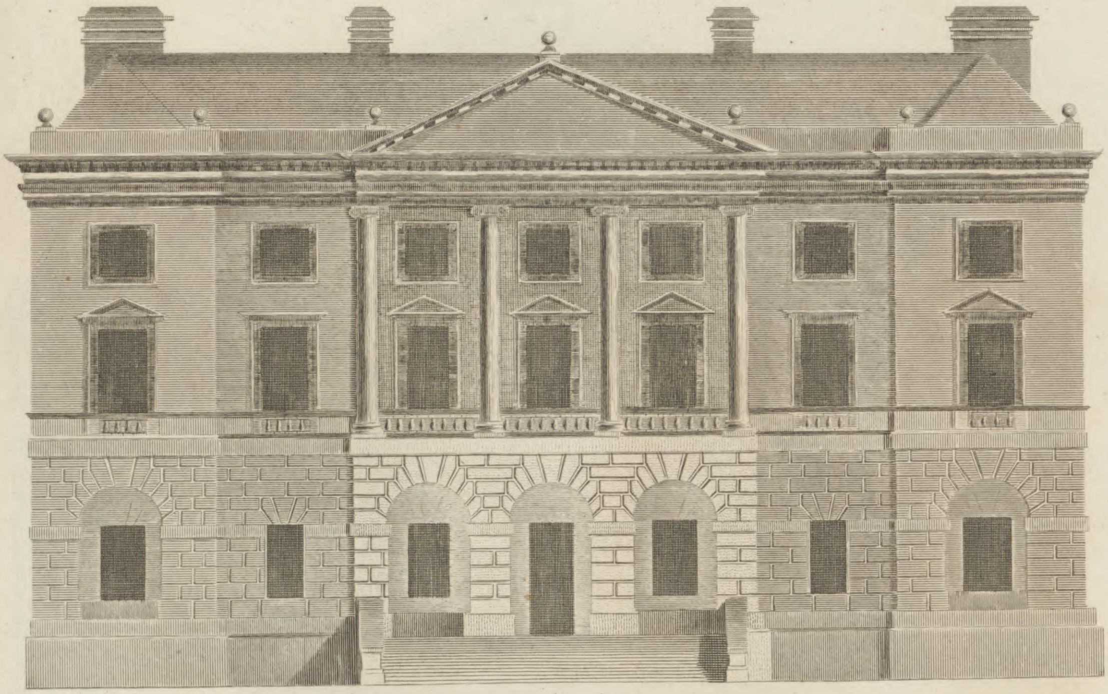
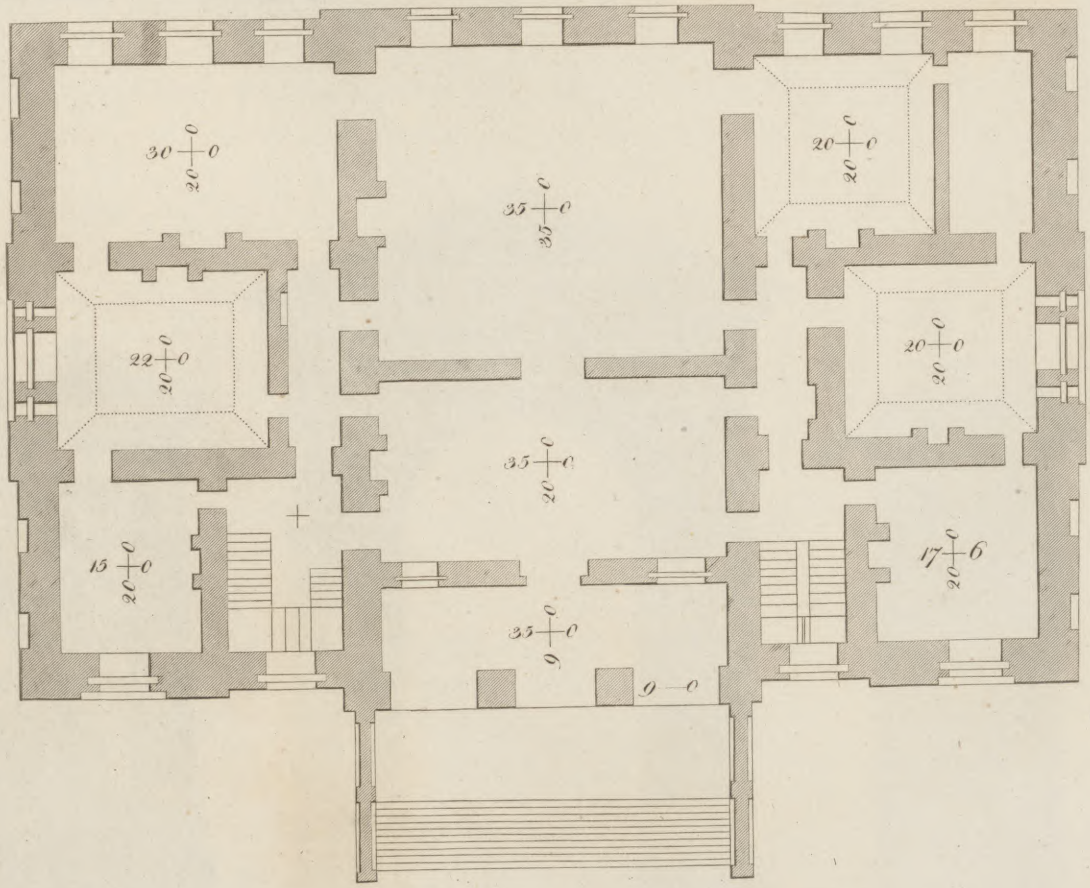








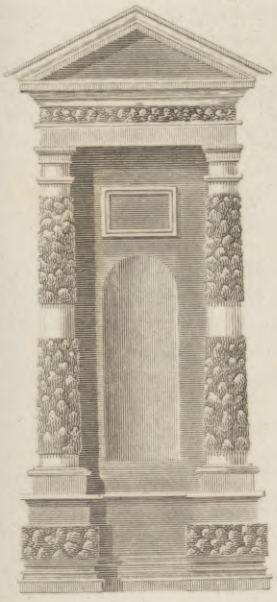
E. Mitchell Sculp.

DESIGNS FOR GATES & PIERS.

3.

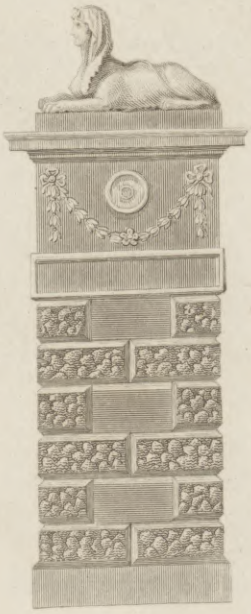
2.

1.



6.

5.



4.

Engd. by W.& D. Lizars Edin.r

Archive ‖ Archons.

ARCHIVE, or ARCHIVES, a chamber or apartment wherein the records, charters, and other papers and evidences, of a state, house, or community, are preserved, to be consulted occasionally.

We say, the *archives* of a college, of a monastery, &c. The archives of ancient Rome were in the temple of Saturn; the archives of the court of chancery are in the rolls office.

ARCHIVIST, ARCHIVISTA, a keeper of an archive.

Under the emperors, the archivist was an officer of great dignity, held equal to the proconsuls, vested with the quality of a count, styled *clarissimus*, and exempted from all public offices and taxes. Among the ancient Greeks and Persians, the trust was committed to none but men of the first rank; among the Franks, the clergy being the only men of letters, kept the office among themselves. Since the erection of the electoral college, the archbishop of Mentz has had the direction of the archives of the empire.

ARCHMARSHAL, the grand marshal of the empire, a dignity belonging to the elector of Saxony.

ARCHONS, in Grecian antiquity, were magistrates appointed after the death of Codrus *. They were chosen from the most illustrious families till the time of Aristides, who got a law passed, by which it was enacted, that, in electing these magistrates, less regard should be paid to birth than to merit.

* See the article *Attica.*

The tribunal of the archons was composed of nine officers. The first was properly the *archon;* by whose name the year of his administration was distinguished. The title of the second was *king;* that of the third, *polemarchus;* to these were added six *thesmothetæ.* These magistrates, elected by the scrutiny of beans, were obliged to prove, before their respective tribes, that they had sprung, both in their father's and their mother's side, for three descents, from citizens of Athens. They were likewise to prove that they were attached to the worship of Apollo, the tutelary god of their country; that they had in their house an altar consecrated to Apollo; and that they had been respectfully obedient to their parents; an important and sacred part of their character, which promised that they would be faithful servants to their country. They were likewise to prove, that they had served in a military capacity the number of years which the republic required of every citizen: and this qualification gave the state experienced officers; for they were not allowed to quit the army till they were 40 years old. Their fortune too, of which they were to inform those before whom they were examined, was a warrant for their fidelity.

After the commissioners, who were appointed to inquire into their character and other requisites, had made a report of them, they were then to swear that they would maintain the laws; which obligation if they neglected, they engaged to send to Delphi a statue of the weight of their bodies. According to a law of Solon, if an archon got drunk, he was condemned to pay a heavy fine, and sometimes even punished with death. Such magistrates as the Athenian archons were well entitled to respect. Hence it was eternal infamy to insult them; and hence Demosthenes observed, that to treat the thesmothetæ with disrespect, was to show disrespect to the republic.

Archons ‖ Archpriest.

Another qualification indispensably required of the second officer of this tribunal, who was called the *king*, was, that he had married the daughter of an Athenian citizen, and that he had espoused her a virgin. This was exacted of him, says Demosthenes, because part of his duty was to sacrifice to the gods jointly with his wife, who instead of appeasing, would have irritated them, if she had not possessed both these honours.

The inquiry into the private title of the nine archons was very severe; and this attention was the more necessary, as they had a right to take a seat in the Areopagus, after they had quitted their office, and given an account of their administration.

When any obscurity occurred in the laws relative to religion and the worship of the gods, the interpretation was submitted to the tribunal of the archons.

Aristotle observes, that Solon, whose aim was to make his people happy, and who found their government in his time aristocratical, by the election of the nine archons, who were annual magistrates, tempered their power, by establishing the privilege of appealing from them to the people, called by lot to give their suffrage, after having taken the oath of the Heliastæ, in a place near the Panathenæum, where Hissus had formerly calmed a sedition of the people, and bound them to peace by an oath.

The archons were the principal officers, not only in civil, but likewise in sacred matters, and especially in the mysteries of Bacchus. The archons, however, who were surnamed *eponymi*, were chiefly employed in civil affairs; yet they presided at the great feasts, and held the first rank there. Hence they are sometimes styled *priests.*

ARCHON is also applied by some authors to divers officers, both civil and religious, under the eastern or Greek empire. Thus bishops are sometimes called *archontes;* and the same may be said of the lords of the emperor's court. We also read of the *archons of the antimensia, archon of archons, grand archon, archon of churches, archon of the gospel, archon of the walls,* &c.

ARCHONTICI, in church history, a branch of Valentinians who maintained that the world was not created by God, but by angels called *Archontes.*

ARCHPRIEST, ARCHPRESBYTER, a priest or presbyter established in some dioceses, with a pre-eminence over the rest. Anciently the archpriest was the first person after the bishop: he was seated in the church next after the bishop; and even acted as his vicar, in his absence, as to all spiritual concerns. In the sixth century, there were found several archpriests in the same diocese; from which time some will have them to have been called *deans.* In the ninth century, they distinguished two kinds of cures or parishes: the smaller governed by simple priests; and the baptismal churches by archpriests; who, besides the immediate concern of the cure, had the inspection of the other inferior priests, and gave an account of them to the bishop, who governed the chief or cathedral church, in person. There are archpresbyters still subsisting in the Greek church; vested with most of the functions and privileges of chorepiscopi or rural deans.

Archtreasurer || Archytas.

ARCHTREASURER, the great treasurer of the German empire. This office was created with the eighth electorate, in favour of the elector Palatine, who had lost his former electorate, which was given to the duke of Bavaria, by the emperor Ferdinand II. who took it away from Frederic V. elector Palatine, after the battle of Prague, where he was defeated in maintaining his election to the crown of Bohemia. The dignity of archtreasurer was contested between the elector of Brunswick, who claimed it in virtue of his descent from the elector Frederic, and the elector Palatine.

ARCHILUTE, ARCILEUTO, a long and large lute, having its bass strings lengthened after the manner of the theorbo, and each row doubled, either with a little octave or an unison. It is used by the Italians for playing a thorough bass.

ARCHYTAS of Tarentum, was a Pythagorean philosopher, and also well skilled in mathematics and geography. He lived in the time of Plato, and, according to report, interposed his influence with Dionysius the tyrant, in order to save the life of that renowned philosopher. According to this date, it would appear that Jamblichus is mistaken when he asserts, that he was a hearer of Pythagoras, and the testimony of a writer mentioned by Photius, would seem more worthy of credit, that he was the eighth successive preceptor of the Pythagorean school. But his fame was not confined to the circle of literature; for so eminent were his military talents, that, in opposition to an express law of his country, that no man should be chosen more than once the general of its armies, he was elevated to that important station no less than seven times. He adopted the sentiments of Pythagoras; in his dissertations on speculative philosophy. He taught in morality, that there is nothing so destructive to man as pleasure; that in every condition of society, virtue is to be pursued for its own merit, and that every extreme is incompatible with virtue. Aristotle was indebted to Archytas for his general heads of arrangement, entitled his "Ten Categories," and very probably for that principal idea in his Ethics, that virtue consists in avoiding excesses. By discovering the duplication of the cube by means of the conic sections, and the method of finding two mean proportionals between two given lines, he displayed his great knowledge in mathematics. He is reported to have invented several curious hydraulic machines, and to have made a kind of winged automaton; and his genius is likewise honoured with the invention of the screw and crane. In a beautiful ode, Horace records his sad fate, in being cast upon the Apulian shore, an unburied corpse; and mentions him as an excellent astronomer and geographer.

Te maris et terræ numeroque carentis arenæ
Mensorem cohibent, Archyta,
Pulveres exigui prope litus parva Matinum
Munera: nec quidquam tibi prodest
Aerias tentasse domos, animoque rotundum
Percurrisse polum, morituro.

Archytas, what avails thy nice survey
Of ocean's countless sands, of earth, and sea?
In vain thy mighty spirit once could soar
To orbs celestial, and their course explore,
If here, upon the tempest-beaten strand,
You lie confin'd, till some more liberal hand
Shall strew the pious dust in funeral rite,
And wing thee to the boundless realms of light.
FRANCIS.

Arcis-sur-Aube || Arctotis

A singular modesty, and a firm command of his passions, were the leading features in his moral character. In his anger he never chastised any of his servants. He said one day to a certain dependant who had disobliged him, "What should I have done to you if I had not been angry?" He maintained a uniform decency not often observed in ancient writings.

A small treatise, entitled Περὶ τῦ Παντος φυσεως, "On the Universe," and some other small fragments, "On Wisdom," and "On the Good and Happy Man," are the only pieces ascribed to this philosopher that are still extant.

ARCIS-SUR-AUBE, a small town of France, in Champagne, now the department of Aube, seated on the river Aube. E. Long. 4. 15. N. Lat. 48. 40.

ARCO, a strong town and castle in the Trentin, belonging to the house of Austria. It was taken by the French in 1703, and abandoned soon after. It stands on the river Sarca, near the north extremity of the lake Garda. E. Long. 10. 48. N. Lat. 45. 52.

ARCONA, a strong town situated on the island of Rugen in the Baltic. It stood on a high promontory, with the east, north, and south sides defended by steep and lofty precipices, and the west by a wall 50 feet high, proportionably thick, and secured by a deep and broad ditch. It was, however, taken and ruined, in 1168, by Valdemar king of Denmark. One of the conditions imposed by the conqueror was, that the inhabitants should destroy a temple they had erected to St Vitus, and deliver up the vast treasure belonging to this tutelary saint. Another was, that they should pay 40 silver yokes for oxen, by way of tribute, and enter as soldiers in the Danish service when called upon.

ARCOS, a strong city of Andalusia in Spain, seated on a high craggy rock, at the bottom of which runs the Guadeleto. Its strength lies not only in its situation, but in the works erected for its defence, and it is inaccessible on every side but one. The governor resides in an old castle, from whence there is a delightful prospect, which extends very far into the neighbouring country. W. Long. 5. 50. N. Lat. 36. 20.

ARCTIC, in *Astronomy*, an epithet given to the north pole, or the pole raised above our horizon. It is called the *arctic pole*, on occasion of the constellation of the little bear, in Greek called ἀρκτος; the last star in the tail whereof nearly points out the north pole.

ARCTIC Circle, is a lesser circle of the sphere, parallel to the equator, and 23° 30′ distant from the north pole; from whence its name. This, and its opposite, the *antarctic*, are called the two *polar circles*; and may be conceived to be described by the motion of the poles of the ecliptic, round the poles of the equator, or of the world.

ARCTIUM, BURDOCK. See BOTANY *Index*.

ARCTOPHYLAX, (from ἀρκτος, *bear*, and φυλαττω, *I guard*), in *Astronomy*, a constellation, otherwise called *Bootes*.

ARCTOPUS, See BOTANY *Index*.

ARCTOTIS. See BOTANY *Index*.

ARCTURUS,

Arcturus || Ardebil.

ARCTURUS, in *Astronomy*, a fixed star, of the first magnitude, in the constellation Arctophylax, or Bootes. The word is formed of ἀρκτος, bear, and ὀυρα, *tail*, q. d. *bear's tail*, as being very near it. This star was known to the ancients, as in the following verse of Virgil:

Arcturum, pluviasque Hyades, geminasque Triones.

See also Job ix. 9. xxxviii. 32.

ARCUATION, in *Gardening*, the method of raising trees by layers, which is done in the following manner. Strong mother plants or stools must be planted in a clear border, and in a straight line, about six feet asunder. When these have shot five or six main branches from the roots, and as many collateral branches, the former must be bent to the ground, and there fastened. The small branches must be covered three inches deep upon the joints, and have a large bason of earth made round them to hold the water. About the middle of September they may be opened, and if they have taken root, may be immediately removed into the nursery; but if they have not sufficiently extended their roots, they must be suffered to remain till the spring, and then transplanted.

ARCUCCIO, ARCUTIO, a machine made of a board, covered with pieces of hoops, like the tilt of a waggon: used in Italy to prevent children from being overlaid and smothered by nurses or others. Every nurse in Florence is obliged to lay her child in an arcutio, under pain of excommunication.

ARCY, PATRICK D', a writer on military affairs. See SUPPLEMENT.

ARDAMON, or ARDAMA, in antiquity, a vessel of water placed at the door of a person deceased, till the time of burial, as a token that the family was in mourning, and to serve to sprinkle and purify persons as they came out of the house.

ARDASSES, in *Commerce*, the coarsest of all the silks of Persia; and as it were the refuse of each kind. In this sense, they say, the *legis*, the *housets*, the *chouſs*, and the *payas ardasses*, to signify the worst of those four sorts of Persian silks.

ARDASSINES, in *Commerce*, called in France *ablaques;* a very fine sort of Persian silks, little inferior in fineness to the sourbastis, or rather cherbassis, and yet it is little used in the silk manufactures of Lyons and Tours, because that kind of silk will not bear hot water in the winding.

ARDEA, the crane. See ORNITHOLOGY *Index*.

ARDEA, in *Ancient Geography*, a town of Latium, the royal residence of Turnus king of the Rutuli, (Livy); so called, either from the augury of the heron, (Hyginus); or from the excessive heat of the country, (Martial). It was in a marshy, sickly situation, (Strabo, Seneca). It was built by Danaë, the mother of Perseus, (Virgil); above five miles distant from the sea, and 20 from Rome: now a hamlet. It was a Roman colony, (Livy); the inhabitants called *Ardeates*. E. Long. 17. 49. N. Lat. 41. 30.

ARDEBIL, or ARDEVIL, a town of Persia in the province of Aderbijan. It was taken and burnt by Jenghiz Khan, in 1222, when most of the inhabitants were destroyed: but it has been since rebuilt; and is still ranked for dignity among the best cities of the kingdom, on account of its having been the residence and burying-place of some of the Persian kings; particularly the sepulchre of Sheik Sefi is at this place, to which the people resort in pilgrimage. He founded a place, which they call his kitchen, with a revenue sufficient to maintain 1000 poor people, and to feed them three times a-day. Three or four of the largest principal streets have shops, and are planted on each side with elms and linden trees, to keep off the excessive heat of the sun; but the houses are poorly built, with bricks dried in the sun: yet most of them, that are not in the bazars or market places, have the pleasure and conveniency of a garden full of trees bearing fruit; and there are large spots in the out parts of the town, where the houses are at a distance from each other, and the spaces between planted with trees, which render the city of a large extent. Ardebil || Arden.

Through the city there pass two branches of a rivulet, which are sometimes enlarged by the melting of the snow on the mountains, so that they have been forced to make canals to divert the stream. In the reign of Shah Abbas, it broke down the dikes and carried away a great number of houses. The city is without walls, and is seated in the midst of a large plain encompassed with mountains, the highest of which lies westward, and is always covered with snow. These render the air sometimes extremely hot, and at others intolerably cold, which occasions epidemical distempers, that carry off great numbers of people. The soil produces no fruit near the city but apples, pears, and peaches; and yet is good both for corn and pasture. The sheep are so numerous, that 100,000 have passed over the city bridge in a day. There are here several sorts of mineral waters, which serve both for common bathing, and for the cure of various diseases; one of these is a sulphureous spring, whose exhalations render the circumambient air extremely disagreeable. There are three springs which produce water as hot as if it was boiling; and from which, waters are conveyed to the public baths in the city. About half a league from the city, on the right hand of the public road, there is a pool of standing water, which is covered all over with salt like ice. E. Long. 47. 30. N. Lat. 37. 55.

ARDECHE, a department in the south-east of France, which derives its name from a river, and comprehends part of Dauphiny. The eastern part is fertile, the western rather hilly. Besides the common species of grain, vines and silk are cultivated. There are some manufactures of silks, woollens, leather, &c. The department contains 550,004 hectares; and in 1816 it had a population of 284,743.

ARDEN, the common name of forests among the Celtæ, from the widely extensive one which ranged for 500 miles across the country of Gaul, or that which covered more than half the county of Warwick in Britain, and the sites of which still retain the appellation of *Arden*, to the much smaller one of the ancient Mancenion, that covered and surrounded the site of the present Manchester. It is written *Arduen* by Cæsar and Tacitus in speaking of the forest in Gaul, and *Ardven* by Ossian in mentioning the woods of Caledonia. It cannot (says Mr Whitaker) be compounded of *ar* the prepositive article in Celtic, and the substantive *den*, as Baxter and Camden assert it to be; but is formed of *ard* an adjective, and *ven* the same as *den*. The meaning of the name therefore is not, as Mr Baxter renders

Arden || Ardrah.

it, simply *the hills*, or even, as the ingenious translator of Ossian interprets it, the *high hill*. *Ard* signifies either *high* or *great*, and *ven* or *den* either a *hill* or *wood*. *Arduen*, *Ardven*, or *Arden*, then, means a considerable wood. Hence, only, the name became applicable to such very different sites, as the *plains* of Warwickshire and the *hills* of Scotland: and it was given, not only to the most extensive forests, to that which was the greatest in Gaul, or so considerable in Britain; but to many that were important only within their own contracted districts, as the wood of Mancenion above mentioned, and others.

ARDENBURG, a town of the Netherlands, in Dutch Flanders, and formerly the most considerable in that country; but it has been dismantled by the Dutch. E. Long. 3. 30. N. Lat. 51. 16.

ARDENNE, a forest in France, formerly of vast extent; but the trees are in many places grubbed up, and where they stood are built cities, towns, and abbeys. At present it extends from Thionville, near the country of Liege, to Doncherry and Sedan, on the confines of Champagne.

ARDENNES, a department of France, which comprehends part of Champagne, and takes its name from the forest. In the north it is covered in many parts with wood; in the south, vines are raised. The most common produce over the whole is rye. It has mines of iron, coal, slate, and quarries of marble. Its manufactures of cloth are much celebrated. It contains 1,029,189 acres, and 346,000 inhabitants.

ARDENTES, in middle-age writers, an appellation given to those afflicted with the ignis sacer, or erysipelas. They were thus called, as seeming to be scorched or burned with the disease. Hence also the abbey of St Genevieve at Paris is called *Domus Ardentium*, by reason, as it is said, that great numbers were cured of that distemper at the shrine of this saint, in the reign of Louis VI.

ARDES, a town of France, in Lower Auvergne, and now in the department of Puy de Dome. It serves as a mart for the commodities and trade between Upper and Lower Auvergne. E. Long. 3. 10. N. Lat. 45. 22.

ARDFERT, a town of Ireland, was the ancient capital of Kerry, with an university, which was held in the highest esteem. It is a bishop's see, and borough by ancient prescription, and has been held *in commendam* with the bishopric of Limeric ever since the Restoration. The bishops were anciently called Bishops of Kerry. St Brandon, to whom the cathedral is dedicated, had his first education in this county, under Bishop Ert; but he finished his studies in Connaught, St Jarlath bishop of Tuam being his preceptor. The ruins here are very extensive. Near the cathedral was an anchorite tower, the loftiest and finest in the kingdom, being 120 feet high: it fell suddenly in 1771. In the ruined churches there are several inscriptions round the mouldings of the tombstones; and over an arch, behind Lord Glandore's house, is an inscription in relief done in a masterly manner, but the characters unknown.

ARDRAH, a small territory or kingdom of Africa, in Guinea properly so called. It lies at the bottom of the gulf of St Thomas, and has a town called *Ardres*, supposed to be the capital. The inhabitants are very licentious, and have neither temple nor any place for religious worship. However they are very courageous; and their king was absolute, till lately that the king of Dahomy made war upon this and the neighbouring territories, brought them under subjection, and burnt the towns, particularly Ardres. The air is very unwholesome to Europeans: yet the natives live to a great age; but the smallpox makes great destruction among them. This country is fertile in Indian corn, palm wine, plants, and fruits, which last all the year; and they make a great deal of salt.

Ardra || Arela

ARDRES, a town of France, in Lower Picardy, now the department of the Straits of Calais. Here was an interview between Francis I. and Henry VIII. king of England in 1520. It is seated in the midst of a morass, eight miles south of Calais. E. Long 2. 0. N. Lat. 50. 35.

ARDS, Barony of, in the county of Down in Ireland: it is a narrow slip of land, in some places three and in none above six miles broad; but the soil is for the most part tolerably good. It lies between the lake of Strangford and the sea, and in the south part it is opposite to Lecale. Sir Thomas Smith obtained a patent for this barony from Queen Elizabeth, and sent his natural son with a colony to possess it; but he was intercepted and slain by an Irishman. After Sir Thomas's death, Ards was granted by James I. to some of the Scots nobility.

ARDUBA, an ancient city of the Pannonians. It was taken by Germanicus about the 7th year of the Christian æra; but its reduction was more owing to the disagreement that reigned among the inhabitants than to the valour of the Romans. The greater part of the citizens were for submitting; but the women, more fond of their ancient laws and liberties than the men, joined some Roman deserters, and falling upon their husbands, killed a great number of them: but being at last overcome by the men, who then submitted to the Romans, the women either threw themselves headlong from the tops of the walls, or, setting fire to their houses, burnt themselves and their children to death.

AREA, in general, denotes any plain surface, whereon we walk, &c. The word is Latin, importing more properly a threshing floor; and is derived from *arere* "to be dry."

Area, in *Architecture*, denotes the space or site of ground on which an edifice stands. It is also used for inner courts and those portions of ground.

Area, in *Geometry*, denotes the superficial content of any figure. Thus, if a figure, e. g. a field, be in form of a square, and its side be 40 feet long, its area is said to be 1600 square feet; or it contains 1600 little squares, each a foot every way.

AREB, a kind of imaginary money used in the dominions of the Great Mogul. Four arebs are equal to one crou, or 100 lacs; one lac to 100,000 roupees.

AREBO, or Arebon, a town on the Slave coast of Guinea, in Africa, seated at the mouth of the river Formosa. The English had once a factory there, as the Dutch have still. It is a large oblong place, indifferently well peopled, and furnished with houses built of reeds and leaves. E. Long. 5. 5. N. Lat. 5. 0.

ARECA, the Fausel-nut. See Botany *Index*.

ARELATE, or Arelatum, is a town of Gallia Narbonensis, situated on the Rhone, denoting a town on, or beyond, a marsh, according to the particular situation

situation of the speaker; called *Arelate Sextanorum* (Pliny, Mela, Coin), because it had a colony of the sixth legion. Writers of the lower age call it *Arelas, -atis*, (Prudentius, Ausonius). There was a double Arelas, one on each side of the river, and joined by a bridge, (Ausonius); that on the left side is thought to have been built by Constantine. Tiberius's father was sent by Julius Cæsar at the head of the colony, (Suetonius); and hence the appellation *Julia Paterna*, as appears from an inscription. It was a favourite place of the Romans, and greatly ornamented; and hence called *Gallula Roma*, (Ausonius). It is now called *Arles*. E. Long. 5. 5. N. Lat. 43. 40.

AREMBERG, a small town of Germany, in the circle of Westphalia, defended by a castle. It is the capital of a county of the same name, and was erected into a principality by the emperor Maximilian II. in favour of John de Ligne, lord of Barbazon, who took the name of *Aremberg*. It is seated on the river Aer. E. Long. 6. 44. N. Lat. 50. 27.

AREMORICA, or ARMORICA, a part of Gaul, between the Sequana and Ligeris, (Cæsar, Hirtius); denoting a country on, or beyond the sea, *ar moer*, or *are moer*, Celtic. Pliny indeed says, that *Aquitania* was formerly called *Aremorica*; but in this he stands alone. In the lower age, the term *Armorica* was confined to Bretagne in France.

ARENA, in Roman antiquity, a place where the gladiators fought; so called from its being always strewed with sand, to conceal from the view of the people the blood spilt in the combat. Nero is said to have strewed the arena with gold dust.

ARENARIA, or SANDWORT. See BOTANY *Index*.

ARENACUM, or ARENACUS, one of the four towns or larger villages in the island of the Batavi, (Tacitus). Now *Arnheim*, in Guelderland. E. Long. 5. 20. N. Lat. 52. 2.

ARENARII, in antiquity, gladiators who combated with beasts in the arena or amphitheatre. The arenarii were slaves of the lowest rank; so that, though manumitted, they were not capable of being Roman citizens. They were the same with what were otherwise called *Bestiarii*.

ARENARIUM, in ecclesiastical writers, denotes a cemetery or burying ground. The arenaria were properly a kind of pits, or holes, under ground, wherein the ancient Christians not only buried their dead, but held their religious assemblies in times of persecution.

ARENSBERG, a small town of Germany, in the circle of Westphalia, upon the river Roer. E. Long. 8. 20. N. Lat. 51. 25.

ARENSBURG, an episcopal and maritime town of Livonia in Sweden, seated in the isle of Osel, in the Baltic sea. E. Long. 22. 40. N. Lat. 58. 15.

AREOLA, among anatomists, the coloured circle surrounding the nipple of the breast.

AREOPAGUS, a sovereign tribunal at Athens, famous for the justice and impartiality of its decrees, to which the gods themselves are said to have submitted their differences. It was in the town, on a rock or hill opposite to the citadel. The word signifies strictly, *rock of Mars*.

Plutarch attributes the establishment of the Areopagus to Solon. Other authors think differently: and with good reason; for it appears undeniable, that this tribunal was instituted before Solon. But the best authorities allow him the honour of its restoration. The city of Athens, governed till this time by tribunals of a circumscribed jurisdiction, which were multiplied by the most trifling accidents and circumstances, took no fixed political or civil form, however closely united the members of those tribunals were by their general views towards the public good, and by the common love of their country. As each of those tribunals could only act in proportion to the power delegated to it, it was impossible that so many different and unequal impressions should give to the great machine of the state that uniform and regular movement which, by an impulse always the same, would keep each part in the situation it should maintain with relation to the whole. Areopagus.

To effect this universal and harmonious power, it was necessary to unite the different channels of public authority, which, by being too much distributed, lost its force. This authority Solon collected, and placed it all in the court of Areopagus, which consequently became the mainspring of the government. The judges of this court, who, under Draco, decided only in cases of murder, now took cognizance of crimes of every kind: and the same tribunal which inflicted capital punishment on murder, poisoning, burning of houses, theft, &c. struck at the roots of those crimes, by arraigning idleness, luxury, and debauchery. Equally attentive to stimulate the indolence of the young, and the languor of the old, these sage judges roused in the one the laudable ambition to serve the state, and restored to the others their former activity. Satisfied that extremes produce the same effects, they thought the republic had as much to fear from the excess of wealth as from the gripe of poverty. Hence they exacted a minute account of the effects of every individual. Hence their great severity to those idle citizens, who, instead of being useful members in a state, are its bane, and its dishonour. Isocrates draws a most beautiful and striking picture of those venerable and astonishing men, and of the order and harmony which flourished in Athens by their wise administration.

The judges of the Areopagus, says that author, were more industrious to prevent crimes, by representing them in an odious light, than to establish modes of punishment. It was their opinion, that the enemies of the state were the instruments destined by the gods to punish the wicked; but that it was their province to correct and reform public and private manners. They were vigilantly attentive to the conduct of all the citizens, but particularly to that of the youth. They well knew that the impetuosity of juvenile passion gave the most violent shocks to health and growing virtue; that it was the duty of inspectors of education to soften the austerity of moral discipline with innocent pleasure; and that no recreations were more eligible than bodily exercises, which enable a young man to give a good education its full play, which improve health, give a pleasurable and agreeable vivacity, and even fortify the mind. The fortunes of the Athenians were too unequal to admit the same mode of education; and therefore the youth were trained in a manner suitable to the rank and circumstances of their respective families.

Areopagus. lies. Those of the inferior classes were taught agriculture and commerce; from this principle, that idleness is followed by indigence, and that indigence excites to the most daring and atrocious crimes. Having thus endeavoured, by wise precautions, to preclude the entrance of moral evil, they thought they had little to fear.

Exercises of the body, such as horsemanship and hunting, were objects of education to the youth of liberal fortune. In this sage distribution, their great aim was to prevent the poor from committing crimes, and to facilitate to the rich the acquisition of virtue. Not satisfied with having established good laws, they were extremely careful to see that they were observed. With this view they had divided the city into quarters, and the country into cantons. Thus every thing passed under their eyes; nothing escaped them; they were acquainted with the private conduct of every citizen. Those who had been guilty of any irregularity, were cited before the magistrates, and were reprehended, or punished in proportion to their misdemeanour.

The same Areopagites obliged the rich to relieve the poor. They repressed the intemperance of the youth by a severe discipline. Corruption in magistrates was suppressed by the punishments denounced against it; and the old men, at the sight of the employments of the young, felt themselves animated with a degree of juvenile vigour and activity.

Religion came likewise under the cognizance of the Areopagites. Plato durst never, we are told by Justin Martyr, divulge his private opinion concerning the Deity. He had learned from the Egyptians the doctrine of Moses. It appeared to him the best, and he embraced it with ardour. But his dread of the Areopagites, who were attached to the prevailing system, would not permit him even to name the author of sentiments which opposed the common tradition.

The public edifices, the cleanness of the streets, the pay of the soldiers, the distribution of the public money; in a word, whatever interested the republic, was under the direction of the Areopagus. The people themselves, jealous as they were of their power, did nothing without consulting this assembly, and suffered it, without a murmur, to amend their precipitate decrees. Yet this authority, however great it may seem, was subject to the laws; by them rewards and punishments were determined; and those respectable judges gave an account of the exercise of their trust to public censors, who were placed betwixt them and the people to prevent the aristocracy from growing too powerful.

The most important qualifications were required in those who entered into the Areopagus. Solon made a law, by which they who had not been archons for a year should not be admitted members of the Areopagus. To give more force to his law, he subjected himself to it, and was only admitted on that title. This was but the first step; those annual magistrates, after having given law to the republic, were interrogated on their administration. If their conduct was found irreproachable, they were admitted Areopagites with eulogium; but the smallest misconduct excluded them from that honour for ever. What administration was not to be expected from a tribunal so well composed! what veneration was not due to men of such rare talents and virtue! Such respect was paid them, that people presumed not to laugh in their presence; and so well established was their reputation for equity, that those whom they condemned, or dismissed without granting their petition, never complained that they had been unjustly treated. Areopa s.

The edifice of the Areopagus was extremely simple; and its roof, which was at first of the most common materials, remained in that state till the time of Augustus. This we learn from Vitruvius. Orestes was the first who thought of embellishing it. He raised in it an altar to Minerva. He likewise adorned it with two seats of solid silver; on one of which the *accuser* sat, and the *accused* on the other. The one seat was consecrated to *Injury*, and the other to *Impudence*. This religious sketch was brought to perfection by Epimenides, who erected altars to those allegorical deities, and soon after a temple, which Cicero mentions in his second book of laws. This temple corresponded with that which Orestes had built to the Furies, who brought him to Athens, and procured him the protection of Minerva. Epimenides dedicated it a second time to the Furies, or *severe Goddesses*, as they were termed by the Athenians. A man was thought lost without resource, and a victim to every human ill, if he enforced a perjury by invoking the sacred name of those tremendous divinities.

Those who employed their thoughts in solving the mysteries of Paganism, imagined that the Eumenides had their temple so near the court of Areopagus, that they might enlighten the judges by their inspiration, and, by their continual assistance, prevent them from committing those errors to which human weakness is liable. To propitiate those terrible deities, and to procure their favour for the Areopagus, they were worshipped with great punctuality and devotion; and the senate itself appointed their priests. Demosthenes had been nominated to preside over their sacrifices; and he thought it very extraordinary, that he to whom the republic had confided so important an office, should be publicly impeached.

It was natural to associate with the Eumenides the other deities who shared with them the sovereign empire over the dead. Epimenides placed in their temples the statues of Pluto, of Mercury, and of Tellus. They were all, according to Pausanias, of an agreeable form. Each of them was placed upon an altar, on which the citizens, or strangers, who had been acquitted by the Areopagus, made their grateful offerings. But it was not to gratitude alone that these several deities owed all the incense that smoked upon their altars. They who had been accused before the senate, harassed with superstition, and uncertain how these deities would be affected towards them, were lavish of sacrifices to obtain their clemency, by which they hoped their judges would likewise be influenced.

The tomb of Oedipus was another of the ornaments of the Areopagus. It was in the outward court of the Areopagus, where a barge was likewise placed, which made a part of the pomp at the public games.

Whatever homage and implicit obedience the court of Areopagus might derive from all this religious parade, the public good was always dearer to them than

Areopagus. than any lower advantages they might have drawn from the altars and temples with which they were surrounded.

The senate assembled in a hall built on the summit of a hill, which was ascended with difficulty by the old men bent with age. However, as for some time they only assembled on the three last days of each month, they bore with patience this inconvenient situation. But public affairs multiplied to such a degree, that they were obliged to add to their three former sittings a fourth, which was held on the seventh day of the month, and which was soon succeeded by an assembly every day. Their meetings were so regular, that they were not interrupted by the most solemn festivals, till Cephisodorus was archon, who, in the third year of the 105th Olympiad, made a decree, which obliged the Areopagites to celebrate, after the example of the other courts, the Apaturian feasts, which lasted five days.

This assiduous and painful exercise of their office made the Areopagites feel all the inconvenience of the situation of their tribunal, and determined them to remove it to a part of the city called the *Royal Portico*. It was a square, exposed to all the inclemencies of the weather. When the judges, who assembled there in profound silence, had taken their places, they were enclosed by a thread, or rather a cord, drawn around them.

They held their assemblies in the night, that their attention to public affairs might not be diverted by external objects,—and (adds Lucian) that they might only be influenced by the arguments, and not by the presence and action, of the speakers. This circumstance explains a passage in Athenæus, who tells us, that none knew the numbers nor faces of the Areopagites. The custom of administering justice in the open air was not peculiar to them. It was followed by all the other tribunals when they tried for murder: for two reasons; —1st, That the judges, the sworn protectors of innocence, might not be hurt by being under cover with criminals, whose hands were polluted with blood. 2dly, That the accuser and the accused might not be under the same roof.

When all the members of the senate were convened, a herald enjoined silence, and ordered the people to retire. As soon as they had departed, the assembly proceeded to business; and as they deemed the least preference a flagrant injustice, the causes which they were to determine were drawn by a kind of lottery; and the same chance which brought them up, distributed them to different numbers of judges, small or great, according to the importance of the several causes.

In early times, the parties themselves stated their cause in a simple manner. The eloquence of advocates was thought a dangerous talent, fit only to varnish crimes. But afterwards the Areopagus, on this point, relaxed from their severity; at first the accused, and soon after the accusers, were permitted to engage those to make the attack and the defence, whose profession it was to exert the art of speaking for others with accuracy and elegance.

Sextus Empiricus seems not to have sufficiently distinguished times, where he says, that the court of Areopagus did not suffer those who are to be tried at Areopagus. their bar to avail themselves of the abilities of others.

What undoubtedly led him into that mistake, was an inviolable custom of that tribunal, which prohibited, in pleadings, all that warm and picturesque oratory which seduces the judgment and inflames the passions. When the suffrages were collected, each person gave his in silence. They voted with a small flint, which they held betwixt the thumb and the two next fingers, and which they put into one of the two urns that stood in a corner of the hall. One stood before the other. The first was called the *urn of death;* the second, the *urn of compassion*. That of death was of brass, and was termed *proper;* that of compassion was of wood, and was termed *improper*. The judges commonly brought their flint to the assembly, and put it into the urn; but, that all the suffrages might be collected, the herald took the two urns, and presented them, one after another, to every senator, commanding him, in the name of the republic, no longer to defer his acquittal or condemnation.

From this method of giving sentence, which was called κρυβδην ψηφος, because it kept the vote of each person undiscovered, the Thirty Tyrants, to make themselves masters of the decisions of the Areopagus, substituted another, by means of which they knew exactly the opinion of each of the judges; for they obliged them to bring their flints publicly, and lay them upon two tables placed before them, the situation of which was quite opposite to that of the urns; for the first of those tables was that of *life*, and the second that of *death*.

The first substances with which they gave their suffrages were not small pieces of the bones of a hog, as some authors assert, but sea-shells; for which pieces of brass, of the same form, termed *spondyla*, were afterwards substituted. The substances with which they voted were distinguished by their form and colour. Those which condemned were black, and perforated in the middle; the others were white, and not perforated. The precaution of piercing the black ones tends to prove, what we have already observed, that the court of Areopagus sat in the night: for what end did it serve to pierce the black shells, or flints, if the judges could have seen them and the white ones, and consequently have distinguished their colours by the assistance of the light? But as they passed sentence in the dark, it is evident that a difference besides that of colour was necessary, to know the black ones from the white. The judges were likewise permitted to multiply, at pleasure, the distinctions between signs, which essentially distinguished the fates of men.

After the suffrages were collected, they were taken out of the two urns, and put into a third vase of brass.

They were then counted; and as the number of white or of black flints was higher or inferior, one of the judges drew with his nail a shorter or a longer line on a tablet with a waxen surface, on which the result of each cause was marked. The short line expressed acquittal; the long, condemnation.

With regard to the emoluments of the judges, they were as moderate as those of the advocates. The length of the process did not enhance its expence; and when the decision of a cause was postponed till the next day, the committee were only paid an obolus on that day. Hence Mercury, in Lucian, is surprised that such

sensible

Areopagus. sensible old men as the senators of Areopagus were should sell at so low a price the trouble of ascending so high.

As to the number of the judges which composed the Areopagus, some authors, attentive only to a part of Solon's regulations, by which he enacted, that for the future, none but the nine archons should be admitted members of the Areopagus, have imagined, that this tribunal was filled anew every year, and that it never consisted of more than nine magistrates. This opinion, and some others, are refuted by the circumstantial account which Diogenes Laertius gives us of the condemnation of Socrates. This great man had wished to substitute a rational hypothesis for the fabulous and extravagant system of religion which prevailed in his time. His project, however laudable, appeared impious in the eye of superstition. Information was laid against him before the Areopagus, and he had as many accusers as fellow-citizens. After the charges and the answers were heard, they proceeded to suffrages. The opinions were divided, but not equally, for the number of those who condemned him exceeded by 281 the number of those who declared him innocent. He made an ironical reply to this iniquitous sentence, by telling his judges, that he took it for granted they would admit him to a maintenance in the Prytaneum. On this sarcasm, 80 of those who had voted in his favour forsook him, went over to the opposite party, and condemned him to die. Here then we have 361 judges who condemn; to whom if we add those who persist in acquitting him, the number must be very considerable.

Of all the judgments of the Areopagus, the most famous one, excepting that of Mars, was the sentence which they passed on Orestes. His trial, which happened under Demophoon the 12th king of Athens, in 375 of the Attic era, owed all its fame to a remarkable circumstance, that gave rise to a custom which was observed ever afterwards. Orestes had killed his mother. He was accused before the Areopagus, and cited to appear in that court. He would have lost his life in consequence of the equal division of the votes, had not Minerva, moved with his misfortunes, declared herself for those who had absolved him, and joined her suffrage to theirs. Thus Orestes was saved. In veneration to this miracle, the Areopagites, whenever the suffrages were equally divided, decided in favour of the accused, by granting him what they termed *the shell of Minerva.* Cephalus and Dedalus were condemned by the Areopagus long before the time of Orestes.

We find in ancient authors some decisions of this tribunal, which bear the strongest marks of justice, though their objects are not interesting. We shall here quote an anecdote from Aulus Gellius, and Valerius Maximus, of a woman who was accused of having poisoned her husband and her son. She was taken and brought before Dolabella, who was then proconsul of Asia. She was no sooner in his presence than she owned the fact: and added, that she had very good reasons for putting her husband and her son to death.—"I had (said she) to my first husband a son whom I tenderly loved, and whose virtues rendered him worthy of my affection. My second husband, and the son whom I bare to him, murdered my favourite child. I thought it would have been unjust to have suffered those two monsters of barbarity to live. If you think, Sir, that I have committed a crime, it is your province to punish it; I certainly never shall repent of it." This affair embarrassed Dolabella. She was afterwards sent to the Areopagus; and that court, when they had examined her a long time, ordered her and her accuser to appear before them again a hundred years after, from the first day of her trial. Areopa Arequi

We must not, however, suppose that the Areopagus always preserved its old reputation; for such is the constitution of human affairs, that perfection, with regard to them, is a violent, and consequently a transitory state. Pericles, who lived about 100 years after Solon, to flatter the people and win them to his party, used his utmost efforts to weaken the authority of the Areopagus, which was then disliked by the multitude. He took from it the cognizance of many affairs which had before come under its jurisdiction; and to forward his design of humbling it, employed the eloquence of Ephialtes, whose talents were formidable, and who was an avowed enemy to the great men of Athens.

The Areopagus itself seemed to second the endeavours of a man who projected its ruin, and by its misconduct hastened its fall. The old rules of the court, by which none were admitted its members but those whose unexceptionable conduct would support its majesty, seemed too severe. They grew less delicate in their choice; and presuming that the faults with which they dispensed, would soon be reformed in the society of so many good examples, vice imperceptibly crept among them: corruption, at first secret and timid, grew insensibly open and daring, and made such progress, that the most shameful crimes were soon exhibited on the stage; and they were not copied from the low and abandoned multitude, but from those senators, once the venerable and austere censors of idleness and of vice. Demetrius, the comic poet, wrote a piece which he entitled *The Areopagitæ*, where he strips the mask off those hypocritical legislators, who were now equally apt to be seduced by wealth and by beauty. So much had the Athenian senate degenerated in the days of Isocrates, cir. 340 years before the Christian era.

Before this tribunal St Paul was called to give an account of his doctrine, and converted Dionysius one of their number.

The end of this court of judicature is as obscure as its origin, which was derived from very remote antiquity. It existed, with the other magistracies, in the time of Pausanias, i. e. in the 2d century. The term of its subsequent duration is not ascertained; but a writer, who lived under the emperors Theodosius the Elder and Younger, in the 5th century, mentions it as extinct.

AREQUIBA, a city of Peru in South America, situated in W. Long. 73°, S. Lat. 17°. It is one of the most beautiful cities in all Peru, being delightfully situated in the valley of Quilca, 100 leagues from Lima, and 20 from the sea, with which it communicates by a fine river. The entrance into the harbour is rather shallow for ships of great burden; but when once they are entered, they may ride securely in 18 fathoms water. This city was founded in 1539, by order of Don Francisco Pizarro, in a place known likewise by the name of *Arequiba;* but its situation being found disadvantageous,

Arequiba || Arethusa.

disadvantageous, the inhabitants obtained leave to remove to the place where the city now stands. The houses are built with stone, and vaulted; and, contrary to what is usual in warm countries, they are lofty, neatly furnished within, and finely decorated on the outside. The inhabitants are also exempt from many diseases common in other parts of Peru; which perhaps is owing to their keeping the streets clean by means of canals which extend to the river. The temperature of the air is extremely good; and though sometimes a slight frost is perceivable, the cold is never excessive, nor the heat troublesome, so that the surrounding fields are clothed with perpetual verdure. These natural advantages, however, are considerably allayed by its being very subject to earthquakes, by which it has already been five times laid in ruins; notwithstanding which, it is populous, and has among its inhabitants some of the noblest families in America.

ARES, a word of Paracelsus's, by which he would express that power of nature in the whole material world, by which species are divided into individuals.

ARETÆUS of Cappadocia, a Greek physician of the sect of the Pneumatists, lived in the reign of Augustus, according to some; according to others, under Trajan or Adrian. He wrote several treatises in the Ionian dialect, on acute diseases, and other medicinal subjects; some of which are still extant. The best edition of his works is that of Boerhaave, in Greek and Latin, with notes, printed in 1731: that of Wigan, printed at Oxford in 1723, in folio, is also much esteemed.

ARETHUSA, in *Fabulous History*, the daughter of Nereus and Doris, and the companion of Diana, who changed her into a fountain to deliver her from the pursuit of her lover Alpheus.

ARETHUSA, a celebrated fountain near the city of Syracuse in Sicily, famous for the quantity of its waters, and the number of fishes it contained. Many fables were invented by the ancients concerning this fountain. They had also a notion that the river ALPHEUS ran under or through the waters of the sea, without mixing with them, from Peloponnesus to Sicily. Mr Brydone informs us, that it still continues to send forth an immense quantity of water, rising at once to the size of a river, but is entirely abandoned by the fishes it formerly contained in such plenty. At some distance from Arethusa is a fountain of fresh water, which boils up very strongly in the sea, insomuch that, after piercing the salt water, it may be sometimes taken up very little affected by it. This fountain Mr Brydone thinks the ancients were ignornant of, or they would not have failed to use it as an argument for the submarine journey of the Alpheus.

Mr Swinburne describes this once famous fountain as a large pool of water near the quay, defended from the sea by a wall, and almost hidden by houses on every other side. The water is not salt, but brackish, and fit for no purpose but washing linen. "This (says he) is the celebrated fountain of Arethusa, whose soft poetical name is known to every reader. The fable of the nymph and her constant lover Alpheus, the excellency of the spring, and the charms of its situation, are themes on which ancient and modern poets have indulged their fancy, and exercised their pens. Alas, how altered! rubbish chokes up its wholesome sources; the waves have found a passage through the rocks, which repeated earthquakes have split; and not a fish is to be seen in it. Sometimes, after an earthquake, it has been left dry; and, at other times, the whole mass of its waters has been tainted by subterranous effluvia. Its fountain head probably lies among the neighbouring hills."

Arethusa || Aretin.

ARETHUSA. See BOTANY *Index*.

ARETIA. See BOTANY *Index*.

ARETIN, GUIDO, famous for his musical improvements, lived in the 13th century. He was a native of Arezzo, a city in Tuscany; and having been taught the practice of music in his youth, and probably retained as a chorister in the service of the Benedictine monastery founded in that city, he became a monk professed, and a brother of the order of St Benedict.

In this retirement he seems to have devoted himself to the study of music, particularly the system of the ancients, and, above all, to reform their method of notation. The difficulties that attended the instruction of youth in the church offices were so great, that, as he himself says, ten years were generally consumed barely in acquiring the knowledge of the plain song; and this consideration induced him to labour after some amendment, some method that might facilitate instruction, and enable those employed in the choral office to perform the duties of it in a correct and decent manner. If we may credit those legendary accounts that are extant in old monkish manuscripts, we should believe he was assisted in his pious intention by immediate communications from heaven: some speak of the invention of the syllables as the effect of inspiration: and Guido himself seems to have been of the same opinion, by his saying it was revealed to him by the Lord; or, as some interpret his words, in a dream: but graver historians say, that being at vespers in the chapel of his monastery, it happened that one of the offices appointed for that day was the hymn * to St John.

UT queant laxis *REsonare fibris*
MIra gestorum *FAmuli tuorum*
SOLve pollutis *LAbiis reatum,*
Sancte Joannes.

* Composed by Paul, a deacon of the church of Aquileia about the year 770.

During the performance of the hymn, he remarked the iteration of the words, and the frequent returns of UT, RE, MI, FA, SOL, LA: he observed likewise a dissimilarity between the closeness of the syllable MI and the broad open sound of FA, which he thought could not fail to impress upon the mind a lasting idea of their congruity; and immediately conceived a thought of applying these six syllables to perfect an improvement either then actually made by him, or under consideration, viz. that of converting the ancient tetrachords into hexachords.

Struck with the discovery, he retired to his study, and having perfected his system, began to introduce it into practice; the persons to whom he communicated it were the brethren of his own monastery, from whom it met with but a cold reception, which in the epistle to his friend, he ascribes undoubtedly to its true cause, envy: however, his interest with the abbot, and his employment in the chapel, gave him an opportunity of trying the efficacy of his method on the boys who were training up for the choral service, and it exceeded the most sanguine expectation. "To the admiration of all (says Cardinal Baronius) a boy there-

Aretin.

by learnt, in a few months, what no man, though of great ingenuity, could before that attain in several years."

The fame of Guido's invention soon spread abroad, and his method of instruction was adopted by the clergy of other countries. We are told by Kircher, that Hermannus, bishop of Hamburgh, and Elviricus bishop of Osnaburg, made use of it; and by the authors of the *Histoire Literaire a la France*, that it was received in that country, and taught in all the monasteries in the kingdom. It is certain that the reputation of his great skill in music had excited in the pope a desire to see and converse with him; of which, and of his going to Rome for that purpose, and the reception he met with from the pontiff, he himself has given a circumstantial account in the epistle hereafter mentioned.

The particulars of this relation are very curious; and as we have his own authority, there is no room to doubt the truth of it. It seems that John XX. or as some writers compute, the 19th pope of that name, having heard of the fame of Guido's school, and conceiving a desire to see him, sent three messengers to invite him to Rome. Upon their arrival, it was resolved by the brethren of the monastery, that he should go thither attended by Grimaldo the abbot, and Peter the chief of the canons of the church of Arezzo. Arriving at Rome, he was presented to the holy father, and by him received with great kindness. The pope had several conversations with him, in all which he interrogated him as to his knowledge in music; and upon sight of an antiphonary which Guido had brought with him, marked with the syllables agreeable to his new invention, the pope looked upon it as a kind of prodigy; and ruminating on the doctrines delivered by Guido, would not stir from his seat till he had learned perfectly to sing off a verse: upon which he declared that he could not have believed the efficacy of the method, if he had not been convinced by the experiment he had himself made of it. The pope would have detained him at Rome; but labouring under a bodily disorder, and fearing an injury to his health from the air of the place, and the heats of the summer, which was then approaching, Guido left that city upon a promise to revisit it, and explain to his holiness the principles of his new system. On his return homewards, he made a visit to the abbot of Pomposa, a town in the duchy of Ferrara, who was very earnest to have Guido settle in the monastery of that place; to which invitation it seems he yielded, being, as he says, desirous of rendering so great a monastery still more famous by his studies there.

Here it was that he composed a tract on music, entitled *Micrologus*, i. e. "a short discourse;" which he dedicated to Theobald bishop of Arezzo; and finished, as he himself at the end of it tells us, under the pontificate of John XX. and in the 34th year of his age. Vossius speaks also of another musical treatise written by him, and dedicated to the same person.

Most of the authors who have taken occasion to mention Guido, speak of the Micrologus as containing the sum of his doctrine; but it is in a small tract, entitled *Argumentum novi Cantus inveniendi*, that his declaration of his use of the syllables, with their several mutations, and in short his whole doctrine of solmisation, is to be found. This tract makes part of an epistle to a very dear and intimate friend of Guido, whom he addresses thus, "Beatissimo atque dulcissimo fratri Michaeli;" at whose request the tract itself seems to have been composed.

Aretin

Whether Guido was the author of any other tracts, is not easy to determine. It nowhere appears that any of his works were ever printed, except that Baronius, in his *Annales Ecclesiastici*, tom. xi. p. 73. has given at length the epistle from him to his friend Michael of Pomposa, and that to Theobald bishop of Arezzo, prefixed to the Micrologus: and yet the writers on music speak of the Micrologus as of a book in the hands of every one. Martini cites several manuscripts of Guido; namely, two in the Ambrosian library at Milan, the one written about the twelfth century, the other less ancient; another among the archives of the chapter of Pistoja, a city in Tuscany; and a third in the Medico-Laurenziano library at Florence, of the 15th century; these are clearly the Micrologus. Of the epistle to Michael of Pomposa, together with the *Argumentum novi Cantus inveniendi*, he mentions only one, which he says is somewhere at Ratisbon. Of the several tracts above mentioned, the last excepted, a manuscript is extant in the library of Baliol college in Oxford. Several fragments of the two first, in one volume, are also among the Harleian manuscripts now in the British Museum, N° 3199; but so very much mutilated, that they afford but small satisfaction to a curious inquirer.

ARETIN, *Leonard*, one of the most learned men of the 15th century, was secretary to the republic of Florence, and translated from the Greek into Latin some of the Lives of Plutarch, and Aristotle's Ethics: he also composed three books of the Punic war, that may serve as a supplement to those wanting in Livy; the history of the transactions in Italy during his time; that of ancient Greece; that of the Goths; that of the republic of Florence; and many other books. He died in 1443, aged 74.

ARETIN, *Francis*, a man of great reading, and well acquainted with the Greek language. He translated into Latin the Commentaries of St Chrysostom upon St John, and about 20 homilies of the same father; he also translated the Letters of Phalaris into Latin, and wrote a treatise *De balneis Puteolanis*. He studied at Sienna, about the year 1443; and afterwards taught law there with such reputation, that they called him the *Prince of Subtleties*, and his wit became a proverb. He displayed his talents chiefly in disputes, in which nobody could withstand him. He gave his opinions in law with so much confidence, ss to assure those who consulted him that they should carry thair cause: nor did experience contradict him; for it was a common saying at the bar, such a cause has been condemned by Aretin, it must therefore be lost. He taught also in the university of Pisa, and in that of Ferrara. He was at Rome under the pontificate of Sixtus IV. but did not stay here long; for he soon perceived that the great hopes which he had built upon his reputation would come to nothing. This pope, however, declared he would have given him a cardinal's hat, had he not thought he should have done a public injury by depriving the youth of such an excellent professor. When old age would not permit him to go through the duties of his office, they dispensed with his reading

Aretin, Aretologi.

of lectures, and his salary was continued. He continued, however, sometimes to mount the chair; and although his lectures had now but little spirit in them, yet he had still many hearers on account of his reputation. One day when the students were gone to some public shows, there were but 40 persons in his auditory; which so mortified him, that he threw away his book: and crying out, "Aretin shall never explain law to a few persons," retired in a passion, and would teach no more. He was severe in his temper, and never kept a servant longer than a month or two; for it was a maxim of his, "that new-hired servants always served best." He was honoured with the title of *knight*, and spent all his life in celibacy; and his way of living was so parsimonious, that he was thereby enabled to amass a great deal of wealth. He had designed this wealth for the maintenance of a college; but he altered his resolution, and left it to his relations.

ARETIN, *Peter*, a native of Arezzo, who lived in the 16th century. He was famous for his satirical writings; and was so bold as to carry his invectives even against sovereigns, and from thence got the title of the *Scourge of Princes*. Francis I. the emperor Charles V. most of the princes of Italy, several cardinals, and many noblemen, courted his friendship by presents, either because they liked his compositions, or perhaps from an apprehension of falling under the lash of his satire. Aretin became thereupon so insolent, that he is said to have got a medal struck, on one side of which he is represented with these words, IL DIVINO ARETINO; and on the reverse, sitting upon a throne, receiving the presents of princes, with these words, I PRINCIPI TRIBUTATI DA POPOLI, TRIBUTANO IL SERVIDO LORO. Some imagine that he gave himself the title of *Divine*, signifying thereby that he performed the functions of a god upon earth, by the thunderbolts with which he struck the heads of the highest personages. He used to boast, that his lampoons did more service to the world than sermons; and it was said of him, that he had subjected more princes by his pen than the greatest had ever done by their arms. Aretin wrote many irreligious and obscene pieces; such are his dialogues, which were called *Ragionamenti*. There is likewise imputed to him another very obscene performance, *De omnibus Veneris schematibus*. "It was about the year 1525 (says Mr Chevillier*) that Julio Romano, the most famous painter of Italy, instigated by the enemy of the salvation of mankind, invented drawings to engrave 20 plates; the subjects are so immodest that I dare only name them. Peter Aretin composed sonnets for each figure. George Vasari, who relates this in his Lives of the Painters, says, he does not know which would be the greatest impurity, to cast one's eyes upon the drawings of Julio, or to dip into the verses of Aretin." Some say that Aretin changed his libertine principles; but however this may be, it is certain that he composed several pieces of devotion. He wrote a paraphrase on the penitential psalms, and another on Genesis; he wrote also the Life of the Virgin Mary, and that of St Catharine of Sienna, and of St Thomas Aquinas. He was author likewise of some comedies. He died in the year 1556, at the age of 65.

* *Origin de l'imprimerie de Paris*, p. 224.

ARETOLOGI, in antiquity, a sort of philosophers, chiefly of the Cynic or Stoic tribe, who having no school or disciples of their own, haunted the tables of great men, and entertained them in their banquets with disputations on virtue, vice, and other popular topics. These are sometimes also denominated *Circulatores Philosophi*. In this sense, the word is derived from the Greek αρετη, *virtue*, and λογος, *discourse*. Some authors choose to derive the word from αρετος, *gratus*, "agreeable;" and define Aretologi, by persons who strive to divert and entertain their audience with jokes and pleasant tales; which latter seems the more natural explication.

Aretologi || Argeia.

AREZZO, a city of Italy, in Tuscany, seated in the territory of Florence, on the declivity of a hill that overlooks the neighbouring plain, between the Citta di Castelli and Florence. It is an ancient city and a bishop's see; and was famous for a kind of earthen ware much esteemed by the Romans. It was greatly fallen to decay when Cosmo de Medicis took it under his protection; since which it has been recovering gradually. It is famed for being the birthplace of Mecænas. E. Long. 12. 2. N. Lat. 43. 27.

ARGEA, or ARGEI, in Roman antiquity, thirty human figures made of rushes, thrown annually by the priests or vestals into the Tiber, on the day of the ides of May.—Plutarch, in his Roman Questions, inquires why they are called *Argea*. There are two reasons assigned. The first, that the barbarous nations who first inhabited these parts cast all the Greeks they could meet with into the Tiber: for Argians was a common name for all Grecians: but that Hercules persuaded them to quit so inhuman a practice, and to purge themselves of the crime by instituting this solemnity. The second, that Evander, an Arcadian, and a sworn enemy of the Argians, to perpetuate that enmity to his posterity, ordered the figures of Argians to be thus cast into the river.

ARGEIA, or ARGOLIS, a district of Peloponnesus, situated between Arcadia to the west, the Egean sea to the east, Laconia and the Sinus Argolicus to the south, and to the north the territory of Corinth and the Sinus Saronicus (Livy, Ptolemy); so called from ARGOS, the capital: Now *Romania di Morea*.

By the Greeks the people were called *Argeii*, from *Argi* or *Argos*; by the Romans, *Argivi*, Argives. They were a colony who migrated, it is said, from Egypt, under the command of Inachus. Polemon and Ptolemy Mendesius, ancient Greek writers, inform us, that Inachus was contemporary with Amosis, who demolished Avaris, and expelled the shepherds out of Egypt. If, with some learned chronologers, we suppose Inachus to have begun to reform the Argives B. C. 1856, and to have died B. C. 1808, he must have been coeval with Amosis, who reigned in Upper Egypt 15 years before the expulsion of the shepherds, and 10 years after that event, which happened B. C. 1806. Inachus was styled the *Son of the Ocean*, because his origin was not known, or because he had come by sea into Greece. Before his arrival the inhabitants were rude and barbarous. These he united and civilized, and instructed in various arts. His son Phoroneus instituted the laws of government; and, on that account, has been called the *first king in Argos*, the *first of men*, and the *father of mortals*. The family of Inachus, after having kept possession of the

Argeia || Argentaria.

throne 347 years, were expelled by Danaus, who arrived B. C. 1509 with a colony from Canaan. Acrisius, the last king of Argos, died B. C. 1313; and was succeeded by Perseus, his grandson, who transferred the seat of government to Mycenæ, 544 years from the first year of Inachus, in the reign of Cecrops II. king of Athens, and about the time when Pelops the son of Tantalus king of Phrygia, having been compelled by Ilus to leave his native country, came into Greece with great wealth, and acquired supreme power in the region afterwards called by his name. In the 37th year of Eurystheus, grandson of Perseus, the Argonautic expedition happened, i. e. B. C. 1224. This unjust and tyrannical prince had assigned to Hercules his tasks; and, after the death of that hero, he banished all his children. These were the Heraclidæ who fled to Athens for protection, and who returned to Peloponnesus 50 years after the destruction of Troy. In the reign of Agamemnon, the Trojan war commenced, and it was carried on with vigour during the space of ten years. In the year B. C. 1184, Troy was taken, and the war was concluded. Scarcely had the Grecians settled in their own country after their return from this dangerous expedition, when the posterity of Hercules invaded Peloponnesus, took possession of it, and divided it among themselves. Here the kingdom of Mycenæ ended, and that of Sparta was established on its ruins. See SPARTA.

ARGEMONE, PRICKLY POPPY. See BOTANY *Index*.

ARGENCES, a town of France, in Lower Normandy, now the department of Calvados, on the river Meance. W. Long. 0. 10. N. Lat. 49. 15.

ARGENT, the common French word for *silver*, of which metal all white fields or charges are supposed to consist. Argent of itself is used in heraldry to signify purity, innocence, beauty, and gentleness; and, according to G. Leigh, if it is compounded with

Gul.	it signifies	boldness;
Azu.		courtesy;
Ver.		virtue;
Pur.		favour;
Sab.		religion;

ARGENTAC, a town of France, in the Limosin, on the river Dordogne. E. Long. 2. 3. N. Lat. 45. 5.

ARGENTAN, a town of France, in the department of Orne, and in the diocese of the Seez. It is seated on an eminence, in the middle of a fertile plain, on the banks of the river Orne, and has a considerable trade in lace. E. Long. 0. 5. N. Lat. 48. 54.

ARGENTARIA, a town of ancient Gaul, thought to stand in the place where the city Colmar now stands. It is remarkable for a great victory gained by the emperor Gratian over the Lentienses, in the month of May, A. D. 378. The Romans being but few in number, were at first overpowered, and obliged to give ground; but soon returning to the charge, they gained in the end a complete victory. Thirty thousand of the barbarians, and among the rest their king Triarius, were killed on the spot; and all the rest, except 5000, taken prisoners.

ARGENTARIA *Creta*, pure white earth, found in Prussia, and much esteemed for cleaning plate.

ARGENTARIUS is frequently used in Roman writers for a money-changer or banker. The argentarii were moneyed people, who made a profit either by the changing, or lending of money at interest. These had their *tabernæ*, or offices, in the *forum Romanum*, built there as early as the reign of L. Tarquinius Priscus. The argentarii and fœneratores were much hated on account of their covetousness and extortion.

Argentarius || Argenti

ARGENTATI MILITES, in antiquity. Livy, lib. vi. speaks of *argentati milites*, as distinguished from *aurati*. Aquinas supposes these to have been similar to the argyraspides and chrysaspides; but the descriptions do not quadrate. Livy only represents the argentati as clothed in white linen coats.

ARGENTEUIL, a town of the Isle of France, seated on the river Seine, five miles north-west of Paris. It is a very beautiful place, with fine vineyards. In the environs are quarries of stucco. In the Benedictine priory they pretend to have the seamless coat of Christ. E. Long. 2. 28. N. Lat. 48. 52.

ARGENTIERE, a small island in the Archipelago, near Milo. It is about 18 miles in compass; and is full of barren mountains, producing nothing but barley, cotton, and a few grapes fit only for eating. The barley and cotton are sown round the only village there is in the island. The ladies are handsome enough, have no other employment but making cotton stockings, and take up with the sailors, who put into the port. The men all use the sea, and in time become good pilots. They have very little religion, are very ignorant, and of very bad morals. Justice is administered by an itinerant cadi, who is sometimes the only Mussulman in the whole island. The only article relating to natural history is the terra cimolia so highly esteemed by the ancients; it is a kind of white chalk, which is very heavy, without taste, and crumbles easily: they use it in washing linen. E. Long. 23. 10. N. Lat. 36. 50.

ARGENTINA. See ICHTHYOLOGY *Index*.

ARGENTINUS, a deity worshipped by the ancients, as the god of silver coin; as Æsculanus, whom they made his father, was the god of brass money, which was in use before silver.

ARGENTON, a town and county of France, in the department of Indre, divided into two by the river Creuse. Here was formerly a castle; but it was demolished by Lewis XIV. E. Long. 1. 38. N. Lat. 40. 30.

ARGENTORA, *Argentina*, (Notitiæ); *Argentoratum*, (Ptolemy); *Argentoratus*, (Ammian); a city of the Tribocci; one of the fifty forts built by Drusus on the Rhine, (Florus): an appellation formed by the Romans from the German, *Argen Strassen* or *Straten*, "unsafe roads for travellers," from the marauding parties of the garrisons that infested the roads. Now *Strasburg*, in Lower Alsace, on the rivulet Ill, near the Rhine. E. Long. 7. 35. N. Lat. 48. 38.

ARGENTUM ALBUM, in our old customs, silver coin, or pieces of bullion that anciently passed for money. By Doomsday tenure, some rents to the king were paid in *argento albo*, common silver pieces of money; other rents in *libris ursis et pensatis*, in metal of full weight and purity: in the next age, that rent which was paid in money, was called *blanch fearm*,

and

Argentum || Argonautic.

and afterwards *white rent*; and what was paid in provisions, was termed *black mail*.

ARGENTUM *Dei*, *God's penny*, anciently signified earnest money, or money given to bind a bargain; in somes places called *erles*, or *arles*, and by the civilians and canonists, *arrhæ*. *Et cepit de prædicto Henrico tres denarios de argenti Dei præ manibus*.

ARGENTUM *Musivum* is a mass consisting of silver-like flakes, used for the colouring of plaster figures, and for other purposes, as pigment. It consists of an amalgam of equal parts of tin, bismuth, and mercury. It is to be mixed with white of eggs, or spirit varnish, and then applied to the intended work, which is afterwards to be burnished.

ARGENTUM *Vivum*, *Mercury* or *Quicksilver*. See MERCURY, and CHEMISTRY *Index*.

ARGESTES, is used by Vitruvius for the wind which blows from that quarter of the horizon, which is 75° from the south and westward. Ricciolus uses the term to denote the wind which blows at 22° 30′ from the west towards the north, coinciding with that which is otherwise called *west-north-west*.

ARGIL, in *Ornithology*, a species of ardea. See ARDEA, ORNITHOLOGY *Index*.

ARGILLA, CLAY, in *Natural History*. See CLAY.

ARGIVI, or ARGEII, the people of Argeia or Argolis. See ARGEIA.

ARGO, in antiquity, a ship or vessel celebrated among the poets; being that wherein the Argonauts, of whom Jason was the chief, made their expedition in quest of the golden fleece. Jason having happily accomplished his enterprise, consecrated the ship Argo to Neptune; or, as others say, to Minerva, in the isthmus of Corinth; where, they add, it did not remain long before it was translated into heaven, and made a constellation. The generality of authors represent the ship Argo as of a long make, resembling the modern galleys; and furnished with thirty benches of rowers. It could not, however, be of any great bulk, since the Argonauts were able to carry it on their backs from the Danube to the Adriatic sea.

ARGO *Navis*, the *Ship Argo*, in *Astronomy*, is a constellation in the southern hemisphere, whose stars in Ptolemy's catalogue, are 45; in Tycho's 11; in the Britannic catalogue, and Sharp's Appendix, 64.

ARGOB, in *Ancient Geography*, a canton lying beyond Jordan, in the half tribe of Manasseh, and in the country of Bashan, one of the most fruitful on the other side of Jordan. In the region of Argob there were sixty cities, called *Bashan-havoth-jair*, which had very high walls and strong gates, without reckoning many villages and hamlets which were not enclosed, Deut. iii. 4. 14. and 1 Kings iv. 13. But Argob was more particularly the name of the capital city of the region of Argob, which Eusebius says was 15 miles west from Gerasa.

ARGONAUTA. See CONCHOLOGY *Index*.

ARGONAUTIC, something belonging to the Argonauts.

The Argonautic expedition is one of the greatest epochas or periods of history which Sir Isaac Newton endeavours to settle, and from thence to rectify the ancient chronology. This he shows, by several authorities, to have been one generation or about 30 years earlier than the taking of Troy, and 43 years later than the death of Solomon. See CHRONOLOGY. Argonautic, Argonauts.

Dr Bryant, however, rejects the history of the Argonautic expedition as a Grecian fable, founded indeed on a tradition derived from Egypt, and ultimately referring to Noah's preservation, &c. in the ark. But although we are not to believe all the romantic stories which poets, and even some grave historians, have told us of these famous adventurers, yet it seems unreasonable to discredit entirely the Argonautic expedition. See ARGONAUTS.

ARGONAUTICA, in literary history, denotes poems on the subject and expeditions of the Argonauts. We have the *Argonautics* of Orpheus in epic verse, published by H. Stephens; the *Argonauticon* of Valerius Flaccus, in eight books of Latin heroics, in imitation of Apollonius, with respect to which Burman observes that the imitator has often surpassed the original; the *Argonautics* of Apollonius Rhodius, an heroic poem, consisting of four books, *opus*, as Quintilian calls it, *non contemnendum*.

ARGONAUTS, in antiquity, a company of illustrious Greeks, who embarked along with Jason, in the ship Argo, from Colchis, with a design to obtain the golden fleece.

The occasion of this expedition is thus represented by Greek writers. Phryxus, flying with his sister Helle from the rage of their stepmother Ino, the daughter of Cadmus, went on board a ship, whose ensign was a golden ram, and sailed to Colchis (now Mingrelia, part of Georgia). Helle was drowned by the way, in that sea which from her was called the *Hellespont*, now the *Dardanelles*. This, according to some, was the ground of the poetical fable, that a ram with a golden fleece swam away with them to Colchis; and that the Argonauts undertook their famed expedition, in order to find that fleece. But Strabo and Arrian inform us, that it was a practice of the Colchians to collect gold on Mount Caucasus by extending fleeces across the beds of the torrents; and as the water passed, the metallic particles remained entangled in the wool: hence, according to those historians, the adventure was named the *expedition of the golden fleece*. Sir Isaac Newton thinks that this expedition was really an embassy sent by the Greeks, during the intestine divisions of Egypt in the reign of Amenophis, to persuade the nations upon the coasts of the Euxine and the Mediterranean seas, to take that opportunity of shaking off the yoke of Egypt, which Sesostris had laid upon them; and that fetching the golden fleece, was only a pretence to cover their true design.

But the most judicious and satisfactory account of the Argonautic expedition seems to be that given by Dr Gillies in his History of Greece. "The northern districts of Thessaly being peculiarly exposed to the dangerous fury of invaders, the petty princes of that province entered into a confederacy for their mutual defence. They assembled in spring and autumn at Thermopylæ, a place afterwards so illustrious, and then governed by Amphictyon, a descendant of Deucalion, whose name is immortalized in the Amphictyonic council. The advantages which the confederates derived from this measure, were soon perceived by their neighbours. The central states gradually acced-

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ed to their alliance; and about the middle of the 14th century before Christ, Acrisius king of Argos, and other princes of Peloponnesus, were allowed to share the benefits and security of this useful association. See AMPHICTYONS.

"After this event, the Amphictyons appear to have long confined themselves to the original purpose of their institution. The states, whose measures were directed by this assembly, found sufficient occupation in defending their own territories; and near a century elapsed, before they undertook, by common consent, any distant expedition. But it was not to be expected that their restless activity could always be exhausted in defensive war. The establishment of the Amphictyons brought together the chiefs most distinguished by birth and bravery. Glory and emulation prompted them to arms, and revenge directed those arms against the barbarians. Jason, Admetus, and other chieftains of Thessaly, having equipped a small fleet in the neighbouring harbour of Iolcus, and particularly the ship Argo of superior size and construction to any before known, were animated with a desire to visit foreign lands, to plant colonies in those parts of them that appeared most delightful, and to retort on their inhabitants the injuries which Greece had suffered from strangers. The princes of the north having proclaimed this spirited design over the central and southern provinces, the standard of enterprise and glory was speedily surrounded by the flower of the Grecian youth, who eagerly embraced this honourable opportunity to signalize their manly valour. Peleus, Tydeus, Telamon, and in general the fathers of those heroic chiefs who in the succeeding age shone with distinguished lustre in the plains of Troy, are numbered among the leaders of the Argonauts. They were accompanied by the chosen warriors, and by the venerable prophets, of their respective tribes; by an Esculapius, the admired father of the healing art; and by the divine Orpheus, whose sublime genius was worthy to celebrate the amazing series of their adventures.

"These adventures, however, have been too much adorned by the graces of poetry, to be the proper subject of historical composition. The designs of the Argonauts are veiled under the allegorical, or at least doubtful, phrase, *of carrying off the golden fleece;* which, though easily explained, if we admit the report that the inhabitants of the eastern banks of the Euxine extended fleeces of wool, in order to collect the golden particles which were carried down by the torrents from Mount Caucasus, is yet described in such various language by ancient writers, that almost every modern who examines the subject, thinks himself entitled to offer, by way of explanation, some new conjecture of his own. But in opposition to the most approved of these conjectures, we may venture to affirm, that the voyage to Colchis was not undertaken with a view to establish extensive plans of commerce, or to search for mines of gold, far less to learn the imaginary art of converting other substances into that precious metal; all such motives expressing a degree of speculation and refinement unknown in that age to the gallant but uninstructed youth of Thessaly. The real object of the expedition may be discovered by its consequences. The Argonauts fought, conquered, and plundered; they settled a colony on the shores of the Euxine; and carried into Greece a daughter of the king of Colchis, the celebrated Medea, a princess of Egyptian extraction, whose crimes and enchantments are condemned to eternal infamy in the immortal lines of Euripides."

ARGONAUTS *of St Nicholas*, was the name of a military order instituted by Charles III. king of Naples, in the year 1382, for the advancement of navigation, or, as some say, merely for preserving amity among the nobles. They wore a collar of shells, enclosed in a silver crescent, whence hung a ship, with this device, *Non credo tempori*, "I do not trust time." Hence these Argonaut knights came to be called *knights of the shell.* They received the order of St Basil, archbishop of Naples; and held their assemblies in the church of St Nicholas, their patron.

ARGOPHYLLUM, WHITE-LEAF (*Forst. Nov. Gen.*); a genus of the monogynia order, belonging to the pentandria class of plants. The capsule is trilocular; the nectarium is pyramidal, pentagonous, and the length of the corolla. There is but one species, the nitidum or glossy, a native of New Caledonia. This genus has great affinity with the ivy; but differs in the nectarium, and perhaps in the fruit.

ARGOS, an ancient name of Peloponnesus; from Argos, one of the kings, (Homer, Strabo).

ARGOS, the capital, and an inland town, of Argolis or ARGEIA. It had different surnames; as *Achaicum*, from the country, or an ancient people, (Homer); *Hippium*, from its breed of horses; and *Inachium*, from the river Inachus, which runs by, or from Inachus the founder of the kingdom, whose name was also given to the river. The Argives related, that this was one of the river gods who adjudged the country to Juno, when she contended for it with Neptune, which deity in return made their water to vanish; the reason why the Inachus flowed only after rain, and was dry in summer. The source was a spring, not copious, on a mountain in Arcadia, and the river served there as a boundary between the Argives and Mantineans.

Ancient Argos stood chiefly on a flat. The springs were near the surface; and it abounded in wells, which were said to have been invented by the daughters of Danaus. This early personage lived in the acropolis or citadel, which was named *Larissa*, and accounted moderately strong. On the ascent was a temple of Apollo on the ridge, which in the second century continued the seat of an oracle. The woman who prophesied was debarred from commerce with the male sex. A lamb was sacrificed in the night monthly; when, on tasting of the blood, she became possessed with the divinity. Farther on was a stadium, where the Argives celebrated games in honour of Nemean Jupiter, and Juno. On the top was a temple of Jupiter, without a roof, the statue off the pedestal. In the temple of Minerva there, among other curious articles, was a wooden Jupiter, with an eye more than common, having one in the forehead. This statue, it was said, was once placed in a court of the palace of Priam, who fled as a suppliant to the altar before it, when Troy was sacked. In this city was also the brazen tower in which Danaë, being confined there by her father, was deflowered by Jupiter.

Argos retains its original name and situation, standing

Argos, Arguim.

ing near the mountains which are the boundary of the plain, with Napoli and the sea in view before it. The shining houses are whitened with lime or plaster. Churches, mud-built cottages and walls, with gardens and open areas, are interspersed, and the town is of considerable extent. Above the other buildings towers a very handsome mosque shaded with solemn cypresses; and behind is a lofty hill, brown and naked, of a conical form, the summit crowned with a neglected castle. The devastations of time and war have effaced the old city. We look in vain (says Mr Chandler) for vestiges of its numerous edifices, the theatre, the gymnasium, the temples, and monuments, which it once boasted, contending even with Athens in antiquity and in favours conferred by the gods.

ARGOS *Amphilochium*, (Thucydides), a city of Acarnania, (Scylax, Pliny); its territory Amphilochia: situated on the east side of the Sinus Ambracius, (Thucydides); distant an hundred and eighty stadia to the south-east of Ambracia, (Polybius). Also called *Argia Amphilochis*, (Mela); *Amphiloci* and *Amphilochici* the people. (Stephanus). The name is from Amphilochus, son of Amphiaraus; and from Argos, the name of his country, in Peloponnesus, (Thucydides).

ARGOS *Hippium*. See ARGOS in Peloponnesus, *supra*.

ARGOS *Hippium*, the ancient name of Arpi; but Lampe is a still more ancient; afterwards called *Argyrippa*, and *Argippa;* built by, and the residence of, Diomedes, on the Cerbalus, (Virgil); afterwards a large and populous city, (Livy): A town of Apulia; now in ruins, and the place called *Arpi*.

ARGOS *Pelasgicum*, (Homer); an appellation denoting Thessaly; so called from the Pelasgi.

ARGOS *Portus*, a port of Tuscany, (Strabo): now Porto Ferrajo, in the north of the island Elba. E. Long. 11. 30. N. Lat. 42. 35.

ARGUIM, an island on the coast of Africa, about sixteen miles distant from Cape Blanco, situated in W. Long. 16. 30. N. Lat. 20. 20. It is scarce two miles in length; notwithstanding which, it was a bone of contention for 87 years between the Portuguese, Dutch, English, and French; and, after a variety of fortune, has at last been totally abandoned.

This island was first discovered by the Portuguese in 1444, when a fleet bound to the east touched at Arguim, and from some little trade carried on with the natives, it was imagined that a settlement there might be of some advantage to Portugal. In consequence of this opinion, a fort was erected on the island, and the Portuguese enjoyed the peaceable possession of it till 1638. At this time, the Dutch having received a minute account of the condition of the island, resolved to attack it: and accordingly landed without molestation from the garrison, which was too weak to oppose them. The Portuguese, however, defended themselves with great intrepidity, and at last surrendered upon honourable terms. The Dutch immediately set about repairing the fortifications, and securing it in the best manner they could: however, in 1665, the fort was reduced almost to a heap of rubbish by an English squadron; but as the fortifications were totally destroyed, and only a small garrison left there, it was easily retaken by the Dutch the next year. They now redoubled their diligence in strengthening the island, entering into alliance with Moorish chiefs, procuring a number of families to settle under protection of the fort, and giving extravagant prices for gums, in order to monopolize the gum trade. By this means the gum trade of the French Senegal Company was almost entirely destroyed; upon which they fitted out a squadron, dispossessed the Dutch, and had the island finally ceded to them by the treaty of Nimeguen.

Arguim || Argus.

Though the Dutch now seemed to be finally expelled, they resolved not to part so easily with such a valuable settlement. Under pretence of being subjects of the elector of Brandenburg, therefore, they erected one of the forts which had been demolished, and there maintained themselves in spite of the utmost endeavours of the French Company to dispossess them. Numberless were the memorials, protests, rescripts, &c. which were published on this occasion, till a new war in 1701 put an end to them. In 1717, however, the French Company having found all their remonstrances ineffectual, fitted out a new squadron; but this armament did not arrive at Arguim before Feb. 26. 1721. The Dutch defended themselves with such intrepidity and conduct as had almost baffled the utmost efforts of the French; but the latter having found means to draw off a Moorish chief from his allegiance, the Dutch were obliged to evacuate Arguim, and retire to Portendic, where they fortified themselves, determining to watch a favourable opportunity for recovering their settlement at Arguim. This was not long wanting, by means of the weakness of the garrison and the imprudence of Duval the French director, who having quarrelled with the Moors, was surprised, defeated, and killed by them; in consequence of which, the settlement fell again into the hands of the Dutch on the 11th of January 1722. In 1723, the Dutch were attacked by another French squadron under the command of the Sieur Riguadiere. This gentleman boasted that the fort could not hold out one day; but though he prevailed so far as to get possession of the cisterns which contained the water of the besieged, he was at last shamefully repulsed, and forced to raise the siege with precipitation. The Dutch, however, did not long enjoy the possession which they had so bravely defended; for, in 1725, their fort was entirely demolished by the French under Du Casse, and has never since been rebuilt by any European nation.

ARGUMENT, in *Rhetoric* and *Logic*, an inference drawn from premises, the truth of which is indisputable, or at least highly probable. See LOGIC.

ARGUMENT, in matters of literature, denotes also the abridgement or heads of a book, history, comedy, chapter, &c. See SYLLABUS.

ARGUMENTATION, the act of inventing, or framing arguments, of making inductions, and drawing conclusions. See INDUCTION, &c.

Argumentation, according to Cicero, is the delivering or unfolding of an argument.—The matter of argumentations is propositions; the form, their due disposition, with regard to one another, so as a conclusion may be drawn from them. See ENTHYMEME, PROPOSITION, RATIOCINATION, SORITES, SYLLOGISM, &c.

ARGUS, in fabulous history, was the son of Aristor, and had 100 eyes, 50 of which were always open. Juno made choice of him to guard Io, whom Jupiter had

Argus || Argyll-shire.

had transformed into a white heifer; but Jupiter, pitying Io for being so closely confined, sent Mercury, who, with his flute, charmed Argos to sleep, sealed up his eyes with his caduceus, and then cut off his head; when Juno, to reward his fidelity, turned him into a peacock, and placed his eyes in his tail.

Argus-shell, a species of porcelain shell, beautifully variegated with spots, resemblimg in some measure those in a peacock's tail.

ARGUTIÆ, witty and acute sayings, which commonly signify something further than what their mere words at first sight seem to import. Writers on rhetoric speak of divers species of argutiæ, viz.

Argutiæ ab alieno, when something is said, which seems repugnant either to the nature and property of a thing, or to common custom, the laws, &c. which yet in reality is consistent therewith; or when something is given as a reason of another, which yet is not the reason of it. For instance, *Si Caius nihil didicisset, errasset minus*; again, *Aureum hoc sæculum est, quia plurimus jam auro honos venit.*

Argutiæ ab allusione, those wherein allusion is made to some history, fable, sentence, proverb or the like; e. g. *Multi umbram captant et carnem amittunt.*

Argutiæ à comparatis, when two things are compared together, which yet at first sight appear very different from each other, but so as to make a pretty kind of simile or dissimile; e. g. *Par est pauper nil cupiens principi omnia habenti.*

Argutiæ à repugnantibus, when two things meet in a subject, which yet regularly cannot be therein; or when two things are opposed to each other, yet the epithet of the one is attributed to the other, e. g. *Dum tacent clamant.*

ARGYLL, Dukes of. See Campbell.

ARGYLLSHIRE, one of the counties of Scotland, supposed to have formed the principal part of the Caledonian kingdom, when the eastern provinces of Scotland submitted to the irresistible power of the Roman empire. It is bounded on the east by the shires of Perth and Dunbarton; on the north by Inverness; on the west and south by the Irish sea and the frith of Clyde, which enter into various bays, sounds, and inlets, round the coast, and form both in the main land and the islands, many spacious and commodious harbours. This county is subdivided into the districts of Kintyre, Knapdale, Argyll Proper, Cowal, and Lorn. Within the same division are also comprehended several Hebudian islands, of which two or three are of considerable extent. Its length from south to north, between the mull of Kintyre and the point of Ardnamurchan, where it joins the shire of Inverness, is about 114 miles, and its breadth, in several places, including the isles, is 70. The total superficies is calculated at 3800 square miles, of which 1063 are insular, and 2735 on the main land.

Similar to the other parts of the Highlands of Scotland, this county presents a very wild and horrid prospect of hills, rocks, and huge mountains, piled upon each other in a stupendous and dreadful disorder, bare, bleak, and barren to the view; or, at best covered with shaggy heath, which appears black and dismal to the eye, except in the summer, when it is variegated with an agreeable bloom of a purple colour. Hence lofty mountains, deep glens, inlets of the sea entering far into the land, form the most striking features in the general aspect of this country. Cruacha-Ben in this county is one of the loftiest mountains in Scotland; and where this county meets the confines of Perth and Dunbarton, the mountains contiguous to Ben-Lomond are but little inferior in height to that mountain. The Loch Fine, Loch Etive, Linnhe Loch, are inlets of the sea. The district of Kintyre enters into the north channel, and is almost divided from the main land at the narrow isthmus of Tarbat. The district of Cowal is also nearly peninsulated by Loch Long on one side and Loch Fine on the other. The interior parts of the county are interspersed with a great number of small fresh-water lakes. A barrenness of soil and scanty vegetation prevail chiefly on the summits of the great mountains, which exhibit great masses of stratified rocks or groups in a columnar form. Even a number of the glens are barren, and afford little pasturage, and are covered in several places with large fragments, which have been separated and precipitated from the impending rocks. On the declivities of the hills and the banks of the lakes there are, however, numerous woods interspersed, which unite with the lofty mountains to form a most romantic scene. In a run of several miles, fertility, verdure, and cultivation, reign through the valley of Glenurchay. Remains of ancient forests are still very extensive in various places; and these consist chiefly of oakes, ashes, pines, and birches. The level of the country, towards the southern parts, descends the nearest to an equality with that of the sea. The elevation of the country is highest towards the interior parts of the counties of Perth and Inverness.

Argy shire

The mountains and forests abound with fallow-deer, roes, stags, and all kinds of wild game; and all over the sea coast, the moors, the heaths, and on the lakes, the wild fowl are numerous. The mountains feed an innumerable quantity of black cattle, which run wild among the hills in winter as well as summer. The circumambient sea, with its lochs, bays, and harbours, pours forth myriads of fish; and in several places of the county iron, copper, lead, and other metals and minerals, have been dug out. Yet, notwithstanding these numerous local advantages, Argyllshire, as well as many other parts of the Highlands, struggles with many great obstacles in the way of improvement. The want of long leases is one of the most material. What inducement can a person have to manure or cultivate a piece of land which he may have taken, when his first work is to erect a hut for himself; and after all the disagreeable inconveniencies attending it, he holds his farm year by year, dependant on the will of his landlord? When he also reflects, that by cultivating his ground in such a manner, the rent which he was this year scarcely able to pay, may be nearly doubled the next year, how can he be able to defray the expence necessarily attending such an improvement, when he is uncertain of a competent return for his labour? It is hoped that proprietors will at length see the manifest advantage that will arise from granting long leases, both to themselves and their tenants; and, by so doing, either to encourage the tenants to build houses, by paying any expence that may remain unpaid at the end of the lease, or build houses for the tenants themselves; and,

by

Argyll-shire.

by these means, they would have surer payment of their rents, which would be augmented; their grounds would be greatly improved, and their vassals would enjoy comfort and ease. Another great obstacle to the general improvement is the rugged face of this county, which renders the great roads few in number, and the intersected roads for the purpose of conveying manure to the grounds being still in their natural rudeness. The chief branch of husbandry followed over the greatest part of this county is the management of sheep, black cattle, and goats. In former times, the ordinary animal stock consisted mostly of black cattle: but within these last 20 years a more skilful method of managing flocks of sheep than was formerly practised, having been introduced by the farmers of the low country; these have been multiplied with great attention and assiduity. Cows and oxen now form only the second considerable branch of the animal stock.

Barley, oats, and potatoes, are the principal articles of crop; and, in some places, the proper manner of tillage has been made use of, excellent manures have been laid upon the ground, and the most suitable rotation of crops has been adopted. In years of ordinary plenty it would appear, that besides affording a considerable surplus to the breweries and distilleries, the grain commonly produced in this county is a sufficient sustenance for its inhabitants. Besides the great profits arising from the iron works and the salmon fisheries, the cutting down of woods has brought much money into Argyll, and still continues to be equally beneficial to the labourer and the landlord.

When the projected canal * shall be completed, and some villages and harbours erected, the populous county of Argyll (Mr Knox affirms) will become one of the most valuable provinces of the British empire. Washed on both sides by the sea; deeply indented by navigable lakes and bays; having an easy communication with the fishing grounds on the north Highlands, with Glasgow and the trading towns on the Clyde, with Ireland, Wales, Whitehaven, Liverpool, Bristol, and other marts on the west coast of England; we may easily conceive, that the period is at no great distance when Argyllshire will become a great commercial county. To corroborate this opinion, he observes, that after a vessel gets under sail from this coast, she enters at once into the Atlantic, where she meets with no interruption till she makes the coast of America or the West Indies. The line, therefore, which nature points out for the inhabitants is that of salt-making, fishing, ship-building, freight or the carrying trade, soap and glass-making, by means of the kelp upon their shores, and sand found upon the islands of Jura and Gigha, which is adapted for the latter.

* This is the Crinan canal, which is now navigable.

In this district the deeds of the celebrated Fingal, whose invincible arm gave a check to the progress of the conquerors of the world, were mostly achieved. Many of the scenes of the battles of that illustrious hero and his gallant followers, which are so beautifully described by Ossian, are still pointed out, and many very ancient monuments still display the warlike spirit of its former inhabitants. In the course of the eighth and ninth centuries, Argyll, along with the neighbouring isles, was conquered by the Danes and Norwegians. For five or six centuries it continued under the dominion of Norway, and during that period, was under the direct administration of feudal chieftains, generally of Norwegian extraction, who each maintained an almost independent government. Along with the Hebudean isles, all the western parts of Argyll became the conquest of the Scottish monarchs in the 14th century. Some time after, Macdonald, the representative of this region, obtained leave from the Scottish crown to hold his possessions as a feudatory to that kingdom; but the turbulent spirit of him and his family could not remain in quietude, and therefore their rebellions were punished with forfeiture. Their estates and titles were bestowed on the *Campbells;* and these have ever since retained them in peace and loyalty, beloved and honoured by their country. The county of Argyll gives the title of *duke* and *earl* to the chief of this family. He likewise enjoys several other important posts under the crown, and is the chief of the Scottish nobility. His vassals are so numerous, that in former times he could on occasion bring 3000 or 4000 fighting men into the field. Argyllshire is generally peopled by this clan, and affords a great number of castles and seats belonging to gentlemen who hold of the duke, and boast themselves descended from his family. Argyllshire sends one member to parliament: it is also the seat of a provincial synod. It contains two royal boroughs and 49 parishes; the population of which is as follows:

Argyll-shire.

	Parishes.	Population in 1755.	Population in 1790—1798.
	Ardchattan	2195	2400
	Ardnamurchan	5000	4542
	Campbelltoun	4597	8700
	Craignish	769	770
5	Dunoon	1757	1683
	Glassary	2751	2568
	Glenorchy	1654	1869
	Inverary	2751	1832
	Inverchaolin	944	504
10	Kilbrandon	1492	2060
	Kilcalmonell	1925	2448
	Kilchrenan	1030	1124
	Kilfinan	1793	1417
	Killean	2391	1911
15	Kilmadan	806	351
	Kilmartin	1150	1537
	Kilmore	1200	1886
	Kilninver	1045	1178
	Knapdale, North	1369	1009
20	Knapdale, South	1292	1524
	Lismore	2812	3526
	Lochgoylhead	1505	1012
	Morven	1223	1764
	Saddel	1369	1341
25	Southend	1391	1300
	Strachur	1193	1061
	ISLANDS.		
	Mull { Torosay	1012	1733
	Mull { Kilfinichen	1685	3002
	Mull { Kilninian	2590	3281

Argyll-shire ‖ Aria.

	Parishes.		Population in 1755.	Population in 1790—98.
30	Islay	Kilarow, Kilchoman, Kildalton	5344	9500
	Jura and Colonsay, &c.		1097	1858
	Coll and Tiry		2702	3457
35	Gigha and Cara		514	614
	Small isles		943	1339
		Total,	63,291	76,101
	Population in 1811		85,585	

See ARGYLESHIRE, SUPPLEMENT.

ARGYRASPIDES, or ARGYROASPIDES, in antiquity, persons armed with silver bucklers, or bucklers silvered.

The argyraspides, according to Quintus Curtius, made the second corps of Alexander's army; the first was the phalanx.—According to Justin's account, lib. xii. cap. 7. Alexander having penetrated into India, and extended his empire as far as the ocean; for a monument of his glory, ordered the armour of his soldiers, and the housings of his horses, to be adorned with silver. And hence commanded them to be called *argyraspides*, from the Greek αργυρος, *silver*, and ασπις, *buckler*.

By this author it should seem, that Alexander's whole army were called *argyraspides*.—After that prince's death, the argyraspides despised all other chiefs of the army, disdaining to obey any other, having borne arms under Alexander.

ARGYRIPÆ, See *ARGOS Hippium*.

ARGYRUNTUM, a maritime town of Illyria (Ptolemy, Pliny). Now Novigrad, a town of Dalmatia. E. Long. 17. 30. N. Lat. 44. 30.

ARHUSEN, a diocese in North Jutland, in Denmark, to the south of Wilburg, about 60 miles in length and 30 in breadth. It contains two capital cities, called *Arhusen* and *Rander*; besides several market towns of less note, and upwards of 300 villages. Arhusen, one of the capitals, is advantageously situated on the coast of the Baltic sea, at the mouth of the river Guda, which runs through it; and it is surrounded with forests full of game. E. Long. 10. 0. N. Lat. 56. 12.

ARIA, one of the ancient names of Thrace, (Stephanus); that is, *martial*, from the character of the people, whose country Euripides calls the residence of Mars, and Sophocles his place of nativity.

ARIA, and *Ariana*, in *Ancient Geography*, whether the same or distinct countries authors are not agreed. Ptolemy has only Aria, and knows nothing about Ariana. Pliny mentions only Ariana, and says nothing about Aria; but distinguishes between the Arii and Ariani: Parthia, he says, has the Arii to the east, Caramania and the Ariani to the south; from which it is conjectured, the Ariani extended farther than the Arii, and comprised the Gedrosii and the Drangæ. Arrian has only Aria and Arii, and is silent about Ariana. But Strabo gives more extensive bounds to Ariana than to Aria, without particularly defining them; only in general he says, that Ariana begins from India, and quotes Eratosthenes; according to whom, Ariana is bounded by the Indus on the east; on the south by the Great sea; by Paropamisus on the north, and by the mountains, quite to the Portæ Caspiæ; on the west by the same boundaries by which Parthia is separated from Media, Caramania from Parætacene and Persia: and thus Ariana is extremely extensive.—Aria has its limits thus described by Ptolemy: On the north, some parts of Margiana and Bactriana; on the east, the Paropamisidæ; on the south the Drangianæ: and Strabo says, the Arii adjoin to the Paropamisidæ on the east.

ARIA, called *Ariapolis*, (Strabo): Now Herat, in Chorasan, set down in an ancient map as situated on the river Arias, which probably gave name to the country Aria. Arrian calls the river *Areios*; Pliny, *Arius*; Ammian, *Arias*: now Heri, which runs by Alexandria, also called *Alexandria Arion* or *Ariorum*.

ARIADNÆA, in Grecian antiquity, two festivals at Naxos, in honour of two women named *Ariadne*. One of them being the daughter of King Minos, they had, in the solemnity dedicated to her, a show of sorrow and mourning; and, in memory of her being left by Theseus near the time of child-birth, it was usual for a young man to lie down and counterfeit all the agonies of a woman in labour. This festival is said to have been first instituted by Theseus, to atone for his ingratitude to that princess.—The other Ariadne was thought to be of a gay and sprightly temper; and therefore her festival was observed with music and other expressions of mirth and joy.

ARIADNE, daughter of Minos king of Crete. Theseus being sent to destroy the Minotaur, Ariadne was so taken with him, that, as a testimony of her love, she gave Theseus a clue of thread to guide him out of the labyrinth. Theseus, having killed the Minotaur, carried off the Athenians he had relieved, together with Ariadne: whom, however, he afterwards forsook.

ARIADNIA, in antiquity. See ARIADNÆA.

ARIANA, in *Ancient Geography*, an extensive country, comprising Paropamisus, Arachosia, Drangiana, and Gedrosia, if we suppose it to reach to the sea. See ARIA.

ARIANNA, a small village six miles north-east from the city of Tunis. Here is a beautiful range of the ancient Carthaginian aqueduct, 74 feet high, supported by columns 16 feet square, and which still increased in grandeur the nearer it approached Carthage. The stones are all diamond cut. Near this spot several ancient mattamones, or subterraneous magazines for corn, have been discovered within these few years, capable of containing 100 bushels, strongly arched with large square stones. The Moors have already begun to demolish them, it being their custom to do so with every thing beautiful as soon as it comes to light.

ARIANO, a town of Italy, in the kingdom of Naples in the Ulterior Principality, with a bishop's see. Mr Swinburne describes it as an ugly city, built upon the uneven summit of a mountain, with an extensive look-out on all sides, but exposed to every blast that blows. It does not appear to be so old as the time of the Romans; therefore may be supposed to owe its rise to the demolition of some neighbouring town, and to the advantages its situation afforded for discovery and defence. It is but a poor place, without

Arianna, Arians.

out trade or manufactures; having declined ever since the desolation caused by an earthquake in 1456. It reckons about 14,000 inhabitants, and no less than 20 parishes and convents, besides an ill-endowed cathedral. The wine made here is pale, like red Champagne, which it also resembles in a certain tartness, exceedingly refreshing in hot weather. The soil lies upon a soft argillaceous stone. At a small distance to the east is a bank consisting of layers of volcanic earths, interspersed with thick strata of oyster shells.

Below the town is a convent of Dominicans, whose house, within these last hundred years, has been thrice rebuilt, having been as often thrown to the ground by earthquakes. The last and most destructive happened in 1732, fatal to all the country that lies along the eastern verge of the Apennines. In order to secure a retreat in case of future accidents, which from their situation they have every reason to expect, these fathers have constructed a small building of wood, the parts of which being joined together with strong iron chains, are contrived so as to have a proper play, and by yielding to the oscillatory motion of the earth, return easily to their equilibrium. E. Long. 15. 19. N. Lat. 41. 8.

ARIANS, followers of Arius, a presbyter of the church of Alexandria about the year 315; who maintained that the Son of God was totally and essentially distinct from the Father; that he was the first and noblest of those beings whom God had created, the instrument by whose subordinate operation he formed the universe; and therefore inferior to the Father both in nature and dignity: afso, that the Holy Ghost was not God, but created by the power of the Son.

The Arians owned that the Son was the Word, but denied that Word to have been eternal. They held, that Christ had nothing of man in him but the flesh, to which the Λογος or Word was joined, which was the same as the soul in us. See *Lardner's Credibility*, &c. vol. ix. book i. c. 69.

The Arians were first condemned and anathematized by a council at Alexandria in 320, under Alexander, bishop of that city; who accused Arius of impiety, and caused him to be expelled from the communion of the church; and afterwards by 380 fathers in the general council of Nice, assembled by Constantine in the year 325. But, notwithstanding that, it was not extinguished; on the contrary, it became the reigning religion, especially in the east, where it obtained much more than in the west. Arius was recalled from banishment by the emperor Constantine in two or three years after the council of Nice, and the laws that had been enacted against him were repealed. In the year 335, Athanasius, his zealous opponent, was deposed and banished into Gaul, and Arius and his followers were reinstated in their privileges, and received into the communion of the church. In little more than a year after this, he fell a victim to the resentment of his enemies, and died a tragical death, occasioned probably by poison, or some other violence. The Arian party found a protector in Constantius, who succeeded his father in the empire of the east; and the zeal with which he abetted them produced many animosities and tumults to the time of his death in the year 362. They underwent various revolutions, persecuting and oppressed, under succeeding emperors, according to the degree of interest they had in the civil power, till at length Theodosius the Great exerted every possible effort to suppress and disperse them. Arians.

The Arians were divided into various sects, of which ancient writers give an account under the names of *Semi-Arians*, *Eusebians*, *Aetians*, *Eunomians*, *Acacians*, *Psathyrians*, and others. But they have been commonly distributed into three classes, viz. the *Genuine Arians*, *Semi-Arians*, and *Eunomians*.

Arianism was carried in the fifth century into Africa under the Vandals; and into Asia under the Goths. Italy, the Gauls, and Spain, were also deeply infected with it; and towards the commencement of the sixth century, it was triumphant in many parts of Asia, Africa, and Europe. But it sunk almost all at once, when the Vandals were driven out of Africa, and the Goths out of Italy, by the arms of Justinian. However, it revived again in Italy under the protection of the Lombards in the seventh century.

Erasmus seems to have aimed in some measure to restore Arianism at the beginning of the sixteenth century, in his Commentaries on the New Testament. Accordingly, he was reproached by his adversaries with Arian interpretations and glosses, Arian tenets, &c. To which he made little answer, save that there was no heresy more thoroughly extinct than that of the Arians: *Nulla heresis magis extincta quam Arianorum.* But the face of things was soon changed. Servetus, a Spaniard by nation, published in 1531 a little treatise against the Trinity, which once more revived the opinions of the Arians in the west. Indeed he rather showed himself a Photinian than an Arian; only that he made use of the same passages of Scripture, and the same arguments against the divinity of our Saviour, with the proper Arians.

It is true, Servetus had not, properly speaking, any disciples; but he gave occasion after his death to the forming of a new system of Arianism in Geneva, much more subtle and artful than his own, and which did not a little perplex Calvin. From Geneva the new Arians removed to Poland, where they gained considerable ground; but at length became Socinians.

The appellation *Arian* has been indiscriminately applied, in more modern times, to all those who consider Jesus Christ as inferior and subordinate to the Father; and whose sentiments cannot be supposed to coincide exactly with those of the ancient Arians. Mr Whiston was one of the first divines who revived this controversy, in the beginning of the 18th century. He was followed by Dr Clarke, who published his famous book, entitled, "The Scripture Doctrine of the Trinity, &c. In consequence of which he was reproached with the title of *Semi-Arian*. He was also threatened by the convocation, and combated by argument. Dr Waterland, who has been charged with verging towards Tritheism, was one of his principal adversaries. The history of this controversy during the present century may be found in a pamphlet entitled, "An Account of all the considerable Books and Pamphlets that have been wrote on either side, in the Controversy concerning the Trinity, from the Year 1712; in which also is contained an Account of the Pamphlets written this last Year, on each side, by the Dissenters, to the End of the Year 1719." Published in London 1720.

Aricina || Arillus.

ARICINA, in *Mythology*, a surname of Diana; under which appellation she was honoured in the forest Aricine, so called from Aricia a princess of the blood royal of Athens. Hippolytus, to whom this princess was married, is said to have erected a temple to Diana in this forest, where he was concealed after his resurrection by Esculapius, and to have established a priest and festivals.

ARIUS MONTANUS, a learned Spanish divine, employed by Philip II. of Spain to publish another edition of the Bible, after that of Cardinal Ximenes; which he finished with applause, and died at Seville in 1589.

ARICA, a port town of South America, in the province of Los Charcas, in Peru. It was formerly a considerable place, but the earthquakes, which are frequent here, have almost entirely ruined it; for there are no more than 150 families, which are most of them blacks, mulattoes, and Indians. Most of the houses are made with canes or reeds, set upright and bound together with cords or thongs; and as it never rains here, they are covered only with mats, which makes the place look at a distance like a heap of ruins.

The vale of Arica is about a league wide, and six leagues long, next the sea, and is all a barren country, except the spot where the old town stood, which is divided into little meadows of clover grass, and plots for sugar canes, with a few olive and cotton trees intermixed. This vale grows narrower as it runs eastward: and a league up there is a village, where they begin to cultivate pimento or Jamaica pepper, which is planted throughout all the rest of the vale; and there are several farms, which produce nothing else, that bring in the value of 80,000 crowns yearly. The Spaniards of Peru are so used to this pepper, that they dress no provisions without it. W. Long. 70. 15. S. Lat. 18. 26.

ARICONIUM, a town of the Silures, (Antonine); now Hereford, (Camden). W. Long. 2. 42. Lat. 52. 6.

ARIDAS, a kind of taffety, manufactured in the East Indies from a shining thread which is got from certain herbs, whence they are styled *aridas of herbs*.

ARIDULLAM, in *Natural History*, a kind of zarnich found in the East Indies. See ZARNICH.

ARIES, in *Zoology*. See OVIS.

ARIES, the battering ram. See *BATTERING Ram*.

ARIES, in *Astronomy*, a constellation of fixed stars, drawn on the globe, in the figure of a ram. It is the first of the twelve signs of the zodiac, from which a twelfth part of the ecliptic takes its denomination.

ARILLUS, an improper term invented by Linnæus, and defined to be the proper exterior coat or covering of the seed which falls off spontaneously.

All seeds are not furnished with an arillus; in many, a dry covering, or scarf skin, supplies its place. In jasmine; hound's tongue, *cynoglossum*; cucumber; fraxinella; *dictamnus*; staff-tree, *celastrus*; spindle-tree, *euonymus*; African spiræa, *diosma*; and the coffee-tree, *coffea*; it is very conspicuous.

In the genus hound's tongue, four of these arilli or proper coats, each enfolding a single reed, are affixed to the stylus: and in this circumstance, says Linnæus, does the essence of the genus consist. In fraxinella, the arillus is common to two seeds. The staff tree has its seeds only half involved with this cover.

Aril || Arima

The arillus is either *baccatus*, succulent, and of the nature of a berry; as in the spindle tree, *euonymus*—*Cartilagineus*, cartilaginous, or gristly; as in the African spiræa, *diosma*—*Coloratus*, coloured; as in the staff-tree—*Elasticus*, endued with elasticity, for dispersing the seeds; as is remarkable in the African spiræa, *diosma*, and fraxinella—*Scaber*, rough and knotty; as in hound's tongue.

Although covered with an arillus or other dry coat, seeds are said to be naked (*semina nuda*) when they are not enclosed in any species of pericarpium or fruit vessel; as in the grasses, and the *labiati* or lipped flowers of Tournefort, which correspond to the *didynamia gymnospermia* of Linnæus. Seeds are said to be covered (*semina tecta*) when they are contained in a fruit vessel, whether capsule, pod, or pulpy pericarpium, of the apple, berry, or cherry kind: (See SEMEN). This exterior coat of the seed is, by some former writers, styled *calyptra*. See CALYPTRA.

The different skins or coverings of the seeds are adapted, say naturalists, for receiving the nutritive juices, and transmitting them within.

ARIMANIUS, the evil god of the ancient Persians. The Persian Magi held two principles; a good demon or god, and an evil one: the first the author of all good, and the other of all evil: the former they supposed to be represented by light, and the latter by darkness, as their truest symbols. The good principle they named *Yezad* or *Yesdan*, and *Ormozd* or *Hormizda*, which the Greeks wrote *Oromasdes*; and the evil demon they called *Ahriman*, and the Greeks *Arimanius*. Some of the Magians held both these principles to have been from all eternity; but this sect was reputed heterodox: the original doctrine being, that the good principle only was eternal, and the other created. —Plutarch (*De Iside et Osiride*, p. 369.) gives the following account of the Magian traditions in relation to these gods, and the introduction of evil into the world, viz. That Oromazes consisted of the most pure light, and Arimanius of darkness; and that they were at war with each other: That Oromazes created the gods; the first, the author of benevolence; the second, of truth; the third, of justice, riches, and the pleasure which attends good actions; and that Arimanius made as many, who were the authors of the opposite evils or vices: that then Oromazes, triplicating himself, removed as far from the sun as the sun is from the earth, and adorned the heaven with stars, appointing the dog star for their guardian and leader: that he also created 24 other gods, and enclosed them in an egg; but Arimanius having also made an equal number, these last perforated the egg, by which means evil and good became mixed together. However, the fatal time will come, when Arimanius, the introducer of plagues and famine, must be of necessity utterly destroyed by the former, and annihilated; then the earth being made plain and even, mankind shall live in a happy state, in the same manner, in the same political society, and using one and the same language. Theopompus writes, that, according to the Magians, the said two gods, during the space of 3000 years, alternately conquer, and are conquered; that for other 3000 years, they will

Arimaspi || Arion.

will wage perpetual war, fight and destroy the works of each other, till at last Hades (or the evil spirit) shall perish, and men become perfectly happy, their bodies needing no food, nor casting any shadow, i. e. being perfectly transparent.

ARIMASPI, (Pliny), a people of Sarmatia Europea, to the south of the Montes Riphæi, said by Mela to have but one eye; a fable broached by Aristeas Proconnesius, according to Herodotus.

ARIMATHEA, a town of Judea, (Evangelists); thought to be the same with *Ramatha*, 1 Sam. i. and thus in the tribe of Ephraim (Wells).—This place is now called *Ramla;* and is in a very ruinous state, containing nothing but rubbish within its boundaries. The aga of Gaza resides here in a serai, the floors and walls of which are tumbling down. He maintains about one hundred horsemen, and as many Barbary soldiers, who (says Mr Volney) are lodged in an old Christian church, the nave of which is used as a stable, and in an ancient khan, which is disputed with them by the scorpions. The adjacent country is planted with lofty olive trees, disposed in quincunces. The greatest part of them are as large as the walnut trees of France; but they are daily perishing through age, the ravages of contending factions, and even from secret mischief: for, in these countries, when a peasant would revenge himself of his enemy, he comes by night, and saws or cuts his trees close to the ground, and the wound, which he takes care to cover, draining off the sap like an issue, the olive tree languishes and dies. Amid the plantations, we meet, at every step, with dry wells, cisterns fallen in, and vast vaulted reservoirs, which prove that, in ancient times, this town must have been upwards of a league and a half in circumference. At present it scarcely contains two hundred families. The little land which is cultivated by a few of them, belongs to the mufti, and two or three persons related to him. The rest content themselves with spinning cotton, which is chiefly purchased by two French houses established there. The only remarkable antiquity at Ramla, is the minaret of a ruined mosque on the road to Yafa, which is very lofty; and by an Arabic inscription appears to have been built by the sultan Saladin.

ARIMINUM, a town of Umbria, or Romagna, at the mouth of the Ariminus, on the gulf of Venice. The seizing on it by Cæsar gave rise to the civil war. Now called *Rimini*. E. Long. 13. 30. Lat 44. 8.

ARIOLI, in antiquity, a kind of prophets, or religious conjurors, who by abominable prayers, and horrible sacrifices at the altars of idols, procured answers to their questions concerning future events. *Isid. Orig.* lib. viii. cap. 9. These are also called *harioli*, and the operation *hariolation*. Sometimes they were denominated *aruspices* or *haruspices*. The *arioli* were distinguished by a slovenly dress, disorderly and matted beards, hair, &c.

ARION, an excellent musician and poet, inventor of dithyrambics. Periander entertained him at his court, where getting an estate, and returning to Corinth, the sailors, for lucre of his money, threw him into the sea; when, according to the poets, a dolphin, charmed with his music, took him on her back and carried him safe to shore.

ARION, an admirable horse, much more famous in poetic history than Bucephalus in that of Alexander. Authors speak variously of his origin, though they agree in giving him a divine one. His production is most commonly ascribed to Neptune. This god, according to some, raised him out of the ground by a stroke of his trident: according to others, he begat him upon the body of the fury Erinnys; according to others, upon that of Ceres, whom he ravished in the form of a horse, she having previously assumed the form of a mare to elude his pursuit. This horse was nursed by the Nereids; and being sometimes yoked with the sea horses of Neptune to the chariot of this god, he drew him with incredible swiftness threw the sea. He had this singularity in him, that his right feet resembled those of a man. Neptune gave him to Capreus king of Haliartus. Capreus made a present of him to Hercules; who mounted him when he took the city of Elis, gained the prize with him in the race against Cygnus the son of Mars near Trœcena, and at last made a present of him to Adrastus. It is under this last master that Arion has signalized himself the most: he won the prize for racing at the Nemean games, which the princes who went to besiege Thebes instituted in honour of Archemorus; and was the cause that Adrastus did not perish in this famous expedition as all the other chiefs did.

Arion || Ariosto.

ARIOSTO, Lodovico, the famous Italian poet, and author of Orlando Furioso, was born at the castle of Reggio in Lombardy in 1474. His father, who was major domo to Duke Hercules, lived to the extent of his fortune, so left but little at his death. Ariosto, from his childhood, showed great marks of genius, especially in poetry; and wrote a comedy in verse on the story of Pyramus and Thisbe, which his brothers and sisters played. His father being utterly unlearned, and rather regarding profit than his son's inclination, compelled him to study the civil law, in which having plodded some years to no purpose, he quitted it for more pleasing studies; yet often lamented, as Ovid and Petrarch did before him, and our own Milton since *, that his father banished him from the Muses. At the age of 24, Ariosto lost his father, and found himself perplexed with family affairs. However, in about six years he was, for his good parts, taken into the service of Don Hippolito, cardinal of Este. At this time he had written nothing but a few sonnets; but now he resolved to make a poem, and chose Bayardo's *Orlando Inamorato* for a groundwork. However, he was prevented writing for a great many years, and was chosen as a fit person to go on an embassy to Pope Julius II. where he gave such satisfaction, that he was sent again, underwent many dangers and difficulties, and at his return was highly favoured. Then, at his leisure, he again applied himself to his poem: but soon after he incurred the cardinal's displeasure for refusing to accompany him into Hungary; by which he was so discouraged, that he deferred writing for 14 years, even till the cardinal's death. After that, he finished by degrees, in great perfection, that which he began with great expectation. Duke Astolfo offered him great promotions if he would serve him; but preferring liberty to grandeur, he refused this and other great offers from princes and cardinals, particularly from Leo X. from all whom he received notwithstanding great presents. The duke of Ferrara delighted

* See his Latin poem, *Ad Patrem.*

Ariosto. delighted so much in his comedies, of which he wrote five, that he built a stage on purpose to have them played in his court, and enabled our poet to build himself a house in Ferrara, with a pleasant garden, where he used to compose his poems, which were highly esteemed by all the princes in Italy, who sent him many presents; but he said, "he would not sell his liberty for the best cardinal's hat in Rome." It was but a small, though convenient house: being asked, why he had not built it in a more magnificent manner, since he had given such noble descriptions of sumptuous palaces, beautiful porticoes, and pleasant fountains, in his Orlando Furioso? he replied, That words were cheaper laid together than stones. Upon the door was the following inscription:

Parva, sed apta mihi, sed nulli obnoxia, sed non
Sordida, parta meo sed tamen ære, domus.

Which Mr Harrington thus translates:

This house is small, but fit for me, but hurtful unto none;
But yet not sluttish, as you see, yet paid for with mine own.

In his diet he was temperate, and so careless of dainties, that he was fit to have lived in the world when they fed upon acorns. Whether he was ever married, is uncertain. He kept company with one Alexandria, to whom, it was reported, he was married privately, and a lady Genevera, whom he slily mentions in the 24th book of his Orlando, as poets are apt to intermix with their fictions some real amours of their own. He was urged to go ambassador to Pope Clement, but would by no means accept this embassy. He translated the *Menecmi* of Plautus: and all his own comedies were so esteemed, that they were frequently acted by persons of the first quality; and when his Lena was first represented, Ferdinand of Este, afterwards marquis of Massa, so far honoured the piece as to speak the prologue. He began one of his comedies in his father's lifetime, when the following incident shows the remarkable talent he had for poetry. His father one day rebuked him sharply, charging him with some great fault; but all the while he returned him no answer. Soon after, his brother began on the same subject: but he easily refuted him, and with strong arguments justified his own behaviour. "Why then (said his brother) did you not satisfy my father?" "In truth (said Lodovico) I was thinking of a part in my comedy; and methought my father's speech to me was so suited to the part of an old man's chiding his son, that I forgot I was concerned in it myself, and considered it only to make it a part of my play." It is also reported of Ariosto, that coming by a potter's shop, he heard him singing a stave out of his Orlando, with so bad a grace, that, out of all patience, he broke with his stick several of his pots. The potter, in a pitiful tone, asking what he meant by wronging a poor man that had never injured him? "You rascal (he replied), I have not done thee half the wrong thou hast done me: for I have broken but two or three pots of thine, not worth so many halfpence; whereas thou has broken and mangled a stanza of mine worth a mark of gold."

Ariosto was tall, of a melancholy complexion, and so absorbed in study and meditation, that he often forgot himself. His picture was drawn by Titian in a masterly manner. He was honoured with the laurel by the hands of the emperor Charles V. He was naturally affable, always assuming less than was his due, yet never putting up a known injury, even from his superiors. He was so fearful on the water, that, whenever he went out of a ship, he would see others go before him; and, on land, he would alight from his horse on the least apprehension of danger. He was of an amorous disposition, and left two natural sons. He enjoyed the friendship of the most eminent men of learning of his time, most of whom he mentions with great respect in the last canto of his Orlando Furioso. His constitution was but weakly, so that he was obliged to have recourse to physicians the greatest part of his life. He bore his last sickness with great resolution and serenity; and died at Ferrara the 8th of July 1533, according to Sir John Harrington, being then 59 years of age. He was interred in the church of the Benedictine monks, who, contrary to their custom, attended his funeral. He had a bust erected to him, and the following epitaph, written by himself, inscribed upon his tomb:

Ariosto || Aristande

Ludovici Ariosti humantur ossa
Sub hoc marmore, seu sub hac humo, seu
Sub quidquid voluit benignus hæres,
Sive hærede benignior comes, seu
Opportunius incidens viator:
Nam scire haud potuit futura: sed nec
Tanti erat, vacuum sibi cadaver
Ut urnam cuperet parare,
Vivens ista tamen sibi paravit,
Quæ scribi voluit suo sepulchro,
Olim si quod haberet id sepulchrum:
Ne cum spiritus hoc brevi peracto
Prescripto spatio misellos artus,
Quos ægre ante reliquerat, reposcet,
Hac et hac cinerem huc et huc revellem
Dum noscat proprium, diu vagetur.

ARIPO, a town on the western coast of the island of Ceylon, at the mouth of the river Sarunda. To the east of this town, is a bank, where they fish for pearls. E. Long. 80. 25. N. Lat. 8. 42.

ARISBA, in *Ancient Geography*, a town of the island of Lesbos (Herodot.).—Another of Troas on the continent, in the territory and to the south-east of Abydos (Polyb.): the rendezvous of Alexander's army after the passage of the Hellespont (Arrian); a colony of the Mitylenians (Stephanus); taken and plundered by Achilles (Virgil.) The residence of Axylus, celebrated by Homer for his hospitality, which gained him the character of Friend of mankind.

ARISH, a Persian long measure, containing about 38 English inches.

ARISI, the Indian name for the plant which produces the rice. See ORYZA, BOTANY *Index*.

ARISTA, or AWN, among botanists, a long needle-like beard, which stands out from the husk of a grain of corn, grain, &c.

ARISTÆUS, son of Apollo and Cyrene, whom, for the many services he had rendered to mankind by his knowledge of all profitable arts, the gods placed among the stars; so that he is the Aquarius in the zodiac. The resemblance of his history to that of Moses has been curiously discussed by Huetius.

ARISTANDER, a famous soothsayer under Alexander the Great, over whom he gained a wonderful

Aristander of Aristides.

ful influence by the good success of his art. He had already had the same employment at the court of King Philip; and it was he who explained better than his brethren the dream that this prince had after having married Olympias.

ARISTARCHUS, a Grecian philosoper of Samos, one of the first that maintained that the earth turns upon its own centre. We are not sure of the age in which he lived; and have none of his works but a *Treatise of the greatness and distance of the Sun and Moon*, translated into Latin by Frederic Commandine, and published with Pappus's explanation in 1572.

ARISTARCHUS, a celebrated grammarian, much esteemed by Ptolemy Philometor, who committed to him the education of his son. He applied himself chiefly to criticism, and made a revisal of Homer's poems, but in too magisterial a way; for such verses as he did not like he treated as spurious. He commented on other poets. Cicero and Horace made use of his name to express a very rigid critic.

ARISTIDA. See BOTANY *Index*.

ARISTIDES, surnamed the *Just*, one of the most celebrated characters of his age for purity and integrity, and cotemporary with Themistocles, was the son of Lysimachus, a man of middle rank, and born at Athens. His dispositions and temper from his youth all conjoined in anticipating that greatness to which he afterwards arose. To a firm, resolute, and placid temper, he likewise added a great contempt of dissimulation, and an utter abhorrence of every thing dishonourable. He began very early to meditate on subjects of government, and applied to his studies with the greatest assiduity. He imbibed a strong predilection for oligarchy upon becoming acquainted with the laws of Lycurgus, which excited his admiration, and gave him a distaste of the unlimited democracy then established in his native city. On the other hand, Themistocles favoured democracy; and even when at school, he is said to have been his constant antagonist on that point. A perpetual opposition to one another in all political points, whether just or unjust, was the consequence of this difference of opinion, when their abilities raised them to several important stations in the state. Although it was deemed absolutely necessary at that time for a party leader to oppose all the acts of his antagonist whatsoever with the greatest vehemence, yet Aristides did not follow this practice without self-reproach. It is related, that one day having firmly opposed a proposal of Themistocles in the assembly, which in his own conscience he knew to be right, on coming out he exclaimed, "The affairs of the Athenians will never prosper, till they throw both of us into the *barathrum*," (the dungeon for condemned criminals). Aristides maintained a strict observance of justice, and when in his own opinion a friend was guilty, he would never screen him from the punishment due to his offence. Neither desirous of profit nor honour, he served his country from the purest principles of duty; and his character was so universally known, that once, when these verses of Æschylus, describing Amphiaraus were recited in the theatre,

"To be, and not to seem, is this man's maxim;
"His mind reposes on its conscious worth,
"And wants no other praise"—

Aristides.

the eyes of the whole assembly were immediately directed towards Aristides, as the true picture of the idea the poet wished to delineate. When in the office of public treasurer, by convicting Themistocles and several others of making free with the public property, he raised up a party against himself; and when he gave in his own account, they to retaliate the affront, accused him of embezzling the public stores: and it was only by the interposition of the court of Areopagus that he got himself cleared. He was, however, again elected to that office, and then, although he kept a secret account against those people concerned with him, he permitted them to plunder without reprehension. It consequently fell out that he was universally praised, his acquaintance cultivated with the greatest avidity, and interest made on all sides to continue him in office: But when the people were about to proceed to elect him again to that trust, he severely chided them, and said, "that while he had served them with fidelity he was treated with calumny, and incurred their displeasure; now that he had really violated his trust, he met with general applause, and was reckoned an excellent citizen." He then exhibited their deceits, and made all parties ashamed of the part they had acted.

Aristides was present at the battle of Marathon, fought B. C. 490, and was next in command among the Athenians to Miltiades; and there, upon that general's proposing to come to battle as soon as possible, he seconded his motion with the utmost vigour. In the field he distinguished himself with intrepidity, valour, and generosity; and being left after the battle to secure the spoils, he executed his trust with honour and fidelity, bringing all to the public account, reserving nothing for himself. He was elected to the important office of chief magistrate the year following; but by the art of Themistocles, the high authority he had attained by his merits was at length converted into an accusation against him; and he was accordingly banished by the ostracism, although a mild, often an unjust measure in the policy of the Athenian state, for getting a temporary relief from the presence of any political influence by which they thought their independence might be injured. A circumstance which occurred on this occasion gives a very high idea of his character. A rustic citizen coming up to vote against him, although not personally acquainted with Aristides, and being himself unable to write, ordered the first person whom he met, who accidentally happened to be Aristides himself, to inscribe his name upon the shell, signifying his acquiescence in the sentence of the state. The patriot said, "Did Aristides ever injure you?" The rustic replied, "I do not so much as know him, but I am tired with everywhere hearing him called *the Just*."—Aristides, taking the shell, wrote his own name upon it, and returned it in silence to the voter. Lifting up his hands to heaven, he supplicated that the Athenians might never behold the day which should induce them to remember Aristides; and then quitted the city.

As the Persians were meditating a new invasion of Greece, he employed himself in his exile in encouraging the Greeks to defend their liberties against the invaders. The Athenians immediately, upon the approach of Xerxes, recalled Aristides, whose absence they began sincerely to regret, along with their other exiles.

Aristides. exiles. At this critical moment, upon his return, he suspended all political animosities; and upon understanding that it was the design of Themistocles to fight the Persian navy in the straits of Salamis, he waited on him in private, proposed an oblivion of all past circumstances, extolled his intentions, and gave him his sincere promise to do the utmost in his power towards effecting his designs. Themistocles, some time after the battle of Salamis, acquainted the Athenians that he had formed a scheme which, although it was of such a nature as forbade his public avowal of it to them, was of inestimable advantage to the state. They immediately ordered that he should communicate it to Aristides. It was a project for consuming the whole confederate fleet of Greece by fire, except their own ships; and thus the entire sway of the sea would be left to the Athenian navy. Aristides reported that nothing could be more unjust, and at the same time, nothing more advantageous that the scheme of Themistocles. Upon this report, the people immediately determined to drop any further thought of it. It was equally to the honour of the Athenians that they made such a determination, and to Aristides that he was made the referree on this occasion. Aristides, before the battle of Platæa, was of considerable service in persuading his countrymen, who were elated with their former successes, to submit to the superior power of the Spartans, and in preserving peace and amity between the confederate forces. He acquitted himself with great valour and resolution in the engagement, and was appointed after the victory to determine a very dangerous dispute concerning the honour of the day, which he conferred upon the Platæans, giving up the claim of the Athenians, the Lacedemonians following his example. Upon the rebuilding of Athens, he was the first person to promote a law which divided the administration among the citizens at large, and enjoined that the archons, or chief magistrates, should be elected out of the whole body of the people, who had so deservedly merited the favour of the state.

Aristides, upon the continuation of the war with the Persians, was sent along with Cimon, the son of Miltiades, to take the command of the Athenian forces in the confederate army. Their humility and meekness, compared with the haughty domineering temper of Pausanias, so engaged the rest of the allies, that the superiority of rank was conferred upon Athens, with the joint concurrence of the other states. The nomination of Aristides to lay an equal assessment upon all the states for the purpose of defraying the expence of the war, was a signal proof of the high idea all Greece had of his integrity and justice. The wisdom and impartiality with which he performed this commission gave universal satisfaction. He obliged all the confederates, after this affair was terminated, solemnly to swear to all the articles of association. The advice which he afterwards gave the Athenians to extend their own territories beyond their proper limits, must certainly have proceeded from some very pressing necessity, when he thus drew down the consequences of the perjury upon his own head. Aristides, on Themistocles's falling under the displeasure of the ruling party, would not concur in a capital prosecution of him; and instead of triumphing over an old enemy, he always spoke of him after his banishment with the highest respect.

In that age it was common for men who had borne the highest public offices to make no increase to their private fortunes, but no man ever carried this disinterestedness to so high a pitch as Aristides. He was indeed so remarkably poor, that when a prosecution was raised against Callias, a rich relation of his, the orator pleading against him, in order to excite the indignation of his audience, made some remarks upon his ability to assist Aristides, and at the same time upon the extreme indigence in which he permitted him and his family to live. Callias, in his vindication, was forced to call Aristides to testify that he had frequently offered him considerable sums, which he would not accept, saying, "that it better became Aristides to glory in his poverty than Callias in his riches," which appear to have been acquired not very honourably.

This great man died about 407 years B. C. according to some at Athens, at an advanced age; others say at Pontus, where he was transacting public business. He was buried at the public expence, and his daughters received portions out of the public treasury; and a pension and an estate in land was bestowed on his son Lysimachus, in gratitude for the signal services Aristides had done his country. (*Gen. Biog.*).

ARISTIDES of Miletus, a famous Greek author, often cited by the ancients.

ARISTIDES, a very eloquent Athenian orator, who became a convert to the Christian religion, and about the year 124 presented to the emperor Adrian an apology for the Christians.

ARISTIDES, *Ælius*, a celebrated orator, born in Mysia, about 129 years before the Christian era. The best edition of his works is that of Oxford, printed in Greek and Latin, in two volumes quarto.

ARISTIDES, a painter cotemporary with Apelles, flourished at Thebes about the 122d Olympiad. He was the first, according to Pliny, who expressed character and passion, the human mind, and its several emotions; but he was not remarkable for softness of colouring. "His most celebrated picture was of an infant (on the taking of a town) at the mother's breast, who is wounded and expiring. The sensations of the mother were clearly marked, and her fear lest the child, upon failure of the milk, should suck her blood." "Alexander the Great (continues the same author) took this picture with him to Pella."

Junius (in his Treatise *de Pictura Veterum*) conjectures that the following beautiful epigram of Æmilianus was written on this exquisite picture:

Ελκε, ταλαν, παρα μητρος ον ωκ ετι μαζον αμελξεις
Ελκυσον υστατιον ναμα κατα φθιμενης.
Η δη γαρ ξιφεεσσι λιποπνοος αλλα τα μητρος
Φιλτρα και εν αιδη παιδοκομειν εμαθον.

Elegantly translated thus:

Suck, little wretch, while yet thy mother lives,
Suck the last drop her fainting bosom gives!
She dies! her tenderness survives her breath,
And her fond love is provident in death.
Webb's Inquiries, Dial. vii. p. 161.

ARISTIPPUS, the founder of the Cyrenaic sect of philosophy, was the son of Aretades, and born at Cyrene in Libya. He flourished about the 96th Olympiad. The great reputation of Socrates induced him to

Aristippus. to leave his own country, and remove to Athens, that he might have the satisfaction of hearing his discourses. He was chiefly delighted with those discourses of Socrates that related the most to pleasure: which he asserted to be the ultimate end in which all happiness consists. His manner of life was agreeable to his opinion: for he indulged himself extremely in all the luxuries of dress, wine, and women. Though he had a good estate, and three country seats, yet he was the only one of the disciples of Socrates who took money for teaching; which being discovered by the philosopher, he asked Aristippus, How he came to have so much? Who in reply asked him, How he came to have so little? Upon his leaving Socrates, he went to Ægina, as Athenæus informs us, where he lived with more freedom and luxury than before. Socrates sent frequent exhortations to him, in order to reclaim him; but all in vain; and with the same view he published that discourse which we find in Xenophon. Here Aristippus became acquainted with Laïs, the famous courtezan of Corinth; for whose sake he took a voyage to that city. He continued at Ægina till the death of Socrates, as appears from Plato's *Phædo*, and the epistle which he wrote upon that occasion. He returned at last into his own country Cyrene, where he professed philosophy, and instituted a sect which, as we observed above, was called the *Cyrenaic*, from the place, and by some writers the *Hedonic* or voluptuous, from its doctrines. During the height of the grandeur of Dionysius the Sicilian tyrant, a great many philosophers resorted to him; and among the rest Aristippus, who was tempted thither by the magnificence of that court. Dionysius asking him the reason of his coming, he replied, "That it was in order to give what he had, and to receive what he had not:" or, as others represent it, "That when he wanted wisdom, he went to Socrates; but now as he wanted money, he was come to him." He very soon insinuated himself into the favour of Dionysius; for being a man of a soft easy temper, he conformed himself exactly to every place, time, and person, and was a complete master of the most refined complaisance.

We have several remarkable passages concerning him during his residence at that court, mentioned by Diogenes Laertius. Dionysius, at a feast, commanded that all should put on women's purple habits, and dance in them. But Plato refused, repeating these lines:

> I cannot in this gay effeminate dress
> Disgrace my manhood or my sex betray.

But Aristippus readily submitted to the command, and made this reply immediately:

> ——At feasts, where mirth is free,
> A sober mind can never be corrupted.

At another time, interceding with Dionysius in behalf of a friend, but not prevailing, he cast himself at his feet: being reproved by one for that excess of humility, he replied, "That it was not he who was the cause of that submission; but Dionysius, whose ears were in his feet." Dionysius showed him three beautiful courtezans, and ordered him to take his choice. Upon which he took them all three away with him, alleging that Paris was punished for preferring one to the other two: but when he had brought them to his door, he dismissed them, in order to show that he could either enjoy or reject with the same indifference. Having desired money of Dionysius, the latter observed to him, that he had assured him a wise man wanted nothing. "Give me (says he) what I ask, and we will talk of that afterwards." When Dionysius had given it him, "Now (says he), you see I do not want." By his complaisance he gained so much upon Dionysius, that he had a greater regard for him than for all the rest of the philosophers, though he sometimes spoke with such freedom to the king, that he incurred his displeasure. When Dionysius asked, Why philosophers haunted the gates of rich men, but not rich men those of philosophers: he replied, "Because the latter know what they want, and the others not." Another time, Dionysius repeating (out of Sophocles, as Plutarch affirms, who ascribes this to Zeno) these verses,

Aristippus.

> He that with tyrants seeks for bare support,
> Enslaves himself, though free he came to court:

he immediately answered,

> He is no slave, if he be free to come.

Diocles, as Laertius informs us, related this in his *Lives of the Philosophers;* though others ascribe this saying to Plato. Aristippus had a contest with Antisthenes the Cynic philosopher; notwithstanding which, he was very ready to employ his interest at court for some friends of Antisthenes, to preserve them from death, as we find by a letter of his to that philosopher. Diogenes followed the example of his master Antisthenes in ridiculing Aristippus, and called him the *court spaniel.*

We have many apophthegms of his preserved.—To one who asked him what his son would be the better for being a scholar? "If for nothing else (said he), yet for this alone, that when he comes into the theatre, one stone will not sit upon another." When a certain person recommended his son to him, he demanded 500 drachmas; and upon the father's replying, that he could buy a slave for that sum, "Do so (said he), and then you will be master of a couple." Being reproached, because, having a suit of law depending, he fee'd a lawyer to plead for him, "Just so (said he), when I have a great supper to make, I always hire a cook." Being asked what was the difference between a wise man and a fool, he replied, "Send both of them together naked to those who are acquainted with neither of them, and then you will know." Being reproved by a certain person (who, according to Mr Stanley, was Plato) for his costly and voluptuous feasts, "I warrant you (said he), that you would not have bestowed three farthings upon such a dinner;" which the other confessing, "Why, then (said he), I find myself less indulgent to my palate than you are to your covetous humour;" or, as it is otherwise represented, "I find, that I love my belly and you love your money." When Simus, treasurer to Dionysius, showed him his house magnificently furnished, and paved with costly marble, (for he was a Phrygian, and consequently profuse); Aristippus spit in his face: upon which the other growing angry, "Why, truly (said he), I could not find a fitter place." His servant carrying after him a great weight of money, and being ready to sink upon the road under his burden,

burden, he bid him throw away all that was too much for him to carry. Horace mentions this fact in his third satire of the second book:

> ————————Quid simile isti
> *Græcus Aristippus? qui servos projicere aurum*
> *In media jussit Libya, quia tardius irent*
> *Propter onus segnes.*

Being asked, what things were most proper for children to be instructed in? he answered, "Those which might prove of the greatest advantage to them when they came to be men." Being reproached for going from Socrates to Dionysius, he replied, "That he went to Socrates when he wanted serious instruction, and to Dionysius for diversion." Having received money of Dionysius at the same time that Plato accepted a book only, and being reproached for it, "The reason is plain (says he), I want money, and Plato wants books." Having lost a considerable farm, he said to one who seemed excessively to compassionate his loss, "You have but one field; I have three left: why should not I rather grieve for you?" Plutarch, who relates this, in his book *De Tranquillitate Animi*, observes upon it, that it is very absurd to lament for what is lost, and not to rejoice for what is left. When a person told him, "That the land for his sake was lost," he replied, "That it was better so, than that he should be lost for the land." Being cast by shipwreck ashore on the island of Rhodes, and perceiving mathematical schemes and diagrams drawn upon the ground, he said, "Courage, friends; for I see the footsteps of men."

After he had lived a long time with Dionysius, his daughter Arete sent to him, to desire his presence at Cyrene, in order to take care of her affairs, since she was in danger of being oppressed by the magistrates. But he fell sick in his return home, and died at Lipara, an Eolian island. With regard to his principal opinions, like Socrates, he rejected the sciences as they were then taught, and pretended that logic alone was sufficient to teach truth and fix its bounds. He asserted, that pleasure and pain were the criterions by which we were to be determined; that these alone made up all our passions; that the first produced all the soft emotions, and the latter all the violent ones. The assemblage of all pleasure, he asserted, made true happiness, and that the best way to attain this was to enjoy the present moments. He wrote a great many books: particularly the history of Libya, dedicated to Dionysius; several Dialogues; and four books of the Luxury of the ancients. There are four epistles of his extant in the Socratic collection published by Leo Allatius.

Besides Arete his daughter, whom he educated in philosophy, Aristippus had also a son, whom he disinherited for his stupidity. Arete had a son who was named *Aristippus* from his grandfather, and had the surname of Μητροδιδακτος, from his mother's instructing him in philosophy. Among his auditors, besides his daughter Arete, we have an account of Æthiops of Ptolemais, and Antipater of Cyrene. Arete communicated the philosophy which she received from her father to her son Aristippus, who transmitted it to Theodorus *the Atheist*, who instituted the sect called *Theodorean.* Antipater communicated the philosophy of Aristippus to Epitimedes his disciple; Epitimedes to Paræbates; Paræbates to Hegesias and Anniceris: and these two last improving it by some additions of their own, obtained the honour each of them of giving a name to the *Hegesiac* and *Annicerian* sect.

ARISTO, a Stoic philosopher, the disciple of Zeno the chief of the Stoics, flourished about 290 years before the Christian era. He differed but little from his master Zeno. He rejected logic as of no use, and natural philosophy as being above the reach of the human understanding. It is said, that being bald, the sun burnt his head; and that this caused his death.—There is a saying of his recorded, which might render the doctrine of Aristippus less odious than it ordinarily is; (see ARISTIPPUS). He used to say, "That a philosopher might do those of his hearers a prejudice who put a wrong interpretation upon good meanings; as for example that the school of Aristippus might send out debauchees, and that of Zeno cynics:" which seems to imply, that the doctrine of this philosopher never produced this effect but when it was misunderstood. He should also have added, that every teacher is therefore obliged to forbear laying down ambiguous maxims, or to prevent false glosses being put upon them.

ARISTOCRACY, a form of government where the supreme power is vested in the principal persons of the state. The word is derived from αριστος, *optimus*, and κρατεω, *impero*, "I govern." The ancient writers of politics prefer the aristocratical form of government to all others. The republic of Venice is an aristocracy. Aristocracy seems to coincide with oligarchy; which, however, is more ordinarily used to signify a corruption of an aristocratical state, where the administration is in the hands of too few, or where some one or two usurp the whole power.

ARISTOGITON, a famous Athenian, who, with Harmodius, killed Hipparchus tyrant of Athens, about 513 years before the Christian era. The Athenians erected a statue to him.

ARISTOLACHIA, BIRTHWORT. See BOTANY *Index*.

ARISTOMENES, a general of the Messenians, renowned for his valour and virtue. See MESSENIA.

ARISTOPHANES, a celebrated comic poet of Athens. He was contemporary with Plato, Socrates, and Euripides; and most of his plays were written during the Peloponnesian war. His imagination was warm and lively, and his genius particularly turned to raillery. He had also great spirit and resolution; and was a declared enemy to slavery, and to all those who wanted to oppress their country. The Athenians suffered themselves in his time to be governed by men who had no other views than to make themselves masters of the commonwealth. Aristophanes exposed the designs of these men, with great wit and severity, upon the stage. Cleon was the first whom he attacked, in his comedy of the *Equites;* and as there was not one of the comedians who would venture to personate a man of his great authority, Aristophanes played the character himself, and with so much success, that the Athenians obliged Cleon to pay a fine of five talents, which were given to the poet. He described the affairs of the Athenians in so exact a manner, that his comedies are a faithful history of that people. For this reason, when Dionysius king of Syracuse desired to

Aristophanes.

to learn the state and language of Athens, Plato sent him the comedies of Aristophanes, telling him, these were the best representations thereof. He wrote above 50 comedies; but there are only 11 extant which are perfect: these are Plutus, the Clouds, the Frogs, Equites, the Acharnenses, the Wasps, Peace, the Birds, the Ecclesiazusæ or Female Orators, the Thesmophosiazusæ or Priestesses of Ceres, and Lysistrata. The Clouds, which he wrote in ridicule of Socrates *, is the most celebrated of all his comedies. Madam Dacier tells us, she was so much charmed with this performance, that after she had translated it, and read it over 200 times, it did not become the least tedious to her, which she could not say of any other piece; and that the pleasure which she received from it was so exquisite, that she forgot all the contempt and indignation which Aristophanes deserved for employing his wit to ruin a man who was wisdom itself, and the greatest ornament of the city of Athens. Aristophanes having conceived some aversion to the poet Euripides, satirizes him in several of his plays, particularly in his Frogs and his Thesmophosiazusæ. He wrote his Peace in the 10th year of the Peloponnesian war, when a treaty of 50 years was concluded between the Athenians and the Lacedæmonians, though it continued but seven years. The Acharnenses was written after the death of Pericles and the loss of the battle in Sicily, in order to dissuade the people from intrusting the safety of the commonwealth to such imprudent generals as Lamachus. Soon after, he represented his Aves or Birds; by which he admonished the Athenians to fortify Decelæa, which he calls by a fictitious name *Nephelococcygia*. The Vespæ, or Wasps, was written after another loss in Sicily, which the Athenians suffered from the misconduct of Chares. He wrote the Lysistrata when all Greece was involved in war; in which comedy the women are introduced debating upon the affairs of the commonwealth; when they come to a resolution, not to go to bed with their husbands till a peace should be concluded. His Plutus, and other comedies of that kind, were written after the magistrates had given orders that no person should be exposed by name upon the stage. He invented a peculiar kind of verse, which was called by his name, and is mentioned by Cicero in his Brutus; and Suidas says, that he also was the inventor of the tetrameter and octameter verse.

* See the article *Socrates*.

Aristophanes was greatly admired among the ancients, especially for the true Attic elegance of his style. The time of his death was unknown; but it is certain he was living after the expulsion of the tyrants by Thrasybulus, whom he mentions in his Plutus and other comedies. There have been several editions and translations of this poet. Nicodemus Frischin, a German, famous for his classical knowledge, in the 16th century, translated Plutus, the Clouds, the Frogs, the Equites, and the Acharnenses, into Latin verse. Quintus Septimus Florens rendered into Latin verse the Wasps, the Peace, and Lysistrata; but his translation is full of obsolete words and phrases. Madam Dacier published at Paris in 1692, a French version of Plutus and the Clouds, with critical notes, and an examination of them according to the rules of the theatre. Mr Lewis Theobald likewise translated these two comedies into the English, and published them with remarks. The most noble edition of this author is that published by Ludolphus Kuster, at Amsterdam, in folio, in 1710, and dedicated to Charles Montague earl of Halifax.

Aristophanes || Aristotle.

ARISTOTELIA, in antiquity, annual feasts celebrated by the citizens of Stagyra, in honour of Aristotle, who was born there; and in gratitude for his having procured from Alexander the rebuilding and repeopling of that city, which had been demolished by King Philip.

ARISTOTELIAN, something that relates to the philosopher Aristotle.

ARISTOTELIAN *Philosophy*, the philosophy taught by Aristotle, and maintained by his followers. The Aristotelian is otherwise called the *Peripatetic Philosophy*. See PERIPATETICS.

ARISTOTELIANS, a sect of philosophers, otherwise called *Peripatetics*.

The Aristotelians and their dogmata prevailed for a long while in the schools and universities; even in spite of all the efforts of the Cartesians, Newtonians, and other corpuscularians. But the systems of the latter have at length gained the pre-eminence; and the Newtonian philosophy in particular is now very generally received. The principles of Aristotle's philosophy, the learned agree, are chiefly laid down in the four books *de Cœlo;* the eight books of *Physical Auscultation*, φυσικης ακροασεως, belonging rather to logic, or metaphysics, than to physics. Instead of the more ancient systems, he introduced matter, form, and privation, as the principles of all things; but he does not seem to have derived much benefit from them in natural philosophy. His doctrines are, for the most part, so obscurely expressed, that it has not yet been satisfactorily ascertained what were his sentiments on some of the most important subjects. He attempted to refute the Pythagorean doctrine concerning the twofold motion of the earth; and pretended to demonstrate, that the matter of the heavens is ungenerated, incorruptible, and subject to no alteration: and he supposed that the stars were carried round the earth in solid orbs. The reader will find a distinct account of the logical part of his philosophy, by Dr Reid professor of moral philosophy in the university of Glasgow, and in the second volume of Lord Kames's Sketches of the History of Man. Mr Harris has published a commentary on his Categories, under the title of *Philosophical Arrangements*.

ARISTOTLE, the chief of the Peripatetic philosophers, born at Stagyra, a small city in Macedon, in the 99th Olympiad, about 384 years before the birth of Christ. He was the son of Nicomachus, physician to Amyntas the grandfather of Alexander the Great. He lost his parents in his infancy; and Proxenes, a friend of his father, who had the care of his education, taking but little notice of him, he quitted his studies, and gave himself up to the follies of youth. After he had spent most of his patrimony, he entered into the army; but not succeeding in this profession, he went to Delphos to consult the oracle what course of life he should follow; when he was advised to go to Athens and study philosophy. He accordingly went thither about 18 years of age, and studied under Plato till he was 37. By this time he had spent his whole fortune; and we are told that he got his living by selling powders, and some receipts in pharmacy. He

Aristotle. followed his studies with most extraordinary diligence, so that he soon surpassed all in Plato's school. He ate little, and slept less; and that he might not oversleep himself, Diogenes Laertius tells us, that he lay always with one hand out of the bed, having a ball of brass in it, which, by its falling into a bason of the same metal, awaked him. We are told that Aristotle had several conferences with a learned Jew at Athens, and that by this means he instructed himself in the sciences and religion of the Egyptians, and thereby saved himself the trouble of travelling into Egypt. When he had studied about 15 years under Plato, he began to form different tenets from those of his master, who became highly piqued at his behaviour. Upon the death of Plato, he quitted Athens; and retired to Atarnya, a little city of Mysia, where his old friend Hermias reigned. Here he married Pythias, the sister of this prince, whom he is said to have loved so passionately, that he offered sacrifice to her. Some time after, Hermias having been taken prisoner by Meranon, the king of Persia's general, Aristotle went to Mitylene the capital of Lesbos, where he remained till Philip king of Macedon having heard of his great reputation, sent for him to be tutor to his son Alexander, then about 14 years of age: Aristotle accepted the offer; and in eight years taught him rhetoric, natural philosophy, ethics, politics, with a certain sort of philosophy, according to Plutarch, which he taught nobody else. Philip erected statues in honour of Aristotle; and for his sake rebuilt Stagyra, which had been almost ruined by the wars.

The last fourteen years of his life he spent mostly at Athens, surrounded with every assistance which men and books could afford him for prosecuting his philosophical inquiries. The glory of Alexander's name, which then filled the world, ensured tranquillity and respect to the man whom he distinguished as his friend: but after the premature death of that illustrious protector, the invidious jealousy of priests and sophists inflamed the malignant and superstitious fury of the Athenian populace; and the same odious passions which proved fatal to the offensive virtue of Socrates, fiercely assailed the fame and merit of Aristotle. To avoid the cruelty of persecution, he secretly withdrew himself to Chalcis in Eubœa. This measure was sufficiently justified by a prudent regard to his personal safety; but lest his conduct should appear unmanly, when contrasted with the firmness of Socrates in a similar situation, he condescended to apologise for his flight, by saying, that he was unwilling to afford the Athenians a second opportunity "to sin against philosophy." He seems to have survived his retreat from Athens only a few months; vexation and regret probably ended his days.

Besides his treatises on philosophy, he wrote also on poetry, rhetoric, law, &c. to the number of 400 treatises, according to Diogenes Laertius; or more, according to Francis Patricius of Venice. An account of such as are extant, and of those said to be lost, may be seen in Fabricius's *Bibliotheca Græca*. He left his writings with Theophrastus, his beloved disciple and successor in the Lycæum; and forbade that they should ever be published. Theophrastus, at his death, trusted them to Neleus, his good friend and disciple: whose heirs buried them in the ground at Scepsis, a town of Troas, to secure them from the king of Pergamus, who made great search everywhere for books to adorn his library. Here they lay concealed 160 years, until, being almost spoiled, they were sold to one Apellicon, a rich citizen of Athens. Sylla found them at this man's house, and ordered them to be carried to Rome. They were some time after purchased by Tyrannion a grammarian: and Andronicus of Rhodes having bought them of his heirs, was in a manner the first restorer of the works of this great philosopher; for he not only repaired what had been decayed by time and ill keeping, but also put them in a better order, and got them copied. There were many who followed the doctrine of Aristotle in the reigns of the 12 Cæsars, and their numbers increased much under Adrian and Antoninus: Alexander Aphrodinus was the first professor of the Peripatetic philosophy at Rome, being appointed by the emperors Marcus Aurelius and Lucius Verus; and in succeeding ages the doctrine of Aristotle prevailed among almost all men of letters, and many commentaries were written upon his works.

Aristot Aristox nus.

The first doctors of the church disapproved of the doctrine of Aristotle, as allowing too much to reason and sense; but Antoninus bishop of Laodicea, Didymus of Alexandria, St Jerome, St Augustin, and several others, at length wrote and spoke in favour of it. In the sixth age Boethius made him known in the west, and translated some of his pieces into Latin. But from the time of Boethius to the eighth age, Joannes Damascenus was the only man who made an abridgement of his philosophy, or wrote any thing concerning him. The Grecians, who took great pains to restore learning in the 11th and following ages, applied much to the works of this philosopher, and many learned men wrote commentaries on his writings: amongst these were Alfarabius, Algazel, Avicenna, and Averroes. They taught his doctrine in Africa, and afterwards at Cordova in Spain. The Spaniards introduced his doctrine into France, with the commentaries of Averroes and Avicenna; and it was taught in the university of Paris, until Amauri having supported some particular tenets on the principles of this philosopher, was condemned for heresy, in a council held there in 1210, when all the works of Aristotle that could be found were burnt, and the reading of them forbidden under pain of excommunication. This prohibition was confirmed, as to the physics and metaphysics, in 1215, by the pope's legate; though at the same time he gave leave for his logic to be read, instead of St Augustin's, used at that time in the university. In the year 1265, Simon, cardinal of St Cecil, and legate from the holy see, prohibited the reading of the physics and metaphysics of Aristotle. All these prohibitions, however, were taken off in 1366; for the cardinals of St Mark and St Martin, who were deputed by Pope Urban V. to reform the university of Paris, permitted the reading of those books which had been prohibited: and in the year 1448, Pope Stephen approved of all his works, and took care to have a new translation of them into Latin.

ARISTOXENUS, one of the most ancient musical writers, was born at Tarentum, a city in *Magna Græcia*, now Calabria. He was the son of a musician, and it appears that he lived about the time of Alexander the Great and his successors. His *Harmonics*

Aristoxenus.

monics in three books, all that are come down to us, together with Ptolemy's Harmonics, were first published by Gogavinus, but not very correctly, at Venice, 1562, in 4to, with a Latin version. John Meursius next translated the three books of Aristoxenus into Latin, from the MS. of Jos. Scaliger; but according to Meibomius, very negligently. With these he printed at Leyden, 1616, 4to, Nicomachus and Alypius, two other Greek writers on music. After this, Meibomius collected these musical writers together; to which he added Euclid, Bacchius senior, Aristides Quintilianus; and published the whole with a Latin version and notes, from the elegant press of Elzevir, Amst. 1652. The learned editor dedicates these ancient musical treatises to Christina queen of Sweden. Aristoxenus is said by Suidas to have written 452 different works, among which those on music were the most esteemed; yet his writings on other subjects are very frequently quoted by ancient authors, notwithstanding Cicero and some others say that he was a bad philosopher, and had nothing in his head but music. The title of several of the lost works of Aristoxenus, quoted by Athenæus and others, have been collected by Meursius in his notes upon this author, by Tonsius and Menage, all which Fabricius has digested into alphabetical order.

Aristoxenus.

ARITHMETIC

IS a science which explains the properties of numbers, and shows the method or art of computing by them.

History of Arithmetic.

1 AT what time this science was first introduced into the world, we can by no means determine. That some part of it, however, was coeval with the human race is absolutely certain. We cannot conceive how any man endowed with reason can be without some knowledge of numbers. We are indeed told of nations in America who have no word in their language to express a greater number than three; and this they call *pœtarrarorincouroac:* but that such nations should have no idea of a greater number than this, is absolutely incredible. Perhaps they may compute by threes, as we compute by tens; and this may have occasioned the notion that they have no greater number than three.

But though we cannot suppose any nation, or indeed any single person, ever to have been without some knowledge of the difference between greater and smaller numbers, it is possible that mankind may have subsisted for a considerable time without bringing this science to any perfection, or computing by any regular scale, as 10, 60, &c. That this, however, was very early introduced into the world, even before the flood, we may gather from the following expression in Enoch's prophecy, as mentioned by the apostle Jude: "Behold, the Lord cometh with *ten thousands* of his saints." This shows, that even at that time men had ideas of numbers as high as we have at this day, and computed them also in the same manner, namely, by tens. The directions also given to Noah concerning the dimensions of the ark, leave us no room to doubt that he had a knowledge of numbers, and of measures likewise. When Rebekah was sent away to Isaac, Abraham's son, her relations wished she might be the mother of *thousands of millions;* and if they were totally unacquainted with the rule of multiplication, it is difficult to see how such a wish could have been formed.

It is probable, therefore, that the four fundamental rules of Arithmetic have always been known to some nation or other. No doubt, as some nations, like the Europeans formerly, and the Africans and Americans now, have been immersed in the most abject and deplorable state of ignorance, they might remain for some time unacquainted with numbers, except such as they had immediate occasion for; and, when they came afterwards to improve, either from their own industry, or hints given by others, might fancy that they themselves, or those from whom they got the hints, had invented what was known long before. The Greeks 2
were the first European nation among whom arithmetic arrived at any degree of perfection. M. Goguet is of opinion, that they first used pebbles in their calculations: a proof of which he imagines is, that the word ψηφιζω, which comes from ψηφος, a little stone, or flint, among other things, signifies *to calculate*. The same, he thinks, is probable of the Romans; and derives the word *calculation* from the use of little stones (*calculi*) in their first arithmetical operations.

If this method, however, was at all made use of, it must have been but for a short time, since we find the Greeks very early made use of the letters of the alphabet to represent their numbers. The 23 letters of their alphabet taken according to their order, at first denoted the numbers 1, 2, 3, 4, 5, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 100, 200, 300, 400, 500, 600, 700, and 800; to which they added the three following, ϛ, ϟ, Ϡ, to represent 6, 90, and 900. The difficulty of performing arithmetical operations by such marks as these may easily be imagined, and is very conspicuous from Archimedes's treatise concerning the dimensions of a circle.

The Romans followed a like method; and besides 3
characters for each rank of classes, they introduced others for five, fifty, and five hundred. Their method is still used for distinguishing the chapters of books, and some other purposes. Their numeral letters and values are the following:

I	V	X	L	C	D	M
One,	five,	ten,	fifty,	one hundred,	five hundred,	one thousand.

Any number, however great, may be represented by repeating and combining these according to the following rules:

1st, When the same letter is repeated twice, or oftener, its value is represented as often. Thus II signifies two; XXX thirty; CC two hundred.

2d, When a numeral letter of lesser value is placed after one of greater, their values are added: thus XI signifies

signifies eleven, LXV sixty-five, MDCXXVIII one thousand six hundred and twenty-eight.

3d, When a numeral letter of lesser value is placed before one of greater, the value of the lesser is taken from that of the greater: thus IV signifies four, XL forty, XC ninety, CD four hundred.

Sometimes IↃ is used instead of D for 500, and the value is increased ten times by annexing Ↄ to the right hand.

Thus IↃ signifies	500	Also CIↃ is used for	1000
IↃↃ	5000	CCIↃↃ for	10000
IↃↃↃ	50000	CCCIↃↃↃ for	100000

Sometimes thousands are represented by drawing a line over the top of the numeral; $\overline{V}$ being used for five thousand, $\overline{L}$ for fifty thousand, $\overline{CC}$ two hundred thousand.

4 Sexagesimal Arithmetic.

About the year of Christ 200, a new kind of arithmetic, called *sexagesimal*, was invented, as is supposed, by Claudius Ptolemæus. The design of it was to remedy the difficulties of the common method, especially with regard to fractions. In this kind of arithmetic, every unit was supposed to be divided into 60 parts, and each of these into 60 others, and so on: hence any number of such parts were called *sexagesimal fractions;* and to make the computation in whole numbers more easy, he made the progression in these also sexagesimal. Thus from one to 59 were marked in the common way: then 60 was called a *sexagesima prima*, or first sexagesimal integer, and had one single dash over it; so 60 was expressed thus I′; and so on to 59 times 60, or 3540, which was thus expressed LIX′. He now proceeded to 60 times 60, which he called a *sexagesima secunda*, and was thus expressed I″. In like manner, twice 60 times 60, or 7200, was expressed by II″; and so on till he came to 60 times 3600, which was a third sexagesimal, and expressed thus, I‴. If any number less than 60 was joined with these sexagesimals, it was added in its proper characters without any dash; thus I′XV represented 60 and 15, or 75; I′VXXV is four times 60 and 25, or 265; X″II′XV, is ten times 3600, twice 60 and 15, or 36, 135, &c. Sexagesimal fractions were marked by putting the dash at the foot, or on the left hand of the letter: thus $I_{,}$ or $'I$ denoted $\frac{1}{60}$; $I_{,,}$ or $''I$ $\frac{1}{3600}$, &c.

5 Indian characters, when brought into use.

The most perfect method of notation, which we now use, came into Europe from the Arabians, by the way of Spain. The Arabs, however, do not pretend to be the inventors of them, but acknowledge that they received them from the Indians. Some there are, indeed, who contend that neither the Arabs nor the Indians were the inventors, but that they were found out by the Greeks. But this is by no means probable; as Maximus Planudes, who lived towards the close of the 13th century, is the first Greek who makes use of them: and he is plainly not the inventor; for Dr Wallis mentions an inscription on a chimney in the parsonage house of Helendon in Northamptonshire, where the date is expressed by M° 133, instead of 1133. Mr Luffkin furnishes a still earlier instance of their use, in the window of a house, part of which is a Roman wall, near the market place in Colchester; where between two carved lions stands an escutcheon with the figures 1090. Dr Wallis is of opinion that these characters must have been used in England at least as long ago as the year 1050, if not in ordinary affairs, at least in mathematical ones, and in astronomical tables. How these characters came to be originally invented by the Indians we are entirely ignorant.

The introduction of the Arabian characters in notation did not immediately put an end to the sexagesimal arithmetic. As this had been used in all the astronomical tables, it was for their sakes retained for a considerable time. The sexagesimal integers went first out, but the fractions continued till the invention of decimals.

6 Treatises on arithmetic.

The oldest treatises extant, upon the theory of arithmetic, are the seventh, eighth, and ninth books of Euclid's Elements, where he treats of proportion and of prime and composite numbers; both of which have received improvements since his time, especially the former. The next, of whom we know any thing, is Nicomachus the Pythagorean, who wrote a treatise of the theory of arithmetic, consisting chiefly of the distinctions and divisions of numbers into classes, as plain, solid, triangular, quadrangular, and the rest of the figurate numbers as they are called, numbers odd and even, &c. with some of the more general properties of the several kinds. This author is, by some, said to have lived before the time of Euclid; by others, not long after. His arithmetic was published at Paris in 1538. The next remarkable writer on this subject is Boethius, who lived at Rome in the time of Theodoric the Goth. He is supposed to have copied most of his works from Nicomachus.

From this time no remarkable writer on arithmetic appeared till about the year 1200, when Jordanus of Namur wrote a treatise on this subject, which was published and demonstrated by Joannes Faber Stapulensis in the 15th century, soon after the invention of printing. The same author also wrote upon the new art of computation by the Arabic figures, and called this book *Algorismus Demonstratus*. Dr Wallis says, this manuscript is in the Savillian library at Oxford, but it hath never yet been printed. As learning advanced in Europe, so did the knowledge of numbers: and the writers on arithmetic soon became innumerable. About the year 1464, Regiomontanus, in his triangular tables, divided the radius into 10,000 parts, instead of 60,000; and thus tacitly expelled the sexagesimal arithmetic. Part of it, however, still remains in the division of time, as of an hour into 60 minutes, a minute into 60 seconds, &c. Ramus in his arithmetic, written about the year 1550, and published by Lazarus Schonerus in 1586, used decimal periods in carrying on the square and cube roots to fractions. The same had been done before by our countrymen Buckley and Record; but the first who published an express treatise on decimals was Simon Stevinius, about the year 1582. As to the circulating decimals, Dr Wallis is the first who took much notice of them. He is also the author of the *arithmetic of infinites*, which has been very usefully applied to geometry. The greatest improvement, however, which the art of computation ever received, is the invention of logarithms. The honour of this invention is unquestionably due to Baron Napier of Merchiston in Scotland, about the end of the 16th or beginning of

the

Notation and Numeration.

the 17th century. By these means arithmetic has advanced to a degree of perfection which the ancients could never have imagined possible, much less hoped to attain; and we believe it may now be reckoned one of those few sciences which have arrived at their utmost height, and which is in its nature capable of little further improvement.

Chap. I. NOTATION and NUMERATION.

7 The first elements of arithmetic are acquired during our infancy. The idea of one, though the simplest of any, and suggested by every single object, is perhaps rather of the negative kind, and consists partly in the exclusion of plurality, and is not attended to till that of number be acquired. Two is formed by placing one object near another; three, four, and every higher number, by adding one continually to the former collection. As we thus advance from lower numbers to higher, we soon perceive that there is no limit to this increasing operation; and that, whatever number of objects be collected together, more may be added, at least, in imagination; so that we can never reach the highest possible number, nor approach near it. As we are led to understand and add numbers by collecting objects, so we learn to diminish them by removing the objects collected; and if we remove them one by one, the number decreases through all the steps by which it advanced, till only one remain, or none at all. When a child gathers as many stones together as suits his fancy, and then throws them away, he acquires the first elements of the two capital operations in arithmetic. The idea of numbers, which is first acquired by the observation of sensible objects, is afterwards extended to measures of space and time, affections of the mind, and other immaterial qualities.

Small numbers are most easily apprehended: a child soon knows what two and what three is; but has not any distinct notion of seventeen. Experience removes this difficulty in some degree; as we become accustomed to handle larger collections, we apprehend clearly the number of a dozen or a score; but perhaps could hardly advance to a hundred without the aid of classical arrangement, which is the art of forming so many units into a class, and so many of these classes into one of a higher kind, and thus advancing through as many ranks of classes as occasion requires. If a boy arrange an hundred stones in one row, he would be tired before he could reckon them; but if he placed them in ten rows of ten stones each, he will reckon an hundred with ease; and if he collect ten such parcels, he will reckon a thousand. In this case, ten is the lowest class, a hundred is a class of the second rank, and a thousand is a class of the third rank.

There does not seem to be any number naturally adapted for constituting a class of the lowest, or any higher rank, to the exclusion of others. However, as ten has been universally used for this purpose by the Hebrews, Greeks, Romans, and Arabians, and by all nations who have cultivated this science, it is probably the most convenient for general use. Other scales, however, may be assumed, perhaps on some occasions, with superior advantage; and the principles of arithmetic will appear in their full extent, if the student can adapt them to any scale whatever: thus, if eight were the scale, 6 times 3 would be two classes, and two units, and the number 18 would then be represented by 22. If 12 were the scale, 5 times 9 would be three classes and nine units, and 45 would be represented by 39, &c.

Notation and Numeration.

It is proper, whatever number of units constitutes a class of the lower rank, that the same number of each class should make one of the next higher. This is observed in our arithmetic, ten being the universal scale: but it is not regarded in the various kinds of moneys, weights, and the like, which do not advance by any universal measure; and much of the difficulty in the practice of arithmetic arises from that irregularity.

As higher numbers are somewhat difficult to apprehend, we naturally fall on contrivances to fix them in our minds, and render them familiar: but notwithstanding all the expedients we can fall upon, our ideas of high numbers are still imperfect, and generally far short of the reality; and though we can perform any computation with exactness, the answer we obtain is often incompletely apprehended.

It may not be amiss to illustrate, by a few examples, the extent of numbers which are frequently named without being attended to. If a person employed in telling money reckon an hundred pieces in a minute, and continue at work ten hours each day, he will take seventeen days to reckon a million; a thousand men would take 45 years to reckon a billion. If we supposed the whole earth to be as well peopled as Britain, and to have been so from the creation, and that the whole race of mankind had constantly spent their time in telling from a heap consisting of a quadrillion of pieces, they would hardly have yet reckoned the thousandth part of that quantity.

All numbers are represented by the ten following characters.

1 2 3 4 5 6 7 8 9 0

One, two, three, four, five, six, seven, eight, nine, cypher.

The nine first are called *significant figures*, or *digits;* and sometimes represent units, sometimes tens, hundreds, or higher classes. When placed singly, they denote the simple numbers subjoined to the characters. When several are placed together, the first or right-hand figure only is to be taken for its simple value: the second signifies so many tens, the third so many hundreds, and the others so many higher classes, according to the order they stand in. And as it may sometimes be required to express a number consisting of tens, hundreds, or higher classes, without any units or classes of a lower rank annexed; and as this can only be done by figures standing in the second, third, or higher place, while there are none to fill up the lower ones; therefore an additional character or cypher (0) is necessary, which has no signification when placed by itself, but serves to supply the vacant places, and bring the figures to their proper station.

The following table shows the names and divisions of the classes.

8.

Notation and Numeration.

8.	4.	3.	7.	9.	8.	2.	5.	6.	4.	7.	3.	8.	9.	7.	2.	6.	4.	5.
TRILLIONS	Hundred thousand of billions	Ten thousand of billions	Thousand billions	Hundred billions	Ten billions	BILLIONS	Hundred thousand of millions	Ten thousand of millions	Thousand millions	Hundred millions	Ten millions	MILLIONS	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Units

The first six figures from the right hand are called the *unit period*, the next five the *million period*, after which the *trillion*, *quadrillion*, *quintillion*, *sextillion*, *septillion*, *octillion*, and *nonillion* periods follow in their order.

It is proper to divide any number, before we reckon it, into periods and half periods, by different marks. We then begin at the left hand, and read the figures in their order, with the names of their places, from the table. In writing any number, we must be careful to mark the figures in their proper places, and supply the vacant places with cyphers.

As there are no possible ways of changing numbers, except by enlarging or diminishing them according to some given rule, it follows, that the whole art of arithmetic is comprehended in two operations, *Addition* and *Subtraction*. However, as it is frequently required to add several equal numbers together, or to subtract several equal ones from a greater, till it be exhausted, proper methods have been invented for facilitating the operation in these cases, and distinguished by the names of *Multiplication* and *Division*; and these four rules are the foundation of all arithmetical operations whatever.

As the idea of number is acquired by observing several objects collected, so is that of fractions by observing an object divided into several parts. As we sometimes meet with objects broken into two, three, or more parts, we may consider any or all of these divisions promiscuously, which is done in the doctrine of vulgar fractions, for which a chapter will be allotted. However, since the practice of collecting units into parcels of tens has prevailed universally, it has been found convenient to follow a like method in the consideration of fractions, by dividing each unit into ten equal parts, and each of these into ten smaller parts; and so on. Numbers divided in this manner are called *Decimal Fractions*.

CHAP. II. ADDITION.

3 ADDITION is that operation by which we find the amount of two or more numbers. The method of doing this in simple cases is obvious, as soon as the meaning of number is known, and admits of no illustration. A young learner will begin at one of the numbers, and reckon up as many units separately as there are in the other, and practice will enable him to do it at once. It is impossible, strictly speaking, to add more than two numbers at a time. We must first find the sum of the first and second; then we add the third to that number; and so on. However, as the several sums obtained are easily retained in the memory, it is neither necessary nor usual to mark them down. When the numbers consist of more figures than one, we add the units together, the tens together, and so on. But if the sum of the units exceed ten, or contain ten several times, we add the number of tens it contains to the next column, and only set down the number of units that are over. In like manner we carry the tens of every column to the next higher. And the reason of this is obvions from the value of the places; since an unit, in any higher place, signifies the same thing as ten in the place immediately lower.

Additi

RULE. "Write the numbers distinctly, units under units, tens under tens; and so on. Then reckon the amount of the right-hand column. If it be under ten, mark it down. If it exceed ten, mark the units only, and carry the tens to the next place. In like manner, carry the tens of each column to the next, and mark down the full sum of the left-hand column."

Example.

346863
876734
123467
314213
712316
438987
279654
———
3092234
24433

As it is of great consequence in business to perform addition readily and exactly, the learner ought to practise it till it become quite familiar. If the learner can readily add any two digits, he will soon add a digit to a higher number with equal ease. It is only to add the unit place of that number to the digit; and, if it exceed ten, it raises the amount accordingly. Thus, because 8 and 6 is 14, 48 and 6 is 54. It will be proper to mark down under the sums of each column, in a small hand, the figure that is carried to the next column. This prevents the trouble of going over the whole operation again, in case of interruption or mistake. If you want to keep the account clean, mark down the sum and figure you carry on a separate paper, and after revising them, transcribe the sum only. After some practice, we ought to acquire the habit of adding two or more figures at one glance. This is particularly useful when two figures which amount to 10, as 6 and 4, or 7 and 3, stand together in the column.

Every operation in arithmetic ought to be revised, to prevent mistakes; and as one is apt to fall into the same mistake, if he revise it in the same manner he performed it, it is proper either to alter the order, or else to trace back the steps by which the operation advanced, which will lead us at last to the number we began with. Every method of proving accounts may be referred to one or other of these heads.

1st, Addition may be proven by any of the following methods: Repeat the operation, beginning at the top of the column, if you began at the foot when you wrought it.

2d, Divide the account into several parts; add these separately, and then add the sums together. If their amount correspond with the sum of the account, when added at once, it may be presumed right. This method is particularly proper when you want to know the sums of the parts, as well as that of the whole.

3d, Subtract the number successively from the sum; if the account be right, you will exhaust it exactly, and find no remainder.

When

Addition.

When the given number consists of articles of different value, as pounds, shillings, and pence, or the like, which are called *different denominations*, the operations in arithmetic must be regulated by the value of the articles. We shall give here a few of the most useful tables for the learner's information.

I. *Sterling Money.*	II. *Avoirdupois Weight.*
4 Farthings = 1 penny, *marked* d.	16 Drams = 1 ounce, oz.
12 Pence = 1 shilling, s.	16 Ounces = 1 pound, lb.
20 Shillings = 1 pound, L.	28 Pounds = 1 quarter, qr.
Also, 6s. 8d. = 1 noble	4 Quart. = 1 hun. wght, C.
12s. = 1 angel	20 Hun. weight = 1 ton, T.
13s. 4d. or two-thirds of a pound = 1 merk.	

Scots money is divided in the same manner as sterling, and has one twelfth of its value. A pound Scots is equal to 1s. 8d. sterling, a shilling Scots to a penny sterling, and a penny Scots to a twelfth part of a penny sterling; a merk Scots is two-thirds of a pound Scots, or 13⅓d. Sterling.

III. *Troy Weight.*	IV. *Apothecaries Weight.*
20 Mites = 1 grain, gr.	20 Grains = 1 scruple, ℈
24 Grains = 1 pen. wt, dwt.	3 Scruples = 1 dram, ʒ
20 Penny wts = 1 ounce, oz.	8 Drams = 1 ounce, ℥
12 Ounces = 1 pound, lib.	12 Ounces = 1 pound, ℔

V. *English Dry Measure.*	VI. *Scots Dry Measure.*
2 Pints = 1 quart	4 Lippies = 1 peck
4 Quarts = 1 gallon	4 Pecks = 1 firlot
2 Gallons = 1 peck	4 Firlots = 1 boll
4 Pecks = 1 bushel	16 Bolls = 1 chalder
8 Bushels = 1 quarter	

VII. *English Land Measure.*	VIII. *Scots Land Measure.*
30¼ Square yards = 1 pole or perch	36 Square ells = 1 fall
40 Poles = 1 rood	40 Falls = 1 rood
4 Roods = 1 acre	4 Roods = 1 acre

IX. *Long Measure.*	X. *Time.*
12 Inches = 1 foot	60 Seconds = 1 minute
3 Feet = 1 yard	60 Minutes = 1 hour
5½ Yards = 1 pole	24 Hours = 1 day
40 Poles = 1 furlong	7 Days = 1 week
8 Furlongs = 1 mile	365 Days = 1 year
3 Miles = 1 league	52 Weeks & 1 day = 1 year

Rule *for Compound Addition.* "Arrange like quantities under like, and carry according to the value of "the higher place."

Note 1. When you add a denomination, which contains more columns than one, and from which you carry to the higher by 20, 30, or any even number of tens, first add the units of that column, and mark down their sum, carrying the tens to the next column; then add the tens, and carry to the higher denomination, by the number of tens that it contains of the lower. For example, in adding shillings, carry by 10 from the units to the tens, and by 2 from the tens to the pounds.

Note 2. If you do not carry by an even number of tens, first find the complete sum of the lower denomination, then inquire how many of the higher that sum contains, and carry accordingly, and mark the remainder, if, any, under the column. For example, if the sum of a column of pence be 43, which is three shillings and sevenpence, mark 7 under the pence column, and carry 3 to that of the shillings. Addition.

Note 3. Some add the lower denominations after the following method; when they have reckoned as many as amounts to one of the higher denomination, or upwards, they mark a dot, and begin again with the excess of the number reckoned above the value of the denomination. The number of dots shows how many are carried, and the last reckoned number is placed under the column.

Examples in Sterling Money.

L.			L.		
145	6	8	16	9	11½
215	3	9	169	16	10
172	18	4	36	12	9¾
645	7	7	54	7	6
737	2	2	30	–	1¼
35	3	9	7	19	6
9	–	7	707	19	11
1764	12	3	14	14	4
780	–	–	84	18	8¾
99	9	9	125	3	7
150	10	–	16	16	8¾
844	9	7	62	5	3

In Avoirdupois Weight.

T.	*C.*	*qr.*	*lb.*	*T.*	*C.*	*qr.*	*lb.*
1	19	3	26	3	15	2	24
–	14	1	16	6	3	–	19
2	18	1	16	5	7	3	26
–	1	2	27	3	2	2	–
3	1	–	10	4	3	1	10
–	17	2	24	–	18	1	12
–	15	3	18	1	1	1	1
4	6	–	5	5	3	–	7
–	6	3	9	6	4	–	9
6	4	–	4	4	6	–	5
5	5	–	5	2	1	3	4

When one page will not contain the whole account, we add the articles it contains, and write against their sum *Carried forward;* and we begin the next page with the sum of the foregoing, writing against it, *Brought forward.*

When the articles fill several pages, and their whole sum is known, which is the case in transcribing accounts, it is best to proceed in the following manner: Add the pages, placing the sums on a separate paper; then add the sums, and if the amount of the whole be right, it only remains to find what number should be placed at the foot and top of the pages. For this purpose, repeat the sum of the first page on the same line; add the sums of the first and second, placing the amount in a line with the second; to this add the sum of the third, placing the amount in a line with the third. Proceed in the like manner with the others; and if the last sum corresponds with the amount of the page, it is right. These sums are transcribed at the foot of the respective pages, and tops of the following ones.

Addition.

Examples.

L.	134	6	8											
	42	3	9	L.	170	5	4	L.	70	4	2	L.	15	3	9
	175	4	9		66	9	8		18	6	8		12	2	6
	42	5	7		73	8	6		12	13	2		7	5	4
	163	7	4		45	3	2		15	3	9		8	–	–
	148	5	8		78	7	9		17	5	4		–	9	6
	73	2	3		12	–	–		18	6	6		–	5	10

	L.			L.			L.			L.		
1st Page,	L.	778	16	–	L.	778	16	–				
2d,		445	14	5		1224	10	5				
3d,		151	19	9		1376	10	2				
4th,		43	6	11		1419	17	1				
	L.	1419	17	1								

Then we transcribe 778l. 16s. at the foot of the first and top of the second pages, 1224l. 10s. 5d. at the foot of the second and top of the third; and so on.

CHAP. III. SUBTRACTION.

SUBTRACTION is the operation by which we take a lesser number from a greater, and find their difference. It is exactly opposite to addition, and is performed by learners in a like manner, beginning at the greater, and reckoning downwards the units of the lesser. The greater is called the *minuend*, and the lesser the *subtrahend*.

If any figure of the subtrahend be greater than the corresponding figure of the minuend, we add ten to that of the minuend, and having found and marked the difference, we add one to the next place of the subtrahend. This is called *borrowing ten*. The reason will appear, if we consider that, when two numbers are equally increased by adding the same to both, their difference will not be altered. When we proceed as directed above, we add ten to the minuend, and we likewise add one to the higher place of the subtrahend, which is equal to ten of the lower place.

RULE. "Subtract units from units, tens from tens, "and so on. If any figure of the subtrahend be greater "than the correponding one of the minuend, borrow "ten."

Example.			
Minuend	173694	738641
Subtrahend	21453	379235
Remainder	152241	359406

To prove subtraction, add the subtrahend and remainder together; if their sum be equal to the minuend, the account is right.

Or subtract the remainder from the minuend. If the difference be equal to the subtrahend, the account is right.

RULE *for Compound Subtraction.* "Place like deno-"minations under like; and borrow, when necessary, "according to the value of the higher place."

Examples.

					C.	*qr.*	*lib.*		*A.*	*R.*	*F.*	*E.*
L.	146	3	3		12	3	19		15	2	24	18
	58	7	6		4	3	24		12	2	36	7
L.	87	15	9		7	3	23		2	3	28	11

Note 1. The reason for borrowing is the same as in simple subtraction. Thus, in subtracting pence, we add 12 pence when necessary to the minuend, and at the next step, we add one shilling to the subtrahend. Subtr-tion

Note 2. When there are two places in the same denomination, if the next higher contain exactly so many tens, it is best to subtract the units first, borrowing ten when necessary; and then subtract the tens, borrowing, if there is occasion, according to the number of tens in the higher denomination.

Note 3. If the value of the higher denomination be not an even number of tens, subtract the units and tens at once, borrowing according to the value of the higher denomination.

Note 4. Some choose to subtract the place in the subtrahend, when it exceeds that of the minuend, from the value of the higher denomination, and add the minuend to the difference. This is only a different order of proceeding, and gives the same answer.

Note 5. As custom has established the method of placing the subtrahend under the minuend, we follow it when there is no reason for doing otherwise; the minuend may be placed under the subtrahend with equal propriety; and the learner should be able to work it either way, with equal readiness, as this last is sometimes more convenient; of which instances will occur afterwards.

Note 6. The learner should also acquire the habit, when two numbers are marked down, of placing such a number under the lesser, that, when added together, the sum may be equal to the greater. The operation is the same as subtraction, though conceived in a different manner, and is useful in balancing accounts and on other occasions.

It is often necessary to place the sums in different columns, in order to exhibit a clear view of what is required. For instance, if the values of several parcels of goods are to be added, and each parcel consists of several articles, the particular articles should be placed in an inner column, and the sum of each parcel extended to the outer column, and the total added there.

If any person be owing an account, and has made some partial payments, the payments must be placed in an inner column, and their sum extended under that of the account in the outer column, and subtracted there.

An example or two will make this plain.

1st.] 30 yards linen at 2s.				L.	3	–	–
45 ditto at 1s. 6d.					4	7	6
						L.	6 7 6
120 lb. thread at 4s.			L.	24			
40 ditto	at 3s.			6			
30 ditto	at 2s. 6d.			3	15		
					33	15	
					L.	40	2 6

2d.] 1773.							
Jan. 15.	Lent James Smith		L.	50			
22.	Lent him further			70			
					L.	120	
Feb. 3.	Received in part		L.	62			
5.	Received further						
	In gold	L. 10 10					
	In silver	13					
				23	10		
						85	10
	Balance due me				L.	34	10

CHAP.

Multiplication.

Chap. IV. MULTIPLICATION.

10

In multiplication, two numbers are given, and it is required to find how much the first amounts to, when reckoned as many times as there are units in the second. Thus, 8 multiplied by 5, or 5 times 8, is 40. The given numbers (8 and 5) are called *factors;* the first (8) the *multiplicand;* the second (5) the *multiplier;* and the amount (40) the *product.*

This operation is nothing else than addition of the same number several times repeated. If we mark 8 five times under each other, and add them, the sum is 40. But, as this kind of addition is of frequent and extensive use, in order to shorten the operation, we mark down the number only once, and conceive it to be repeated as often as there are units in the multiplier.

For this purpose, the learner must be thoroughly acquainted with the following multiplication table, which is composed by adding each digit twelve times.

Twice	Thrice	Four times	Five times	Six times	Seven times
1 is 2	1 is 3	1 is 4	1 is 5	1 is 6	1 is 7
2 4	2 6	2 8	2 10	2 12	2 14
3 6	3 9	3 12	3 15	3 18	3 21
4 8	4 12	4 16	4 20	4 24	4 28
5 10	5 15	5 20	5 25	5 30	5 35
6 12	6 18	6 24	6 30	6 36	6 42
7 14	7 21	7 28	7 35	7 42	7 49
8 16	8 24	8 32	8 40	8 48	8 56
9 18	9 27	9 36	9 45	9 54	9 63
10 20	10 30	10 40	10 50	10 60	10 70
11 22	11 33	11 44	11 55	11 66	11 77
12 24	12 36	12 48	12 60	12 72	12 84

Eight times	Nine times	Ten times	Eleven times	Twelve times
1 is 8	1 is 9	1 is 10	1 is 11	1 is 12
2 16	2 18	2 20	2 22	2 24
3 24	3 27	3 30	3 33	3 36
4 32	4 36	4 40	4 44	4 48
5 40	5 45	5 50	5 55	5 60
6 48	6 54	6 60	6 66	6 72
7 56	7 63	7 70	7 77	7 84
8 64	8 72	8 80	8 88	8 96
9 72	9 81	9 90	9 99	9 108
10 80	10 90	10 100	10 110	10 120
11 88	11 99	11 110	11 121	11 132
12 96	12 108	12 120	12 132	12 144

If both factors be under 12, the table exhibits the product at once. If the multiplier only be under 12, we begin at the unit place, and multiply the figures in their order, carrying the tens to the higher place, as in addition.

Ex. 76859 multiplied by 4, or 76859 added 4 times.

4	76859
	76859
307436	76859
	307436

If the multiplier be 10, we annex a cypher to the multiplicand. If the multiplier be 100, we annex two cyphers; and so on. The reason is obvious, from the use of cyphers in notation.

If the multiplier be any digit, with one or more cyphers on the right hand, we multiply by the figure, and annex an equal number of cyphers to the product. Thus, if it be required to multiply by 50, we first multiply by 5, and then annex a cypher. It is the same thing as to add the multiplicand 50 times; and this might be done by writing the account at large, dividing the column into 10 parts of 5 lines, finding the sum of each part, and adding these ten sums together. Multiplication.

If the multiplier consists of several significant figures, we multiply separately by each, and add the products. It is the same as if we divided a long account of addition into parts corresponding to the figures of the multiplier.

Example. To multiply 7329 by 365

7329	7329	7329	36645= 5 times.
5	60	300	439740= 60 times.
36645	439740	2198700	2198700=300 times.
			2675085=365 times.

It is obvious that 5 times the multiplicand added to 60 times, and to 300 times, the same must amount to the product required. In practice, we place the products at once under each other; and as the cyphers arising from the higher places of the multiplier are lost in the addition, we omit them. Hence may be inferred the following

RULE. "Place the multiplier under the multiplicand, and multiply the latter successively by the significant figures of the former; placing the right-hand figure of each product under the figure of the multiplier from which it arises; then add the product."

Ex.				
	7329	42785	37846	93956
	365	91	235	8704
	36645	42785	189230	375824
	43974	385065	113538	657692
	21987		75692	751648
	2675085	3893435	8893810	817793024

A number which cannot be produced by the multiplication of two others is called a *prime number;* as 3, 5, 7, 11, and many others.

A number which may be produced by the multiplication of two or more smaller ones, is called a *composite number.* For example 27, which arises from the multiplication of 9 by 3; and these numbers (9 and 3) are called the *component parts* of 27.

Contractions and Varieties in Multiplication.

First, If the multiplier be a composite number, we may multiply successively by the component parts.

Ex. 7638 by 45 or 5 times 9

45	9	7638	1st, 5492 by 72
38190			2d, 13759 by 56
30552	5	68742	3d, 56417 by 144
342710		343710	4th, 73048 by 84
			5th, 166549 by 125
			6th, 378914 by 54
			7th, 520813 by 63

Because the second product is equal to five times the first, and the first is equal to nine times the multi-

Multiplication.

plicand, it is obvious that the second product must be five times nine, or forty-five times as great as the multiplicand.

Secondly, If the multiplier be 5, which is the half of 10, we may annex a cypher, and divide by 2. If it be 25, which is the fourth part of 100, we may annex two cyphers, and divide by 4. Other contractions of the like kind will readily occur to the learner.

Thirdly, To multiply by 9, which is one less than 10, we may annex a cypher; and subtract the multiplicand from the number it composes. To multiply by 99,999, or any number of 9's, annex as many cyphers, and subtract the multiplicand. The reason is obvious; and a like rule may be found, though the unite place be different from 9.

Fourthly, Sometimes a line of the product is more easily obtained from a former line of the same than from the multiplicand.

Ex. 1st.]	1372	2d.]	1348
	84		36
	5488		8088
	10976		4044
	115248		48528

In the first example, instead of multiplying by 5, we may multiply 5480 by 2; and, in the second, instead of multiplying by 3, we may divide 8088 by 2.

Fifthly, Sometimes the product of two or more figures may be obtained at once, from the product of a figure already found.

Ex. 1st.]	14356	2d.]	3462321
	648		96484
	114848		13849284
	918784		166191408
	9302688		332382816
			334058579364

In the second example, we multiply first by 4; then because 12 times 4 is 48, we multiply the first line of the product by 12, instead of multiplying separately by 8 and 4; lastly, because twice 48 is 96, we multiply the second line of the product by 12, instead of multiplying separately by 6 and 9.

When we follow this method, we must be careful to place the right-hand figure of each product under the right-hand figure of that part of the multiplier which it is derived from.

It would answer equally well in all cases, to begin the work at the highest place of the multiplier; and contractions are sometimes obtained by following that order.

Ex. 1st.]	3125	or	3125	2d.]	32452
	642		642		52575
	18750		18750		162260
	12500		131250		811300
	6250		2006250		2433900
	2006250				1706163900

It is a matter of indifference which of the factors be used as the multiplier; for 4 multiplied by 3 gives the same product as 3 multiplied by 4; and the like holds universally true. To illustrate this, we may make three rows of points, four in each . . . . row, placing the rows under each other; . . . . and we shall have also four rows, con- . . . . taining three points each, if we reckon the rows downwards.

Multiplication is proven by repeating the operation, using the multiplier for the multiplicand, and the multiplicand for the multiplier. It may also be proven by division, or by casting out the 9's; of which afterwards; and an account, wrought by any contraction, may be proven by performing the operation at large, or by a different contraction.

Compound Multiplication.

Rule I. "If the multiplier do not exceed 12, the "operation is performed at once, beginning at the "lowest place, and carrying according to the value of "the place."

[*Examples.*]	*Cwt. qr. lb.*	*A. R. P.*	*Lb.oz.dwt.*
L.	13 6 7	12 2 8	13 3 18	7 5 9
	9	5	6	12
L.	119 19 3	62 3 12	83 — 28	89 5 8

Rule II. "If the multiplier be a composite number, "whose component parts do not exceed 12, multiply "first by one of these parts, then multiply the product "by the other. Proceed in the same manner if there "be more than two."

Ex. 1st.] L. 15 3 8 by 32=8×4
8

L.121 9 4 = 8 times.
4

L.485 17 4 = 32 times.

2d.] L. 17 3 8 by 75=5×5×3
3

L. 51 11 – = 3 times.
5

L.257 15 – = 15 times.
5

L.1288 15 – = 75 times.

Note 1. Although the component parts will answer in any order, it is best, when it can be done, to take them in such order as may clear off some of the lower places at the first multiplication, as is done in Ex. 2d.

Note 2. The operation may be proved, by taking the component parts in a different order, or dividing the multiplier in a different manner.

Rule III. "If the multiplier be a prime number, "multiply first by the composite number next lower, "then by the difference, and add the products."

L.

Multiplication.

L. 35 17 9 by 67=64+3
8 64= 8×8

L. 287 2 -=8 times.
8

L.2296 16 -=64 times.
107 13 3= 3 times.

L.2404 9 3=67 times.

Here because 8 times 8 is 64, we multiply twice by 8, which gives 2296l. 16s. equal to 64 times the multiplicand; then we find the amount of 3 times the multiplicand, which is 107l. 13s. 3d.; and it is evident that these added, amount to 67, the multiplicand.

RULE IV. "If there be a composite number a little above the multiplier, we may multiply by that "number, and by the difference, and subtract the second product from the first."

L. 17 4 5 by 109=108— 2
12 108+ 9×12

L. 206 13 -
9

L.1859 17 —=108 times.
34 8 10= 2 times.

L.1825 8 2=206 times.

Here we multiply by 12 and 9, the component parts of 108, and obtain a product of 1860l. 6s. equal to 108 times the multiplicand; and, as this is twice oftener than was required, we subtract the multiplicand doubled, and the remainder is the number sought.

Example. 34l. 8s. 2½d. by 3465.

RULE. V. "If the multiplier be large, multiply by "10, and multiply the product again by 10; by "which means you obtain an hundred times the given "number. If the multiplier exceed 1000, multiply "by 10 again; and continue it farther, if the multiplier require it; then multiply the given number "by the unit place of the multiplier; the first product "by the ten-place, the second product by the hundred-place; and so on. Add the products thus obtained together."

L. 34 8 2½ by 5=L. 172 1 0½= 5 times
10

10 times L. 344 2 1 by 6= 2064 12 6 = 60 times
10

100 times L. 3441 — 10 by 4= 13764 3 4 = 400 times
10

1000 times L.34410 8 4 by 3=103231 5 — =3000 times

L.119232 9 10½=3465 times

The use of multiplication is to compute the amount of any number of equal articles, either in respect of measure, weight, value, or any other consideration. The multiplicand expresses how much is to be reckoned for each article; and the multiplier expresses how many times that is to be reckoned. As the multiplier points out the number of articles to be added, it is always an abstract number, and has no reference to any value or measnre whatever. It is therefore quite improper to attempt the multiplication of shillings by shillings, or to consider the multiplier as expressive of any denomination. The most uowuuoo instances in which the practice of this operation is required, are, to find the amount of any number of parcels, to find the value of any number of articles, to find the weight or measure of a number of articles, &c.

Division.

This computation, for changing any sum of money, weight, or measure, into a different kind, is called REDUCTION. When the quantity given is expressed in different denominations, we reduce the highest to the next lower, and add thereto the given number of that denomination; and proceed in like manner till we have reduced it to the lowest denomination.

Example. To reduce 46l. 13. 8¾d. to farthings.

L. 46
20

920 shillings in L.46
13

933 shillings in L.46 13
12

11196 pence in L.46 13
8

11204 pence in L.46 13 8
4

44186 farthings in L.46 13 8
3

44819 farthings in L.46 13 8¾

Or thus:

L. 46 13 4¾
20

933
12

11204
4

44819

It is easy to take in or add the higher denomination at the same time we multiply the lower.

CHAP. V. DIVISION.

IN division, two numbers are given; and it is required to find how often the former contains the latter. Thus, it may be asked how often 21 contains 7, and the answer is exactly 3 times. The former given number (21) is called the *Dividend;* the latter (7) the *Divisor;* and the number required (3) the *Quotient.* It frequently happens that the division cannot be completed exactly without fractions. Thus it may be asked, how often 8 is contained in 19? the answer is twice, and the remainder of 3.

This operation consists in subtracting the divisor from the dividend, and again from the remainder, as often as it can be done, and reckoning the number of subtractions; as,

21	19
7 first subtraction	8 first subtraction
14	11
7 second subtraction	8 second subtraction
7	3 remainder.
7 third subtraction.	
0	

As this operation, performed at large, would be very tedious, when the quotient is a high number, it is proper to shorten it by every convenient method; and, for this purpose, we may multiply the divisor by any number whose product is not greater than the dividend, and so subtract it twice or thrice, or oftener at the same time. The best way is to multiply it by the greatest number, that does not raise the product too high, and that number is also the quotient. For example, to divide 45 by 7, we inquire what is the greatest multiplier for 7, that does not

Division. not give a product above 45; and we shall find that it is 6; and 6 times 7 is 42, which, substracted from 45, leaves a remainder of 3. Therefore 7 may be substracted 6 times from 45; or, which is the same thing, 45 divided by 7, gives a quotient of 6, and a remainder of three.

If the divisor do not exceed 12, we readily find the highest multiplier that can be used from the multiplication table. If it exceed 12, we may try any multiplier that we think will answer. If the product be greater than the dividend, the multiplier is too great; and if the remainder, after the product is substracted from the dividend, be greater than the divisor, the multiplier is too small. In either of these cases, we must try another. But the attentive learner, after some practice, will generally hit on the right multiplier at first.

If the divisor be contained oftener than ten times in the dividend, the operation requires as many steps as there are figures in the quotient. For instance, if the quotient be greater than 100, but less than 1000, it requires 3 steps. We first inquire how many hundred times the divisor is contained in the dividend, and subtract the amount of these hundreds. Then we inquire how often it is contained ten times in the remainder, and subtract the amount of these tens. Lastly, We inquire how many single times it is contained in the remainder. The method of proceeding will appear from the following example:

To divide 5936 by 8.

From	5936	
Take	5600	= 700 times 8.
Rem.	336	
From which take	320	= 40 times 8.
Rem.	16	
From which take	16	= 2 times 8.
	0	742 times 8 in all.

It is obvious, that as often as 8 is contained in 59, so many hundred times it will be contained in 5900, or in 5936; and, as often as it is contained in 33, so many ten times it will be contained in 330, or in 356; and thus the higher places of the quotient will be obtained with equal ease as the lower. The operation might be performed by substracting 8 continually from the dividend, which will lead to the same conclusion by a very tedious process. After 700 substractions, the remainder would be 336; after 40 more, it would be 16; and after 2 more, the dividend would be entirely exhausted. In practice, we omit the cyphers, and proceed by the following

Rules. 1st, "Assume as many figures on the left "hand of the multiplier as contain the divisor once "or oftener: find how many times they contain it, "and place the answer as the highest figure of the "quotient.

2d, "Multiply the divisor by the figure you have "found, and place the product under the part of the "dividend from which it is obtained.

3d, "Substract the product from the figures above it.

4th, "Bring down the next figure of the dividend "to the remainder, and divide the number it makes up, "as before."

Examples.] 1st. 8)5936(742 2d. 63)30114(748 Division

	56..		252..
	33		491
	32		441
	16		504
	16		504
	0		0

3d. 365)974932(2671 $\frac{17}{365}$

	730...
	2449
	2190
	2593
	2555
	382
	365
Remainder	17

The numbers which we divide, as 59, 33, and 16, in the first example, are called *dividuals*.

It is usual to mark a point under the figures of the dividend, as they are brought down, to prevent mistakes.

If there be a remainder, the division is completed by a vulgar fraction, whose numerator is the remainder, and its denominator the divisor. Thus, in Ex. 3. the quotient is 2671, and the remainder 17; and the quotient completed is $2671\frac{17}{365}$.

A number which divides another without a remainder is said to measure it; and the several numbers which measure another, are called its *aliquot parts*. Thus, 2, 4, 6, 8, and 12, are aliquot parts of 24. As it is often useful to discover numbers which measure others, we may observe,

1st, Every number ending with an even figure, that is, with 2, 4, 6, 8, or 0, is measured by 2.

2d, Every number ending with 5 or 0, is measured by 5.

3d, Every number, whose figures, when added, amount to an even number of 3's or 9's, is measured by 3 or 9, respectively.

Contractions and Varieties in Division.

First, When the divisor does not exceed 12, the whole computation may be performed without setting down any figures except the quotient.

Ex. 7)35868 (5124 or 7)35868
5124

Secondly, when the divisor is a composite number, and one of the component parts also measures the dividend, we may divide successively by the component parts.

Ex. 1st.] 30114 by 63 2d.] 975 by 105 = 5 × 7 × 3

	9)30114		5)975
	7) 3346		3)195
Quotient	478		7) 65
		Quotient	$9\frac{2}{7}$

This method might be also used, although the component parts of the divisor do not measure the dividend; but the learner will not understand how to manage

Division. manage the remainder till he be acquinted with the doctrine of vulgar fractions.

Thirdly, When there are cyphers annexed to the divisor, cut them off, and cut off an equal number of figures from the dividend; annex those figures to the remainder. *Ex.* To divide 378643 by 5200.

52|00)3786|43(72$\frac{4243}{5200}$.
364 .

146
104

4243

The reason will appear by performing the operation at large, and comparing the steps.

To divide by 10, 100, 1000, or the like. Cut off as many figures on the right hand of the dividend as there are cyphers in the divisor. The figures which remain on the left hand compose the quotient, and the figures cut off compose the remainder.

Fourthly, When the divisor consists of several figures, we may try them separately, by inquiring how often the first figure of the divisor is contained in the first figure of the dividend, and then considering whether the second and following figures of the divisor be contained as often in the corresponding ones of the dividend with the remainder (if any) prefixed. If not, we must begin again, and make trial of a lower number. When the remainder is nine, or upwards, we may be sure the division will hold through the lower places; and it is unnecessary to continue the trial farther.

Fifthly, We may make a table of the products of the divisor, multiplied by the nine digits, in order to discover more readily how often it is contained in each dividual. This is convenient when the dividend is very long, or when it is required to divide frequently by the same divisor.

73 by 2 = 146	73)53872694(737982
3 = 216	511.....
4 = 292	
5 = 365	277
6 = 438	219
7 = 511	
8 = 584	582
9 = 657	511
	716
	657
	599
	584
	155
	146
	Rem. 8

Sixthly, To divide by 9, 99, 999, or any number of 9's, transcribe under the dividend part of the same, shifting the highest figure as many places to the right hand as there are 9's in the divisor. Transcribe it again, with the like change of place, as often as the length of the dividend admits; add these together, and cut off as many figures from the right hand of the sum as there are 9's in the divisor. The figures which remain on the left hand compose the quotient, and those cut off the remainder. Division.

If there be any carriage to the unit place of the quotient, add the number carried likewise to the remainder, as in Ex. 2.; and if the figures cut off be all 9's, add 1 to the quotient, and there is no remainder.

Examples. 1st] 99)324123 2d.]99)547825

	3241	5478
	32	54
	3273|96	5533|57
Quotient	3273 and rem. 96.	1
		Quotient 5533.58 rem.

3d.] 999)476523
476

476|999
1

Quotient 477

To explain the reason of this, we must recollect, that whatever number of hundreds any dividend contains, it contains an equal number of 99's, together with an equal number of units. In Ex. 1. the dividend contains 3241 hundreds, and a remainder of 23. It therefore contains 3241 times 99, and also 3241, besides the remainder already mentioned.—Again, 3241 contains 32 hundreds, and a remainder of 41: it therefore contains 32 99's, and also 32, besides the remainder of 41. Consequently the dividend contains 99, altogether, 3241 times, and 32 times, that is, 3273 times, and the remainder consists of 23, 41, and 32, added, which makes 96.

As multiplication supplies the place of frequent additions, and division of frequent substractions, they are only repetitions and contractions of the simple rules, and when compared together, their tendency is exactly opposite. As numbers, increased by addition, are diminished and brought back to their original quantity by subtraction; in like manner, numbers compounded by multiplication are reduced by division to the parts from which they were compounded. The multiplier shows how many additions are necessary to produce the number; and the quotient shows how many subtractions are necessary to exhaust it. It follows, that the product, divided by the multiplicand, will quote the multiplier; and because either factor may be assumed for the multiplicand, therefore, the product divided by either factor, quotes the other. It follows, also, that the dividend is equal to the product of the divisor and quotient multiplied together; and hence these operations mutually prove each other.

To prove multiplication. Divide the product by either factor. If the operation be right, the quotient is the other factor, and there is no remainder.

To prove division. Multiply the divisor and quotient together; to the product add the remainder, if any; and, if the operation be right, it makes up the dividend. Otherwise divide the dividend (after subtracting the remainder, if any) by the quotient. If the operation be right, it will quote the divisor. The reason of all those rules may be collected from the last paragraph.

Compound Division.

12 Rule I. "When the dividend only consists of different denominations, divide the higher denomination, and reduce the remainder to the next lower, taking in (p. 629. Rule V.) the given number of that denomination, and continue the division."

Examples.

Divide L. 465 : 12 : 8 by 72.

L.	s.	d.	L.	s.	d.
72)465	12	8	(6	9	4
432	. . .				
33					
20					
72)672					
648					
24					
14					
72)296					
288					
8 Rem.					

Or we might divide by the component parts of 72, (as explained under *Thirdly*, p. 631).

Divide 345 cwt. 1 q. 8 lb. by 22.

Cwt.	q.	lb.	Cwt.	q.	lb.
22)345	1	8	(15	2	21
22 . . .					
125					
110					
15					
4					
22)61					
44					
17					
28					
144					
34					
22)484					
44					
44					
44					
0					

Rule II. "When the divisor is in different denominations, reduce both divisor and dividend to the lowest denomination, and proceed as in simple division. The quotient is an abstract number."

To divide 38l. 13s. by 3l. 4s. 5d.

L.			L.		
3	4	5	38	13	
20			20		
64			773		
12			12		
773			)9276(12 quote.		
			773		
			1546		
			1546		
			0		

To divide 96 cwt. 1 q. 20 lb. by 3 cwt. 2q. 8lb.

Cwt.	q.	lb.	Cwt.	q.	lb.
3	2	8)	96	1	20
4			4		
14			385		
28			28		
120			3100		
28			770		
4|00			)108|00(27 quote.		

It is best not to reduce the terms lower than is necessary to render them equal. For instance, if each of them consists of an even number of sixpences, fourpences, or the like, we reduce them to sixpences, or fourpences, but not to pence.

The use of division is to find either of the factors by whose multiplication a given number is produced, when the other factor is given; and therefore is of two kinds, since either the multiplier or the multiplicand may be given. If the former be given, it discovers what that number is which is contained so many times in another. If the latter be given, it discovers how many times one number is contained in another. Thus, it answers the questions of an opposite kind to those mentioned under Rule IV. p. 629. as, To find the quantity of a single parcel or share; to find the value, weight, or measure, of a single article; to find how much work is done, provisions consumed, interest incurred, or the like, in a single day, &c.

The last use of division is a kind of reduction exactly opposite to that described under Rule V. p. 629. The manner of conducting and arranging it, when there are several denominations in the question, will appear from the following examples.

1. To reduce 15783 pence, to pounds, sh. and pence.

	20	
12)15783(1315(65		
12 · · ·	120 ·	
37	115	
36	100	
18	15	
12		
63		
60		
3		

Answer, 65l. 15s. 3d.

2. To reduce 174865 grs. to lb. oz. and dwt. Troy.

	20	12	
24)174865(7286(364(30			
168 · · ·	60 · ·	36 ·	
68	128	04	
48	120		
206	86		
192	80		
145	6		
144			
1			

Ans. 38lb. 4 oz. 6dwt. 1 gr.

In the first example, we reduce 15783 pence to shillings, by dividing by 12, and obtain 1315 shillings, and a remainder of 3 pence. Then we reduce 1315 shillings to pounds, by dividing by 20, and obtain 65 pounds and a remainder of 15 shillings. The divisions might have been contracted.

In the practice of arithmetic, questions often occur which require both multiplication and division to resolve. This happens in reduction, when the higher denomination does not contain an exact number of the lower.

Rule *for mixed reduction.* "Reduce the given denomination by multiplication to some lower one, which is an aliquot part of both; then reduce that by division to the denomination required."

Ex. Reduce 31742l. to guineas.

31742	Here we multiply by 20, which reduces the pounds to shillings; and divide the product by 21, which reduces the shillings to guineas.
20	
21)634840(30230	
63 · · · ·	
048	
42	
64	
63	
10	Answer, 30230 guineas and 10 shillings.

As

As Portuguese money frequently passes here in payments, we shall give a table of the pieces, and their value.

A moidore	= L. 1	7	–
A half moidore	= –	13	6
A quarter moidore	= –	6	9
A double Joannes	= 3	12	–
A Joannes -	= 1	16	–
A half ditto -	= –	18	–
A quarter ditto	= –	9	–
An eighth ditto	= –	4	6

Note 1. Guineas may be reduced to pounds, by adding one-twentieth part of the number.

2. Pounds may be reduced to merks by adding one half.

3. Merks may be reduced to pounds by subtracting one-third.

4. Four moidores are equal to three Joannes: wherefore moidores may be reduced to Joannes, by subtracting one-fourth; and Joannes to moidores, by adding one-third.

5. Five Joannes are equal to 9l. Hence it is easy to reduce Portuguese money to sterling.

Another case, which requires both multiplication and division, is, when the value, weight, measure, or duration of any quantity is given, and the value, &c. of a different quantity required, we first find the value, &c. of a single article by division, and then the value, &c. of the quantity required, by multiplication.

Ex. If 3 yards cost 15s. 9d. what will 7 yards cost, at the same rate?

s.	d.	
3) 15	9	Price of 3 yards.
5	3	Price of 1 yard, by Rule IV. p. 629.
	7	
L. 1	16 9	Price of 7 yards (by par. *ult.* p. 632. col. 1.).

Many other instances might be adduced, where the operation, and the reason of it, are equally obvious. These are generally, though unnecessarily, referred to the rule of Proportion.

We shall now offer a general observation on all the operations in arithmetic. When a computation requires several steps, we obtain a just answer, whatever order we follow. Some arrangements may be preferable to others in point of ease, but all of them lead to the same conclusion. In addition, or subtraction, we may take the articles in any order, as is evident from the idea of number; or, we may collect them into several sums, and add or subtract these, either separately or together. When both the simple operations are required to be repeated, we may either complete one of them first, or may introduce them promiscuously, and the compound operations admit of the same variety. When several numbers are to be multiplied together, we may take the factors in any order, or we may arrange them into several classes, find the product of each class, and then multiply the products together. When a number is to be divided by several others, we may take the divisors in any order, or we may multiply them into each other, and divide by the product; or we may multiply them into several parcels, and divide by the products successively. Lastly, When multiplication and division are both required, we may begin with either; and when both are repeatedly necessary, we may collect the multipliers into one product, and the divisors into another; or, we may collect them into parcels, or use them singly, and that in any order. Still we shall obtain the proper answer, if none of the terms be neglected.

When both multiplication and division are necessary to obtain the answer of a question, it is generally best to begin with the multiplication, as this order keeps the account as clear as possible from fractions. The example last given may be wrought accordingly as follows:

s.	d.
15	9
	7
3)5 10	3
1 16	9

Some accountants prove the operations of arithmetic by a method which they call casting out the 9's, depending on the following principles:

First, If several numbers be divided by any divisor: (the remainders being always added to the next number), the sum of the quotients, and the last remainder, will be the same as those obtained when the sum of the number is divided by the same divisor. Thus, 19, 15, and 23, contain, together, as many 5's, as many 7's, &c. as their sum 57 does, and the remainders are the same; and, in this way, addition may be proven by division. It is from the correspondence of the remainders, that the proof by casting out the 9's is deduced.

Secondly, If any figure with cyphers annexed, be divided by 9, the quotient consists entirely of that figure; and the remainder is also the same. Thus, 40, divided by 9, quotes 4, remainder 4; and 400 divided by 9, quotes 44, remainder 4. The same holds with all the digits; and the reason will be easily understood: every digit, with a cypher annexed, contains exactly so many tens; it must therefore contain an equal number of 9's, besides a remainder of an equal number of units.

Thirdly, If any number be divided by 9, the remainder is equal to the sum of the figures of the number, or to the remainder obtained, when that sum is divided by 9. For instance, 3765, divided by 9, leaves a remainder of 3; and the sum of 3, 7, 6, and 5, is 21, which divided by 9, leaves a remainder of 3. The reason of this will appear from the following illustration:

3000	divided by quotes	333;	remainder 3
700	quotes	77;	remainder 7
60	quotes	6;	remainder 6
5	quotes	0;	remainder 5
3765		416	Sum of rem. 21

Again: 21 divided by 9 quotes 2; remainder 3

wherefore, 3765 divided by 9 quotes 418; remainder 3; for the reason given. Hence we may collect the following rules for practice,

To cast the 9's out of any number, or to find what remainder will be left when any number is divided by 9: Add the figures; and when the sum exceeds 9, add the figures which would express it. Pass by the 9's; and when the sum comes exactly to 9, neglect it, and begin anew. For example, if it be required to cast the 9's out of 3573294, we reckon thus; 3 and

Division. 5 is 8, and 7 is 15; 1 and 5 is 6, and 3 is 9, which we neglect; 2 and (passing by 9) 4 is 6; which is the remainder or RESULT. If the article out of which the 9's are to be cast contains more denominations than one, we cast the 9's out of the higher, and multiply the result by the value of the lower, and carry on the product (casting out the 9's, if necessary), to the lower.

To prove addition, cast the 9's out of the several articles, carrying the results to the following articles; cast them also out of the sum. If the operation be right, the results will agree.

To prove subtraction, cast the 9's out of the minuend; cast them also out of the subtrahend and remainder together; and if you obtain the same result, the operation is presumed right.

To prove multiplication, cast the 9's out of the multiplicand, and also out of the multiplier, if above 9. Multiply the results together, and cast the 9's, if necessary, out of their product. Then cast the 9's out of the product, and observe if this result correspond with the former.

Ex. 1st.] 9276 res. $6\times8=48$ res. 3.
8

74208 res. 3.

2d.] 7898 res. $5\times3=15$ res. 6.
48 res. 3

63184
31592

379104 res. 6.

The reason of this will be evident, if we consider multiplication under the view of repeated addition. In the first example it is obviously the same. In the second, we may suppose the multiplicand repeated 48 times. If this be done, and the 9's cast out, the result, at the end of the 9th line, will be 0; for any number, repeated 9 times, and divided by 9, leaves no remainder. The same must happen at the end of the 18th, 27th, 36th, and 45th lines; and the last result will be the same as if the multiplicand had only been repeated 3 times. This is the reason for casting out the 9's from the multiplier as well as the multiplicand.

To prove division, cast the 9's out of the divisor, and also out of the quotient; multiply the results, and cast the 9's out of the product. If there be any remainder, add to it the result, casting out the 9's, if necessary. If the account be right, the last result will agree with that obtained from the dividend.

Ex.] 42) 2490 (59 res. $5\times6=30$ res. 3.
res. 6 210

390
378

Rem. 12 - - res. 3.

And the result of the dividend is 6

This depends on the same reason as the last; for the dividend is equal to the product of the divisor and quotient added to the remainder.

We cannot recommend this method, as it lies under the following disadvantages. Divisio

First, If an error of 9, or any of its multiples, be committed, the results will nevertheless agree; and so the error will remain undiscovered. And this will always be the case, when a figure is placed or reckoned in a wrong column; which is one of the most frequent causes of error.

Secondly, When it appears by the disagreement of the results, that an error has been committed, the particular figure or figures in which the error lies are not pointed out; and, consequently, it is not easily corrected.

CHAP. VI. RULE OF PROPORTION.

SECT. I. SIMPLE PROPORTION.

QUANTITIES are reckoned proportional to each other, when they are connected in such a manner, that if one of them be increased or diminished, the other increases or diminishes at the same time; and the degree of the alteration on each is a like part of its original measure; thus four numbers are in the same proportion, the first to the second as the third to the fourth, when the first contains the second, or any part of it, as often as the third contains the fourth, or the like part of it. In either of these cases, the quotient of the first, divided by the second, is equal to that of the third divided by the fourth: and this quotient may be called the *measure of the proportion.* 13

Proportionals are marked down in the following manner:

6 : 3 :: 8 : 4
12 : 36 :: 9 : 27
9 : 6 :: 24 : 18
16 : 24 :: 10 : 15

The rule of Proportion directs us, when three numbers are given, how to find a fourth, to which the third may have the same proportion that the first has to the second. It is sometimes called the *Rule of Three*, from the three numbers given; and sometimes the *Golden Rule*, from its various and extensive utility.

RULE. "Multiply the second and third terms together, and divide the product by the first."

Ex. To find a fourth proportional to 18, 27, and 34.

18 : 27 :: 34 : 51
34

108
81

18)918(51
90

18
18

0

To explain the reason of this, we must observe that if two or more numbers be multiplied or divided alike, the products or quotients will have the same proportion.

18 : 27
Multiplied by 34, 612 : 918
Divided by 18, 34 : 51

Proportion. The products 612, 918, and the quotients 34, 51, have therefore the same proportion to each other that 18 has to 27. In the course of this operation, the products of the first and third term are divided by the first; therefore the quotient is equal to the third.

The first and second terms must always be of the same kind; that is, either both moneys, weights, measures, both abstract numbers, or the like. The fourth, or number sought, is of the same kind as the third.

When any of the terms is in more denominations than one, we may reduce them all to the lowest. But this is not always necessary. The first and second should not be reduced lower than directed p. 632. col. 1. par. *penult.*; and, when either the second or third is a simple number, the other, though in different denominations, may be multiplied without reduction.

			L.	*s.*	*d.*			
Ex. 5	:	7 ::	25	11	3			
					7			
						L.	*s.*	*d.*
			5) 178	18	9	(35	19	9

The accountant must consider the nature of every question, and observe the circumstance which the proportion depends on; and common sense will direct him to this if the terms of the question be understood. It is evident that the value, weight, and measure of any commodity is proportioned to its quantity; that the amount of work or consumption is proportioned to the time; that gain, loss, or interest, when the rate and time are fixed, is proportioned to the capital sum from which it arises; and that the effect produced by any cause is proportioned to the extent of the cause. In these, and many other cases, the proportion is direct, and the number sought increases or diminishes along with the term from which it is derived.

In some questions, the number sought becomes less, when the circumstances from which it is derived become greater. Thus, when the price of goods increases, the quantity which may be bought for a given sum is smaller. When the number of men employed at work is increased, the time in which they may complete it becomes shorter; and, when the activity of any cause is increased, the quantity necessary to produce a given effect is diminished. In these, and the like, the proportion is said to be inverse.

General Rule *for stating all questions, whether direct or inverse.* "Place that number for the third "term which signifies the same kind of thing with "what is sought, and consider whether the number "sought will be greater or less. If greater, place the "least of the other terms for the first; but, if less, "place the greatest for the first."

Ex. 1st.] If 30 horses plough 12 acres, how many will 42 plough in the same time?

H. H. A.
30 :: 42 :: 12

Here, because the thing sought is a number of acres, we place 12, the given number of acres, for the third term; and, because 42 horses will plough more than 12, we make the lesser number 30, the first term, and the greater number, 42, the second term.

Ex. 2d.] If 40 horses be maintained for a certain sum on hay, at 5d. per stone, how many will be maintained on the same sum when the price of hay rises to 8d. Proportion.

d. d. H.
8 : 5 :: 40

Here, because a number of horses is sought, we make the given number of horses, 40, the third term; and, because fewer will be maintained for the same money, when the price of hay is dearer, we make the greater price, 8d. the first term; and the lesser price 5d. the second term.

The first of these examples is direct, the second inverse. Every question consists of a supposition and demand. In the first, the supposition is, that 30 *horses plough* 12 *acres*, and the demand *how many* 42 *will plough?* and the first term of the proportion, 30, is found in the supposition, in this and every other direct question. In the second, the supposition is, *that* 40 *horses are maintained on hay at* 5d. and the demand, *how many will be maintained on hay at* 8d.? and the first term of the proportion, 8, is found in the demand, in this and every other inverse question.

When an account is stated, if the first and second term, or first and third, be measured by the same number, we may divide them by that measure, and use the quotients in their stead.

Ex. If 36 yards cost 42 shillings, what will 27 cost?

Y. Y. sh.
36 : 27 :: 42
4 : 3 :: 42
—— s. d.
4)126(31 6

Here 36 and 27 are both measured by 9, and we work with the quotients 4 and 3.

Sect. II. Compound Proportion. 14

Sometimes the proportion depends upon several circumstances. Thus, it may be asked, if 18 men consume 6 bolls corn in 28 days, how much will 24 men consume in 56 days? Here the quantity required depends partly on the number of men, partly on the time; and the question may be resolved into the two following ones:

1st, If 18 men consume 6 bolls, in a certain time, how many will 24 men consume in the same time?

M. M. B. B.
18 : 24 : 6 : 8
6

Answer, 24 men will consume 8 bolls in the same time.

18)144(8

2d, If a certain number of men consume 8 bolls in 28 days, how many will they consume in 56 days?

D. D. B. B.
28 : 56 :: 8 : 16
8

Ans. The same number of men will consume 16 bolls in 56 days.

28)448(16

In the course of this operation, the original number of bolls, 6, is first multiplied into 24, then divided by 18, then multiplied into 8, then divided by 28. It would answer the same purpose to collect the multipliers into one product, and the divisors into another; and then to multiply the given number of bolls by the former, and divide the product by the latter, p. 633. col. 1. par. *ult.*

The above question may therefore be stated and wrought as follows:

Proportion. Men 18 : 24 :: 6 bolls
Days 28 : 56

144 144
36 120

504 1344
6

504)8064(16

Here we multiply 18 into 28 for a divisor, and 6 into the product of 24 by 56, for a dividend.

"In general, state the several particulars on which "the question depends, as so many simple proportions, "attending to the sense of the question to discover "whether the proportions should be stated directly or "inversely; then multiply all the terms in the first "rank together, and all those in the second rank to-"gether; and work with the product as directed in "the simple rule (Sect. i. p. 634.")

Example. If 100 men make 3 miles of road in 27 days, in how many days will 150 men make 5 miles?

Men 150 : 100 :: 27 days.
3 5

450 500
27

450)13500(30 days, ans.

Here the first stating is inverse, because more men will do it in fewer days; but the second is direct, because more miles will require more days.

The following contraction is often useful. After stating the proportion, if the same number occurs in both ranks, dash it out from both; or, if any term in the first rank, and another in the second rank are measured by the same numbers, dash out the original terms, and use the quotients in their stead.

Ex. If 18 men consume 30l. value of corn in 9 months, when the price is 16s. per boll, how many will consume 54l. value in 6 months, when the price is 12s. per boll? In this question, the proportion depends upon three particulars, the value of corn, the time and the price. The first of which is direct, because the more the value of provisions is, the more time is required to consume them: but the second and third are inverse, for the greater the time and price is, fewer men will consume an equal value.

Value 30 : 54 :: 18 men.
Months 6 : 9
Price 12 : 16
10 9
3 3
4

36
18

288
36

10)648(64 8/10

Here we observe 6 in the first rank measures 54 in the second: so we dash them out, and place the quotient 9 in the second rank. Next, because 30 and 9 are both measured by 3, we dash them out, and place down the quotients 10 and 3; then, because 12 and 16 are both measured by 4, we dash them out, and place down the quotients 3 and 4. Lastly, Because there is now 3 in both columns, we dash them out, and work with the remaining terms, according to the rule.

The moneys, weights, and measures of different countries, may be reduced from the proportion which they bear to each other.

Ex. If 112 lb. avoirdupois make 104 lb. of Holland, and 100 lb. of Holland make 89 of Geneva, and 110 of Geneva make 117 of Seville, how many lbs. of Seville will make 100lb. avoirdupois? Proportion.

112 : 104 :: 100
100 : 89
110 : 117

If it be required, how many lb. avoirdupois will make 100 of Seville, the terms would have been placed in the different columns thus:

104 : 112 :: 100
89 : 100
117 : 110

Sect. III. Distributive Proportion.

If it be required to divide a number into parts, which have the same proportion to each other, that several other given numbers have, we add these numbers together, and state the following proposition: As the sum is to the particular numbers, so is the number required to be divided to the several parts sought.

Ex. 1st.] Four partners engage to trade in company; A's stock is 150l. B's 320l. C's 350l. D's 500l.; and they gain 730l.: Required how much belongs to each, if the gain be divided among them in proportion to their stocks?

					Rem.
A's stock	L. 150	1320 : 150 :: 730 :	L. 82	19	1 — 120
B's	320	1320 : 320 :: 730 :	176	19	4 — 960
C's	350	1320 : 350 :: 730 :	193	11	2 — 720
D's	500	1320 : 500 :: 730 :	276	10	3 — 840
Whole stock	1320	Proof L. 730			

This account is proved by adding the gains of the partners; the sum of which will be equal to the whole gain, if the operation be right; but, if there be remainders, they must be added, their sum divided by the common divisor, and the quotient carried to the lowest place.

Ex. 2d.] A bankrupt owes A 146l. B 170l. C 45l. D 480l. and E 72l.; his whole effects are only 342l. 7s. 6d. How much should each have?

A's debt	L.146	913 : 146 :: L.342 7 6 :	L. 54 15	A's share.
B's	170	913 : 170 :: 342 7 6	63 15	B's
C's	45	913 : 45 :: 342 7 6	16 17 6	C's
D's	480	913 : 480 :: 342 7 6	180	D's
E's	72	913 : 72 :: 342 7 6	27	E's
	L.913		L.342 7 6	

This might also be calculated, by finding what composition the bankrupt was able to pay per pound; which is obtained by dividing the amount of his effects by the amount of his debts, and comes to 7s. 6d. and then finding by the rules of practice, how much each debt came to at that rate.

Chap. VII. RULES FOR PRACTICE.

The operations explained in the foregoing chapters comprehend the whole system of arithmetic, and are sufficient for every computation. In many cases, however, the work may be contracted, by adverting to the particular circumstances of the question. We shall explain, in this chapter, the most useful methods which practice has suggested for rendering mercantile computations easy; in which the four elementary rules of arithmetic are sometimes jointly, sometimes separately employed.

Sect. I. Computation of Prices.

The value of any number of articles, at a pound, a shilling,

Practice.

shilling, or a penny, is an equal number of pounds, shillings, or pence; and these two last are easily reduced to pounds. The value, at any other rate, may be calculated by easy methods, depending on some contraction already explained, or on one or more of the following principles.

1st, If the rate be an aliquot part of a pound, a shilling, or a penny, then an exact number of articles may be bought for a pound, a shilling, or a penny; and the value is found by dividing the given number accordingly. Thus, to find the price of so many yards at 2s. 6d. which is the eighth part of a pound, we divide the quantity by eight, because every eight yards cost L.1.

2d, If the rate be equal to the sum of two other rates which are easily calculated, the value may be found by computing these separately, and adding the sums obtained. Thus, the price of so many yards, at 9d. is found, by adding their prices, at 6d. and 3d. together.

3d, If the rate be equal to the difference of two easy rates, they may be calculated separately, and the lesser subtracted from the greater. Thus, the value of so many articles at 11d. is found, by subtracting their value at a penny from their value at a shilling. We may suppose that a shilling was paid for each article, and then a penny returned on each.

4th, If the rate be a composite number, the value may be found by calculating what it comes to at one of the component parts, and multiplying the same by the other.

Case I. "When the rate is an aliquot part of a "pound, divide the quantity by the number which "may be bought for a pound."

Table of the aliquot parts of L.1.

10 shillings	$= \frac{1}{2}$ of L.1.	1s. 4d.	$= \frac{1}{13}$ of L.1.
6s. 8d.	$= \frac{1}{3}$	1s. 3d.	$= \frac{1}{16}$
5s.	$= \frac{1}{4}$	1s.	$= \frac{1}{20}$
4s.	$= \frac{1}{5}$	8d.	$= \frac{1}{30}$
3s. 4d.	$= \frac{1}{6}$	6d.	$= \frac{1}{40}$
2s. 6d.	$= \frac{1}{8}$	4d.	$= \frac{1}{60}$
2s.	$= \frac{1}{10}$	3d.	$= \frac{1}{80}$
1s. 8d.	$= \frac{1}{12}$	2d.	$= \frac{1}{120}$

Ex. 1st.] What is the value of 7463 yards, at 4s.?

5)7463

L. 1492 12s.

2d.] What is the value of 1773 yards, at 3d.?

80)1773

L. 22 3 3

In the first example we divide by 5 because 4s. is $\frac{1}{5}$ of a pound; the quotient 1492 shows how many pounds they amount to; besides which there remain three yards at 4s. and these come to 12s. In the second example, we divide by 80, as directed, and the quotient gives L.22, and the remainder 13 yards, which at 3d. come to 3s. 3d.

This method can only be used in calculating for the particular prices specified in the table. The following 6 cases comprehend all possible rates, and will therefore exhibit different methods of solving the foregoing questions.

Case II. "When the rate consists of shillings only, "multiply the quantity by the number of shillings, and "divide the product by 20: Or, if the number of "shillings be even, multiply by half the number, and "divide the product by 10."

Ex. 1st.] 4573 at 13s.

13

13719
4573

20)59449

L. 2972 9s.

2d.] 7543 at 14s. Practice.

7

10)52801

L. 5280 2s.

The learner will easily perceive, that the method in which the second example is wrought, must give the same answer as if the quantity had been multiplied by 14, and divided by 20; and as the division by 10 doubles the last figure for shillings, and continues all the rest unchanged for pounds, we may obtain the answer at once, by doubling the right-hand figure of the product before we set it down.

If the rate be the sum of two or more aliquot parts of a pound, we may calculate these as directed in Case I. and add them. If it be any odd number of shillings, we may calculate for the even number next lower, and add thereto the value of a shilling. If it be 19s. we may subtract the value at a shilling, from the value at a pound.

Case III. "When the rate consists of pence only."

Method 1. If the rate be an aliquot part of a shilling, divide the quantity accordingly, which gives the answer in shillings; if not, it may be divided into two or more aliquot parts: calculate these separately, and add the values; reduce the answer to pounds.

1 penny is $\frac{1}{12}$ of a shilling
2d. $\frac{1}{6}$ of ditto.
3d. $\frac{1}{4}$ of ditto.
4d. $\frac{1}{3}$ of ditto.
6d. $\frac{1}{2}$ of ditto.
5d. is the sum of 4d. and 1d. or of 2d. and 3d.
7d. is the sum of 4d. and 3d. or of 6d. and 1d.
8d. is the sum of 6d. and 2d. or the double of 4d.
9d. is the sum of 6d. and 3d.
10d. is the sum of 6d. and 4d.
11d. is the sum of 6d. 3d. and 2d.

Ex. 1st.] 7423 at 4d.

3)7423

20)2474 4

L. 123 14 4

Here, because 4d. is one third of a shilling, we divide by 3, which gives the price in shillings, and reduce these by division to pounds.

2d.] 9786 at 9d.

At 6d. $= \frac{1}{2}$ of 1s. 4893
At 3d. $= \frac{1}{2}$ of 6d. 2446 6
At 9d. 7339 6

L. 366 19 6

Here we suppose, that first 6d. and then 3d. is paid for each article; half the quantity is the number of shillings which they would cost at 6d. each. Half of that is the cost at 3d. and these added and reduced give the answer.

3d.] 4856 at 11d.

At 6d. $= \frac{1}{2}$ of 1s. 2428
At 3d. $= \frac{1}{2}$ of 6d. 1214
At 2d. $= \frac{1}{3}$ of 6d. 809 $\frac{4}{4}$
11d. 4451 4

L. 222 11 4

Here we calculate what the articles would cost at 6d. at 3d. and at 2d. and add the values.

It is sometimes easier to calculate at two rates, whose difference is the rate required, and subtract the lesser value from the greater. Thus, the last example may be wrought by subtracting the value at a penny from the value at a shilling. The remainder must be the value

Practice.

value at 11d.

At 1s.	4856s.	10d. may be wrought as the difference of 1s. and 2d.; and several other rates in like manner.
At 1d.=$\frac{1}{12}$	404 8	
At 11d.	4451 4	
	L.222 11 4	

Meth. 2. *Multiply the quantity by the number of pence, the product is the answer in pence. Reduce it to pounds.*

Meth. 3. *Find the value at a penny by division, and multiply the same by the number of pence.*

Case IV. "When the rate consists of farthings only, find the value in pence, and reduce it by division "to pounds."

Ex. 1st.] 37843 at 1 farthing.

4)37843 farth.
12) 9460$\frac{3}{4}$ pence
788 4$\frac{3}{4}$
L. 39 8 4$\frac{3}{4}$

3d. 72564 at $\frac{1}{4}$d.

3
4)217692 farth.
1) 54423 pence
4535 3
L. 226 15 3

2d.] 23754 at $\frac{1}{2}$d.

2)23754 halfpence
12)11877 pence
989 9
L. 49 9 9

Or, 72564

At $\frac{1}{2}$d. 3682 d.
At $\frac{1}{4}$d. 18141 d.
12)54423 d.
4535 3
L. 226 15 3

We may also find the amount in twopences, threepences, fourpences, or sixpences, by one division, and reduce these as directed in Case I.

Case V. "When the rate consists of pence and farthings, find the value of the pence, as directed in "Case III. and that of the farthings from the proportion which they bear to the pounds. Add these together, and reduce."

Ex. 1st.] 3287 at 5$\frac{1}{4}$d.

At 4d.=$\frac{1}{3}$ of 1s.	1095	8
At 1d.=$\frac{1}{4}$ of 4d.	273	11
At 1f.=$\frac{1}{4}$ of 1d.	68	5$\frac{3}{4}$
At 5$\frac{1}{4}$	1438	$\frac{1}{4}$
	L. 71	18 $\frac{3}{4}$

2d.] 4573 at 2$\frac{3}{4}$

At 2d.=$\frac{1}{6}$ of 1s.	762	2
At $\frac{1}{2}$d.=$\frac{1}{4}$ of 2d.	190	6$\frac{1}{2}$
At $\frac{1}{4}$d.=$\frac{1}{2}$ of $\frac{1}{2}$d.	85	3$\frac{1}{4}$
At 2$\frac{1}{4}$	1037	11$\frac{3}{4}$
	L. 51	17 11$\frac{3}{4}$

3d.] 2842 at 3$\frac{1}{4}$d.

At 3d.=$\frac{1}{4}$ of 1s.	710	6
At 3f.=$\frac{1}{4}$ of 3d.	176	7$\frac{1}{2}$
At 3$\frac{1}{4}$	887	1$\frac{1}{2}$
	L. 44	8 1$\frac{1}{2}$

4th.] 3572 at 7$\frac{1}{2}$d.

At 6d.=$\frac{1}{2}$ of 1s.	1386	
At 1$\frac{1}{2}$d.=$\frac{1}{4}$ of 6d.	346	6
At 7$\frac{1}{2}$	1732	6
	L. 87	12 6

It is sometimes best to join some of the pence with the farthings in the calculation. Thus, in Ex. 4. we reckon the value at 6d. and at 3 halfpence, which makes 7$\frac{1}{2}$d.

Practice.

If the rate be 1$\frac{1}{2}$, which is an eighth part of a shilling, the value is found in shillings, by dividing the quantity by 8.

Case VI. "When the rate consists of shillings and "lower denominations."

Method 1. *Multiply the quantity by the shillings, and find the value of the pence and farthings, if any, from the proportion which they bear to the shillings. Add and reduce.*

Ex. 1st.] 4258 at 17s. 3d.

17
29806
4258
72386

17s.		
3d.=$\frac{1}{4}$ of 1s.	1064	6
17s. 3d.	73450	6
	L. 3672 10	6

2d.] 5482 at 12s. 4$\frac{1}{2}$d.

12
65784

12s.		
3d.=$\frac{1}{4}$ of 1s.	1370	6
1$\frac{1}{2}$d.=$\frac{1}{2}$ of 3d.	685	3
12s. 4$\frac{1}{2}$d.	67839	9
	L. 3391 19	9

Method 2. *Divide the rate into aliquot parts of a pound; calculate the values corresponding to these, as directed in* Case I. *and add them.*

Ex. 1st.] 3894 at 17s. 6d.

10s.=$\frac{1}{2}$	L. 1947	
5s.=$\frac{1}{4}$	973	10
2s. 6d.=$\frac{1}{8}$	486	15
17s. 6d.	L. 3407	5

2d.] 1765 at 9s. 2d.

6s. 8d.=$\frac{1}{3}$	L. 588	6 8
2s. 6d.=$\frac{1}{8}$	220	12 6
9s. 2d.	808	19 2

Sometimes part of the value is more readily obtained from a part already found; and sometimes it is easiest to calculate at a higher rate, and subtract the value at the difference.

3d.] 63790 at 5s. 4d.

4s. =$\frac{4}{5}$ of L.12758	
1s.4d.=$\frac{1}{3}$ of 4s.	4252 13 4
5s.4d.	L. 17010 13 4

4th.] 3664 at 14s. 9d.

10s.=$\frac{1}{2}$	L. 1832
5s.=$\frac{1}{2}$ of 10s.	916
15s.	2748
3d.=$\frac{1}{20}$ of 5s.	45 16
14s. 9d.	L. 2702 4

Method 3. *If the price contain a composite number of pence, we may multiply the value at a penny by the component parts.*

Ex. 5628 at 2s. 11d. or 35d.

12)5628
20)469
L. 23 9
5
L. 117 5
7
L. 820 15

Case

Practice. CASE VII. "When the rate consists of pounds and "lower denominations."

Method 1. *Multiply by the pounds, and find the value of the other denominations from the proportion which they bear to the pounds.*

Ex. 1st.] 3592 at L.3 : 12 : 8.

3

L.3		10776
12s.	$=\frac{1}{3}$ of L.3	2155 4
8d.	$=\frac{1}{18}$ of 12s.	119 14 8
L.3 12 8		L.13050 18 8

2d.] 543 at L. 2 : 5 : $12\frac{1}{2}$.

2

L.2		1086
5s.	$=\frac{1}{4}$ of L.1	135 15
10d.	$=\frac{1}{6}$ of 5s.	22 12 6
$\frac{1}{2}$d.	$=\frac{1}{20}$ of 10d.	1 2 $7\frac{1}{2}$
		L.1245 10 $1\frac{1}{2}$

Method 2. *Reduce the pounds to shillings, and proceed as in* Case VI.

Ex. 1st.] 3592 at L.3 : 12 : 8

	72	20
	7184	72
	25144	
	258624	At 4s.
4d. $=\frac{1}{5}$s.	1197 4	At 1d. $=\frac{1}{12}$s.
4d. $=\frac{1}{5}$s.	1197 4	
		44s. 11d.
8d.	261018 8	
	L.13050 18 8	

2d.] 3683 at L.2 : 4 : 11

	45
	18415
	14732
	165735
At 1d. $=\frac{1}{12}$s.	307 11
	165427 – 1
	L.8271 7 1

The learner should at first try every calculation more ways than one; which will not only serve the purpose of proving the operation, but will render him expert at discovering the best method for solving each question, and will lead him to invent other methods; for we have not exhausted the subject.

Thus, if the number of articles be 20, each shilling of the rate makes a pound of the amount. If it be 12, each penny of the rate makes a shilling of the amount. If 240, each penny of the rate makes a pound of the amount. If 480, each halfpenny makes a pound. If 960, each farthing makes a pound. If the number of articles be a multiple, or an aliquot part of any of these, the amount is easily calculated. And if it be near to any such number, we may calculate for that number, and add or subtract for the difference.

We have hitherto explained the various methods of computation, when the quantity is a whole number, and in one denomination. It remains to give the proper directions when the quantity contains a fraction, or is expressed in several denominations.

When the quantity contains a fraction, work for the integers by the preceding rules, and for the fraction take proportional parts.

When the quantity is expressed by several denominations, and the rate given for the higher; calculate the higher, consider the lower one as fractions, and work by the last rule.

When the rate is given for the lower denomination, reduce the higher denomination to the lower, and calculate accordingly.

Practice. Note 1st, 7 lb. 14 lb. and 21 lb. are aliquot parts of 1 qr.: and 16 lb. is $\frac{1}{7}$ of 1 cwt.; and are therefore easily calculated.

2d, If the price of a dozen be so many shillings, that of an article is as many pence; and if the price of a gross be so many shillings, that of a dozen is as many pence.

3d, If the price of a ton or score be so many pounds, that of 1 cwt. or a single article, is as many shillings.

4th, Though a fraction less than a farthing is of no consequence, and may be rejected, the learner must be careful lest he lose more than a farthing, by rejecting several remainders in the same calculation.

SECT. II. DEDUCTIONS on WEIGHTS, &c. 18

The full weight of any merchandise, together with that of the cask, box, or other package, in which it is contained, is called the *gross weight*. From this we must make proper deductions, in order to discover the quantity for which price or duty should be charged, which is called the *nett weight*.

Tare is the allowance for the weight of the package; and this should be ascertained by weighing it before the goods are packed. Sometimes, however, particularly in payment of duty, it is customary to allow so much per C. or so much per 100 lb. in place of tare.

Tret is an allowance of 4lb. on 104 granted on currants, and other goods on which there is waste, in order that the weight may answer when the goods are retailed.

Cloff, or Draught, is a further allowance granted on some goods in London, of 2 lb. on every 3 C. to turn the scale in favour of the purchaser. The method of calculating these and the like will appear from the following examples.

Ex. 1st. What is the nett weight of 17 C. 2 q. 14lb. tare 18 lb. per cwt.

	C. q. lb.	*C. q. lb.*
	17 2 14 gross. or	17 2 14
		6
16lb. $=\frac{1}{7}$ C.	2 2 2	
2lb. $=\frac{1}{8}$ of 16lb.	1 7	105 3 –
		3
18 lb.	2 3 $9\frac{1}{4}$ tare	
		317 1 –
	14 3 $4\frac{1}{4}$ nett.	28) 317$\frac{1}{4}$lb. *C. q. lb.*
		4) 11 $9\frac{1}{4}$ (2 3 $9\frac{1}{4}$ tare.

In the first method, we add the tare at 16lb. which is $\frac{1}{7}$ of the gross weight, to the tare, at 2 lb. which is $\frac{1}{8}$ of the former. In the second, we multiply the gross weight by 18; the tare is 1 lb. for each cwt. of the product, and is reduced by division to higher denominations.

2d.] What is tret of 158 C. 2 q. 24 lb.

C. q. lb. *C. q. lb.*

22) 158 2 26 (6 – 11 Tret.

156

2

4

10

28

286

286

0

Because tret is always 4 lb. in 104, or 1 lb. in 26, it is obtained by dividing by 26.

Practice.

3d.] What is the cloff on 28 C. 2 q.?

C.	q.
28	2
	2
3) 57	(19 lb.

This allowance being 2 lb. on every 3 C. might be found by taking $\frac{2}{3}$ of the number of C's and multiplying it by 2. It is better to begin with multiplication, for the reason given, p. 633. col. 2. par. 1.

Sect. III. Commission, &c.

19 It is frequently required to calculate allowances on sums of money, at the rate of so many per 100l. Of this kind is Commission, or the allowance due to a factor for buying or selling goods, or transacting any other business; Premium of Insurance, or allowance given for engaging to repay one's losses at sea, or otherwise; Exchange, or the allowance necessary to be added or subtracted for reducing the money of one place to that of another; Premiums on Stock, or the allowance given for any share of a public stock above the original value. All these and others of a like kind are calculated by the following

Rule. "Multiply the sum by the rate, and divide "the product by 100. If the rate contain a fraction, "take proportional parts."

Ex. What is the commission on 728l. at $2\frac{1}{4}$ per cent.?

	728
	2
2 per cent.	1456
$\frac{1}{2}$	364
$\frac{1}{4}$	182
	1|00)20|02
	20
	40
	12
	4|80
	4 Answ. L.20 — $4\frac{1}{4}$
	3|20

When the rate is given in guineas, which is common in cases of insurance, you may add a twentieth part to the sum before you calculate. Or you may calculate at an equal number of pounds, and add a twentieth part to the answer.

When the given sum is an exact number of 10 pounds, the calculation may be done without setting down any figures. Every 10l. at $\frac{1}{2}$ per cent. is a shilling; and at other rates in proportion. Thus, 170l. at $2\frac{1}{2}$ per cent. is 17s.; and, at $\frac{1}{4}$ per cent. 8s. 6d.

Sect. IV. Interest.

20 Interest is the allowance given for the use of money by the borrower to the lender. This is computed at so many pounds for each hundred lent for a year, and a like proportion for a greater or a less time. The highest rate is limited by our laws to 5 per cent. which is called the *legal interest;* and is due on all debts constituted by bond or bill, which are not paid at the proper term, and is always understood when no other rate is mentioned.

Practic

The interest of any sum for a year, at any rate, is found by the method explained in the last section.

The interest of any number of pounds for a year, at 5 per cent. is one-twentieth part, or an equal number of shillings. Thus, the interest of 34675l. for a year, is 34675 shillings.

The interest for a day is obtained by dividing the interest for a year, by the number of days in a year. Thus, the interest of 34675l. for a day is found by dividing 34675 shillings by 365, and comes to 95 shillings.

The interest for any number of days is obtained by multiplying the daily interest by the number of days. Thus the interest of 34675l. for 17 days, is 17 times 95 shillings or 1615 shillings; and this divided by 20, in order to reduce it, comes to 80l. 15s.

It would have served the same purpose, and been easier, to multiply at first by 17, the number of days; and instead of dividing separately by 365, and by 20, to divide at once by 7300, the product of 365 multiplied by 20; and this division may be facilitated by the table inserted p. 631. col. 1.

The following practical rules may be inferred from the foregoing observations.

I. *To calculate interest at 5 per cent.* "Multiply the "principal by the number of days, and divide the pro- "duct by 7300."

II. *To calculate interest at any other rate.* "Find "what it comes to at 5 per cent. and take a proper pro- "portion of the same for the rate required."

Ex. 1st. Interest on 34675l. for 17 days, at 5 per cent.?

	34675
	17
	242725
	34675
	L. s.
73|00)	5894|75(80 15
	584
	5475
	20
	1095|00
	73
	365
	365
	0

Ex. 2d. Interest on 304l. 3s. 4d. for 8 days, at 4 per cent.

	L. 304	3	4	
			8	
			s.	*d.*
73|00)	2433	6	8(6	8
			20	
			486|66	
			438	
			4866	
			12	
			584|00	
			584	
			0	

Interest.

Int. at 5 per cent. L. — 6 8
Deduce $\frac{1}{5}$ — 1 4

Int. at 4 per cent. L. — 5 4

When partial payments are made, we proceed in the following manner: Let us suppose a bill of 170l. was due 12th August, that 54l. was paid on the 18th September, 56l. on the 17th October, and the balance on the 14th November; and let it be required to find how much interest is due.

		Days.		
Aug. 12.	L. 170	37	1190	
Sept. 18. pd.	54		510	
				6290
	116	29	1044	
Oct. 17. pd.	56		232	
				3364
	60	28		1680
Nov. 14. pd.	60			
	—		7300)11334(L. 1 : 11 : $\frac{1}{2}$.	
	0			

Here we subtract the several payments from the original sum in their order, placing the dates in the margin; and from this it appears that there is interest due on 170l. from 12th August to 18th September, on 116l. from 18th September to 17th October, and on 60l. from 17th October to 14th November. We next compute the number of days in each of these periods, and mark it against the respective sum. Then we multiply each sum by the number of days; reserving a column, when necessary, for the products of the several figures in the multiplier. Lastly, We add these products, and divide their sum by 7300.

Interest on current accounts is calculated nearly in the same manner. For example, let the interest due on the following account be required to 31st July, at 4 per cent.

Dr. Mr A. Baird, his account current with W. Neil, Cr.

1775.						1775.			
Jan. 15.	To cash	L.160				Mar. 22.	By cash	L.50		
Mar. 12.	To ditto	36				May 16.	By ditto	37		
June 23.	To ditto	13	4	6		June 15.	By ditto	25	12	6
July 19,	To ditto	26	13	4		28.	By ditto	32	5	4

1775.		L.	s.	d.	Days			
Jan. 15.	Dr.	160			56	960		
Mar. 12.	Dr.	36				800		
							8960	Jan. 16
	Dr.	196			10		1960	Feb. 28
22.	Cr.	50						Mar. 31
								Apr. 30
	Dr	146			55	730		May 31
May 16.	Cr.	37				730		June 30
							8030	July 31
	Dr	109			30		3270	—
June 13.	Cr.	25	12	6				Days 197
	Dr.	83	7	6	8		667	
23.	Dr	13	4	6				
	Dr.	96	12		5		483	
28.	Cr.	32	5	4				
	Dr.	64	6	8	21	64		
July 19.	Dr.	26	13	4		1287		
							1351	
31.		91			12		1092	
					197	7300	25813 (L.3 10 8$\frac{1}{2}$ at	

Deduce $\frac{1}{5}$ part 14 1$\frac{1}{2}$

Interest at 4 per cent. L.2 16 7

Here the sums on either side of the account are introduced according to the order of their dates. Those on the Dr. side are added to the former balance, and those on the Cr. side subtracted. Before we calculate the days, we try if the last sum 91l. be equal to the balance of the account, which proves the additions and subtractions; and, before multiplying, we try if the sum of the column of days be equal to the number of days, from 15th January to 31st of July.

In the 5th and 6th multiplications, we begin at the pence column, and take in the carriage, In the 7th, instead of multiplying the 6s. 8d. by 21, we add the third part 21 to the product, because 6s. 8d. is the third of a pound. This is done by marking down the second line 1287, instead of 1280. As the computation on the odd shillings and pence is troublesome, and makes a very small increase of the interest, some neglect them altogether; others add one to the pound, when the shillings exceed 10, and neglect them when below it.

2d.] Required interest on the following account to 31st December, allowing 5 per cent. when the balance is due to J. T. and 4 per cent. when due to N. W.

Dr. Mr J. T. his account current with N. W. Cr.

Dec. 31.	To balance	L.150	April 9.	By cash	L. 70
Mar. 12.	To cash	120	May 12.	By cash	300
June 17.	To cash	165	June 3.	By cash	240
Sept. 24.	To cash	242	Aug. 2.	By cash	10
Oct. 9.	To cash	178			

1755.		L.	Days			
Dec. 31.	Dr.	150	71	150		
1776.				1050		
Mar. 12.	Dr.	120			10650	
				2160		
	Dr.	270	28	540		
April 9.	Cr.	70			7560	
	Dr.	200	33		6600	
May 12.	Cr.	300				
	Cr.	100	22			2200
June 3.	Cr.	240				
	Cr.	340	14	1360		4760
17.	Dr.	165		340		
	Cr.	175	46	1050		8050
Aug. 2.	Cr.	10		700		
	Cr.	185	53	555		9805
Sept. 24.	Dr.	242		925		
	Dr.	57	15	285		
Oct. 9.	Dr.	178		57		
					855	
Dec. 31.	Dr.	235	83	705		
				1880		
			365		19505	
				7300	45170	24815

Interest due to N. W. at 5 per cent.	L.6	8	9
Deduce $\frac{1}{5}$ - -	1	5	9
Due to N. W. at 4 per cent.	L.5	3	0
Due to J. T. at 5 per cent.	3	7	11$\frac{1}{2}$
Balance due to N. W.	L.1	15	0$\frac{1}{2}$

Interest.

In this account, the balance is sometimes due to the one party, sometimes to the other. At the beginning, there is a balance due to N. W.; and on the 9th of April there is 200l. due him. On the 12th of May, J. T. pays him 300l. which discharges what he owed, and leaves a balance of 100l. due him. The balance continues in J. T's favour till the 24th of September, when N. W. pays 242l. These changes are distinguished by the marks Dr. and Cr. The products are extended in different columns, and divided separately.

When payments are made on constituted debts, at considerable distances of time, it is usual to calculate the interest to the date of each payment, and add it to the principal, and then subtract the payment from the amount.

Ex. A bond for 540l. was due the 18th Aug. 1772; and there was paid 19th March 1773, 50l.; and 19th December 1773, 25l.; and 23d September 1774, 25l.; and 18th August 1775, 110l. Required the interest and balance due on the 11th November 1775?

A bond due 13th August 1772				L.540		
Interest to 19th March 1773, 218 days	L.16	2	6	16	2	6
				L.566	2	6
Paid 19th March 1773				50	0	0
Balance due 19th March 1773				L.506	2	6
Interest to 19th December 1773, 272 days	19	1	2	19	1	2
				L.525	3	8
Paid 19th December 1773				25	0	0
Balance due 19th December 1773				500	3	8
Interest to 23d September 1774, 278 days	19	0	9	19	0	9
				L.519	4	5
Paid 23d September 1774				25		
Balance due 23d September 1774				L.494	4	5
Interest to 18th August 1775, 329 days	22	5	3	22	5	3
				L.516	9	8
Paid 18th August 1775				110		
Balance due 18th August 1775				L.406	9	8
Interest to 11th November 1775, 85 days	4	14	6	4	14	6
Balance due 11th November 1775				L.411	4	2
Amount of the interest	L.81	4	2			

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CHAP. VIII. VULGAR FRACTIONS.

IN order to understand the nature of vulgar fractions, we must suppose unity (or the number 1) divided into several equal parts. One or more of these parts is called a *fraction*, and is represented by placing one number in a small character above a line, and another under it: For example, two fifth parts is written thus, $\frac{2}{5}$. The number under the line (5) shows how many parts unity is divided into, and is called the *denominator*. The number above the line (2) shows how many of these parts are represented, and is called the *numerator*.

It follows from the manner of representing fractions, that, when the numerator is increased, the value of the fraction becomes greater; but, when the denominator is increased, the value becomes less. Hence we may infer, that, if the numerator and denominator be both increased, or both diminished, in the same proportion, the value is not altered; and therefore, if we multiply both by any number whatever, or divide them by any number which measures both, we shall obtain other fractions of equal value. Thus, every fraction may be expressed in a variety of forms, which have all the same signification.

Vulg. Fracti.

A fraction annexed to an integer, or whole number, makes a mixed number. For example, five and two third-parts, or $5\frac{2}{3}$. A fraction whose numerator is greater than its denominator is called an *improper fraction*. For example, seventeen third-parts, or $\frac{17}{3}$. Fractions of this kind are greater than unity. Mixed numbers may be represented in the form of improper fractions, and improper fractions may be reduced to mixed numbers, and sometimes to integers. As fractions whether proper or improper may be represented in different forms, we must explain the method of reducing them from one form to another, before we consider the other operations.

PROBLEM I. "To reduce mixed numbers to improper "fractions: Multiply the integer by the denominator "of the fraction, and to the product add the numerator. "The sum is the numerator of the improper fraction "sought, and is placed above the given denominator."

Ex. $5\frac{2}{3}=\frac{17}{3}$

5 integer.
3 denominator.

15 product.
2 numerator given.

17 numerator sought.

Because one is equal to two halves, or 3 third-parts, or 4 quarters, and every integer is equal to twice as many halves, or four times as many quarters, and so on; therefore, every integer may be expressed in the form of an improper fraction, having an assigned denominator: The numerator is obtained by multiplying the integer into the denominator. Hence the reason of the foregoing rule is evident: 5, reduced to an improper fraction, whose denominator is 3, makes $\frac{15}{3}$. and this added to $\frac{2}{3}$ amounts to $\frac{17}{3}$.

PROBLEM II. "To reduce improper fractions to "whole or mixed numbers: Divide the numerator by "the denominator."

Ex. $\frac{112}{17}=6\frac{10}{17}$

17)112(6$\frac{10}{17}$
102
10

1. $\frac{3148}{10}$
2. $\frac{342}{12}$
3. $\frac{75316}{27}$
4. $\frac{157764}{128}$
5. $\frac{3655}{15}$
6. $\frac{73904}{14}$
7. $\frac{86422}{21}$
8. $\frac{43652}{218}$

This problem is the converse of the former, and the reason may be illustrated in the same manner.

PROBLEM III. "To reduce fractions to lower terms: "Divide both numerator and denominator by any num- "ber which measures both, and place the quotients in "the form of a fraction."

Example. $\frac{135}{360} = \frac{27}{72} = \frac{3}{8}$

Here we observe that 135 and 360 are both measured by 5, and the quotients form $\frac{27}{72}$ which is a fraction of the same value as $\frac{135}{360}$ in lower terms. Again, 27 and 72 are both measured by 9, and the quotients form $\frac{3}{8}$, which is still of equal value, and in lower terms.

It is generally sufficient, in practice, to divide by such measures as are found to answer on inspection, or by the rules given p. 629. col 2. But, if it be required to reduce a fraction to the lowest possible terms, we must divide

Vulgar Fractions.

vide the numerator and denominator by the greatest number which measures both. What number this is may not be obvious, but will always be found by the following rule.

To find the greatest common measure of two numbers, divide the greater by the lesser, and the divisor by the remainder continually, till nothing remain; the last divisor is the greatest common measure.

Example. Required the greatest number which measures 475 and 589?

475)589(1
475
114)475(4
456
19)114(6
114
0

Here we divide 589 by 475, and the remainder is 114; then we divide 475 by 114, and the remainder is 19; then we divide 114 by 19, and there is no remainder: from which we infer, that 19, the last divisor, is the greatest common measure.

To explain the reason of this, we must observe, that any number which measures two others, will also measure their sum and their difference, and will measure any multiple of either. In the foregoing example, any number which measures 589, and 475, will measure their difference 114, and will measure 456, which is a multiple of 114; and any number which measures 475, and 456, will also measure their difference 19. Consequently, no number greater than 19 can measure 589 and 475. Again, 19 will measure them both, for it measures 114, and therefore measures 456, which is a multiple of 114, and 475, which is just 19 more than 456; and, because it measures 475 and 114, it will measure their sum 589. To reduce $\frac{475}{589}$ to the lowest possible terms, we divide both numbers by 19, and it comes to $\frac{25}{31}$.

If there be no common measure greater than 1, the fraction is already in the lowest terms.

If the greatest common measure of 3 numbers be required, we find the greatest measure of the two first, and then the greatest measure of that number, and the third. If there be more numbers, we proceed in the same manner.

PROBLEM IV. "To reduce fractions to others of "equal value that have the same denominator: 1st, "Multiply the numerator of each fraction by all the "denominators except its own. The products are numerators to the respective fractions sought." 2d, "Multiply all the denominators into each other; the "product is the common denominator."

Ex. $\frac{4}{5}$ and $\frac{7}{9}$ and $\frac{3}{8}=\frac{288}{360}$ and $\frac{280}{360}$ and $\frac{135}{360}$.

$4\times9\times8=288$ first numerator.
$7\times5\times8=280$ second numerator.
$3\times5\times9=135$ third numerator.
$5\times9\times8=360$ common denominator.

Here we multiply 4, the numerator of the first fraction, by 9 and 3 the denominators of the two others; and the product 288 is the numerator of the fraction sought, equivalent to the first. The other numerators are found in like manner, and the common denominator 360, is obtained by multiplying the given denominators 5, 9, 8, into each other. In the course of the whole operation, the numerators and denominators of each fraction are multiplied by the same number, and therefore their value is not altered.

The fractions thus obtained may be reduced to lower terms, if the several numerators and denominators have a common measure greater than unity. Or, after arranging the number for multiplication, as is done above, if the same number occur in each rank, we may dash them out and neglect them; and if numbers which have a common measure occur in each, we may dash them out and use the quotients in their stead; or any number which is a multiple of all the given denominators, may be used as a common denominator. Sometimes a number of this kind will occur on inspection, and the new numerators are found by multiplying the given ones by the common denominator, and dividing the products by the respective given denominators.

If the articles given for any operation be mixed numbers, they are reduced to improper fractions by Problem I. If the answer obtained be an improper fraction, it is reduced to a mixed number by Problem II. And, it is convenient to reduce fractions to lower terms, when it can be done, by Problem III. which makes their value better apprehended, and facilitates any following operation. The reduction of fractions to the same denominator by Problem IV. is necessary to prepare them for addition or subtraction, but not for multiplication or division.

1. ADDITION of VULGAR FRACTIONS. 22

RULE. "Reduce them, if necessary, to a common "denominator; add the numerators, and place the sum "above the denominator."

Ex. 1st.] $\frac{3}{5}+\frac{2}{9}=\frac{27}{45}+\frac{10}{45}$ by Problem IV.$=\frac{37}{45}$

2d.] $\frac{5}{7}+\frac{8}{9}+\frac{9}{10}=\frac{450}{630}+\frac{560}{630}+\frac{567}{630}=\frac{1577}{630}\ \frac{450}{560}$

By Problem II.$=3\frac{317}{630}=\frac{567}{1577}$

The numerators of fractions that have the same denominator signify like parts; and the reason for adding them is equally obvious, as that for adding shillings or any other inferior denomination.

Mixed numbers may be added, by annexing the sum of the fractions to the sum of the integers. If the former be a mixed number, its integer is added to the other integers.

2. SUBTRACTION of VULGAR FRACTIONS. 23

RULE. "Reduce the fractions to a common denominator; subtract the numerator of the subtrahend "from the numerator of the minuend, and place the remainder above the denominator."

Ex. Subtract $\frac{2}{7}$ from $\frac{5}{12}$ — remainder $\frac{11}{84}$.

$\frac{5}{12}=\frac{35}{84}$, $\frac{2}{7}=\frac{24}{84}$ by Prob. IV.

from 35
take 24
rem. 11

To subtract a fraction from an integer: subtract the numerator from the denominator, and place the remainder above the denominator; prefix to this the integer diminished by unity.

Ex. Subtract $\frac{3}{7}$ from 12. — remainder $11\frac{4}{7}$.

To subtract mixed numbers, proceed with the fractions by the foregoing rule, and with the integers in the common method. If the numerator of the fraction in the subtrahend exceed that in the minuend, borrow the value of the denominator, and repay it by adding 1 to the unit place of the subtrahend.

Vulgar Fractions.

Ex. Subtract $145\frac{7}{9}$ from $238\frac{3}{5}$.

$\frac{3}{5}=\frac{27}{45}$, $\frac{7}{9}=\frac{35}{45}$ by Prob. IV.

$248\frac{27}{45}$ — $145\frac{35}{45}$ — $102\frac{37}{45}$

$\frac{27}{45}$ — $\frac{35}{72}$ — $\frac{35}{37}$

Here, because 27, the numerator of the fraction in the minuend, is less than 35, the numerator of the subtrahend, we borrow 45 the denominator; 27 and 45 make 72, from which we subtract 35, and obtain 37 for the numerator of the fraction in the remainder, and we repay what was borrowed, by adding 1 to 5 in the unit place of the subtrahend.

The reason of the operations in adding or subtracting fractions will be fully understood, if we place the numerators of the fractions in a column like a lower denomination, and add or subtract them as integers, carrying or borrowing according to the value of the higher denomination.

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3. Multiplication of Vulgar Fractions.

Rule. "Multiply the numerators of the factors "together for the numerator of the product, and the "denominators together for the denominator of the "product."

Ex. 1st.] $\frac{2}{3}\times\frac{5}{7}=\frac{10}{21}$

$2\times5=10$ num.

$3\times7=21$ den.

2d] $8\frac{2}{3}\times7\frac{3}{4}=\frac{1302}{12}\times65\frac{2}{20}$

$8\frac{2}{3}=\frac{26}{3}$ by Prob. I.

$7\frac{3}{4}=\frac{31}{4}$ by ditto.

$42\times31=1302$

$5\times4=20$

To multiply $\frac{5}{7}$ by $\frac{2}{3}$, is the same as to find what two third parts of $\frac{5}{7}$ comes to; if one-third part only had been required, it would have been obtained by multiplying the denominator 7 by 3, because the value of fractions is lessened when their denominators are increased: and this comes to $\frac{5}{21}$; and, because two-thirds were required, we must double that fraction, which is done by multiplying the numerator by 2, and comes to $\frac{10}{21}$. Hence we infer, that fractions of fractions, or compound fractions, such as $\frac{2}{7}$ of $\frac{3}{5}$ are reduced to simple ones by multiplication. The same method is followed when the compound fraction is expressed in three parts or more.

If a number be multiplied by any integer, its value is increased: If it be multiplied by 1, or taken one time, it undergoes no alteration. If it be multiplied by a proper fraction, or taken for one half, two-thirds, or the like, its value is diminished, and the product is less than the number multiplied.

The foregoing rule extends to every case, when there are fractions in either factor. For mixed numbers may be reduced to improper fractions, as is done in Ex. 2d.; and integers may be written, or understood to be written, in the form of fractions whose numerator is 1. It will be convenient, however, to give some further directions for proceeding, when one of the factors is an integer, or when one or both are mixed numbers.

1st, To multiply an integer by a fraction, multiply it by the numerator, and divide the product by the denominator. *Ex.* $3756\times\frac{3}{5}=2253\frac{3}{5}$

3

5)11268($2253\frac{3}{5}$

2d, To multiply an integer by a mixed number, we multiply it first by the integer, and then by the fraction, and add the products.

Ex. $138\times5\frac{3}{4}=793\frac{1}{2}$

$138\times5=690$

$138\times\frac{3}{4}$

3

4)414($103\frac{1}{2}$

$793\frac{1}{2}$

3d, To multiply a mixed number by a fraction, we may multiply the integer by the fraction, and the two fractions together, and add the products.

Ex. $15\frac{3}{8}\times\frac{2}{9}=3\frac{5}{12}$

$15\times\frac{2}{9}=3\frac{3}{9}=3\frac{4}{12}$

$\frac{3}{8}\times\frac{2}{9}=\frac{6}{72}=\frac{1}{12}$

$3\frac{5}{12}$

4th, When both factors are mixed numbers, we may multiply each part of the multiplicand first by the integer of the multiplier, and then by the fraction, and add the four products.

Ex. $8\frac{2}{5}$ by $7\frac{3}{4}$

$8\times7=56$

$8\times\frac{3}{4}=\frac{24}{4}=6$ by Prob. II.

$\frac{2}{5}\times7=\frac{14}{5}=2\frac{4}{5}$ — $2\frac{16}{20}$

$\frac{2}{5}\times\frac{3}{4}=$ — $\frac{6}{20}$

product $65\frac{2}{20}$ as before.

4. Division of Vulgar Fractions.

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Rule I. "Multiply the numerator of the dividend "by the denominator of the divisor. The product is "the numerator of the quotient."

II. "Multiply the denominator of the dividend by "the numerator of the divisor. The product is the de-"nominator of the quotient."

Ex. Divide $\frac{2}{3}$ by $\frac{7}{9}$. Quotient $\frac{18}{35}$

$2\times9=18$

$5\times7=35$.

To explain the reason of this operation, let us suppose it required to divide $\frac{5}{7}$ by 7, or to take one-seventh part of that fraction. This is obtained by multiplying the denominator by 7; for the value of fractions is diminished by increasing their denominators, and comes to $\frac{5}{49}$. Again, Because $\frac{7}{9}$ is nine times less than seven, the quotient of any number divided by $\frac{7}{9}$ will be nine times greater than the quotient of the same number divided by 7. Therefore we multiply $\frac{2}{35}$ by 9, and obtain $\frac{18}{35}$.

If the divisor and dividend have the same denominator, it is sufficient to divide the numerators.

Ex. $\frac{12}{17}$ divided by $\frac{3}{17}$ quotes 4.

The quotient of any number divided by a proper fraction is greater than the dividend. It is obvious, that any integer contains more halves, more third parts and the like, than it contains units; and, if an integer and fraction be divided alike, the quotients will have the same proportion to the numbers divided; but the value of an integer is increased when the divisor is a proper fraction; therefore, the value of a fraction in the like case is increased also.

The foregoing rule may be extended to every case, by reducing integers and mixed numbers to the form of improper fractions. We shall add some directions for shortening the operation when integers and mixed numbers are concerned.

1st, When the dividend is an integer, multiply it by

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by the denominator of the divisor, and divide the product by the numerator.

Ex. Divide 368 by $\frac{5}{7}$

7

5)2576(515$\frac{5}{5}$ quotient.

2d, When the divisor is an integer, and the dividend a fraction, multiply the denominator by the divisor, and place the product under the numerator.

Ex. Divide $\frac{3}{8}$ by 5 quotient $\frac{3}{40}$.

$8 \times 5 = 40$

3d, When the divisor is an integer, and the dividend a mixed number, divide the integer, and annex the fraction to the remainder; then reduce the mixed number, thus formed, to an improper fraction, and multiply its denominator by the divisor.

Ex. To divide $576\frac{4}{11}$ by 7 quotient $82\frac{2}{77}$

7) 576 (82

56

16

14

$2\frac{4}{11} = \frac{26}{11}$

$11 \times 7 = 76$

Here we divide 576 by 7, the quotient is 82, and the remainder 2, to which we annex the fraction $\frac{4}{11}$; and reduce $2\frac{4}{11}$ to an improper fraction $\frac{26}{11}$, and multiply its denominator by 7, which gives $\frac{26}{77}$.

Hitherto we have considered the fractions as abstract numbers, and laid down the necessary rules accordingly. We now proceed to apply these to practice. Shillings, and pence may be considered as fractions of pounds, and lower denominations of any kind as fractions of higher; and any operation, where different denominations occur, may be wrought by expressing the lower ones in one form of vulgar fractions, and proceeding by the following rules. For this purpose the two following problems are necessary.

PROBLEM V. "To reduce lower denominations to "fractions of higher, place the given number for the "numerator, and the value of the higher for the denominator."

Examples.

1. Reduce 7d. to the fraction of a shilling. Ans. $\frac{7}{12}$.
2. Reduce 7d. to a fraction of a pound. Ans. $\frac{7}{240}$.
3. Reduce 15s. 7. to a fraction of a pound. Ans. $\frac{187}{240}$.

PROBLEM VI. "To value fractions of higher denominations, multiply the numerator by the value of "the given denomination; and divide the product by "the denominator; if there be a remainder, multiply "it by the value of the next denomination, and continue the division."

Ex. 1st.] Required the value of $\frac{17}{60}$ of 1l.

17

20

s. d.

60)340(5 8

300

40

12

60)480

480

0

2d.] Required the value of $\frac{8}{9}$ of 1 cwt.

8

9

qrs. lb.

9)32(3 15$\frac{5}{9}$

27

5

28

9)140

9

50

45

5

Decimal Fractions.

In the first example, we multiply the numerator 17 by 20, the number of shillings in a pound, and divide the product 340 by 60, the denominator of the fraction, and obtain a quotient of 5 shillings; then we multiply the remainder 40 by 12, the number of pence in a shilling, which produces 480, which divided by 60 quotes 8d. without a remainder. In the second example we proceed in the same manner; but as there is a remainder, the quotient is completed by a fraction.

Sometimes the value of the fraction does not amount to an unit of the lowest denomination; but it may be reduced to a fraction of that or any other denomination, by multiplying the numerator according to the value of the places. Thus $\frac{1}{1289}$ of a pound is equal to $\frac{12}{1289}$ of a shilling, or $\frac{240}{1289}$ of a penny, $\frac{960}{1289}$ of a farthing.

CHAP. IX. DECIMAL FRACTIONS.

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SECT. I. NOTATION *and* REDUCTION.

THE arithmetic of vulgar fractions is tedious, and even intricate to beginners. The difficulty arises chiefly from the variety of denominators; for when numbers are divided into different kinds of parts, they cannot be easily compared. This consideration gave rise to the invention of decimal fractions, where the units are divided into like parts; and the divisions and subdivisions are regulated by the same scale which is used in the arithmetic of integers. The first figure of a decimal fraction signifies tenth parts, the next hundredth parts, the next thousandth parts, and so on: and the columns may be titled accordingly. Decimals are distinguished by a point, which separates them from integers, if any be prefixed.

The use of cyphers in decimals, as well as in integers, is to bring the significant figures to their proper places, on which their value depends. As cyphers, when placed on the left hand of an integer, have no signification, but, when placed on the right hand, increase the value ten times each; so cyphers, when placed on the right hand of a decimal, have no signification; but, when placed on the left hand, diminish the value ten times each.

The notation and numeration of decimals will be obvious from the following examples.

4.7	signifies Four and seven tenth parts.
.47	Four tenth parts, and seven hundredth parts, or 47 hundredth parts.
.047	Four hundredth parts, and seven thousandth parts, or 47 thousandth parts.
.407	Four tenth parts, and seven thousandth parts, or 407 thousandth parts.
4.07	Four, and seven hundredth parts.
4.007	Four, and seven thousandth parts.

The column next the decimal point is sometimes called *decimal primes*, the next *decimal seconds*; and so on.

To reduce vulgar fractions to decimal ones: "Annex a cypher to the numerator, and divide it by the "denominator, annexing a cypher continually to the "remainder."

Ex.

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Ex. 1st.] $\frac{12}{75}$=.16

75)120(16
75
450
450
0

2d.] $\frac{5}{64}$=.078125

64)500(078125
448
520
512
80
64
160
128
320
320

3d.] $\frac{2}{3}$=.666

3)20(666
18
*20
18
20
18
20

4th.] $\frac{5}{8}$=.833

6)50(83
48
*20
18
20
18
20

5th.] $\frac{7}{27}$=.259

27)70(259
54
160
135
250
243
*70

6th.] $\frac{7}{22}$=.3,18,18.

22)70(31818
66
*40
22
180
176
*40
22
180

The reason of this operation will be evident, if we consider that the numerator of a vulgar fraction is understood to be divided by the denominator; and this division is actually performed when it is reduced to a decimal.

In like manner, when there is a remainder left in division, we may extend the quotient to a decimal, instead of completing it by a vulgar fraction, as in the following example:

25)646(25$\frac{21}{25}$ or 25.84.
50
146
125
Rem. 21.0
200
100
100
0

From the foregoing examples, we may distinguish the several kinds of decimals. Some vulgar fractions may be reduced exactly to decimals, as Ex. 1st and 2d, and are called *terminate* or *finite decimals*. Others cannot be exactly reduced, because the division always leaves a remainder; but, by continuing the division, we will perceive how the decimal may be extended to any length whatever. These are called *infinite decimals*. If the same figure continually returns, as in Ex. 3d and 4th, they are called *repeaters*. If two or more figures return in their order, they are called *circulates*. If this regular succession go on from the beginning, they are called *pure repeaters*, or *circulates*, as Ex. 3d and 5th. If otherwise, as Ex. 4th and 6th, they are mixed repeaters or circulates, and the figures prefixed to those in regular succession are called the *finite part*. Repeating figures are generally distinguished by a dash, and circulates by a comma, or other mark, at the beginning and end of the circle; and the beginning of a repeater or circulate is pointed out in the division by an asterisk.

Decim Fractio

Lower denominations may be considered as fractions of higher ones, and reduced to decimals accordingly. We may proceed by the following rule, which is the same, in effect, as the former.

To reduce lower denominations to decimals of higher. "Annex a cypher to the lower denomination, and divide it by the value of the higher. When there are several denominations, begin at the lowest, and reduce them in their order."

Ex. To reduce 5 cwt. 2. qr. 21 lb. to a decimal of a ton?

28)210(.75
196
140
140
0

4)2.75(.6875
24
35
32
30
28
20
20
0

20)5.6874(.284375
40
168
160
87
80
75
60
150.
140
100
100
0

Here, in order to reduce 21 lb. to a decimal of 1 qr. we annex a cypher, and divide by 28, the value of 1 qr. This gives .75. Then we reduce 2.75 qrs. to a decimal of 1 cwt. by dividing by 4, the value of 1 cwt. and it comes to .6875. Lastly, 5.6875 cwt. is reduced to a decimal of a ton by dividing by 20, and comes to .284375.

To value a decimal fraction. "Multiply it by the value of the denomination, and cut off as many decimal places from the product as there are in the multiplicand. The rest are integers of the lower denomination."

Example. What is the value of .425 of L. 1?

.425
20
sh. 8.500
6
d. 3.000

Sect. II. Arithmetic *of* Terminate Decimals.

The value of decimal places decreases like that of integers, ten of the lower place in either being equal to one of the next higher: and the same holds in passing from decimals to integers. Therefore, all the operations are performed in the same way with decimals, whether 27

Decimal Fractions.

whether placed by themselves or annexed to integers, as with pure integers. The only peculiarity lies in the arrangement and pointing of the decimals.

In addition and subtraction, "Arrange units under "units, tenth parts under tenth parts, and proceed as "in integers."

32.035	from 13.348	and 12.248
116.374	take 9.2993	10.6752
160.63		
12.3645	4.0487	1.5728
331.4035		

In multiplication, "Allow as many decimal places "in the product as there are in both factors. If the "product has not so many places, supply them by pre-"fixing cyphers on the left hand."

Ex. 1st.]	1.37	2d.]	43.75	3d.]	.1572
	1.8		.48		.12
	1096		35000		.01864
	137		17500		
	2.466		21.0000		

The reason of this rule may be explained, by observing, that the value of the product depends on the value of the factors; and since each decimal place in either factor diminishes its value ten times, it must equally diminish the value of the product.

To multiply decimals by 10, move the decimal point one place to the right; to multiply by 100, 1000, or the like, move it as many places to the right as there are cyphers in the multiplier.

In division, "Point the quotient so that there may "be an equal number of decimal places in the dividend "as in the divisor and quotient together."

Therefore, if there be the same of decimal places in the divisor and dividend, there will be as many in the quotient.

If there be more in the dividend, the quotient will have as many as the dividend has more than the divisor.

If there be more in the divisor, we must annex (or suppose annexed) as many cyphers to the dividend as may complete the number in the divisor, and all the figures of the quotient are integers.

If the division leave a remainder, the quotient may be extended to more decimal places; but these are not regarded in fixing the decimal point.

The reason for fixing the decimal point, as directed, may be inferred from the rule followed in multiplication. The quotient multiplied by the divisor produces the dividend; and therefore the number of decimal places in the dividend is equal to those in the divisor and quotient together.

The first figure of the quotient is always at the same distance from the decimal point, and on the same side as the figure of the dividend, which stands above the unit place of the first product. This also takes place in integers: and the reason is the same in both.

It was formerly observed, that numbers were diminished when multiplied by proper fractions, and increased when divided by the same. Thus, multiplication by fractions corresponds with division by integers; and division by fractions with multiplication by integers; when we multiply by $\frac{1}{2}$ or .5, we obtain the same answer as when we divide by 2, and every integer has a correspondent decimal, which may be called its *reciprocal*. Multiplication by that decimal supplies the place of division by the integer, and division supplies the place of multiplication.

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To find the reciprocal of any number, divide 1 with cyphers annexed by that number.

Ex. Required the reciprocal of 625.

625)1.000(.0016
625
3750
3750
0

The product of any number multiplied by .0016 is the same as the quotient divided by 625. *Example.*

625)9375(15	9375
625	.0016
3125	56250
3125	9375
0	15.0000

Because .0016 is $\frac{1}{625}$ of unity, any number multiplied by that fraction will be diminished 625 times. For a like reason, the quotient of any number divided by .0016, will be equal to the product of the same multiplied by 625. *Example.*

.0016)516.0000(322500	516
48·····	625
36	2580
32	1032
40	3096
32	322500
80	
80	
0	

Sect. III. Approximate Decimals.

It has been shown that some decimals, though extended to any length, are never complete; and others, which terminate at last, sometimes consist of so many places, that it would be difficult in practice to extend them fully. In these cases, we may extend the decimal to three, four, or more places, according to the nature of the articles, and the degree of accuracy required, and reject the rest of it as inconsiderable. In this manner we may perform any operation with ease by the common rules, and the answers we obtain are sufficiently exact for any purpose in business. Decimals thus restricted are called *approximates*.

Shillings, pence, and farthings, may be easily reduced to decimals of three places, by the following rule. Take half the shillings for the first decimal place, and the number of farthings increased by one, if it amount to 24 or upwards; by two, if it amount to 48 or upwards; and by three, if it amount to 72 or upwards, for the two next places.

The reason of this is, that 20 shillings make a pound, two shillings is the tenth part of a pound; and therefore

fore half the number of shillings makes the first decimal place. If there were 50 farthings in a shilling, or 1000 in a pound, the units of the farthings in the remainder would be thousandth parts, and the tens would be hundredth parts, and so would give the two next decimal places; but because there are only 48 farthings in a shilling, or 960 in a pound, every farthing is a little more than the thousandth part of a pound; and since 24 farthings make 25 thousandth parts, allowance is made for that excess by adding 1 for every 24 farthings, as directed.

If the number of farthings be 24, 48, or 72, and consequently the second and third decimal places 25, 50, and 75, they are exactly right; otherwise they are not quite complete, since there should be an allowance of $\frac{1}{24}$, not only for 24, 48, and 72 farthings, but for every other single farthing. They may be completed by the following rule: Multiply the second and third decimal places, or their excess above 25, 50, 75, by 4. If the product amount to 24 or upwards, add 1; if 48, add 2; if 72, add 3. By this operation we obtain two decimal places more; and by continuing the same operation, we may extend the decimal till it terminate in 25, 50, 75, or in a repeater.

Decimals of sterling money of three places may easily be reduced to shillings, pence, and farthings, by the following rule: Double the first decimal place, and if the second be 5 or upwards, add 1 thereto for shillings. Then divide the second and third decimal places, or their excess above 50, by 4, first deducing 1, if it amount to 25, or upwards; the quotient is pence, and the remainder farthings.

As this rule is the converse of the former one, the reason of the one may be inferred from that of the other. The value obtained by it, unless the decimal terminate in 25, 50 or 75, is a little more than the true value; for there should be a deduction, not only of 1 for 25, but a little deduction of $\frac{1}{25}$ on the remaining figures of these places.

We proceed to give some examples of the arithmetic of approximates, and subjoin any necessary observations.

Addition.

Cwt.	*qrs.*	*lb.*	
3	2	14	= 3.625
2	3	22	= 2.94642
3	3	19	= 3.61964
4	1	25	= 4.47321
14	3	24	14.96427

Subtraction.

Cwt.	*qrs.*	*lb.*	
3	2	2	= 3.51785
1	1	19	= 1.41964
3	–	11	2.09821

If we value the sum of the approximates, it will fall a little short of the sum of the articles, because the decimals are not complete.

Some add 1 to the last decimal place of the approximate, when the following figure would have been 5, or upwards. Thus the full decimal of 3qrs. 22lb. is .946,428571, and therefore .94643 is nearer to it than .946,42. Approximates, thus regulated, will in general give exacter answers, and sometimes above the true one, sometimes below it.

The mark + signifies that the approximate is less than the exact decimal, or requires something to be added. The mark — signifies that it is greater, or requires something to be subtracted.

Multiplication.

```
Meth. 1st]8278+   Meth. 2d]8278   Meth. 3d].8278
           2153+           2153             3512
     ----------      ----------          -------
       24834            16556|            16556
      41390               827|8             827
      8278                413|90            413
     16556                 24|834            24
     ----------      ----------          -------
     1782|2534        1782|2534            1782
```

Here the last four places are quite uncertain. The right-hand figure of each particular product is obtained by multiplying 8 into the figures of the multiplier; but if the multiplicand had been extended, the carriage from the right-hand place would have been taken in; consequently the right-hand place of each particular product, and the four places of the total product, which depend on these, are quite uncertain. Since part of the operation therefore is useless, we may omit it; and for this purpose, it will be convenient to begin (as in p. 629. col. 1. *fifth* variety) at the highest place of the multiplier. We may perceive that all the figures on the right hand of the line on Meth. 2. serve no purpose, and may be left out, if we only multiply the figures on the multiplicand, whose products are placed on the right hand of the line. This is readily done by inverting the multiplier in Meth. 3. and beginning each product with the multiplication of that figure which stands above the figure of the multiplier that produces it, and including the carriage from the right-hand place.

If both factors be approximates, there are as many uncertain places, at least in the product, as in the longest factor. If only one be an approximate, there are as many uncertain places as there are figures in that factor, and sometimes a place or two more, which might be affected by the carriage. Hence we may infer, how far it is necessary to extend the approximates, in order to obtain the requisite number of certain places in the product.

Division.

```
.3724—)798|64327+(2144   or 3724)79864327(2144
       744|8                     7448
       ------                    ----
        53|84                     538
        37|24                     372
       ------                    ----
        16|602                    166
        14|896                    148
       ------                    ----
         1|7063                    18
         1|4892                    14
       ------                    ----
          2171                      4
```

Here all the figures on the right hand of the line are uncertain; for the right-hand figure of the first product 7448 might be altered by the carriage, if the divisor were extended; and all the remainders and dividuals that follow are thereby rendered uncertain. We may omit these useless figures; for which purpose, we dash a figure on the right hand of the divisor at each step, and neglect it when we multiply by the figure of the quotient next obtained; but we include the carriage. The operation, and the reason of it, will appear clear, by comparing the operation at large, and contracted, in the above example.

Chap.

Interminate Decimals.

Chap. X. INTERMINATE DECIMALS.

Sect. I. Reduction of Interminate Decimals.

As the arithmetic of interminate decimals, otherwise called the *arithmetic of infinites*, is facilitated by comparing them with vulgar fractions, it will be proper to inquire what vulgar fractions produce the several kinds of decimals, terminate or interminate, repeaters or circulates, pure or mixed. And first, we may observe, that vulgar fractions, which have the same denominator, produce decimals of the same kind. If the decimals corresponding to the numerator 1 be known, all others are obtained by multiplying these into any given numerator, and always retain the same form, providing the vulgar fraction be in its lowest terms.

Thus, the decimal equal to $\frac{1}{7}$ is .142857
which multiplied by 3

produces the decimal equal to $\frac{3}{7}$. .428571

Secondly, If there be cyphers annexed to the significant figures of the denominator, there will be an equal number of additional cyphers prefixed to the decimal. The reason of this will be evident, if we reduce these vulgar fractions to decimals, or if we consider that each cypher annexed to the denominator diminishes the value of the vulgar fraction ten times, and each cypher prefixed has a like effect on the value of the decimal.

Thus, $\frac{1}{7}$=.142857, $\frac{2}{25}$=.28 $\frac{45}{100}$=.0,45
$\frac{1}{70}$=.0,142857, $\frac{7}{2500}$=.0028 $\frac{1}{2000}$=.000,45

We may therefore confine our attention to vulgar fractions whose numerator is 1, and which have no cyphers annexed to the significant figures of the denominator.

Thirdly, Vulgar fractions, whose denominators are 2 or 5, or any of their powers, produce terminate decimals; for if any power of 2 be multiplied by the same power of 5, the product is an equal power of 10, as appears from the following table:

2	× 5	=	10	
2^2 or 4	× 5^2 or	25=	100 or 10^2	
2^3 or 8	× 5^3 or	125=	1000 or 10^3	
2^4 or 16	× 5^4 or	625=	10000 or 10^4	
2^5 or 32	× 5^5 or	3125=	100000 or 10^5	

And the reason is easily pointed out: for $2^3 \times 5^3 = 2 \times 2 \times 2 \times 5 \times 5 \times 5$; or, because the factors may be taken in any order, $= 2 \times 5 \cdot \times 2 \times 5 \times 2 \times 5$; and this, if we multiply the factors by pairs, becomes $10 \times 10 \times 10$, or 10^3. The like may be shown of any other power. And we may infer, that if any power of 10 be divided by a like power of 2 or 5, the quotient will be an equal power of 5 or 2 respectively, and will come out exact, without a remainder; and, since the vulgar fractions above mentioned are reduced to decimals by some such division, it follows that the equivalent decimals are terminate.

The number of places in the decimal is pointed out by the exponent of the power; for the dividend must be a like power of 10, or must have an equal number of cyphers annexed to 1, and each cypher of the dividend gives a place of the quotient.

Ex. $\frac{1}{32}$=.03125, a decimal of 5 places, and 32=$\frac{5}{2}$.

```
32)1.00000(.03125
   96 . . .
   ----
    40
    32
   ----
    80
    64
   ----
   160
   160
```

Again, No denominators except 2, 5, or their powers, produce terminate decimals. It is obvious from p. 631. col. 2. par. 4. that, if any denominator which produces a terminate decimal be multiplied thereby, the product will consist of 1, with cyphers annexed; and consequently the lowest places of the factors, multiplied into each other, must amount to 10, 20, or the like, in order to supply a cypher for the lowest place of the product; but none of the digits give a product of this kind, except 5 multiplied by the even numbers; therefore one of the factors must terminate in 5, and the other in an even number. The former is measured by 5, and the latter by 2, as was observed p. 630. col. 2. par. 7. Let them be divided accordingly, and let the quotients be multiplied. This last product will be exactly one-tenth part of the former; and therefore will consist of 1, with cyphers annexed, and the factors which produce it are measured by 5 and 2, as was shewn before. This operation may be repeated; and one of the factors may be divided by 5, and the other by 2, till they be exhausted; consequently they are powers of 5 and 2.

Fourthly, Vulgar fractions, whose denominators are 3 or 9, produce repeating decimals.

Thus, $\frac{1}{9}$=.11$\dot{1}$ $\frac{5}{9}$=55$\dot{5}$
$\frac{2}{9}$=.22$\dot{2}$ $\frac{2}{3}$ or $\frac{6}{9}$=66$\dot{6}$
$\frac{1}{3}$ or $\frac{3}{9}$=.33$\dot{3}$ $\frac{7}{9}$=77$\dot{7}$
$\frac{4}{9}$=.44$\dot{4}$ $\frac{8}{9}$=88$\dot{8}$

The repeating figure is always the same as the numerator. Hence we infer, that repeating figures signify ninth parts; a repeating 3 signifies $\frac{1}{3}$; a repeating 6 signifies $\frac{2}{3}$; and a repeating 9 signifies $\frac{9}{9}$, or 1.

The value of repeating decimals may also be illustrated by collecting the values of the different places: for example, let the value of 11$\dot{1}$ be required: the first decimal place signifies $\frac{1}{10}$, the next, $\frac{1}{100}$, the next $\frac{1}{1000}$. The sum of the two first places is $\frac{11}{100}$, of the three places $\frac{111}{1000}$; and so on. If we subtract these values successively from $\frac{1}{9}$, the first remainder is $\frac{1}{90}$, the second $\frac{1}{900}$, the third $\frac{1}{9000}$. Thus, when the value of the successive figures is reckoned, the amount of them approaches nearer and nearer to $\frac{1}{9}$, and the difference becomes 10 times less for each figure assumed; and, since the decimal may be extended to any length, the difference will at last become so small, that it need not be regarded. This may give a notion of a decreasing series, whose sum may be exactly ascertained, though the number of terms be unlimited.

Fifthly, Vulgar fractions, whose denominators are a product of 3 or 9 multiplied by 2, 5, or any of their powers, produce mixed repeaters. The reason of this will be evident, if, in forming the decimal, we divide the numerator successively by the component parts of the denominator, as directed p. 630. col. 1. par. ult. &c.

Intermi-nate Decimals.

&c. The first divisor is 2, 5, or some of their powers, and consequently gives a finite quotient by p. 649, col. 1. par. 3, &c. The second divisor is 3 or 9; and therefore, when the figures of the dividend are exhausted, and figures annexed to the remainder, the quotient will repeat, by p. 649. col. 2. par. 2.

Ex. $\frac{1}{144}$ 144=16×9.

		9	
144)	1.000(.00694	or 16)1.00(.0625	
	864		96.00694
	1360		40
	1296		32
	* 640		80
	576		80
	640		0

In order to illustrate this subject farther, we shall explain the operation of casting ont the threes, which resembles that for casting out the nines, formerly laid down, p. 633. col. 2. par. 4.—p. 634. col. 2. par. 3. and depends on the same principles, being a method of finding the remainder of a number divided by 3. If the same number be divided by 3 and by 9, the remainders will either agree, or the second remainder will exceed the first by 3 or by 6. The reason of this will be obvious, if we suppose a collection of articles assorted into parcels of 3, and afterwards into parcels of 9, by joining three of the former together. If the lesser parcels be all taken up in composing the greater ones, the remainder will be the same at the end of the second assortment as before; but if one of these lesser parcels be left over, the remainder will be more, and if two of them be left over, the remainder will be 6 more. Therefore, when the nines are cast out from any number, and the result divided by 3, the remainder is the same as when the number is divided by 3: Thus, the results on casting out the 3's may be derived from those obtained by casting out the 9's; and the same correspondence which was pointed out with respect to the latter, for proving the operations of arithmetic, applies also to the former.

To cast out the 3's from any number, add the figures, neglecting 3, 6, or 9; and, when the sum amounts to 3, 6, or 9, reject them; and carry on the computation with the excess only. For example, take 286754: in casting out the 3's we compute thus; 2 and 8 is 10, which is three times 3, and 1 over; 1 and (passing by 6) 7 is 8, which is twice 3 and 2 over; 2 and 5 is 7, which is twice 3 and 1 over; lastly, 1 and 4 is 5, which contains 3 once, and 2 over, so the result is 2.

If the 3's be cast out from 2^2 or 4, the result is 1; from 2^3 or 8, the result is 2; from 2^4 or 16, the result is 1; and universally the odd powers of 2 give a result of 2, and the even powers give a result of 1. As every higher power is produced by multiplying the next lower by 2, the result of the product may be found by multiplying the result of the lower power by 2, and casting out the 3's if necessary. Therefore if the result of any power be one, that of the next higher is 2, and that of the next higher (4 with the 3's cast out, or) 1. Thus the results of the powers of 2 are 1 and 2 by turns; also, because the result of 5, when the 3's are cast out, is 2, its powers will have the same results as the corresponding powers of 2.

If the denominator be a product of an even power of 2 or 5, multiplied by 3, the repeating figure of the corresponding decimal is 3; but, if it be the product of an odd power, the repeating figure is 6. For, in forming the decimal, we may divide by the component parts of the denominator, and the first divisor is a power of 2 or 5; therefore the first quotient is a like power of 4 or 2 (p. 649. col. 1. par. 3. &c.) and this power is again divided by 4. If it be an even power, the remainder or result is 1, as was demonstrated above; and if cyphers be annexed to the remainder, and the division continued, it quotes a repeating 3; but it be an odd power, the remainder is 2, and the quotient continued by annexing cyphers is a repeating 6.

If the denominator be 9, multiplied by 2, or any of its powers, the repeating figure may be found by casting out the 9's from the corresponding power, by 5; and if it be multiplied by 5, or any of its powers, by casting out the 9's from the corresponding power of 2. For if the decimal be formed by two divisions, the first quotes the corresponding power; and the second, because the divisor is 9, repeats the resulting figure after the dividend is exhausted.

If any mixed repeater be multiplied by 9, the product is a terminate decimal, and may be reduced (p. 649. col. 1. par. 3. &c.) to a vulgar fraction, whose denominator is 2, 5, or some of their powers; therefore all mixed repeaters are derived from vulgar fractions, whose denominators are products of 2, 5, or their powers, multiplied by 3 or 9.

Sixthly, All denominators, except 2, 5, 3, 9, the powers of 2 and 5, and the products of these powers, multiplied by 3 or 9, produce circulating decimals. We have already shown, that all terminate decimals are derived from 2, 5, or their powers; all pure repeaters, from 3 or 9; and all mixed repeaters, from the products of the former multiplied by the latter. The number of places in the circle is never greater than the denominator diminished by unity: Thus $\frac{1}{7}$ produces .142857, a decimal of 6 places; and $\frac{1}{17}$ produces .0588235294117647, a decimal of 16 places. The reason of this limit may be inferred from the division; for whenever a remainder which has recurred before, returns again, the decimal must circulate, and the greatest number of possible remainder is one less than the divisor: But frequently the circle is much shorter. Thus $\frac{1}{11}$=.09, a circle of 2 places.

When a vulgar fraction, whose numerator is 1, produces a pure circulate, the product of the circle multiplied by the denominator, will consist of as many 9's as there are places in the circle. Thus $\frac{1}{7}$=.142857, which multiplied by 7 produces 999999. The like holds in every decimal of the same kind; for they are formed by dividing 10, or 100, or 1000, or some like number, by the denominator, and the remainder is 1, when the decimal begins to circulate; for the division must be then exactly in the same state as at the beginning: Therefore, if the dividend had been less by 1, or had consisted entirely of 9's, the division would have come out without a remainder; and since the quotient multiplied by the divisor, produces the dividend, as was shown p. 631. col. 2. par. 3. it follows, that the circulating figures, multiplied by the denominator, produce an equal number of 9's.

Every vulgar fraction, which produces a pure circulate,

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late, is equal to one whose numerator is the circulating figures, and its denominator a like number of 9's. If the numerator be 1, the vulgar fraction is reduced to that form by multiplying both terms into the circle of the decimal; and if the numerator be more than 1, the equivalent decimal is found by multiplying that which corresponds to the numerator 1 into any other numerator.

Thus $\frac{1}{7}$=.142857,=$\frac{142857}{999999}$ and $\frac{1}{10}$=.027.=$\frac{27}{999}$
$\frac{2}{7}$=.285714,=$\frac{285714}{999999}$ $\frac{2}{37}$=.054.=$\frac{54}{999}$
$\frac{3}{7}$=.428571,=$\frac{428571}{999999}$ $\frac{3}{37}$=.216.=$\frac{216}{999}$

Hence we may infer, that pure circulates are equal in value to vulgar fractions whose numerators consist of the circulating figures, and denominators of as many 9's as there are places in the circle. To place this in another point of view, we shall reduce a vulgar fraction, whose numerator consists entirely of 9's, to a decimal.

$\frac{375}{999}$ 990)375000(.375,
2997··

7530
6993

5370
4995

*375

The remainder is now the same as the dividend, and therefore the quotient must circulate; and, in general, since any number with 3 cyphers annexed, may be divided by 1000, without a remainder, and quotes the significant figures; therefore, when divided by 999, it must quote the same figures, and leave an equal remainder. This also applies to every divisor which consists entirely of 9's. Circles of two places, therefore, signify ninety-ninth parts; circles of 3 places, signify nine hundred and ninety-ninth parts; and so on.

The value of circulating decimals may also be illustrated by adding the values of the places. Thus, if two figures circulate, the first circle signifieth hundredth parts, and every following circle signifies one hundred times less than the preceding; and their values added, as in p. 649. col. 2. par. 3. will approach nearer to ninety-ninth parts than any assigned difference, but will never exactly complete it.

All denominators which are powers of 3, except 9, produce pure circulates; and the number of places in the circle is equal to the quotient of the denominator divided by 9.

Thus, $\frac{1}{27}$=.037, a circle of 3 places, and 27 divided by 9=3
$\frac{1}{81}$=.012345679, a circle of 9 places, and 81 divided by 9=9.

These decimals may be formed, by dividing the numerator by the component parts of the denominator. In the first example, the component parts of the numerator are 9 and 3. The division by 9 quotes a pure circulate, and the circulating figure is not 3, 6, or 9, if the vulgar fraction be in its lowest terms. And any other repeating figure divided by 3, quotes a pure circulate of 3 places; for the first dividual must leave a remainder of 1 or 2. If the first remainder be 1, the second remainder is 2, (because, if 1 be prefixed to the repeating figure, and the 3's be cast out, the result is 2), and, for a like reason, the third dividual clears off without a remainder. If the first remainder be 2, the second is (twice 2 or 4, with the 3's cast out, or) 1, and the third 0; so the circle is always complete at 3 places, and the division begins anew. The sum of such a circle cannot be a multiple of 3; for since the repeating figure is not 3, nor any of its multiples, the sum of 3 places is not a multiple of 9, and therefore cannot be divided by 9, nor twice by 3, without a remainder.

Interminate Decimals.

Again, If the decimal equal to $\frac{1}{27}$ be divided by 3, we shall obtain the decimal equal to $\frac{1}{81}$. The dividend, as we have shown already, is a pure circulate of 3 places, whose sum is not a multiple of 3. Therefore, when divided by 3, the first circle leaves a remainder of 1 or 2, which being prefixed to the second, and the division continued, the remainder at the end of the second circle, is 2 or 1, and at the end of the third circle, there is no remainder; all which may be illustrated by casting out the 3's. The division being completed at 9 places, finishes the circle; and it may be shown, as before, that the sum of these places is not a multiple of 3. The learner will apprehend all this if he reduce these, or the like vulgar fractions, to decimals, by successive divisions.

27= 9×3, and 9)1.0(.1111, and 3) 1111(.037,
81=27×3, and 3)037,037,037(.012345679.

For the same reason, if any circulating decimal, not a multiple of 3, be divided by 3, the quotient will circulate thrice as many places as the dividend; and if any circulate obtained by such division be multiplied by 3, the circle of the product will be restricted to one-third of the places in the multiplicand.

All vulgar fractions, whose denominators are multiples of 2, 5, or their powers, except those already considered, produce mixed circulates; for they may be reduced by dividing by the component parts of the denominator. The first divisor is 2, 5, or some of their powers, and therefore gives a fine quotient. The second divisor is none of the numbers enumerated p. 650. col. 2. par. 2. and therefore gives a circulating quotient when the significant figures of the dividend are exhausted, and cyphers annexed to the remainder.

Ex. $\frac{1}{216}$

216)1.000(.004,629,
864

*1360
1296

640
432

2080
1944

*1360

216=27×8,
or 8)1.000
27) .125(.004,629,
108

*170
162

80
54

260
243

17

All mixed circulates are derived from vulgar fractions

Interminate Decimals.

tions of this kind, whose denominators are multiples of 2, 5, or their powers; and therefore all other denominators, except 8 and 9, produce pure circulates. The reader will easily perceive, that when a decimal is formed from a vulgar fraction, whose numerator is 1, when the remainder 1 occurs in the division the decimal is a pure circulate; but if any other remainder occurs twice, the decimal is a mixed circulate. We are to show that this last will never happen, unless the divisor be a multiple of 2, 5, or their powers. If two numbers be prime to each other, their product will be prime to both; and if two numbers be proposed, whereof the first does not measure the second, it will not measure any product of the second, if the multiplier be prime to the first. Thus, because 7 does not measure 12, it will not measure any product of 12 by a multiplier prime to 7. For instance, it will not measure 12×3, or 36. Otherwise, the quotient of 12 divided by 7, or $1\frac{5}{7}$ multiplied by 3, would be a whole number, and 5×3 would be measured by 7, which it cannot be, since 5 and 3 are both prime to 7.

Now, if we inspect the foregoing operation, we shall perceive that the product of 136, the remainder where the decimal begins to circulate, multiplied by 999, is measured by the denominator 216. But 999 is not measured by the denominator, otherwise the decimal would have been a pure circulate; therefore 126 and 136 are not prime to each other, but have a common measure, and that measure must apply to 864, a multiple of 126, and to 1000, the sum of 136 and 864; see p. 642, col. 2. par. *ult.* &c. But it was proven, p. 649, col. 1. par. 1. that no numbers, except the powers of 5 and 2, measure a number consisting of 1 with cyphers annexed; consequently the denominator must be measured by a power of 2 or 5. The reader will perceive, that the exponent of the power must be the same as the number of cyphers annexed to 1, or as the number of figures in the finite part of the decimal.

We shall now recapitulate the substance of what has been said with respect to the formation of decimals: 2, 5, and their powers, produce finite decimals, by p. 649, col. 1. par. 3, &c. and the number of places is measured by the exponent of the power; 3 and 9 produce pure repeaters (p. 649. col. 2. par. 2.) The products of 2, 5, and their powers, by 3 or 9, produce mixed repeaters by p. 649. col. 2. par. *ult.*; their products by other multipliers, produce mixed circulates by p. 649. col. 2. par. *ult.*; and all numbers of which 2 and 5 are not aliquot parts, except 3 and 9, produce pure circulates. To find the form of a decimal corresponding to any denominator, divide by 2, 5, and 10, as often as can be done without a remainder; the number of divisions shows how many finite places there are in the decimal, by p. 651. col. 2. par. 3. If the dividend be not exhausted by these divisions, divide a competent number of 9's by the last quotient, till the division be completed without a remainder: the number of 9's required show how many places there are in the circle; and the reason may be inferred from p. 650. col. 2. par. 5.

We shall conclude this subject by marking down the decimal produced by vulgar fractions, whose numerator is 1, and denominator 30; and under that the reader may observe their connexion with the denominators.

$\frac{1}{2}=.5$	$\frac{1}{16}=.0625$
$\frac{1}{3}=.33\dot{3}$	$\frac{1}{17}=.0588235294117647$
$\frac{1}{4}=.25$	$\frac{1}{18}=.05\dot{5}$
$\frac{1}{5}=.2$	$\frac{1}{19}=.052631578947368421,$
$\frac{1}{6}=.16\dot{6}$	$\frac{1}{20}=.05$
$\frac{1}{7}=.142857$	$\frac{1}{21}=.047619,$
$\frac{1}{8}=.125$	$\frac{1}{22}=.0,45,45,$
$\frac{1}{9}=.1\dot{1}$	$\frac{1}{23}=.0434782608695652173913,$
$\frac{1}{10}=.1$	$\frac{1}{24}=.041\dot{6}$
$\frac{1}{11}=.09,09,$	$\frac{1}{25}=.04$
$\frac{1}{12}=.08\dot{3}$	$\frac{1}{26}=.0,384615,$
$\frac{1}{13}=.079623$	$\frac{1}{27}=.037,$
$\frac{1}{14}=.0,714285$	$\frac{1}{28}=.03,571428$
$\frac{1}{15}=.0,66\dot{6}$	$\frac{1}{29}=.0344827586206896551724137931,$
	$\frac{1}{30}=.03\dot{3}$

Interminate Decim.

RULES *for reducing interminate decimals to vulgar fractions.*

I. "If the decimal be a pure repeater, place the repeating figure for the numerator, and 9 for the denominator."

II. "If the decimal be a pure circulate, place the circulating figures for the numerator, and as many 9's as there are places in the circle for the denominator."

III. "If there be cyphers prefixed to the repeating or circulating figures, annex a like number to the 9's in the denominator."

IV. "If the decimal be mixed, subtract the finite part from the whole decimal. The remainder is the numerator; and the denominator consists of as many 9's as there are places in the circle, together with as many cyphers as there are finite places before the circle."

Thus, $235,62,=\frac{23327}{99000}$

From the whole decimal	23562
We subtract the finite part	235
and the remainder	23327 is the numerator.

The reason may be illustrated by dividing the decimal into two parts, whereof one is finite, and the other a pure repeater or circulate, with cyphers prefixed. The sum of the vulgar fractions corresponding to these will be the value of the decimal sought.

$.235,62$, may be divided into $.235\frac{235}{1000}$ by Rule I. and $.000,62=\frac{62}{99000}$ by Rules II. III.

In order to add these vulgar fractions, we reduce them to a common denominator; and, for that purpose, we multiply both terms of the former by 99, which gives $\frac{23265}{99000}$; then we add the numerators.

235 or by method explained p. 628. col. 1. par 3.
99

		Sum of numerators.		
2115	23500	23265	or	23562
2115	235	62		235
23265	23265	23327		23327

The value of circulating decimals is not altered, though one or more places be separated from the circle, and considered as a finite part, providing the circle be completed. For example, .27 may be written .2,72, $\frac{270}{900}$, or $\frac{27}{99}$, which is also the value of .27. And if two or more circles be joined, the value of the decimal is still the same. Thus, $2727,=\frac{2727}{9999}$, which is reduced by dividing the terms by 101 to $\frac{27}{99}$.

Interminate Decimals.

All circulating decimals may be reduced to a similar form, having a like number both of finite and circulating places. For this purpose, we extend the finite part of each as far as the longest, and then extend all the circles to so many places as may be a multiple of the number of places in each.

Ex. ·34,725, extended, ·34,725725725725,
1,4562, 14,562456245624,

Here the finite part of both is extended to two places, and the circle to 12 places, which is the least multiple for circles of 3 and 4 places.

30 SECT. II. ADDITION *and* SUBTRACTION *of* INTERMINATE DECIMALS.

To add repeating Decimals. "Extend the repeating "figures one place beyond the longest finite ones, and "when you add the right-hand column, carry to the "next by 9."

Ex. ·3752$\dot{4}$ or 37524 ·23 ·29$\dot{6}$ $\frac{7}{36}$
·8 88888 ·328 ·42 $\frac{11}{45}$
·643 643 ·469$\dot{1}$ ·7548 $\frac{11}{74}$
·73 73333 ·3$\dot{6}$ ·31 $\frac{2}{73}$
264046

To subtract repeating Decimals. "Extend them as "directed for addition, and borrow at the right-hand "place, if necessary, by 9."

·93560 ·646 ·7358 ·7382 ·469
·84738 ·53421 ·62563 ·68 ·38
·08721 ·11173

The reason of these rules will be obvious, if we recollect that repeating figures signify nine parts. If the right-hand figure of the sum or remainder be 0, the decimal obtained is finite; otherwise it is a repeater.

To add circulating Decimals. "Extend them till "they become similar (p. 652. col. 1. par. *ult.* &c.); "and when you add the right-hand column, include "the figure which would have been carried if the circle had been extended further."

Ex. 1st.]	*Extended.*	*Ex.* 2d.]	*Extended.*
·574,	·574,574,	·874,	·874,874,874,
·2,698,	·269,869,	·1463	·146,333333,
·428	·428	·1,58,	·158,585858,
·37,983	·379,839,	·32,	·323,232323,
	1.652,284,		1.503,026390,

Note 1. Repeaters mixed with circulates are extended and added as circulates.

Note 2. Sometimes it is necessary to inspect two or more columns for ascertaining the carriage; because the carriage from a lower column will sometimes raise the sum of the higher, so as to alter the carriage from it to a new circle. This occurs in Ex. 2.

Note 3. The sum of the circles must be considered as a similar circle. If it consist entirely of cyphers, the amount is terminate. If all the figures be the same, the amount is a repeater. If they can be divided into parts exactly alike, the amount is a circle of fewer places; but, for the most part, the circle of the sum is similar to the extended circles.

·3,868,	·0842,	$\frac{2}{7}$	·368	·003094·	$\frac{5}{81}$,
·4,375,	·08,42	$\frac{3}{5}$	·57,	·765,	$\frac{7}{48}$
·853492,	·0,842	$\frac{8}{11}$	·895	·76,	$\frac{2}{11}$
·62,	·0842	$\frac{16}{17}$	·742	·765	$\frac{3}{22}$.

Interminate Decimals.

To subtract circulating Decimals. "Extend them "till they become similar; and when you subtract the "right-hand figure, consider whether 1 would have "been borrowed if the circles had been extended further, and make allowance accordingly.

·5,72,	·974, or	·974974	·8,135, or ·8,135135,
·4,86,	·86,	·868686	·452907 or ·4,529074,
·0,85,		·106288,	·3,606060,
			or, 3,60

31 SECT. III. MULTIPLICATION *of* INTERMINATE DECIMALS.

CASE I. "When the multiplier is finite and the "multiplicand repeats, carry by 9 when you multiply "the repeating figure: The right-hand figure of each "line of the product is a repeater; and they must be "extended and added accordingly."

Ex. ·1349$\dot{4}$
·376
94461
80966
4048332
·0495246$\dot{1}$

If the sum of the right-hand column be an even number of 9's, the product is finite; otherwise, it is a repeater.

CASE II. "When the multiplier is finite, and the "multiplicand circulates, add to each product of the "right-hand figure the carriage which would have "been brought to it if the circle had been extended. "Each line of the product is a circle similar to the "multiplicand, and therefore they must be extended "and added accordingly."

The product is commonly a circulate similar to the multiplicand; sometimes it circulates fewer places, repeats, or becomes finite; it never circulates more places.

Ex. ·37,46, ×·235
235,
187,32,
1123,93,
7492,92,
·08804,19,

1. ·674. ×·78
2. ·37, ×.86
3. ·625, ×.42
4. ·4793, ×4.8
5. ·3,75, ×1.24
6. ·2,963, ×.36

CASE III. "When the multiplier repeats or circulates, find the product as in infinite multipliers, and "place under it the products which would have arisen "from the repeating or circulating figures, if extended."

Ex. 1st.] ·958+·8 2d.] ·784+·36
8 36
7664 4704
766|4 2352
76|64
7|664 28224
|7664 282|24
2,8224
·8513 ·284,09,

3d.]

Intermi-nate Decimals.

3d.] .714285, × 54,
54

2859142
35714285

38,571428	571428	571428,
385714	285714	285714,
3857	142857	142857,
38	571428	571428,
	385714	385714,
	3857	142857,
	38	571428,
		385714,
		3857,
		38,
38,961038,	961038,	961038,

It is evident, that if a repeating multiplier be extended to any length, the product arising from each figure will be the same as the first, and each will stand one place to the right hand of the former. In like manner, if a circulating multiplier be extended, the product arising from each circle will be alike, and will stand as many places to the right hand of the former as there are figures in the circle. In the foregoing examples, there are as many of these products repeated as is necessary for finding the total product. If we place down more, or extend them further, it will only give a continuation of the repeaters or circulates.

This is obvious in Ex. 1st and 2d. As the learner may not comprehend it so readily in Ex. 3d. when the multiplicand is a circulate, and consequently each line of the product is also a circulate, we have divided it into columns, whose sums exhibit the successive circles. The sum of the first column is 38,961037, and there is a carriage of 1 from the right-hand column, which completes 38,961038. This one is supplied from the three first lines of the second column, the sum of which is 999999, and being increased by 1 in consequence of the carriage from the third column, amounts to 1,000000, and therefore carries 1 to the first column, and does not affect the sum of the remaining lines, which are the same as those of the first column. The third column contains two sets of these lines, which amount to 999999, beside the lines which compose the circle. Each of these sets would be completed into 1,000000 by the carriage from the 4th column, if extended, and each would carry 1 to the second column. One of these would complete the sum of the three first lines, and the other would complete the sum of the circle. In like manner, if the circles be extended ever so far, the increasing carriages will exactly answer for the increasing deficiencies, and the sum will be always a continuation of the circle; but the product could not circulate, unless the sum of the lines marked off in the second column had consisted entirely of 9's; or had been some multiple of a number of 9's; and the circles must be extended till this take place, in order to find the complete product.

The multiplication of interminate decimals may be often facilitated, by reducing the multiplier to a vulgar fraction, and proceeding as directed p. 643. col. 1. par. 6.
Thus,

4th.] $.3824 \times \dot{7}. = \frac{7}{9}$
7
9)2.6768
$.974\dot{2}$

5th.] $.384 \times .2\dot{3} = \frac{23}{90}$
23   2
1152   23
768
90)8.832
$.0981\dot{3}$.

Therefore, in order to multiply by $\dot{3}$, we take one-third part of the multiplier; and, to multiply by $\dot{6}$, we take two-thirds of the same. Thus,

6th.] $.784 = .\dot{3} \times \frac{1}{3}$
3).784
$.261\dot{3}$

7th.] $.8761 \times .\dot{6} = \frac{2}{3}$
2
3)1.7522
$.5840\dot{6}$

As the denominator of the vulgar fractions always consists of 8's, or of 9's with cyphers annexed, we may use the contraction explained p. 631. col 1. par. *ult.* &c.; and this will lead us exactly to the same operation which was explained p. 653. col. 2. par. *ult.* &c. on the principles of decimal arithmetic.

8th.] $.735 \times .3,26 = \frac{323}{990}$
323   3
2205   323
1470
2205
99|0(237405
2374,05
23,74
,23
.239803,

9th.] $.270 \times 365, = \frac{365}{999}$
365
1390
1668
834
999)101470,
101,
101,571,

When the multiplier is a mixed repeater or circulate, we may proceed as in Ex. 5th and 8th; or we may divide the multiplier into two parts, of which the first is finite, and the second a pure repeater or circulate, with cyphers prefixed, and multiply separately by these, and add the products.

Thus, $.384 \times .2\dot{3}$ or by .2 = .0768
and by $.05 = .0213\dot{3}$
.09813

or thus, .384
$.2\dot{3}$
9)1920
$213\dot{3}$
768
$0981\dot{3}$

In the following examples, the multiplicand is a repeater; and therefore the multiplication by the numerator of the vulgar fraction is performed as directed p. 653. col. 2. par. 2.

10th.]

Interminate Decimals.

10th.] .68β × .8$\frac{5}{9}$

5

9)3.41β(.37,962,
27

71
63

*86
81

56
54

26
18

*86

11th.] .63 × .2,39 = $\frac{237}{990}$

.237 2

443 237
1899
12669

99)15010(.15,16,
99

511
495

*160
99

610
594

*16

In the following examples the multiplicand is a circulate, and therefore the multiplication by the numerator is performed as directed p. 653. col. 2. par 4.

12th.] .3,81, × 53 = $\frac{48}{990}$

48 5

3054 48
15272

990)183,27,(.203,63,
18

*032
27

57
54

*32

13th.] .12, × 03, = $\frac{3}{990}$

3

99)36,36(.036730945821854912764,
666

723
306
936
453
576
813
216
183
846
543
486
903
126
273
756
633
396
*036

In Ex. 13th, we have omitted the products of the divisor, and only marked down the remainders. These are found, by adding the left-hand figure of the dividual to the remaining figures of the same. Thus, 363 is the first dividual; and 3, the left-hand figure, added to 63, the remaining figures, gives 66 for the first remainder; and the second dividual, 666, is completed by annexing the circulating figure 6. The reason of which may be explained as follows. The highest place of each dividual shows, in this example, how many hundreds it contains; and as it must contain an equal number of ninety-nines, and also an equal number of units, it follows, that these units, added to the lower places, must show how far the dividual exceeds that number of ninety-nines. The figure of the quotient is generally the same as the first place of the dividual, sometimes one more. This happens in the last step of the foregoing example, and is discovered when the remainder found, as here directed, would amount to 99, or upwards; and the excess above 99 only, must in that case be taken to complete the next dividual.

14th.].01, × .01, = $\frac{1}{990}$

1

99).01(000102030405060708091011121314151617181920
(21222324252627282930313233343536373839 40
(41424344454647484950515253545556575859 60
(61626364656667686970717273747576777879 80
(81828384858687888990919293949596979899

The number of places in the circle of the product is sometimes very great, though there be few places in the factors: but it never exceeds the product of the denominator of the multiplier, multiplied by the number of places in the circle of the multiplicand. Therefore, if the multiplier be 3 or 6, the product may circulate three times as many places as the multiplicand; if the multiplier be any other repeater, nine times as many; if the multiplier be a circulate of two places, ninety-nine times as many; thus, in the last example, .01, a circulate of two places, multiplied by .10, a circulate of two places, produces a circulate of twice 99, or 198 places. And the reason of this limit may be inferred from the nature of the operation; for the greatest possible number of remainders, including 0, is equal to the divisor 99; and each remainder may afford two dividuals, if both the circulating figures, 3 and 6, occur to be annexed to it. If the multiplier circulate three places, the circle of the product, for a like reason, may extend nine hundred and ninety-nine times as far as that of the multiplicand. But the number of places is often much less.

The multiplication of interminate decimals may be proven, by altering the order of the factors, (p. 628. col. 2. par. 2.) or by reducing them both to vulgar fractions in their lowest terms, multiplying these as directed p. 643. col. 2. par. 3. and reducing the product to a decimal.

Sect. IV. Division *of* Interminate Decimals.

32

Case I. "When the dividend only is interminate, "proceed as in common arithmetic; but, when the figures of the dividend are exhausted, annex the repeating figure, or the circulating figures in their order, instead of cyphers, to the remainder."

Ex.

Intermi-nate Decimals.

Ex. 1st.] Divide .5376 by 7

.7).537$\dot{6}$(.76,095238,
49
42
42
*066
63
36
35
16
14
26
21
56
56
*066

2d.] Divide .84$\dot{3}$ by 5.

.5)84$\dot{3}$(.168$\dot{6}$
5
34
30
43
40
*33
30
33

2d.] Divide .6532$\dot{8}$ by 8.

8).6532$\dot{8}$(.08166$\dot{1}$.

In these accounts the quotient is never finite. It may repeat if the dividend repeats; or, if the dividend circulate, it may circulate an equal number of places, often more, and never fewer. The greatest possible extent of the circle is found by multiplying the divisor into the number of places in the circle of the dividend. Thus, a circulate of 3 places, divided by 3, quotes a circulate of 3 times 3 or 9 places.

Case II. "When the divisor is interminate, the "multiplications and subtractions must be performed "according to the directions given for repeating and "circulating decimals."

Ex. 1st.] Divide .37845 by $\dot{5}$.

$\dot{5}$).37845(.68121
33333$\dot{3}$
4511$\dot{6}$
4444$\dot{4}$
67$\dot{2}$
55$\dot{5}$
11$\dot{6}$
111
$\dot{5}$
$\dot{5}$
0

2d.] Divide .245892 by 2.18.

.2,18.).245892(1.127005
218181,81,
27710,18,
21818,18,
5892,00,
4363,63,
1528,63,
1527,28,
1090,90
1090,90
0

The foregoing method is the only one which properly depends on the principles of decimal arithmetic; but it is generally shorter to proceed by the following rule.

Extract. of Roots.

"Reduce the divisor to a vulgar fraction, multiply "the dividend by the denominator, and divide the product by the numerator."

Ex. 1st.] Divide .37845 by $\dot{5}=\frac{5}{9}$.
9
5)3,40605(.68121.

2d.] Divide .3784$\dot{5}$ by $\dot{6}=\frac{2}{3}$
3
2)1.353$\dot{6}$(.56768$\dot{3}$.

Note 1. Division by $\dot{3}$ triples the dividend, and division by $\dot{6}$ increases the dividend one half.

Note 2. When the divisor circulates, the denominator of the vulgar fraction consists of 9's, and the multiplication is sooner performed by the contraction explained p. 628. col. 1. par. 1. It may be wrought in the same way, when the divisor repeats, and the denominator, of consequence, is 9.

Note 3. If a repeating dividend be divided by a repeating or circulating divisor; or, if a circulating dividend be divided by a similar circulating dividend; or, if the number of places in the circle of the divisor be a multiple of the number in the dividend; then the product of the dividend multiplied by the denominator of the divisor will be terminate, since like figures are subtracted from like in the contracted multiplication, and consequently no remainder left. The form of the quotient depends on the divisors as explained at large, p. 649. col. 1. par. 1.—p. 651. col. 2. par. 3.

Note 4. In other cases, the original and multiplied dividend are similar, and the form of the quotient is the same as in the case of a finite divisor. See p. 655. col. 2. par. *ult.* &c.

Note 5. If the terms be similar, or extended till they become so, the quotient is the same as if they were finite, and the operation may be conducted accordingly; for the quotient of vulgar fractions that have the same denominator is equal to the quotient of their numerators.

Chap. XI. OF THE EXTRACTION OF ROOTS.

The origin of powers by involution has already been explained under the article Algebra, N° 66. There 33
now remains therefore only to give the most expeditious methods of extracting the square and cube roots; the reasons of which will readily appear from what is said under that article. As for all powers above the cube, unless such as are multiples of either the square and cube, the extraction of their roots admits of no deviation from the algebraic canon which must be always constructed on purpose for them.

If the root of any power not exceeding the seventh power be a single digit, it may be obtained by inspection, from the following table of powers.

Extraction of Roots.

1st power or root.	2d power or square.	3d power or cube.	4th power or biquadrate.	5th power or sursolid.	6th power or cube squared.	7th power.
1	1	1	1	1	1	1
2	4	8	16	32	64	128
3	9	27	81	243	729	2187
4	16	64	256	1024	4096	16384
5	25	125	625	3125	15625	78125
6	36	216	1296	7776	46656	279936
7	49	343	2401	16807	117649	823543
8	64	512	4096	32768	262144	2097152
9	81	729	6561	59049	531441	4782969

Sect. I. Extraction *of the* Square Root.

34 Rule I. "Divide the given number into periods of "two figures, beginning at the right hand in integers, "and pointing toward the left. But in decimals, begin "at the place of hundreds, and point toward the right. "Every period will give one figure in the root."

II. "Find by the table of powers, or by trial, the "nearest lesser root of the left-hand period; place the "figure so found in the quot; subtract its square from "the said period, and to the remainder bring down the "next period for a dividual or resolvend."

III. "Double the quot for the first part of the di-"visor; inquire how often this first part is contained "in the whole resolvend, excluding the units place; "and place the figure denoting the answer both in the "quot and on the right of the first part; and you have "the divisor complete."

IV. "Multiply the divisor thus completed by the "figure put in the quot, subtract the product from the "resolvend, and to the remainder bring down the fol-"lowing period for a new resolvend, and then proceed "as before."

Note 1st. If the first part of the divisor, with unity supposed to be annexed to it, happen to be greater than the resolvend, in this case place 0 in the quot, and also on the right of the partial divisor; to the resolvend bring down another period; and proceed to divide as before.

Note 2. If the product of the quotient figure into the divisor happen to be greater than the resolvend, you must go back and give a lesser figure to the quot.

Note 3. If, after every period of the given number is brought down, there happen at last to be a remainder, you may continue the operation, by annexing periods or pairs of cyphers, till there be no remainder, or till the decimal part of the quot repeat or circulate, or till you think proper to limit it.

Ex. 1st. Required the square root of 133225.

```
Square number 133225(365 root          365
              9                        365
                                      ----
  1 div. 66)432 resolvend.            1825
            396 product.              2190
                                      1095
  2 div. 725) 3625 resolvend.         ------
              3625 product.           133225 proof.
```

2d.] Required the square root of 72, to eight decimal places.

```
     72.00000000
     64
    ----
  164)800
      656
    ------
 1688)14400
      13504
    -------
 16965)89600
       84825
    --------
 169702)477500
        339404
 169704)138096
   .... 135763
        -------
          2333
          1697
          ----
           636
           509
           ---
           127
           118
           ---
           (9)
```

After getting half of the decimal places, work by contracted division for the other half; and obtain them with the same accuracy as if the work had been at large.

3d.] Required the square root of .2916.

```
     .2916(.54 root.
      25
     ----
  104 416
      416
```

If the square root of a vulgar fraction be required, find the root of the given numerator for a new numerator, and find the root of the given denominator for a new denominator. Thus the square root of $\frac{4}{9}$ is $\frac{2}{3}$, and the root of $\frac{16}{25}$ is $\frac{4}{5}$; and thus the root of $\frac{25}{4}$ ($=6\frac{1}{4}$) is $\frac{5}{2}=2\frac{1}{2}$.

But if the root of either the numerator or denominator cannot be extracted without a remainder, reduce the vulgar fraction to a decimal, and then extract the root, as in Ex. 3d. above.

Sect. II. Extraction *of the* Cube Root.

Rule I. "Divide the given number into periods of "three figures, beginning at the right hand in integers, "and pointing toward the left. But in decimals, begin "at the place of thousands, and point toward the right. "The number of periods shows the number of figures "in the root."

II. "Find by the table of powers, or by trial, the "nearest lesser root of the left-hand period; place the "figure so found in the quot; subtract its cube from "the said period; and to the remainder bring down "the next period for a dividual or resolvend."

The divisor consists of three parts, which may be found as follows:

Extraction of Roots.

III. "The first part of the divisor is found thus: "Multiply the square of the quot by 3, and to the pro- "duct annex two cyphers; then inquire how often this "first part of the divisor is contained in the resolvend, "and place the figure denoting the answer in the quot."

IV. "Multiply the former quot by 3, and the pro- "duct by the figure now put in the quot; to this last "product annex a cypher; and you have the second "part of the divisor. Again, Square the figure now "put in the quot for the third part of the divisor; "place these three parts under one another, as in addi- "tion; and their sum will be the divisor complete."

V. "Multiply the divisor, thus completed, by the "figure last put in the quot, subtract the product from "the resolvend, and to the remainder bring down the "following period for a new resolvend, and then pro- "ceed as before."

Note 1. If the first part of the divisor happen to be equal to or greater than the resolvend; in this case, place 0 in the quot, annex two cyphers to the said first part of the divisor, to the resolvend bring down another period, and proceed to divide as before.

Note 2. If the product of the quotient figure into the divisor happen to be greater than the resolvend, you must go back, and give a lesser figure to the quot.

Note 3. If, after every period of the given number is brought down, there happen at last to be a remainder, you may continue the operation by annexing periods of three cyphers till there be no remainder, or till you have as many decimal places in the root as you judge necessary.

Ex. 1st. Required the cube root of 12812904.

. . .

Cube number 12812904(234 root.
8

1st part 1200 })4812 resolvend.
2d part 180 }
3d part 9 }

1 divisor 1389 × 3 = 4167 product.

1st part 158700 })645904 resolvend.
2d part 2760 }
3d part 16 }

2 divisor 161476 × 4 = 645904 product.

PROOF.

234	Square 54756
234	234
936	219024
702	164268
468	109512
Square 54756	Cube 12812904

2d.] Required the cube root of $28\frac{1}{4}$.

. . .

28.750000(3.06 root.
27

270000 })1750000 resolv.
5400 }
36 }

Div. 275436 × 6 = 1652616 prod.

97384 rem.

PROOF.

3.06	Sq. 9.3636
3.06	3.06
1836	561816
918	280908
Sq. 9.3636	28.652616
	97384 rem.
	28.750000 cube.

If the cube root of a vulgar fraction be required, find the cube root of the given numerator for a new numerator, and the cube root of the given denominator for a new denominator. But if the root of either cannot be extracted without a remainder, reduce the vulgar fraction to a decimal, and then extract the root.

Under the article ARITHMETIC in the SUPPLEMENT, will be found a full exposition of the fundamental principles of the science.

A R I

Arius.

ARIUS, a divine of the fourth century, the head and founder of the ARIANS, a sect which denied the eternal divinity and substantiality of the Word. He was born in Libya, near Egypt. Eusebius, bishop of Nicomedia, a great favourite of Constantia, sister of the emperor Constantine, and wife of Licinius, became a zealous promoter of Arianism. He took Arius under his protection, and introduced him to Constantia; so that the sect increased, and several bishops embraced it openly. There arose, however, such disputes in the cities, that the emperor, in order to remedy these disorders, was obliged to assemble the council of Nice, where, in the year 325, the doctrine of Arius was condemned. Arius was banished by the emperor, all his books were ordered to be burnt, and capital punishment was denounced against whoever dared to keep them. After five years banishment, he was recalled to

A R I

Arius.

Constantinople, where he presented the emperor with a confession of his faith, drawn up so artfully, that it fully satisfied him. Notwithstanding which, Athanasius, now advanced to the see of Alexandria, refused to admit him and his followers to communion. This so enraged them, that by their interest at court, they procured that prelate to be deposed and banished. But the church of Alexandria still refusing to admit Arius into their communion, the emperor sent for him to Constantinople; where, upon delivering in a fresh confession of his faith in terms less offensive, the emperor commanded Alexander, the bishop of that church, to receive him the next day into his communion: but that very evening Arius died. The manner of his death was very extraordinary: as his friends were conducting him in triumph to the great church of Constantinople, Arius, pressed by a natural necessity, stepped aside to ease himself;

Arius, Ark.

himself; but expired on the spot, his bowels gushing out.

But the heresy did not die with the heresiarch: his party continued still in great credit at court. Athanasius, indeed, was soon recalled from banishment, and as soon removed again; the Arians being countenanced by the government, and making and deposing bishops as it best served their purposes. In short, this sect continued with great lustre above 300 years: it was the reigning religion of Spain for above two centuries: it was on the throne both in the east and west; it prevailed in Italy, France, Pannonia, and Africa; and was not extirpated till about the end of the 8th century.

This heresy was again set on foot in the west by Servetus, who, in 1531, wrote a little treatise against the mystery of the Trinity. After his death Arianism got footing in Geneva; from whence it removed into Poland; but at length degenerated, in a great measure, into Socinianism. Erasmus seems to have aimed at reviving Arianism, in his Commentaries on the New Testament; and the learned Grotius seems to lean a little that way.

With regard to the state of Arianism in England, it may be sufficient to observe, that from the numerous publications of that cast which are daily making their appearance, it seems to be rather a growing, than exploded, doctrine there.

Plate LVII. fig. 1.

ARK, or *Noah's* ARK, a floating vessel built by Noah, for the preservation of his family, and the several species of animals, during the deluge.

The ark has afforded several points of curious inquiry among the critics and naturalists, relating to its form, capacity, materials, &c.

The wood whereof the ark was built is called in the Hebrew *Gopher wood*, and in the Septuagint *square timbers*. Some translate the original *cedar*, others *pine*, others *box*, &c. Pelletier prefers cedar on account of its incorruptibility, and the great plenty of it in Asia; whence Herodotus and Theophrastus relate, that the kings of Egypt and Syria built whole fleets thereof, instead of deal.

The learned Mr Fuller, in his Miscellanies, has observed, that the wood whereof the ark was built was nothing but that which the Grecks call κυπαρισσος, or the *cypress tree*; for, taking away the termination, *kupar* and *gopher* differ very little in sound. This observation the great Bochart has confirmed, and shown very plainly that no country abounds so much with this wood as that part of Assyria which lies about Babylon.

In what place Noah built and finished his ark is no less made a matter of disputation. But the most probable opinion is, that it was built in Chaldea, in the territories of Babylon, where there was so great a quantity of cypress in the groves and gardens in Alexander's time, that that prince built a whole fleet out of it for want of timber. And this conjecture is confirmed by the Chaldean tradition, which makes Xisuthrus (another name for Noah) set sail from that country.

The dimensions of the ark, as given by Moses, are 300 cubits in length, 50 in breadth, and 30 in height; which some have thought too scanty, considering the number of things it was to contain; and hence an argument has been drawn against the authority of the relation. To solve this difficulty, many of the ancient fathers and the modern critics have been put to very miserable shifts: But Buteo and Kircher have proved geometrically, that taking the common cubit of a foot and a half, the ark was abundantly sufficient for all the animals supposed to be lodged in it. Snellius computes the ark to have been above half an acre in area. Father Lamy shows, that it was 110 feet longer than the church of St Mary at Paris, and 64 feet narrower: and if so, it must have been longer than St Paul's church in London, from west to east, and broader than that church is high in the inside, and 54 feet of our measure in height; and Dr Arbuthnot computes it to have been 81,062 tons.

Ark.

The things contained in it were, besides eight persons of Noah's family, one pair of every species of unclean animals, and seven pair of every species of clean animals, with provisions for them all during the whole year. The former appears, at first view, almost infinite; but if we come to a calculation, the number of species of animals will be found much less than is generally imagined; out of which, in this case, are excepted such animals as can live in the water; and Bishop Wilkins shows that only 72 of the quadruped kind needed a place in the ark.

By the description Moses gives of the ark, it appears to have been divided into three stories, each ten cubits or 15 feet high; and it is agreed on, as most probable, that the lowest story was for the beasts, the middle for the food, and the upper for the birds, with Noah and his family; each story being subdivided into different apartments, stalls, &c. though Josephus, Philo, and other commentators, add a kind of fourth story under all the rest; being, as it were, the hold of the vessel, to contain the ballast and receive the filth and fæces of so many animals: but F. Calmet thinks, that what is here reckoned a story, was no more than what is called the *keel* of ships, and served only for a conservatory of fresh water. Drexelius makes 300 apartments; F. Fournier, 333; the anonymous author of the questions on Genesis, 400; Buteo, Temporarius, Arias Montanus, Hostus, Wilkins, Lamy, and others, suppose as many partitions as there were different sorts of animals. Pelletier makes only 72, viz. 36 for the birds, and as many for the beasts. His reason is, that if we suppose a greater number, as 333 or 400, each of the eight persons in the ark must have had 37, 41, or 60 stalls to attend and cleanse daily, which he thinks impossible to have been done. But it is observed, that there is not much in this: to diminish the number of stalls without the diminution of animals is in vain; it perhaps being more difficult to take care of 300 animals in 72 stalls than in 300. As to the number of animals contained in the ark, Buteo computes that it could not be equal to 500 horses; he even reduces the whole to the dimensions of 56 pair of oxen. F. Lamy enlarges it to 64 pair of oxen, or 128 oxen; so that, supposing one ox equal to two horses, if the ark had room for 256 horses, there must have been room for all the animals. But the same author demonstrates, that one floor of it would suffice for 500 horses, allowing nine feet square to a horse.

As to the food in the second story, it is observed by Buteo from Columella, that 30 or 40 pounds of hay ordinarily suffices for an ox a day; and that a solid cubit of hay, as usually pressed down in our hay ricks,

Ark. weighs about 40 pounds; so that a square cubit of hay is more than enough for one ox in one day. Now it appears, that the second story contained 150,000 solid cubits; which divided between 206 oxen, will afford each more hay, by two-thirds, than he can eat in a year. Bishop Wilkins computes all the carnivorous animals equivalent, as to the bulk of their bodies, and their foods, to 17 wolves, and all the rest to 280 beeves. For the former he allows 1825 sheep; and for the latter, 109,500 cubits of hay: all which will be easily contained in the two first stories, and a deal of room to spare. As to the third story, nobody doubts of its being sufficient for the fowls, with Noah, his sons, and daughters. Upon the whole, the learned bishop remarks, that of the two, it appears much more difficult to assign a number and bulk of necessary things to answer the capacity of the ark, than to find sufficient room for the several species of animals already known to have been there. This he attributes to the imperfection of our list of animals, especially those of the unknown parts of the earth; adding, that the most expert mathematician at this day could not assign the proportion of a vessel better accommodated to the purpose than is here done: and hence he finally concludes, that the capacity of the ark, which had been made an objection against Scripture, ought to be esteemed a confirmation of its divine authority; since, in those ruder ages, men, being less versed in arts and philosophy, were more obnoxious to vulgar prejudices than now; so that, had it been a human invention, it would have been contrived, according to those wild apprehensions, which arise from a confused and general view of things, as much too big as it had been represented too little.

But it must be observed, that, besides the places requisite for the beasts and birds, and their provisions, there was room required for Noah to lock up household utensils, the instruments of husbandry, grains, and seeds to sow the earth with after the deluge; for which purpose it is thought that he might spare room in the third story for 36 cabins, besides a kitchen, a hall, four chambers, and a space about 48 cubits in length to walk in.

Plate LVII. fig. 2. *Ark of the Covenant*, a small chest or coffer, three feet nine inches in length, two feet three inches in breadth, and two feet three inches in height, in which were contained the golden pot that held manna, and Aaron's rod, and the tables of the covenant. This coffer was made of shittim wood, and covered with a lid, which was made of solid gold. The ark was reposited in the holiest place of the tabernacle. It was taken by the Philistines, and detained 20, some say 40 years, at Kirjath-jearim; but the people being afflicted with emerods on account of it, returned it with divers presents. It was afterwards placed in the temple.

The lid or covering of the ark was called the *propitiatory* or *mercy-seat;* over which were two figures placed called *Cherubims*, with expanded wings of a peculiar form. Here the Schechinah rested both in the tabernacle and temple in a visible cloud: hence were issued the Divine oracles by an audible voice; and the high-priest appeared before this mercy-seat once every year on the great day of expiation; and the Jews, wherever they worshipped, turned their faces towards the place where the ark stood.

In the second-temple there was also an ark, made of the same shape and dimensions with the first, and put in the same place, but without any of its contents and peculiar honours. It was used as a representative of the former on the day of expiation, and a repository of the original copy of the holy Scriptures, collected by Ezra and the men of the great synagogue, after the captivity. And in imitation of this, the Jews to this day have a kind of ark in their synagogues, wherein their sacred books are reposited. This they call *aron*. Leo of Modena gives a description thereof in his Account of the Customs and Ceremonies of those of his Nation. "The Jews (says he), in the eastern side of their synagogues, have an ark, or armory, called *aron*, in memory of the ark of the covenant. In this are preserved the five books of Moses, written on vellum, with ink made on purpose," &c. Some have supposed that the figure of this ark is still remaining on the triumphal arch of Titus at Rome; though Villalpandus and others, with greater reason, are of opinion, that it is the table of shew bread. *Prideaux's Con.* vol. i. p. 209. Tertullian calls this ark *Armarium Judaicum;* whence the phrase, *to be in the armory of the synagogue*, q. d. in the number of canonical writings.

A chest or coffer, very nearly resembling the Jewish ark, and called the *house of the God*, was found in Huaheine, one of the islands in the southern sea. Mr Banks could obtain no other information concerning it than what the name imports. *Hawkesworth's Account*, &c. vol. ii. p. 252.

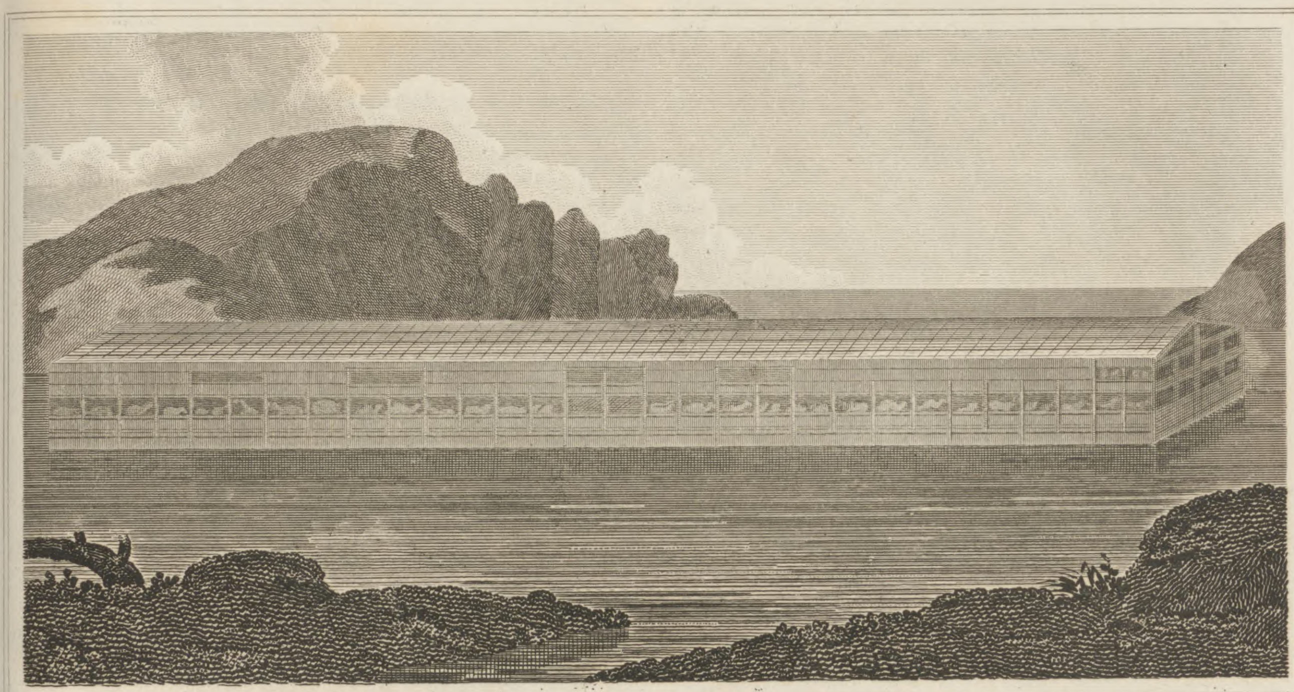
ARKLOW, a sea-port town of Ireland, in the county of Wicklow, and province of Leinster. W. Long. 6. 15. N. Lat. 52. 55.

ARKWRIGHT, Sir Richard, celebrated for his invention of machinery in spinning and carding cotton, was originally a country barber in poor circumstances, but acquired by his inventions a very great fortune. About the year 1767, when he had quitted the profession of a barber, and went up and down the country buying hair, he came to Warrington. At that time, it is said, he had some mechanical project in view, of the nature of a perpetual motion. One John Kay, a clockmaker of that place, becoming acquainted with him, endeavoured to dissuade him from this scheme, but said that much money might be made by spinning cotton, which he promised to describe to him. Arkwright urged as an objection, that that scheme had been the ruin of many; but he came to Kay's bedside next morning, and asked him if he could make a small engine at a moderate expence, as this Kay had been employed to make a cotton-spinning engine for a Mr Hayes, who likewise employed himself in making cylindrical carding engines, and who was brought as a witness on the trial in which Arkwright's patent was set aside in 1785. Mr Hayes proved, that he had invented an engine of a similar construction to Arkwright's, but had not brought it to perfection. Arkwright and Kay made application to Peter Atherton, Esq. now of Liverpool, to make such an engine; but he refused to undertake it, from the external poverty of the former, although on the evening of the same day he undertook to give Kay the use of a smith, and watch-tool maker, to make the heavier parts of the engine; and Kay agreed to instruct the workmen, and to make the clockmakers share of it. In this manner Arkwright's

NOAHS ARK.

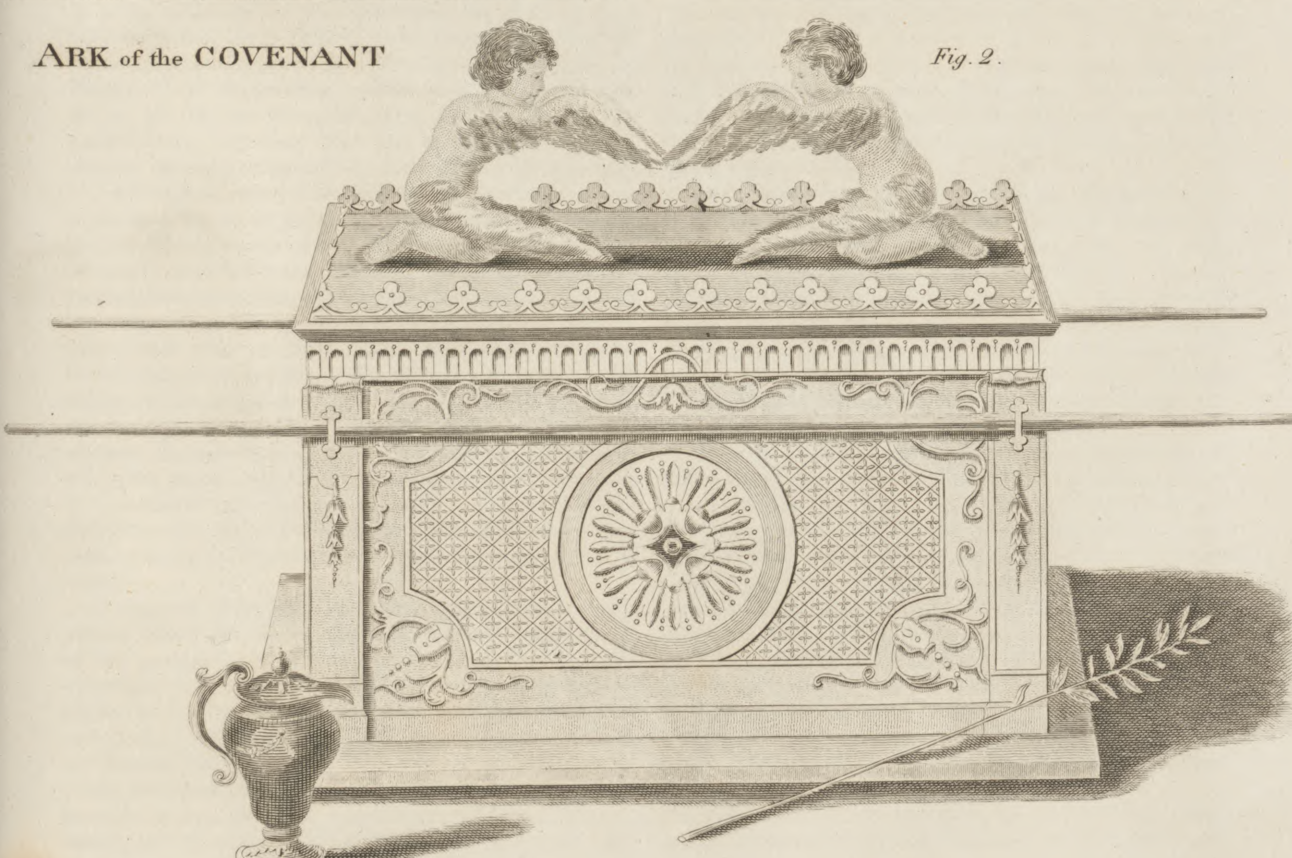
floating on the waters of the deluge

Fig. 1.



ARK of the COVENANT

Fig. 2.



E. Mitchell sculp.t

Arkwright. wright's first engine was made, for which he afterwards took out a patent. Mr Arkwright went into partnership soon after with a Mr Smally of Preston in Lancashire; but being at a loss for money, they went to Nottingham, and there, by the assistance of some rich individuals, erected a considerable cotton mill, which was turned by horses.

The report generally circulated through the manufacturing towns is, that he borrowed these inventions, and that he enriched himself at other men's expence and ingenuity. From all accounts, however, it appears, that the cotton-spinning was no new attempt at the time Mr Arkwright engaged in it, but an object which had been the subject of much attention; but as it had not succeeded, it would accordingly happen, that more difficulties were to be overcome, and subjects of subordinate inventions to be digested, and brought to maturity and effect. Although the carding and spinning of cotton before Mr Arkwright engaged in it was hardly any thing, yet it became a great national manufacture through his means. He states in his case, as drawn by himself, that one Paul and others of London, about 40 or 50 years previous to his time, having invented an engine for spinning cotton, obtained a patent for it, after which they repaired to Nottingham; and there, after having been assisted by several persons, and much money had been expended on the undertaking, many families had been ruined by the failure of their scheme;—that various engines had been constructed by different persons, for spinning cotton, flax, wool, &c. into several threads at once, about 20 or 30 years back, but that no real advantage had been derived from them; and that an engine was construeted in 1767, by one Hargrave of Blackwell in Lancashire, which would at once spin 20 or 30 threads of cotton into yarn for the fustian manufacture, but that after his engine had been destroyed by popular tumults in Lancashire, he removed to Nottingham, where for a while he practised under a patent; but an association being formed against him, his patent was rendered null, and at length he died in obscurity and distress; that he, Arkwright, had invented certain engines for spinning and carding, which had taken about five years in bringing them to perfection; and after 12,000l. had been expended upon them, they had neither produced advantage or profit either to him or his partners. As it must be allowed, that he did not think to make his scheme to bear all at once, he must certainly be considered as the person who after many others had been unsuccessful, engaged in a national undertaking, did display so much skill, perseverance, and activity, as to make it not only productive of value to himself, but likewise to the nation at large.

It appears, from these various accounts, that the object in which Sir Richard Arkwright was engaged, is of the greatest national value; that from his various exertions, he is deserving both of the respect and admiration of the world; and, that although his family is enriched, the benefits which the nation have received are inestimably greater.

On the 22d of December, 1786, upon presenting an address from the high sheriff and hundred of Wirksworth, he was knighted by his present majesty, and died August 3. 1793, at his works at Crumford, in Derbyshire. (*Gen. Biog.*). Arkwright || Arm.

ARLES, a city of France, in the department of the Mouths of the Rhone, formerly Provence, seated on the east side of the Rhone, on a hill, whose declivity is towards the north. It is an archbishop's see; and is celebrated for its antiquities both within and without the city. Those of which any remains are now to be seen are the amphitheatre, the obelisk, the elysian fields, the sepulchres, columns with their capitals, busts, pedestals, aqueduets, with some remains of the capitol, and the temples of their gods. The other ancient monuments are entirely destroyed. Under the amphitheatre, in 1651, they found the statue of Venus, which was worshipped by this city; and has been since carried to the castle of Versailles. It is a master-piece which will always be admired by connoisseurs.

The amphitheatre is one of the most remarkable pieces of antiquity. It was built by the Romans, but the time is unknown, though some say by Julius Cæsar. It is of an oval form, and about 400 yards in circumferenee, and the front is 34 yards in height. The middle, called the *arena*, is 142 yards wide and 104 broad. The porticoes or piazzas are three stories, built with stones of a prodigious size. Each of them consists of 60 arches, which still remain; and the walls are of surprising thickness, but gone to decay.

The obelisk is the only one of this kind to be seen in France. It seems to be one of the forty brought from Egypt to Rome, because it is of the same oriental granite with them. They are generally full of hieroglyphic characters; but this is quite smooth. In 1675, it was found in a private garden near the walls of the city, not far from the Rhone. It consists of one piece; and is 52 feet high, and 7 in diameter at the base. It is now supported with four lions made of bronze; and on the top a blue ball is placed, with the arms of France, and over that a sun.

The Pagans burying place called the *Elysian Fields*, is without the city, upon an agreeable hill, divided into two parts. The first, called *Moulaires*, has very few tombs, they having been broken to build the walls of gardens, which are made in that place. The second, called *Eliscamp*, contains a great number. Those of the Pagans have the letters D. M. which signify *Diis Manibus*. Those of the Christians have a cross. Pieces of coin of gold, silver, and bronze, are found here; as also urns, lamps, and cups, without number.

Here is a royal academy of sciences, consisting of thirty members, who must be natives, gentlemen, and inhabitants of the city. It enjoys the same privileges as that at Paris. Arles is surrounded with marshy land, which renders the air full of vapours, and makes it not very wholesome. E. Long. 4. 48. N. Lat. 43. 0.

ARLEUX, an ancient town in France, in the department of the North, with a castle. It was taken by the French in 1645, and retaken by the allies in 1711: but the French got possession again the same month. E. Long. 3. 6. N. Lat. 50. 20.

ARLON, an ancient town of the Netherlands, formerly a strong place, but now dismantled. E. Long. 5. 28. N. Lat. 49. 4.

ARM, a part of the human body, terminating at one end in the shoulder, and at the other in the hand.

Arm || Armada.

ARM, among sportsmen, is applied to a horse, when by pressing down his head, he endeavours to defend himself against the bit, to prevent his being checked by it. The remedy is, to have a wooden ball covered with velvet, or other matter, put on his chaul, which will so press him between the jaw bones as to prevent his bringing his head so near his breast.

ARM, in *Geography*, is used for the branch of a sea or river. Italy and Sicily are only parted by an arm of the sea. St George's arm in the Mediterranean is the Thracian Bosphorus.

ARM is also used figuratively for power. The secular arm is the lay or temporal authority of a secular judge; to which recourse is had for the execution of the sentences passed by ecclesiastical judges.

The church sheds no blood: even the judges of the inquisition, after they have found the person guilty, surrender him to the secular arm. The council of Antioch, held in 341, decrees, that recourse be had to the secular arm to repress those who refuse obedience to the church: for secular arm, they here use exterior power.

ARM, in respect of the magnet. A loadstone is said to be armed, when it is capped, cased, or set in iron or steel, in order to make it take up the greater weight, and also to distinguish readily its poles. See MAGNETISM.

ARMACALES, a river of Babylon (Abydenus); called *Fossa Regia*, the *Royal Trench* or *Cut* (Polybius); the *Royal River* (Ptolemy); *Almarchur* (Pliny); *Naarmalcha*, (Ammian); a factitious channel or cut, made by Nabuchodonosor, and a horn or branch of the Euphrates, (Abydenus). The Euphrates naturally divides into two channels, one passing through Babylon, the other through Seleucia, and then falls into the Tigris; the factitious channel between these two is the Royal River; which mixes with the Tigris, a great deal lower down than Seleucia, at Apamea, (Ptolemy).

ARMADA, a Spanish term, signifying a fleet of men of war. The armada which attempted to invade England in the time of Queen Elizabeth, is famous in history.

This armada, to which the Spaniards, in confidence of success, gave the name of *Invincible*, consisted of 150 ships, most of which were greatly superior in strength and size to any that had been seen before. It had on board near 20,000 soldiers, and 8000 sailors, besides 2000 volunteers of the most distinguished families in Spain. It carried 2650 great guns, was victualled for half a year, and contained such a quantity of military stores, as only the Spanish monarch, enriched by the treasures of the Indies and America, could supply. The troops on board were to be joined by 34,000 more which the duke of Parma had assembled in the neighbourhood of Nieuport and Dunkirk. For transporting these, he had, with incredible labour, provided a great number of flat-bottomed vessels, and had brought sailors to navigate them from the towns in the Baltic. Most of these vessels had been built at Antwerp; and as he durst not venture to bring them from thence by sea to Nieuport, lest they should have been intercepted by the Dutch, he was obliged to send them along the Scheldt to Ghent, from Ghent to Bruges by the canal which joins these towns, and from Bruges to Nieuport by a new canal which he dug on the present occasion. This laborious undertaking, in which several thousand workmen had been employed, was already finished, and the duke now waited for the arrival of the Spanish fleet; hoping, that as soon as it should approach, the Dutch and English ships which cruised upon the coast would retire into their harbours. Armada.

When the news reached England that this mighty fleet was preparing to sail, terror and consternation universally seized the inhabitants. A fleet of not above 30 ships of war, and those very small in comparison, was all that was to oppose it by sea. All the commercial towns of England, however, were required to furnish ships for reinforcing this small navy. The citizens of London, instead of fifteen vessels, which they were commanded to equip, voluntarily fitted out double the number; and the gentry and nobility equipped 43 ships at their own charge. Lord Howard of Effingham was admiral: and under him served Drake, Hawkins, and Forbisher, all of them renowned as seamen of courage and capacity. The principal fleet was stationed at Plymouth. A smaller squadron, consisting of 40 vessels, English and Flemish, was commanded by Lord Seymour, second son of Protector Somerset, and lay off Dunkirk in order to intercept the duke of Parma.

The land forces of England were more numerous than those of the enemy, but inferior in discipline and experience. An army of 20,000 men was disposed in different bodies along the south coast, with orders to retire backwards and waste the country, if they could not prevent the Spaniards from landing; 22,000 foot and 1000 horse, under the command of the earl of Leicester, were stationed at Tilbury, in order to defend the capital; and the principal army, consisting of 34,000 foot and 2000 horse, commanded by Lord Hunsdon, was reserved for guarding the queen's person, and appointed to march whithersoever the enemy should appear. These armies, though all the Spanish forces had been able to land, would possibly have been sufficient to protect the liberties of their country. But as the fate of England, in that event, must depend on the issue of a single battle, all men of serious reflection entertained the most awful apprehensions of the shock of at least 50,000 veterans, commanded by experienced officers, under so consummate a general as the duke of Parma. The queen alone was undaunted. She issued all her orders with tranquillity, animated her people to a steady resistance, and employed every resource which either her domestic situation or her foreign alliances could afford her. She even appeared on horseback in the camp at Tilbury; and riding through the lines, discovered a cheerful and animated countenance, exhorted the soldiers to remember their duty to their country and their religion, and professed her intention, though a woman, to lead them herself into the field against the enemy, and rather perish in battle than survive the ruin and slavery of her people. "I know (said she, intrepidly) I have but the weak and feeble arm of a woman; but I have the heart of a king, and of a king of England too!" The heroic spirit of Elizabeth communicated itself to the army, and every man resolved to die rather than desert his station.

The Spanish armada was ready in the beginning of May; but its sailing was retarded by the death of the marquis

Armada. marquis of Santa Croce the admiral, and that also of the vice-admiral the duke of Paliano. The command of the expedition was therefore given to the duke of Medina Sidonia, a man entirely unexperienced in sea affairs. This promotion, in some measure, served to frustrate the design, which was also rendered less successful by some other accidents. Upon leaving the port of Lisbon, the armada next day met with a violent tempest, which sunk some of the smallest of their shipping, and obliged the fleet to put back into the harbour. After some time spent in refitting, they put again to sea. Being descried by Fleming, a Scotch pirate, who was roving in those seas, he immediately sailed towards the English fleet, and informed the admiral of their approach. Effingham had just time to get out of port when he saw the Spanish armada coming full sail towards him, disposed in the form of a crescent, and stretching the distance of seven miles from the extremity of one division to that of the other. The English admiral considering that the Spaniards would probably be much superior to him in close fight, by reason of the size of their ships and the number of their troops, wisely resolved to content himself with harassing them in their voyage, and with watching attentively all the advantages which might be derived from storms, cross winds, and such like fortuitous accidents. It was not long before he discerned a favourable opportunity of attacking the vice-admiral Recaldo. This he did in person; and on that occasion displayed so much dexterity in working his ship, and in loading and firing his guns, as greatly alarmed the Spaniards for the fate of the vice-admiral. From that time they kept much closer to one another; notwithstanding which, the English on the same day attacked one of the largest galeasses. Other Spanish ships came up in time to her relief; but in their hurry one of the principal galleons, which had a great part of the treasure on board, ran foul of another ship, and had one of her masts broken. In consequence of this misfortune she fell behind, and was taken by Sir Francis Drake; who on the same day took another capital ship, which had been accidentally set on fire.

Several other rencounters happened, and in all of them the English proved victorious, through the great advantage which they derived from the lightness of their ships, and the dexterity of the sailors. The Spaniards in that age did not sufficiently understand nautical mechanics, to be able to avail themselves of the unusual magnitude of their ships. The English sailed round them, approached or retired, with a velocity that filled them with amazement, and did infinitely greater execution with their cannon; for while every shot of theirs proved effectual, their ships suffered very little damage from the enemy, whose guns were planted too high, and generally spent their force in air.

The Spaniards, however, still continued to advance till they came opposite to Calais; there the duke de Medina having ordered them to cast anchor, he sent information to the duke of Parma of his arrival, and entreated him to hasten the embarkation of his forces. Farnese accordingly began to put his troops on board. But at the same time he informed Medina, that, agreeably to the king's instructions, the vessels which he had prepared were proper only for transporting the troops, but were utterly unfit for fighting; and for this reason, till the armada were brought still nearer, and the coast cleared of the Dutch ships which had blocked up the harbours of Nieuport and Dunkirk, he could not stir from his present station, without exposing his army to certain ruin, the consequence of which would probably be the entire loss of the Netherlands. Armada.

In compliance with this request, the armada was ordered to advance; and it had arrived within sight of Dunkirk, between the English fleet on the one hand, and the Dutch on the other, when a sudden calm put a stop to all its motions. In this situation the three fleets remained for one whole day. About the middle of the night a breeze sprung up; and Lord Howard had recourse to an expedient which had been happily devised on the day before. Having filled eight ships with pitch, sulphur, and other combustible materials, he set fire to them, and sent them before the wind against the different divisions of the Spanish fleet.

When the Spaniards beheld these ships in flames approaching towards them, it brought to their remembrance the havock which had been made by the fire ships employed against the duke of Parma's bridge at the siege of Antwerp. The darkness of the night increased the terror with which their imaginations were overwhelmed, and the panic flew from one end of the fleet to the other. Each crew, anxious only for their own preservation, thought of nothing but how to escape from the present danger. Some of them took time to weigh their anchors, but others cut their cables, and suffered their ships to drive with blind precipitation, without considering whether they did not thereby expose themselves to a greater danger than that which they were so solicitous to avoid. In this confusion the ships ran foul of one another: the shock was dreadful, and several of them received so much damage as to be rendered unfit for future use.

When daylight returned, Lord Howard had the satisfaction to perceive that his stratagem had fully produced the desired effect. The enemy were still in extreme disorder, and their ships widely separated and dispersed. His fleet had lately received a great augmentation by the ships fitted out by the nobility and gentry, and by those under Lord Seymour, who had left Justin de Nassau as alone sufficient to guard the coast of Flanders. Being bravely seconded by Sir Francis Drake and all the other officers, he made haste to improve the advantage which was now presented to him, and attacked the enemy in different quarters at the same time with the utmost impetuosity and ardour. The engagement began at four in the morning and lasted till six at night. The Spaniards displayed in every rencounter the most intrepid bravery; but, from the causes already mentioned, they did very little execution against the English; while many of their own ships were greatly damaged, and twelve of the largest were either run aground, or sunk, or compelled to surrender.

It was now evident that the purpose of the armada was utterly frustrated. The Spanish admiral, after many unsuccessful rencounters, prepared therefore to make his way home; but as the winds were contrary to his return through the Channel, he resolved to take the

Armada || Armagh.

the circuit of the island. The English fleet followed him for some time; and had not their ammunition fallen short, through the negligence of the public offices in supplying them, they had obliged the armada to surrender at discretion. Such a conclusion of that vain-glorious enterprise would have been truly illustrious to the English, but the event was scarcely less fatal to the Spaniards. The armada was attacked by a violent storm in passing the Orkneys; and the ships, having already lost their anchors, were obliged to keep at sea, while the mariners, unaccustomed to hardships, and unable to manage such unwieldy vessels, allowed them to drive on the Western isles of Scotland, or on the coast of Ireland, where they were miserably wrecked. Not one half of the fleet returned to Spain, and a still smaller proportion of the soldiers and seamen; yet Philip, whose command of temper was equal to his ambition, received with an air of tranquillity the news of so humbling a disaster. "I sent my fleet (said he) to combat the English, not the elements. God be praised that the calamity is not greater!" This calamity, however, was sensibly felt all over Spain, and there was scarcely a single family of rank in the kingdom that did not go into mourning for the death of some near relation; insomuch that Philip, dreading the effect which this universal face of sorrow might produce upon the minds of the people, imitated the conduct of the Roman senate after the battle of Cannæ, and published an edict to abridge the time of public mourning.

ARMADILLA, in Spanish America, denotes a squadron of men of war, to the number of six or eight, from twenty-four to fifty pieces of cannon, which the king maintains, to prevent foreigners from trading with the Spaniards and the Indians, both in time of war and peace.

The vessels of this armadilla are those that have been so much talked of, under the name of *guarda costas*. They have even power to take all Spanish merchant ships they meet with on the coast that have not licenses from the king.

The South sea has its armadilla as well as the North sea. The ordinary abode of the former is at Calao, the port of Lima; that of the latter at Carthagena.

ARMADILLO, in *Zoology*, a synonyme of the dasypus. See DASYPUS, MAMMALIA *Index*.

ARMAGEDDON, a place spoken of in the Revelation (xvi. 16.), which literally signifies the mountain of Mageddon or Megiddo, a city situated in the great plain at the foot of Mount Carmel, where King Josiah received his mortal wound in the battle against Necho king of Egypt. At Armageddon, the three unclean spirits, coming out of the dragon's mouth, shall gather together the kings of the earth to the battle of the great day of God Almighty (Rev. xvi. 13. 14.). The word armageddon, according to Mr Poole, does not signify any particular place, but is here an allusion, as some think, to that of Megiddo, mentioned Judges v. 19. where Barak overcame Sisera with his great army, and where Josiah was slain (2 Kings xxiii. 30.). Others translate this word, *the mountain of the gospel*, and others, *the mountain of apples or fruits*.

ARMAGH, a county of Ireland, bounded by Louth on the south; Lough-Neagh, on the north; Tyrone and Monaghan, on the west; and Down in part on the east, from which it is separated by the river Newry. It is in length 32 miles, in breadth 20; and is divided into five baronies, containing about 290,786 acres, or 454 English square miles. Both the air and soil are good, especially the latter, which is said to be the richest in Ireland; only there is a certain tract in it called the *Fewes*, that is, *hilly* and *barren*. The county of Armagh sends two members, and the city one, to the imperial parliament.

Armagh || Armamaxi.

Armagh, standing near the river Kalin, gives name to the county, and is the see of the primate of all Ireland. It is said to have been founded by St Patrick in the fifth century: and in 1142, it was constituted an archbishopric, together with Dublin, Cashel, and Tuam, by Cardinal Papyreo, with the consent of the kings, dukes, bishops, abbots, and states of Ireland. This Papyreo was sent into Ireland by Pope Eugenius, to reform the abuses that had crept into the church discipline of that country. Here was anciently a famous monastery built by St Columbo, or Columbanus, about the year 610. The cathedral was often burnt, but as often rebuilt and enlarged, and particularly by Patrick Scanlain, about 1262. His successor Nicholas, son of Molissa, besides books, rich ecclesiastical vestments, and other things, bestowed on it an annual pension of twenty marks. He appropriated also to his see the manor of Dromyskin. He died the 10th of May, 1303. This town was first subjected to the English by John de Courcy; but afterwards entirely destroyed by Tir Oen, or O'Neal, in Queen Elizabeth's time. However, it was afterwards recovered, rebuilt, and garrisoned by the English.

The see of Armagh is valued in the king's books, by an extent taken anno 30th Henry VIII. at 183l. 17s. 5½d. Irish money per annum, which amounts to 187l. 18s. 0¾d. the difference between Irish and Sterling money being at that time one-fourth. But by an extent returned in the 15th of James I. it is valued at 400l. sterling per annum, and pays so much first fruits to this day. It is reputed to be worth annually 8000l. The chapter of Armagh is composed of five dignitaries and four prebendaries, who have voices in every capitular act. The dignitaries are thus ranked, viz. a dean, chanter, chancellor, treasurer, and archdeacon. There are also eight vicars choral, and an organist, attendant on the service of the cathedral. The vicars choral were anciently fewer; and of the number only one priest. Primate Marsh added another priest, but without increasing the number of vicars. In the year 1720, Primate Lindsay obtained a new charter for enlarging the number of the said vicars to eight, and laid out upwards of 4000l. on a purchase, in augmentation of the estate of the choir. See ARMAGH, SUPPLEMENT.

ARMAGNAC, formerly a province of Guienne in France, which with Gascony now forms the department of Gers, is 55 miles in length, and 40 in breadth; bounded on the west by the river Garonne, on the south by Bigorre and Bearn, on the west by Gascony, and on the north by Condomois and Agenois: Auch is the capital town. It is fertile in corn and wine, and carries on a considerable trade in brandy, wool, and bonchretin pears, which are excellent.

ARMAMAXI, in antiquity, a kind of Scythian chariots or carriages, composed of two wheels, variously

Armament || Armenia.

ously adorned with crowns, shields, breastplates, and other spoils, carried in procession after the images of the gods and great men.

ARMAMENT, a large body of forces, raised and provided with the furniture of war, either for land or sea service.

ARMATURA, in a general sense, is the same with what we otherwise call armour.

ARMATURA is more particularly used in the ancient military art, for a kind of exercise, performed with missive weapons, as darts, spears, arrows, and the like. In this sense, armatura stands contradistinguished from palaria; the latter being the exercise of the heavy-armed, the former of the light-armed.

The armatura was practised with great diligence among the Romans; they had their *campidoctores*, on purpose to instruct the *tyrones* or young soldiers in it. Under it were included the throwing of the spear or javelin, shooting with bows and arrows, &c.

ARMATURA is also an appellation given to the soldiers who were light-armed.

ARMATURA is also a denomination given to the soldiers in the emperor's retinue. Of these we find two schools, mentioned in the *Notitia Imperii*, called the *armaturæ seniores* and *armaturæ juniores*. Their commander was entitled *tribunus armaturarum*.

ARMED, in the sea language. A cross bar shot is said to be armed, when some rope yarn or the like is rolled about the end of the iron bar, which runs through the shot.

ARMED, in *Heraldry*, is used when the horns, feet, beak, or talons, of any beast or bird of prey, are of a different colour from the rest of their body.

ARMED *Ship*, a vessel occasionally taken into the service of the government in time of war, and employed to guard some particular coast, or attend on a fleet. She is therefore armed and equipped in all respects like a ship of war, and commanded by an officer of the navy, who has the rank of master and commander. All ships of this sort are upon the establishment of the king's sloops, having a lieutenant, master, purser, surgeon, &c.

ARMENE, or ARMINA, anciently a hamlet of Paphlagonia, (Ptolemy). The inhabitants encompassed it with a wall, because of the coldness of the place, imagining by that means to render it warmer. But this proving ineffectual, gave rise to the proverb *Armenen muro cingere*, used to express some egregious folly.

ARMENIA, a country of Asia, anciently divided into Armenia Major and Minor. Armenia Major, according to Strabo, was bounded on the south by Mount Taurus, which separated it from Mesopotamia; on the east, by the two Medias; on the north by Iberia and Albania, or rather that part of Mount Caucasus which surrounds them both; and on the west, by Armenia Minor, or the mountains Paryadres, some Pontic nations, and the Euphrates. The most considerable cities were Artaxata, Tigranocerta, and Theodosiopolis. —Armenia Minor was bounded on the east by the Euphrates; on the south by Mount Taurus, which separated it from Cilicia; on the west and north by a long chain of mountains, called in different places *Mons Scordiscus*, *Amanus*, and *Antitaurus*, by which it was separated from Cappadocia.

Whence this tract received the name of *Armenia* is not determined. The Greeks suppose it to be so called from one *Armenus* who attended Jason in the Argonautic expedition, and afterwards settled in this country. Others, transforming Armenia into Aramia, derive its name from Aram the son of Shem, or from one of the kings of Armenia bearing that name. Bochart imagines it to be a contraction or compound of *Aar*, a Hebrew word signifying a "mountain," and *Mini* signifying "metal," and which was the name of a province of Armenia mentioned by the prophet Jeremiah. Armenia.

Herodotus derives the ancient Armenians from the Phrygians, by reason that several Phrygian words were crept into the ancient Armenian language. But Strabo reckons them to have been originally Syrians, which Bochart looks upon to be the most probable opinion.

Armenia is said to have been very early advanced to the honour of a kingdom. Berosus makes one Sytha the first founder of this monarchy, whose successor Bardanes, he says, was driven out by Ninus king of Assyria. Plutarch mentions one Araxes king of Armenia, who in a war with the Persians, being assured of success by an oracle, provided he sacrificed his two daughters, caused the two daughters of one Miesalcus, a nobleman of his court, to be sacrificed in their stead, flattering himself that he thereby complied with the oracle. But Miesalcus did not fail to revenge the death of his own daughters by putting the king's two daughters to death, and pursued himself so closely, that he was drowned in attempting to swim across the Araxes, which was then called *Helmus*.

The Armenians were in process of time subdued by the Medes, to whom Astyages made them tributaries, but allowed them to be governed by their own kings; but on the dissolution of the Median empire by Cyrus, the kingdom was reduced to the form of a province, and they were governed by Persian prefects or lieutenants. On the destruction of the Persian empire by Alexander the Great, Armenia fell into the hands of the Macedonians; to whom it continued subject till the beginning of the reign of Antiochus the Great. This prince having appointed two prefects, called *Zadriades* and *Artaxias*, to govern Armenia, they excited the people to a revolt, and caused themselves to be proclaimed kings of the provinces over which they presided. Antiochus being then very young, they were attended with success beyond their expectation; which encouraged them to attempt the enlargement of their territories. Accordingly, invading the neighbouring countries, they took from the Medes the provinces of Caspiana, Phaunitis, and Basoropida; from the Iberians Chorzena and Gogorena on the other side of the Cyrus; from the Chalybes and Mossynæci, the provinces of Pareneta and Herexena, which bordered on Armenia Minor.

On this occasion, the above-mentioned division of the kingdom into Armenia Major and Minor first took place. Artaxias became king of Armenia Major and Zadriades of Armenia Minor; and this distinction subsists even at this day.

By whom Artaxias was succeeded is not known; neither have we any account of the transactions of his reign, farther than that Antiochus led a powerful army against him and Zadriades, but without being able to recover a single province. Upon this he concluded a peace, designing to fall upon them at a proper opportunity;

Armenia. portunity; but they having entered into alliance with the Romans, by that means secured themselves in the possession of their kingdom. After this, Artaxias was defeated and taken prisoner by Antiochus Epiphanes; but, somehow or other, seems to have been restored to his kingdom.

From this time we meet with a chasm in the Armenian history for 70 years; during which all we know is, that Tigranes, the king's son, was delivered up as an hostage to the Parthians; from whence it is plain, that the Armenians had been carrying on an unsuccessful war with that nation. On the news of his father's death, however, the Parthians set the young king at liberty, having first obliged him to give up a considerable part of his kingdom by way of ransom.

Tigranes being thus restored to his father's kingdom, was prevailed upon in the beginning of his reign to enter into an alliance with Mithridates Eupator against the Romans, whose power began to give jealousy to all the princes of Asia. One of the articles of this treaty was, that Mithridates should have the cities and conquered countries, and Tigranes the captives and plunder. In consequence of this, Tigranes was to invade Cappadocia, which he had lately been obliged, by a decree of the senate of Rome, to give up to Ariobarzanes. But before either of the princes took the field, a marriage was solemnized with all possible magnificence between Tigranes and Cleopatra the daughter of Mithridates.

Immediately after the nuptials, Tigranes set out on his intended expedition; and Ariobarzanes, on the first news of his march, abandoned his kingdom and fled to Rome. Thus Tigranes, without fighting a stroke, enriched himself with the booty, and then proclaimed Ariarathes, Mithridates's son, king of Cappadocia, to the universal satisfaction of the people.

In the mean time, the Syrians being harassed with a long and intestine war of the Seleucidæ, invited Tigranes to come and take possession of their country; which he accordingly did, and kept it for 18 years, till he was driven out by Pompey, and Syria reduced to the form of a Roman province. Encouraged by this success, he next invaded Armenia Minor; defeated and killed King Artanes, who opposed him with a considerable army; and in one campaign made himself master of the whole kingdom. From Armenia Minor he marched against the Asiatic Greeks, the Adiabenians, the Assyrians, and the Gordians; carrying all before him, and obliging the people wherever he came to acknowledge him sovereign. From this second expedition he returned home loaded with booty, which he soon after increased by the spoils of Cappadocia, invading that kingdom a second time at the instance of Mithridates, who had been obliged by the Romans to withdraw his forces from thence. From Cappadocia Tigranes, besides other booty, brought back into Armenia no fewer than 300,000 captives, having surrounded the country with his numerous forces in such a manner that none could escape. These, together with the prisoners he had taken in his two first expeditions, he employed in building the city of Tigranocerta, which they afterwards peopled.

In the mean time Mithridates, who had concluded a peace with the Romans for no other end than to gain time, sent a solemn embassy to Tigranes, inviting him to enter into a second alliance against the common enemy. This he at first declined; but in the end was prevailed upon by his wife Cleopatra to send him considerable supplies, though he never came heartily into the war, not caring to provoke the Romans, who on their part kept fair with him, taking no notice for the present of the supplies he had sent Mithridates. That unfortunate prince being soon after defeated by Lucullus, was forced to fly for shelter into Armenia, where he met with a very cold reception from his son-in-law, who would neither see him, treat with him, nor own him as his relation; however, he promised to protect his person, and allowed him in one of his castles a princely retinue, and a table suitable to his former condition. Armenia.

Though this total overthrow of Mithridates might have opened the eyes of Tigranes, and made him oppose with all his might the growing power of the Romans, he foolishly left them to finish their conquest of Pontus, while he marched at the head of a very numerous army against the Parthians, with a design to recover from them the dominions they had formerly extorted from him before they set him at liberty. These he easily retook; and not satisfied with what formerly belonged to him, he added to them all Mesopotamia, the countries that lay about Ninus and Arbela, and the fruitful province of Mygdonia; the Parthians, though at that time a mighty people, flying everywhere before him. From Mesopotamia Tigranes marched into Syria to quell a rebellion which had been raised by Cleopatra, surnamed *Selene;* who after the death of her husband Antiochus Pius, reigned jointly with her sons in that part of Syria which Tigranes had not seized on. The malcontents were quickly reduced; and the queen herself was taken prisoner, and confined to the castle of Seleucia, where she was soon after put to death by the king's orders. From Syria Tigranes passed into Phœnicia, which he subdued either entirely or in great part, spreading far and wide the terror of his arms, insomuch that all the princes of Asia except those who were in alliance with the Romans, either in person or by their deputies, submitted and paid homage to the conqueror.

The king, having now subdued all Syria to the borders of Egypt, and being elated with a long course of victories and prosperous events, began to look upon himself as far above the level of other crowned heads. He assumed the title of *King of kings*, and had many kings waiting upon him as menial servants. He never appeared on horseback without the attendance of four kings dressed in livery, who ran by his horse; and when he gave answers to the nations that applied to him, the ambassadors stood on either side the throne with their hands clasped together, that attitude being of all others then accounted among the orientals the greatest acknowledgment of vassalage and servitude. In the midst of all this haughtiness, however, he was unexpectedly visited by an ambassador from Lucullus the Roman general, who, without any ceremony, told him, that he came to demand Mithridates king of Pontus, who had taken refuge in his dominions, and, in case of his refusal, to declare war against him. Notwithstanding his high opinion of himself, Tigranes returned a mild answer to this message: in which, however, he refused to deliver up his father-in-law; and being

Armenia. being highly provoked at Lucullus for not giving him the title of *King of kings* in his letter, he did not so much as bestow upon him the title of *general* in his answer. In the mean time, being informed that Zarbienus king of the Gordians had entered into a private alliance with the Romans, he put him, his wife, and children to death; and then, returning into Armenia, received with the greatest pomp imaginable his father-in-law Mithridates, whom till that time he had not admitted into his presence, though he had resided a year and eight months in his dominions. They had several private conferences; and at last Mithridates was sent back to Pontus with 10,000 horse, to raise there what disturbances he could.

Lucullus, on the other hand, hearing the king's resolution to protect Mithridates, immediately began his march for Armenia, at the head of only two legions of foot and 3000 horse, having left 6000 men in Pontus to keep that country quiet. Having passed the Euphrates without opposition, he detached two parties; one to besiege a city where he heard that Tigranes's treasure and concubines were kept; and the other, under Sextilius, to block up Tigranocerta, in order to draw the king to a battle. But Tigranes, after having put to death the scout that brought him the first intelligence of the approach of the Romans, made towards Mount Taurus, which he had appointed for the place of the general rendezvous. The Roman general then despatched Muræna in pursuit of the king; who, having overtaken him in a narrow pass, defeated him, and, besides all the baggage, carried off a great many prisoners, the king himself have fled in the beginning of the skirmish. After this, he sent out several parties to scour the country, in order to prevent the innumerable forces of Tigranes from joining into one body. This, however, he was not able to effect; Tigranes was joined by such numbers of Gordians, Medes, Adiabenians, Albanians, Iberians, &c. that before he left Mount Taurus, his army consisted, according to Plutarch, of 150,000 foot armed cap-a-pee, 35,000 pioneers, 20,000 archers and slingers, and 55,000 horse.

Lucullus was so far from being dismayed at this formidable army, that the only fear he had was lest the king should follow the advice of Mithridates, which was, not to engage the Romans, but, by ravaging the country, distress them for want of provisions. In order to draw him to a battle, therefore, he formed the siege of Tigranocerta, imagining that Tigranes would never suffer that fine city to be taken without making an attempt to relieve it. The event fully answered his expectations: Tigranes having called a council of war, it was unanimously resolved to attack the Romans; and Taxilis, whom Mithridates sent to dissuade the king from venturing a battle, was in danger of losing his head on account of the advice he gave. The Roman general finding Tigranes disposed to come to an engagement, left Muræna with 6000 men to carry on the siege, while he himself marched against the king's vast army with only 10,000 men according to some, and the highest computations make them no more than 18,000. The Romans were at first greatly disheartened; but being encouraged by Lucullus, they immediately broke the Armenian army, who betook themselves to flight almost at the first onset. The Romans pursued them till night, making a most terrible slaughter. Plutarch informs us, that of the Armenians, Armenia. 100,000 foot were killed, and that very few of the cavalry escaped; whereas of the Romans only five men were killed and 100 wounded. Antiochus the philosopher mentioning this battle, says that the sun never beheld the like: and Livy, that the Romans never fought to such a disadvantage; the conquerors not amounting to a twentieth part of the conquered. Tigranes in his flight having met with his son in as forlorn a condition as himself, resigned to him his royal robes and diadem, desiring him to shift for himself and save those royal ensigns. The young prince delivered them to a trusty friend, who, being taken by the Romans, consigned them to Lucullus.

While the king was making his escape after this terrible overthrow, he was met by Mithridates, who was marching to his assistance at the head of a considerable army. The king of Pontus cheered up his son-in-law as well as he could, and encouraged him to continue the war: advising him, instead of fruitlessly bewailing the present disaster, to rally his troops, raise new supplies, and renew the war, not questioning but that in another campaign he might repair all the losses he had sustained: but while the two kings were consulting upon these matters, Lucullus made himself master of Tigranocerta. From this city he marched into the small kingdom of Gordyene, where he celebrated, with the utmost pomp, the obsequies of King Zarbienus, whom Tigranes had put to death, lighting the funeral pile with his own hand. In this kingdom, besides immense sums of gold and silver, he met with such store of provisons as enabled him to carry on the war without putting the republic to any charge.

The two kings, having levied new forces, appointed their troops to rendezvous in the spacious plains on the other side of Mount Taurus; whereupon Lucullus leaving Gordyene, and passing by Mount Taurus, encamped close by the enemy. Several skirmishes happened for some time between the two armies without any considerable advantage; but Lucullus could by no means draw them to a general engagement. Upon this he decamped, as if he designed to march to Artaxata and lay siege to that place, where Tigranes had left his wife and children, with great part of his treasures. He had scarce formed his camp when the enemy appeared, and sat down close by him. Lucullus did not allow them to fortify their camp, but immediately attacked them, and having put them to flight after a faint resistance, pursued them all night with great slaughter, took most of the chief officers prisoners, and returned the next day loaded with booty.

The Roman soldiers now, finding the cold very severe, though it was no later in the year than the autumnal equinox, requested their general to allow them to retire into winter quarters. This request he rejected with indignation; upon which they mutinied. Lucullus did all he could to persuade them to continue in their duty; and prevailed so far that they consented to lay siege to Nisibis in hopes of booty. This place they took: and Lucullus, to the great satisfaction of his troops, took up his winter quarters there. The next year, however, his forces again mutinied, accusing him of amassing immense wealth for himself; and throwing their empty purses at his feet, told him, that

Armenia. as he enriched himself alone, he might carry on the war by himself. He endeavoured to appease them as much as possible; but the sedition being fomented by a party who favoured Pompey the Great, at that time aspiring to the command of Lucullus's army, the latter found himself obliged to sit still and see Mithridates and Tigranes overrun Cappadocia, and recover all Armenia and great part of Pontus. They would have gained much greater advantages, had not a son of Tigranes taken arms against his father, and obliged him to divide his troops. The father and son coming to a pitched battle, the latter was defeated, and forced to save himself in Parthia, where he persuaded Phraates, king of that country, to assist him with a numerous army against his father. Phraates having laid siege to Artaxata, Tigranes the elder was obliged to hide himself in the mountainous parts of his kingdom; upon which the king of Parthia returned home. Of this Tigranes the father being apprised, he immediately abandoned the fastnesses of the mountains; and falling upon his son at Artaxata, dispersed the rebels with great slaughter; and entered his metropolis in triumph. Tigranes the son first fled to Mithridates; but finding him reduced to great straits, having been overcome a few days before, with the loss of 40,000 men, by Pompey, he went over to the Romans, and led them into Armenia against his father as an ally of Mithridates.

Tigranes, being now quite dispirited, and unable to make head against the Romans, resolved at once to submit. Accordingly he waited on Pompey in his camp, and having delivered his sword to two lictors, prostrated himself before him, and laid his diadem at his feet. Pompey, however, gave him a gracious reception, restored him the kingdom of Armenia, but fined him of 6000 talents for making war on the Roman people without cause. As the king had appealed to the Roman general for justice against his son, Pompey heard both parties the next day, and made the son governor of Gordyene and Sophene; but the treasures that were kept in the latter he adjudged to his father, because without them he could not pay the fine. The son, being thus disappointed, endeavoured first to make his escape, and afterwards, by private messengers, solicited the inhabitants not to deliver up the treasures to his father. This being taken very much amiss by Pompey, he caused him to be kept in irons; and even then he found means to stir up Phraates king of Parthia, whose daughter he had married, against the Romans, and to form a conspiracy against his father's life; whereupon Pompey sent him in chains to Rome, where he was kept prisoner in the house of L. Flavius a senator, till the tribuneship of P. Clodius, who, being bribed with a large sum of money, set him at liberty in spite of Pompey and the senate.

Tigranes being now thoroughly humbled, willingly yielded to the Romans, Cappadocia, Syria, Cilicia, and that part of Phœnicia which he possessed, contenting himself with his paternal kingdom; and not only paid the fine laid upon him, but made large presents to Pompey, and all the officers of his army, which procured him the title of *the friend and ally of the Roman people*. He afterwards entered into a war with Phraates king of Parthia, by whom he was overcome, and would have been driven out of his kingdom, had not a peace been brought about by the mediation of Pompey. He ever after cultivated a strict friendship with the Romans; insomuch that he not only refused to receive Mithridates, who fled to him after he had been routed by Pompey near Mount Stella, but even offered a reward of 100 talents to any one that would put him to death. His second son also, by name Sariaster, took up arms against him; but by the assistance of the Romans, that rebellion was soon quelled. He died in the 85th year of his age; and was succeeded by his son Artuasdes, called by Josephus *Artabazes*, by Orosius *Artabanes*, and by others *Artoadistes*. Armenia.

From this time to the time of Trajan, Armenia was governed by its own kings; but as they were plainly vassals to the Romans, though they did not take that title till the reign of the emperor Nero, their history falls to be considered under that of the Romans.

By Trajan the kingdom of Armenia Major was reduced to the form of a Roman province; but it soon recovered its liberty, and was again governed by its own kings in the reigns of Constantine the Great, and his successor, to whom the kings of Armenia were feudatories. In the reign of Justin II. the Saracens subdued and held it till the irruption of the Turks, who possessed themselves of this kingdom, and gave it the name of *Turcomania*. The Turks, after the reduction of Armenia, invaded Persia, and other countries subject to the emperors of the east; which gave the Armenians an opportunity of shaking off the Turkish yoke, and setting up kings of their own, by whom they were governed till the country was again subdued by Occadan, or, as some style him *Heccata*, the son of Cingis, and first cham of the Tartars. Neither was the conquest of Armenia by the Tartars so absolute as to extirpate the race of their kings: seeing we read of Haithon, surnamed the *Armenian*, reigning some time after, and going in person to treat with Mungo, the great cham of Tartary, of the concerns of his kingdom; and in our chronicles we find mention made of Leo king of Armenia, who, in the reign of Richard II. came into England to sue for aid against the Turks, by whom he had been driven from his kingdom. In the year 1472 of the Christian era Ussan Cassanes king of Armenia succeeding to the crown of Persia, made Armenia a province of that empire; in which state it continued till the year 1522, when it was subdued by Selim II. and made a province of the Turkish empire. Some say that Selim I. reduced it on his return from Persia, where he had gained a complete victory over the great Sophi Ismael. But Sansovin assures us, that in the reign of Selim I. who died in 1520, both the Lesser and Greater Armenia had their own kings; and adds, that Selim caused the head of the king of the Lesser Armenia to be cut off and sent to Venice as a mark of his victory. We read nowhere else of any kings of Armenia after it became a province of Persia. Be that as it will, the Turkish annals cited by Calvisius inform us, that Selim II. conquered Armenia in 1552, since which time it has ever continued subject to the Turks, except the eastern part, which the Persians are masters of to this day.

Concerning Armenia Minor, we find very little recorded, except what has been already mentioned, and what falls under the Roman history. It was made a Roman province by Vespasian, continued so till the division

Armenia. division of the empire, when it was subjected to the emperors of the east; and, on the decline of their power, was subdued first by the Persians, and afterwards by the Turks, who gave it the name of *Genech*, and have kept it ever since.

This country is still divided into the Great and Small. Great Armenia comprehends what is now called *Turcomania*. It has Georgia on the north, from which it is separated by high mountains; the river Euphrates on the west; Diarbeker, Curdistan, and Aderbijan, on the south; and Shirvan on the east. The chief towns in that part of Armenia belonging to Turkey are Arzum the capital, near the springs of the Euphrates, a large city and a great thoroughfare for the caravans betwixt Turkey and Persia; Kara, a strong city, head of the government of the same name; Bayazid, a republic of Curds, near Mount Ararat: Baha, another republic of the same; and Van or Wan, on the lake Van, the head of a government of the same name; with other towns of less note. That part of Armenia subject to Persia is chiefly contained in the province of Aran, in which are several fine towns; as, Erivan or Rivan, the capital of the whole; Ganjals, one of the finest cities in Persia, in the north of the province, near the Kur; Kapan, on the south side, near the Aras; besides Naksivan, Astabad Julsa, Ordabad, Baylakan or Pilkan on the Aras; Berdah and Shilkah on the Kur.

The country in general is full of mountains and valleys, lakes and rivers; particularly the country about the Three Churches, near Erivan, is admirably fine, being full of rivulets, which render it extremely fruitful. Besides great quantities of all sorts of grain, here are fields of a prodigious extent covered with tobacco: but it is not a native of the place, though supposed by some to be the terrestrial paradise: for it all came originally from America. The rest of the country produces rice, cotton, flax, melons, and grapes: in short, there is nothing wanting but olives; which is by some thought to prove that the ark could not rest on Mount Ararat, because the dove brought an olive branch in her mouth, and this tree never leaves a place where it once grew. It seems, however, to have been otherwise anciently; for Strabo tells us, that the olive grew in Gogarene, a province of Armenia. They get oil to burn from the ricinus, and use linseed oil in the kitchen. The water melons are as cool as ice in the hottest day, and melt in the mouth; the best are produced in the salt lands, near the Three Churches and the river Aras. After rain, the sea salt lies in crystals upon the fields, and even crackles under the feet. About ten miles from the Three Churches, in the road to Teflis, there are pits or quarries of fossil salt, which yield enough to supply all Persia, without being exhausted: they cut it into large pieces like stone, and each buffalo carries two of them; the mountain from whence it is dug is nothing but a mass of salt, which appears like a rock of silver when the sun shines on the places not covered with earth.

This country has been remarkable for its extreme cold from the remotest antiquity; Sir John Chardin tells us, that he found ice in the rivulets in the mornings even of the month of July. In many places, also, if they had not the convenience of watering their grounds, they would be almost entirely barren.

The Armenians are an honest, civil, polite people, Armenia. scarce troubling themselves about any thing else but trade, which they carry on in most parts of the world, by which means they have spread themselves over the east, and also a great part of Europe; and wherever they come, commerce is carried on with spirit and advantage.

The religion of the Armenians is the Christian, of the Eutychian sect; that is, they own but one nature in Jesus Christ; and when they speak of the hypostatical union, that he is perfect God and perfect man without mixture. They have a high esteem for a book they call the *Little Gospel*, which treats of the infancy of Jesus, and says that the Virgin Mary being pregnant, her sister Salome accused her of having prostituted herself; to which the Virgin answered, that she needed only to lay her hand on her belly, and she would know how she came to be with child: this Salome accordingly did, and fire came out of her belly, which consumed the half of her arm; upon which she acknowledged her fault, and drew it back; after which it was healed by putting it to the same place.

The Armenian clergy consist of patriarchs, archbishops, doctors, secular priests, and monks. The secular priests are not allowed to marry a second time; and therefore they take care to choose young healthy wives; they maintain themselves and families by following some occupation, insomuch that they have hardly time to perform their ecclesiastical functions: they lie in the churches on the vigils of those days they are obliged to officiate.

The Armenian monks are of the order of St Basil; and every Wednesday and Friday they eat neither fish, nor eggs, nor oil, nor any thing made of milk, and during Lent they live upon nothing but roots; they are allowed wine only on the Saturday in the Holy Week, and meat on the Easter Sunday. Besides the great Lent they have four others of eight days each, which are instituted to prepare for the four great festivals, of the Nativity, the Ascension, the Annunciation, and of St George; in which times they must not so much as speak of eggs, fish, oil, or butter.

The Armenians have seven sacraments; baptism, confirmation, penance, the eucharist, extreme unction, orders, and matrimony. In baptism, the child is plunged three times into the water, and the same form of words that is used with us is repeated every time; the priest then puts a small cord made with silk and cotton on the neck of the infant, and anoints his forehead, chin, stomach, armpits, hands, and feet, making the sign of the cross on each part. When the child is baptized, he is carried home by the godfather with the sound of drums and trumpets. The women do not go to church till 40 days after their delivery; and they observe many Jewish customs.

At the communion, to which infants of two or three months old are admitted, the priests give a piece of the consecrated host soaked in the consecrated wine. The elements are covered with a great veil, and placed in a cupboard near the altar, on the side of the gospels. When the priest takes the chalice and patin, he is followed by his deacons and subdeacons, with flambeaux and plates of copper furnished with bells: in this manner, with a censer before him, he goes in procession round the sanctuary: he then sets them on the altar,

pronounces

Armenia || Armillary.

pronounces the words of consecration, and turns himself to the people, who fall down, kiss the earth, and beat their breasts; then, after taking it himself, he distributes the host soaked in wine to the people.

The Armenians seem to place the chief part of their religion in fastings and abstinences: and among the clergy, the higher the degree the lower they must live; insomuch that it is said the archbishops live on nothing but pulse. They consecrate holy water but once a-year; at which time every one fills a pot and carries it home, which brings in a considerable revenue to the church.

ARMENIACA. See PRUNUS.

ARMENIAN, something belonging to or produced in Armenia: thus we say, *Armenian bole*, *Armenian stone*, &c. See BOLE, and *ARMENUS Lapis*.

ARMENTIERS, a small handsome town in the department of the North in France, containing 7600 inhabitants. It was taken by Lewis XIV. in 1667, who dismantled it; and it now belongs to the French. It is seated on the river Lis. E. Long. 3. 3. N. Lat. 50. 40.

ARMENUS LAPIS, *Armenian stone*, in *Natural History*, a mineral substance, which is but improperly called a *stone;* being no other than an ochreous earth; and properly called *blue ochre*. It is a very valuable substance in painting, being a bright and lively blue. It was in so high esteem as a paint among the ancients, that counterfeits were continually attempted to serve in its place. Theophrastus had recorded it as a thing judged worthy a place in the Egyptian annals, which of their kings had the honour of inventing the factitious kind; and he tells us the genuine native substance was a thing of that value, that presents were made of it to great persons, and that the Phœnicians paid their tribute in it.—It is a very beautiful earth, of an even and regular texture; and of a fine blue, sometimes deeper, sometimes paler, and frequently mixed with green. It is soft, tender, and light; of an even, but somewhat dusty surface; it adheres firmly to the tongue, and is dry, but not harsh to the touch. It easily breaks between the fingers, and does not stain the hands. It is of a brackish disagreeable taste, and does not ferment with acids. It is a very scarce fossil; but is found very pure, though but in small quantities, in the mines at Gosselaer in Saxony. It is frequently found spotted with green, and sometimes with black; and very often is mixed among the green ochre, called *berggruen* by the Germans, which has thence been erroneously called by its name. See further the article BICE.

ARMIERS, a town in France in the department of the North, seated on the river Sambre. E. Long. 3. 45. N. Lat. 50. 15.

ARMIGER, a title of dignity, belonging to such gentlemen as bear arms; and these are either by courtesy, as sons of noblemen, eldest sons of knights, &c.; or by creation, such as the king's servants, &c. See ESQUIRE.

ARMILLARY, in a general sense, something consisting of rings or circles.

ARMILLARY Sphere, an artificial sphere composed of a number of circles of the mundane sphere, put together in their natural order, to ease and assist the imagination in conceiving the constitution of the heavens and the motions of the celestial bodies. The armillary sphere revolves upon its axis within a silvered horizon, which is divided into degrees, and moveable every way upon a brass supporter. The other parts are the equinoctial, zodiac, meridian, the two tropics, and the two polar circles. See GEOGRAPHY.

Armillary || Arminians

ARMILUSTRIUM, in Roman antiquity, a feast held among the Romans, in which they sacrificed, armed, to the sound of trumpets.

ARMINIANS, a religious sect, or party, which arose in Holland, by a separation from the Calvinists. They followed the doctrine of Arminius (see the next article); who, thinking the doctrine of Calvin, with regard to free-will, predestination, and grace, too severe, began to express his doubts concerning them in the year 1591; and upon further inquiry adopted sentiments more nearly resembling those of the Lutherans than of the Calvinists. After his appointment to the theological chair at Leyden, he thought it his duty to avow and vindicate the principles which he had embraced; and the freedom with which he published and defended them exposed him to the resentment of those that adhered to the theological system of Geneva, which then prevailed in Holland; but his principal opponent was Gomar, his colleague. The controversy which was thus begun, became more general after the death of Arminius, in the year 1609, and threatened to involve the United Provinces in civil discord. The Arminian tenets gained ground under the mild and favourable treatment of the magistrates of Holland, and were adopted by several persons of merit and distinction. The Calvinists, or Gomarists, as they were now called, appealed to a national synod: accordingly the synod of Dort was convened by order of the States General, in 1618, and was composed of ecclesiastical deputies from the United Provinces, as well as from the reformed churches of England, Hessia, Bremen, Switzerland, and the Palatinate. The principal advocate in favour of the Arminians was Episcopius, who, at that time, was professor of divinity at Leyden. It was first proposed to discuss the principal subjects in dispute, and that the Arminians should be allowed to state and vindicate the grounds on which their opinions were founded: but some difference arising as to the proper mode of conducting the debate, the Arminians were excluded from the assembly; their case was tried in their absence; and they were pronounced guilty of pestilential errors, and condemned as corrupters of the true religion. In consequence of this decision, they were treated with great severity: they were deprived of all their posts and employments; their ministers were silenced, and their congregations were suppressed. However, after the death of Prince Maurice, who had been a violent partizan in favour of the Gomarists, in the year 1625, the Arminian exiles were restored to their former reputation and tranquillity; and under the toleration of the state, they erected churches and founded a college at Amsterdam, appointing Episcopius to be the first theological professor. The Arminian system has very much prevailed in England since the time of Archbishop Laud, and its votaries in other countries are very numerous.

The distinguishing tenets of the Arminians may be comprised

Arminians. comprising in the followed five articles; relating to predestination, universal redemption, the corruption of man, conversion, and perseverance.

1. "With respect to the first, they maintained, "That God, from all eternity, determined to bestow salvation on those who he foresaw would persevere unto the end in their faith in Christ Jesus; and to inflict everlasting punishment on those who should continue in their unbelief, and resist unto the end his divine succours: so that election was conditional, and reprobation in like manner the result of foreseen infidelity and persevering wickedness."

2. On the second point the Arminians taught, "That Jesus Christ, by his sufferings and death, made an atonement for the sins of all mankind in general, and of every individual in particular; that, however, none but those who believe in him can be partakers of their divine benefit."

3. On the third article, they held, "That true faith cannot proceed from the exercise of our natural faculties and powers, nor from the force and operation of free will; since man, in consequence of his natural corruption, is incapable either of thinking or doing any good thing; and that, therefore, it is necessary, in order to his conversion and salvation, that he be regenerated, and renewed by the operation of the Holy Ghost, which is the gift of God through Jesus Christ."

4. "That this divine grace, or energy of the Holy Ghost, begins and perfects every thing that can be called good in man, and consequently all good works are to be attributed to God alone; that, nevertheless, this grace is offered to all, and does not force men to act against their inclination, but may be resisted and rendered ineffectual by the perverse will of the impenitent sinner." Some modern Arminians interpret this and the last article with a greater latitude.

5. "That God gives to the truly faithful, who are regenerated by his grace, the means of preserving themselves in this state;" and though the first Arminians made some doubt with respect to the closing part of this article, their followers uniformly maintained, "that the regenerate may lose true justifying faith, forfeit their state of grace, and die in their sins."

The modern system of Arminianism likewise, founded on a comprehensive plan projected by Arminius himself, as appears from a passage in his last will, extends the limits of the Christian church, and relaxes the bonds of fraternal communion in such a manner, that Christians of all sects and denominations, whatever their sentiments and opinions may be, Papists excepted, may be formed into one religious body, and live together in brotherly love and concord. But, in order to avoid the reproach of being altogether unconnected by any common principles, Episcopius drew up a confession of faith, expressed for the most part in words and phrases of Holy Scripture, which the Arminians have generally adopted, though not enjoined upon them by any authoritative obligation. The Arminians are also called *Remonstrants*, from an humble petition, entitled their *Remonstrance*, which, in the year 1610, they addressed to the States of Holland. Their principal writers are Arminius, Episcopius, Vorstius, Grotius, Curcellæus, Limborch, Le Clerc, and Wetstein; not to mention many others of more modern date.

ARMINIUS, JAMES, whose real name in Low Dutch was James Harmanni, a famous Protestant divine, from whom the modern sect of Arminians (see the preceding article) take their name, was born at Oude water, in Holland, in 1560. He was ordained minister at Amsterdam on the 11th of August 1588; where he soon distinguished himself by his sermons, which were remarkable for their solidity and learning, and gained him universal applause; but Martin Lydias, professor of divinity at Franeker, judging him a fit person to refute a writing in which Beza's doctrine of predestination had been attacked by some ministers of Delft, Arminius at his entreaties undertook the task; but upon thoroughly examining the reasons on both sides, he came into the opinions he proposed to destroy, and afterwards went still farther than the ministers of Delft had done. In 1600, he opposed those who maintained that ministers should subscribe the confession and catechism every year. In 1602, a pestilential disease raged at Amsterdam, during which he acted with the greatest resolution and courage, in assisting the poor, and comforting the sick; and Lucas Trelcatius and Francis Junius dying of that disease at Leyden, the curators of that university chose Arminius professor of divinity there, and he was afterwards made doctor of divinity. Disputes upon grace were soon after kindled in that university; and he was at length engaged in a new contest, occasioned by a disputation of his concerning the divinity of the Son. These contests, his continual labour, and the concern of seeing his reputation blasted by a multitude of slanders in relation to his opinions, impaired his health, and threw him into a fit of sickness, of which he died on the 19th of October 1609. Arminius was esteemed an excellent preacher; his voice was low, but very agreeable; and his pronunciation admirable; he was easy and affable to persons of all ranks, and facetious in his conversation amongst his friends. His great desire was, that Christians would bear with one another in all controversies which did not affect the fundamentals of their religion; and when they persecuted each other for points of indifference, it gave him the utmost dissatisfaction. The curators of the university of Leyden had so great a regard for him, that they settled a pension upon his wife and children. He left several works, viz. 1. Disputationes de diversis Christianæ religionis capitibus. 2. Orationes, itemque tractatus insigniores aliquot. 3. Examen modesti libelli Gulielmi Perkinsi de prædestinationis modo et ordine, itemque de amplitudine gratiæ divinæ. 4. Analysis capitis noni ad Romanos. 5. Dissertatio de vero et genuino sensu capitis septimi epistolæ ad Romanos. 6. Amica collatio cum D. Francisco Junio de prædestinatione, per literas habita. 7. Epistola ad Hippolytum à collibus." Arminius || Armoisin.

ARMIRO, a town of Thessaly, in European Turkey; seated on the gulf of Velo. E. Long. 23. 5. N. Lat. 39. 10.

ARMISTICE, in military affairs, a temporary truce or cessation of arms for a very short space of time. The word is Latin, *armistitium;* and compounded of *arma*, "arms," and *sto*, "to stand, or stop."

ARMOISIN, a silk stuff, or kind of taffety, manufactured in the East Indies, at Lyons in France, and at Lucca in Italy. That of the Indies is slighter than those made in Europe.

ARMONIAC,

Armoniac || Armourer.

ARMONIAC. See AMMONIAC, CHEMISTRY *Index.*

ARMONICA. See HARMONICA.

ARMORIAL, something relating to arms or coats of arms. See ARMS and HERALDRY.

ARMORIC, or AREMORIC, something that belongs to the province of Bretagne, or Britanny, in France. The name *Armorica* was anciently given to all the northern and western coast of Gaul, from the Pyrenees to the Rhine; under which name it was known even in Cæsar's time. The word is of Bas Breton origin, and denotes as much as *maritime;* compounded, according to M. Menage, of, *ar*, "upon," and *more*, "sea."

ARMORIST, a person skilled in the knowledge of armour.

ARMORUM CONCUSSIO; the clashing of arms practised by the Roman armies previous to an engagement, and intended to strike a panic into their enemies; it always followed the classicum and the barritus. See CLASSICUM and BARRITUS.

ARMOUR, a defensive habit, wherewith to cover and secure the body from the attacks of an enemy. In ancient statutes this is frequently called *harness.*—Parts of armour are, the buckler, cuirass, helmet, coat of mail, gauntlet, &c.

A complete armour anciently consisted of a casque or helm, a gorget, cuirass, gauntlets, tasses, brassets, cuishes, and covers for the legs, to which the spurs were fastened. This they called *armour cap-a-pie;* and was the wear of the cavaliers and men at arms.—The infantry had only part of it; viz. a pot or headpiece, a cuirass, and tasses; but all light. Lastly, The horses themselves had their armour, wherewith to cover the head and neck. Of all this furniture of war, scarce any thing is now retained except the cuirass; the gorget, or neck piece worn by officers, being at present only a badge of honour, and of no defence.

The gallantry of going to the battle naked, without any defensive armour, prevailed so far, that the French, during the reign of Louis XIV. were obliged to be continually issuing ordonnances to restrain it; in consequence of which the general officers, and those of the cavalry, were obliged to resume the cuirass, which yet has been but ill observed.

ARMOUR, *Coat*, is the escutcheon of any person, or family, with its several charges, and other furniture; as mantling, crest, supporters, motto, &c. Thus we say, a gentleman of coat armour; meaning one who bears arms.

ARMOURER, a maker of arms or armour.—The Roman armourers were disposed in certain places in the empire, it being forbid either to sell, or buy, or make arms elsewhere. They were exempt from all offices and taxes, and received a salary from the public.

When once they had taken the employment on themselves, neither they nor their children were allowed to quit it. To prevent this, they had a kind of note, or stigma, impressed on the arm, whereby they might be known. If any of them fled, or secreted their ware, the rest were obliged to answer for him; on account of which, the effects of such as died without a legal heir went to the college. There were 15 armamentaries, or repositories of arms, in the Eastern empire, placed near the frontiers, and 19 in the Western.

ARMOURER *of a ship*, a person whose office is to take care that the arms be in a condition fit for service.

Armoure || Arms.

ARMOURY, a storehouse of arms, or a place wherein military habiliments are kept, to be ready for use. There are armouries in the Tower, and in all arsenals, citadels, castles, &c.

ARMOURY is also used for a branch of heraldry; being the knowledge of coat armours, as to their blazons and various intendments.

ARMOZA, or HARMOZIA, a town in Caramania, at the mouth of the Anamis, which falls into the Persian gulf (Arrian); *Armuza*, (Ptolemy); and from this the neighbouring island, and a small kingdom, take the modern name of *Ormus*. E. Long. 56. 17. N. Lat. 27. 0.

ARMS, ARMA, in a general sense, includes all kinds of weapons, whether for defence or offence. Nicod derives the word from the Latin phrase *quod operiant armos*, because they cover the shoulders or sides; but Varro derives *arma, ab arcendo, eo quod arceant hostes*, It is supposed that the first artificial arms were of wood, and were only employed against beasts; and that Belus, the son of Nimrod, was the first that waged war: whence, according to some, came the appellation *bellum*. Diodorus Siculus takes Belus to be the same with Mars, who first trained soldiers up to battle.—Arms of stone, and even of brass, appear to have been used before they came to iron and steel. Josephus assures us, that the patriarch Joseph first taught the use of iron arms in Egypt, arming the troops of Pharaoh with a casque and buckler.

What contributed most to render the Romans masters of the world, was, that having successively warred against all nations, they constantly renounced their own methods, arms, &c. wherever they met with better. Thus Romulus during his war with the Sabines, a bold and warlike nation, adopted their broad buckler, in lieu of the small Argian buckler, which he had used till that time.

The principal arms of the ancient Britons were hatchets, scythes, lances, swords, and bucklers: the Saxons, &c. brought in the halbert, bow, arrows, arbalists, &c. By the ancient laws of England, every man was obliged to bear arms, except the judges and clergy. Under Henry VIII. it was expressly enjoined on all persons to be regularly instructed, even from their tender years, in the exercise of the arms then in use; viz. the long bow and arrows: and to be provided with a certain number of them. 33 Hen. VIII.

ARMS, *Arma*, in *Law*, are extended to any thing which a man takes in his hand in his wrath, to cast at, or strike another.

By the common law, it is an offence for persons to go or ride armed with dangerous weapons: but gentlemen may wear common armour, according to their quality, &c. 3d Inst. The king may prohibit force of arms, and punish offenders according to law; and herein every subject is bound to be aiding. Stat. 7. Edw. I. None shall come with force and arms before the king's justices, nor ride armed in affray of the peace, on pain to forfeit their armour, and to suffer imprisonment, &c. 2 Edw. III. c. 3.

The importation of arms and ammunition are prohibited by 1 Jac. II. c. 8. and by 1 W. and M. stat. 2 c. 2. Protestant subjects may have arms for their defence.

Arms. fence. So likewise arms, &c. shipped after prohibition, are forfeited by 29 Geo. I. c. 16. sec. 2.

Arms of offence in use among us at present are, the sword, pistol, musket, bayonet, pike, &c.

The arms of the Highlanders are, the broadsword, target, poniard, and whinyar or durk, &c. There are several acts of parliament for disarming the Highlanders; see 1 Geo. I. c. 54.; 11 Geo. I. c. 26.; 19 Geo. II. c. 39.; 21 Geo. II. c. 34.; 26 Geo. II. c. 22. and 29.

Fire-Arms are those charged with powder and ball; such are cannon, mortars, and other ordnance; muskets, carabines, pistols, and even bombs, grenadoes, carcasses, &c. In the History of the Royal Academy for the year 1707, we have an account of some experiments made with fire arms, differently loaded, by M. Cassini. Among other things he observes, that by loading the piece with a ball which is somewhat less than the calibre, and only laying a little gunpowder below the ball and a good deal above it, it will yield a vehement noise, but have no sensible effect or impulse on the ball. This he takes to have been all the secret of those people who pretended to sell the art of rendering one's self invulnerable, or shot proof.

Arms, Pass of, was a kind of combat in use among the ancient cavaliers.

Arms, Stand of. A stand of arms signifies a musket, a bayonet, a sword, belt, and cartridge box.

Arms of parade or *courtesy*, were those used in the ancient justs and tournaments; which were commonly unshod lances, swords without edge or point, wooden swords, and even canes.

Arms denote the natural weapons, or parts of defence, of beasts; as claws, teeth, tusks of elephants, beaks of birds, &c.

Arms, are also used figuratively for the profession of a soldier. Thus we say, He was bred to arms.

Arms, or *Armories*, are also used in heraldry for marks of dignity and honour, regularly composed of certain figures and colours, given or authorized by sovereigns, and borne on banners, shields, coats, &c. for the distinction of persons, families, and states; and passing by descent to posterity. They are called *arms*, in regard they are borne principally on the buckler, cuirass, banners, and other apparatus of war. They are also called *coats of arms*, *coat armour*, &c. because anciently embroidered on surcoats, &c. See Heraldry. Some will have the name to have been first occasioned by the ancient knights, who in their justs and tournaments bore certain marks (which were frequently their mistress's favours) in their armour, i. e. their helmets or shields, to distinguish them from each other.

Arms at present follow the nature of titles, which being made hereditary, these are also become so, being the several marks for distinguishing of families and kindreds, as names are of persons and individuals.

Arms are variously distinguished by the *Heralds*.

Arms of Alliance, are those which families or private persons join to their own, to denote the alliances which they have contracted by marriage.

Arms Assumptive, are such as a man has a right to assume of himself in virtue of some gallant action. As, if a man who is no gentleman of blood, nor has coat armour, takes a gentleman, lord, or prince, prisoner in any lawful war; he becomes entitled to bear the shield of such prisoner, and enjoy it to him and his heirs. The foundation hereof is that principle in military law, that the dominion of things taken in lawful war passes to the conqueror. Arms.

Arms, canting, are those wherein the figures bear an allusion to the name of the family. Such are those of the family of La Tour in Auvergne, who bear a tower; that of the family of Prado in Spain, whose field is a meadow. Most authors hold these the most noble and regular, as is shown by an infinity of instances produced by Father Varrenne and Menetrier.—They are much debased when they come to partake of the *Rebus*.

Arms, charged, are such as retain their ancient integrity and value, with the addition of some new honourable charge or bearing, in consideration of some noble action.

Arms of community, are those of bishoprics, cities, universities, and other bodies corporate.

Arms of concession, or augmentation of honour, are either entire arms, or else one or more figures given by princes, as a reward for some extraordinary service.

Arms of dominion, are those which emperors, kings, and sovereign states bear; being annexed to the territories which they possess. Thus the three lions are the arms of England; the fleurs de lys those of France, &c.

Arms of family, or *paternal arms*, are such as belong to a particular family, and which no other person has a right to assume.

Arms, full, or *entire*, are such as retain their primitive purity, integrity, or value; without any alterations, diminutions, abatements, or the like. It is a rule, that the simpler and less diversified the arms, the more noble and ancient they are. For this reason Garcias Ximenes, first king of Navarre, and his successors for several ages, bore only gules, without any figure at all.

The arms of princes of the blood, of all younger sons, and junior families, are not pure and full; but distinguished and diminished by proper differences, &c.

Arms of patronage, are those which governors of provinces, lords of manors, &c. add to their family arms, in token of their peculiar superiority and jurisdiction.

Arms of pretension, are those of such kingdoms or territories to which a prince or lord has some claim, and which he adds to his own, though the kingdoms or territories be possessed by a foreign prince or other lord. Thus the kings of England have quartered the arms of France with their own, ever since the claim of Edward III. to that kingdom, in 1330.

Arms of succession, are assumed by those who inherit estates, manors, &c. by will, entail, or donation, and which they either impale or quarter with their own arms.

Arms are also said to be *parted*, *couped*, *quartered*, &c.

Arms are said to be *false* and *irregular*, when there is something in them contrary to the established rules of heraldry. As, when metal is put on metal, or colour on colour, &c.

The laws, and other affairs of arms, with the cognizance of offences committed therein, belong, among us, to the earl marshal and college of arms.

Arms, in *Falconry*, denote the legs of a hawk, from the thigh to the foot. See Falconry.

Armstrong.

ARMSTRONG, Dr John, an eminent physician, poet, and miscellaneous writer, was born in Castleton parish, Roxburghshire, where his father and brother were ministers; completed his education in the university of Edinburgh, where he took his degree in physic, Feb. 4. 1732, with much reputation; and published his thesis, as the forms of that university require; the subject was *De tabe purulenta*. In 1735 he published a little humorous fugitive pamphlet in 8vo, entitled, "An Essay for abridging the Study of Physic; to which is added a Dialogue betwixt Hygeia, Mercury, and Pluto, relating to the practice of Physic, as it is managed by a certain illustrious Society. As also an Epistle from Usbeck the Persian to Joshua Ward, Esq." This piece contains much fun and drollery; in the dialogue, he has caught the very spirit of Lucian. In 1737 he published a Synopsis of the History and Cure of the Venereal Disease, 8vo. This was soon followed by the *Economy of Love*; a poem which has much merit, but, it must be confessed, is too strongly tinctured with the licentiousness of Ovid. It is said, however, that his maturer judgment expunged many of the luxuriances of youthful fancy, in an edition "revised and corrected by the author" in 1768. It appears by one of the cases on literary property, that Mr Millar paid 50 guineas for the copy-right of this poem, which was intended as a burlesque on some didactic writers. It has been observed of Dr Armstrong, that his works have great inequalities, some of them being possessed of every requisite to be sought after in the most perfect composition, while others can hardly be considered as superior to the productions of mediocrity. *The Art of preserving Health*, his best performance, which was published in 1744, will transmit his name to posterity as one of the first English writers, and has been honoured with the following testimony of a respectable critic. On this work we shall also transcribe a beautiful eulogium from an eminent physician*: "Of all the poetical performances on this subject that have come to my hands, Dr Armstrong's Art of preserving Health is by far the best. To quote every charming description and beautiful passage of this poem, one must transcribe the whole. We cannot, however, expect new rules, where the principal design was to raise and warm the heart into a compliance with the solid precepts of the ancients, which he has enforced with great strength and elegance. And, upon the whole, he has convinced us, by his own example, that we ought not to blame antiquity for acknowledging

One power of physic, melody, and song."

* *Dr Mackenzie's History of Health.*

In 1746 Dr Armstrong was appointed one of the physicians to the Hospital for Lame and Sick Soldiers behind Buckingham house. In 1751 he published his poem on Benevolence, in folio; and in 1753, "Taste, an Epistle to a young Critic." In 1758 appeared, "Sketches or Essays on various subjects, by Launcelot Temple, Esq. in two parts." In this production, which possesses much humour and knowledge of the world, and which had a remarkably rapid sale, he is supposed to have been assisted by Mr Wilkes. In 1760 he had the honour of being appointed physician to the army in Germany, where in 1761 he wrote a poem called "Day, an Epistle to John Wilkes of Aylesbury, Esq." In this poem, which is not collected in his works, he wantonly hazarded a reflection on Churchill, which drew on him the serpent-toothed vengeance of that severest of satirists, whose embalming or corrosive pen could deify or lampoon any man, according as he acquiesced with, or dissented from his political principles. In 1770 Dr Armstrong published a collection of Miscellanies, in 2 vols.; containing, 1. The Art of preserving Health. 2. Of Benevolence, an Epistle to Eumenes. 3. Taste, an Epistle to a young Critic, 1753. 4. Imitations of Shakespeare and Spenser. 5. The Universal Almanack, by Noureddin Ali. 6. The Forced Marriage, a tragedy. 7. Sketches." In 1771 he published "A short Ramble through some parts of France and Italy, by Launcelot Temple;" and in 1773, in his own name, a quarto pamphlet, under the title of "Medical Essays;" towards the conclusion of which, he accounts for his not having such extensive practice as some of his brethren, from his not being qualified to employ the usual means, from a ticklish state of spirits, and a distempered excess of sensibility. He complains much of the behaviour of some of his brethren, of the herd of critics, and particularly of the reviewers. He died in Sept. 1779; and to the no small surprise of his friends, left behind him more than 300l. saved out of a very moderate income, arising principally from his half-pay.

Armstrong || Army.

ARMUYDEN, a sea-port town of the United Provinces, in the island of Walcheren, formerly very flourishing; but now inconsiderable, the sea having stopped up the harbour. The salt works are its chief resource. E. Long. 3. 40. N. Lat. 51. 30.

ARMY, a large number of soldiers, consisting of horse and foot, completely armed, and provided with artillery, ammunition, provisions, &c. under the command of one general, having lieutenant-generals, major-generals, brigadiers, and other officers under him. An army is composed of squadrons and battalions; and is usually divided into three corps, and formed in three lines: the first line is called the *van-guard*, the second the *main body*, and the third the *rear-guard*, or *body of reserve*. The middle of each line is possessed by the foot; the cavalry form the right and left wing of each line; and sometimes they place squadrons of horse in the intervals between the battalions. When the army is drawn up in order of battle, the horse are placed at five feet distance from each other, and the foot at three. In each line the battalions are distant from each other 180 feet, which is nearly equal to the extent of their front; and the same holds of the squadrons, which are about 300 feet distant, the extent of their own front. These intervals are left for the squadrons and battalions of the second line to range themselves against the intervals of the first, that both may more readily march through these spaces to the enemy: the first line is usually 300 feet distant from the second, and the second from the third, that there may be sufficient room to rally when the squadrons and battalions are broken. See the article War.

This is to be understood of a land army only. A naval or sea army is a number of ships of war, equipped and manned with sailors and marines, under the command of an admiral, with other inferior officers under him. See War, Part II.

It has been observed, that in Europe a prince with a million of subjects cannot keep an army of above 10,000 men, without ruining himself. It was other-

wise

Army. wise in the ancient republics: the proportion of soldiers to the rest of the people, which is now as about one to 100, might then be as about one to eight. The reason seems owing to that equal partition of lands which the ancient founders of commonwealths made among their subjects; so that every man had a considerable property to defend, and means to defend it with: whereas, among us, the lands and riches of a nation being shared among a few, the rest have no way of subsisting but by trades, arts, and the like; and have neither any free property to defend, nor means to enable them to go to war in defence of it, without starving their families. A large part of our people are either artisans or servants, and so only minister to the luxury and effeminacy of the great. While the equality of lands subsisted, Rome, though only a little state, being refused the succours which the Latins were obliged to furnish after the taking of the city in the consulate of Camillus, presently raised ten legions within its own walls; which was more, Livy assures us, than they were able to do in his time, though masters of the greatest part of the world. A full proof, adds the historian, that we are not grown stronger; and that what swells our city is only luxury, and the means and effects of it.

Our armies anciently were a sort of militia, composed chiefly of the vassals and tenants of the lords. When each company had served the number of days or months enjoined by their tenure, or the customs of the fees they held, they returned home. The armies of the empire consist of divers bodies of troops, furnished by the several circles. The gross of the French armies under the Merovingian race, consisted of infantry. Under Pepin and Charlemagne, the armies consisted almost equally of cavalry and foot: but since the declension of the Carlovingian line, the fees being become hereditary, the national armies, says Le Gendre, are chiefly cavalry.

A well regulated standing army is greatly superior to a militia; although a militia, it is to be observed, after serving two or three campaigns, may become equal to a standing army, and in every respect a match for veteran troops. See MILITIA.

One of the first standing armies of which we have a distinct account, in any well authenticated history, is that of Philip of Macedon. His frequent wars with the Thracians, Illyrians, Thessalians, and some of the Greek cities in the neighbourhood of Macedon, gradually formed his troops, which in the beginning were probably militia, to the exact discipline of a standing army. When he was at peace, which was very seldom, and never for any long time together, he was careful not to disband that army. It vanquished and subdued, after a long and violent struggle, indeed, the gallant and well exercised militias of the principal republics of ancient Greece; and afterwards, with very little struggle, the effeminate and ill exercised militia of the great Persian empire. The fall of the Greek republics and of the Persian empire, was the effect of the irresistible superiority which a standing army has over every sort of militia. It is the first great revolution in the affairs of mankind of which history has preserved any distinct or circumstantial account.

The fall of Carthage, and the consequent elevation of Rome, is the second. All the varieties in the fortune of those two famous republics may very well be accounted for from the same cause. Army.

From the end of the first to the beginning of the second Carthaginian war, the armies of Carthage were continually in the field, and employed under three great generals, who succeeded one another in the command; Hamilcar, his son-in-law Asdrubal, and his son Hannibal; first in chastising their own rebellious slaves, afterwards in subduing the revolted nations of Africa, and, lastly, in conquering the great kingdom of Spain. The army which Hannibal led from Spain into Italy must necessarily, in those different wars, have been gradually formed to the exact discipline of a standing army. The Romans, in the mean time, though they had not been altogether at peace, yet they had not during this period, been engaged in any war of very great consequence; and their military discipline, it is generally said, was a good deal relaxed. The Roman armies which Hannibal encountered at Trebia, Thrasymenus, and Cannæ, were militia opposed to a standing army. This circumstance, it is probable, contributed more than any other to determine the fate of those battles.

The standing army which Hannibal left behind him in Spain, had the like superiority over the militia which the Romans sent to oppose it, and in a few years, under the command of his brother the younger Asdrubal, expelled them almost entirely from that country.

Hannibal was ill supplied from home. The Roman militia, being continually in the field, became in the progress of the war a well disciplined and well exercised standing army; and the superiority of Hannibal grew every day less and less. Asdrubal judged it necessary to lead the whole, or almost the whole, of the standing army which he commanded in Spain, to the assistance of his brother in Italy. In this march he is said to have been misled by his guides; and in a country which he did not know, was surprised and attacked by another standing army, in every respect equal or superior to his own, and was entirely defeated.

When Asdrubal had left Spain, the great Scipio found nothing to oppose him but a militia inferior to his own. He conquered and subdued that militia; and in the course of the war, his own militia necessarily became a well disciplined and well exercised standing army. That standing army was afterwards carried to Africa, where it found nothing but a militia to oppose it. In order to defend Carthage, it became necessary to recal the standing army of Hannibal. The disheartened and frequently defeated African militia joined it, and at the battle of Zama composed the greater part of the troops of Hannibal. The event of that day determined the fate of the two rival republics.

From the end of the second Carthaginian war till the fall of the Roman republic, the armies of Rome were in every respect standing armies. The standing army of Macedon made some resistance to their arms. In the height of their grandeur, it cost them two great wars and three great battles, to subdue that little kingdom; of which the conquest would probably have been still more difficult, had it not been for the cowardice of its last king. The militias of all the civilized nations of the ancient world, of Greece, of Syria, and

Army. of Egypt, made but a feeble resistance to the standing armies of Rome. The militias of some barbarous nations defended themselves much better. The Scythian or Tartar militia, which Mithridates drew from the countries north of the Euxine and Caspian seas, were the most formidable enemies whom the Romans had to encounter after the second Carthaginian war. The Parthian and German militias too were always respectable, and upon several occasions gained very considerable advantages over the Roman armies. In general, however, and when the Roman armies were well commanded, they appear to have been very much superior.

Many different causes contributed to relax the discipline of the Roman armies. Its extreme severity was, perhaps, one of those causes. In the days of their grandeur, when no enemy appeared capable of opposing them, their heavy armour was laid aside as unnecessarily burdensome, their laborious exercises were neglected as unnecessarily toilsome. Under the Roman emperors, besides, the standing armies of Rome, those particularly which guarded the German and Pannonian frontiers, became dangerous to their masters, against whom they used frequently to set up their own generals. In order to render them less formidable, according to some authors Dioclesian, according to others Constantine, first withdrew them from the frontiers, where they had always before been encamped in great bodies, generally of two or three legions each, and dispersed them in small bodies through the different provincial towns, from whence they were scarce ever removed, but when it became necessary to repel an invasion. Small bodies of soldiers quartered in trading and manufacturing towns, and seldom removed from these quarters, became themselves tradesmen, artificers, and manufacturers. The civil came to predominate over the military character; and the standing armies of Rome gradually degenerated into a corrupt, neglected, and undisciplined militia, incapable of resisting the attack of the German and Scythian militias, which soon afterwards invaded the western empire. It was only by hiring the militia of some of those nations to oppose to that of others, that the emperors were for some time able to defend themselves. The fall of the western empire is the third great revolution in the affairs of mankind, of which ancient history has preserved any distinct or circumstantial account. It was brought about by the irresistible superiority which the militia of a barbarous has over that of a civilized nation; which the militia of a nation of shepherds has over that of a nation of husbandmen, artificers, and manufacturers. The victories which have been gained by militias have generally been not over standing armies, but over other militias in exercise and discipline inferior to themselves. Such were the victories which the Greek militia gained over that of the Persian empire; and such too were those which in later times the Swiss militia gained over that of the Austrians and Burgundians.

The military force of the German and Scythian nations, who established themselves upon the ruins of the western empire, continued for some time to be of the same kind in their new settlements as it had been in their original country. It was a militia of shepherds and husbandmen, which in time of war took the field under the command of the same chieftains whom it was accustomed to obey in peace. It was therefore tolerably well exercised and tolerably well disciplined. As arts and industry advanced, however, the authority of the chieftains gradually decayed, and the great body of the people had less time to spare for military exercises. Both the discipline and the exercise of the feudal militia, therefore, went gradually to ruin, and standing armies were gradually introduced to supply the place of it. When the expedient of a standing army, besides, had once been adopted by one civilized nation, it became necessary that all its neighbours should follow the example. They soon found that their safety depended upon their doing so, and that their own militia was altogether incapable of resisting the attack of such an army. Army.

The soldiers of a standing army, though they may never have seen an enemy, yet have frequently appeared to possess all the courage of veteran troops, and the very moment that they took the field, to have been fit to face the hardiest and most experienced veterans. In a long peace the generals perhaps may sometimes forget their skill; but where a well regulated standing army has been kept up, the soldiers seem never to forget their valour.

When a civilized nation depends for its defence upon a militia, it is at all times exposed to be conquered by any barbarous nation which happens to be in its neighbourhood. The frequent conquests of all the civilized countries in Asia by the Tartars, sufficiently demonstrates the natural superiority which the militia of a barbarous has over that of a civilized nation. A well regulated standing army is superior to every militia. Such an army, as it can best be maintained by an opulent and civilized nation, so it can alone defend such a nation against the invasion of a poor and barbarous neighbour. It is only by means of a standing army, therefore, that the civilization of any country can be perpetuated, or even preserved for any considerable time.

As it is only by means of a well regulated standing army that a civilized country can be defended, so it is only by means of it that a barbarbous country can be suddenly and tolerably civilized. A standing army establishes, with an irresistible force, the law of the sovereign through the remotest provinces of the empire, and maintains some degree of regular government in countries which could not otherwise admit of any. Whoever examines with attention the improvements which Peter the Great introduced into the Russian empire, will find that they almost all resolve themselves into the establishment of a well regulated standing army. It is the instrument which executes and maintains all his other regulations. That degree of order and internal peace which that empire has ever since enjoyed, is altogether owing to the influence of that army.

Men of republican principles have been jealous of a standing army as dangerous to liberty. It certainly is so, wherever the interest of the general and that of the principal officers are not necessarily connected with the support of the constitution of the state. The standing army of Cæsar destroyed the Roman republic; the standing army of Cromwell turned the long parliament out of doors. But where the sovereign is himself the general,

Army & Arnaud.

general, and the principal nobility and gentry of the country the chief officers of the army; where the military force is placed under the command of those who have the greatest interest in the support of the civil authority, because they have themselves the greatest share of that authority; a standing army can never be dangerous to liberty: on the contrary it may, in some cases, be favourable to liberty. The security which it gives to the sovereign renders unnecessary that troublesome jealousy which in some modern republics seems to watch over the minutest actions, and to be at all times ready to disturb the peace of every citizen. Where the security of the magistrate, though supported by the principal people of the country, is endangered by every popular discontent; where a small tumult is capable of bringing about in a few hours a great revolution; the whole authority of government must be employed to suppress and punish every murmur and complaint against it. To the sovereign, on the contrary, who feels himself supported not only by the natural aristocracy of the country, but by a well regulated standing army, the rudest, the most groundless, and the most licentious remonstrances, can give little disturbance. He can safely pardon or neglect them, and his consciousness of his own superiority naturally disposes him to do so. That degree of liberty which approaches to licentiousness can be tolerated only in countries where the sovereign is secured by a well regulated standing army. It is in such countries only that the public safety does not require that the sovereign should be trusted with any discretionary power for suppressing even the impertinent wantonness of this licentious liberty.

ARNALL, WILLIAM, a noted political writer in defence of Sir Robert Walpole, was originally an attorney's clerk; but being recommended to Walpole, he employed him for a course of years in writing the *Free Briton* and other papers in defence of his administration. By the report of the secret committee, he appears to have received, in the space of four years, no less than 10,997l. 6s. 8d. out of the treasury for his writings! but spending his money as fast as it came, and his supplies stopping on Sir Robert's resignation, he died broken-hearted and in debt, in the 26th year of his age. His invention was so quick, that his honourable employer used to say, no man in England could write a pamphlet in so little time as Arnall.

ARNAUD DE MEYRVEILH, or MEREUIL, a poet of Provence, who lived at the beginning of the 13th century. He wrote a book entitled *Las recastenas de sa contesse*, and a collection of poems and sonnets. He died in the year 1220. Petrarch mentions him in his Triumph of Love.

ARNAUD DE VILLA NOVA, a famous physician, who lived about the end of the 13th and beginning of the 14th century. He studied at Paris and Montpelier, and travelled through Italy and Spain. He was well acquainted with languages, and particularly with the Greek, Hebrew, and Arabic. He was at great pains to gratify his ardent desire after knowledge; but this passion carried him rather too far in his researches: he endeavoured to discover future events by astrology, imagining this science to be infallible; and upon this foundation he published a prediction, that the world would come to an end in the middle of the 14th century. He practised physic at Paris for some time; but having advanced some new doctrines, he drew upon himself the resentment of the university; and his friends, fearing he might be arrested, persuaded him to retire from that city. Upon his leaving France, he retired to Sicily, where he was received by King Frederick of Arragon with the greatest marks of kindness and esteem. Some time afterwards, this prince sent him to France, to attend Pope Clement in an illness; and he was shipwrecked on the coast of Genoa, about the year 1313. The works of Arnaud, with his life prefixed, were printed in one volume in folio, at Lyons, in 1520; and at Basil in 1585, with the notes of Nicholas Tolerus.

Arnaud, Arnay-le-duc.

ARNAUD D'ANDILLY, *Robert*, the son of a celebrated advocate of the parliament of Paris, was born in 1588; and being introduced young at court, was employed in many considerable offices, all which he discharged with great integrity and reputation. In 1644 he quitted business, and retired into the convent of Port Royal des Champs, where he passed the remainder of his days in a continued application to works of piety and devotion; and enriched the French language with many excellent translations of different writers, as well as with religious compositions of his own. He died in 1674, and his works are printed in 8 vols. folio.

ARNAUD, *Antony*, brother of the preceding, and a doctor of the Sorbonne, was born in 1612. He published, in 1643, *A Treatise on frequent Communion*, which highly displeased the Jesuits; and the disputes upon grace, which broke out about this time in the university of Paris, and in which he took a zealous part with the Jansenists, helped to increase the animosity between him and the Jesuits. But nothing raised so great a clamour against him as the two letters he wrote on *Absolution*; in the second of which the faculty of divinity found two propositions which they condemned, and M. Arnaud was expelled the society. Upon this he retired; and during a retreat which lasted near 25 years, he composed that great variety of works which are extant of his, on grammar, geometry, logic, metaphysics, and theology. In 1679, he withdrew from France, lived in obscurity in the Netherlands, and died in 1694. His heart, at his own request, was sent to be deposited in the Port Royal. Arnaud had a remarkable strength of genius, memory, and command of his pen; nor did these decay even to the last year of his life. Mr Bayle says, he had been told by persons who had been admitted into his familiar conversation, that he was a man very simple in his manners; and that unless any one proposed some question to him, or desired some information, he said nothing that was beyond common conversation, or that might make one take him for a man of great abilities; but when he set himself to give an answer to such as proposed a point of learning, he seemed as it were transformed into another man: he would then deliver a multitude of fine things with great perspicuity and learning.

ARNAUD DE RONSIL, *George*, an eminent French surgeon. See SUPPLEMENT.

ARNAY-LE-DUC, a town of France, in the department of Cote d'Or, which carries on a pretty good trade. It is seated on the Auxois, in a valley near the river Aroux. E. Long. 4. 26. N. Lat. 47. 7.

ARNDT,

Arndt ‖ Arnisæus.

ARNDT, John, a famous Protestant divine of Germany, born at Ballenstad, in the duchy of Anhalt, in the year 1555. At first he applied himself to the study of physic: but falling into a dangerous sickness, he made a vow to change his profession for that of divinity, if he should be restored to health; which he accordingly did upon his recovery. He was a minister first at Quedlinburg and then at Brunswick. He met with great opposition in this last city: his success as a preacher raising the enmity of his brethren, who became his bitter enemies. In order to ruin his character, they ascribed a variety of errors to him; and persecuted him to such a degree, that he was obliged to leave Brunswick, and retire to Isleb, where he was minister for three years. In 1611, George duke of Lunenburg, who had a high opinion of his integrity and sanctity, gave him the church of Zell, and appointed him superintendant of all the churches in the duchy of Lunenburg; which office he discharged for 11 years, and died in 1621. It is reported that he foretold his death, having said to his wife, upon his return home after his last sermon, that now he had preached his funeral sermon. He wrote in High Dutch *A Treatise on True Christianity*, which has been translated into several languages.

ARNE, Dr Thomas Augustine, distinguished by his skill in music, was the son of Mr Arne an upholsterer in Covent-Garden, whom Addison is supposed to have characterized in N° 155 and N° 160 of The Tatler; and brother of Mrs Cibber the player. He was early devoted to music, and soon became eminent in his profession. July 6. 1759, he had the degree of doctor of music conferred on him at Oxford. His compositions are universally applauded, and he was also particularly skilful in instructing vocal performers. He died March 5. 1778, having written the following pieces: *Artaxerxes*, 1762; *The Guardian outwitted*, 1764; *The Rose*, 1778; all of them operas.

ARNHEIM, a town of the Low Countries, in the province of Guelderland, capital of Veluive. It is adorned with several fine churches, particularly that of St Walburg and of St Eusebius; which last has a very high tower. The town has five gates, and several fine ramparts, part of which are washed by the Rhine, and the other parts have wide and deep ditches before them. There is a canal made between this place and Nimeguen, at the expence of both towns, on which boats pass backwards and forwards to carry on a trade between them. The air is very healthful; on which account it is inhabited by persons of distinction. E. Long. 5. 55. N. Lat. 52. 0.

ARNICA, Leopard's bane. See Botany *Index*.

ARNISÆUS, Henningus, a philosopher and physician of great reputation, about the beginning of the 17th century. He was born at Halberstadt in Germany, and was professor of physic in the university of Helmstadt. His political works are much esteemed. The most remarkable of them is his book *De authoritate principum in populum semper inviolabili*, printed at Francfort in 1612. In this he maintains that the authority of princes ought not to be violated. He wrote also upon the same doctrine his three books, *De jure Majestatis*, printed at the same place in 1610; and his *Reflectiones Politicæ*, printed at Francfort in 1615. Having received an invitation to go to Denmark, he went thither, and was made counsellor and physician to the king. He travelled into France and England, and died in November 1635. Besides the pieces already mentioned, he wrote several philosophical, medicinal, and poetical treatises.

Arnisæus ‖ Arnold.

ARNOBIUS, professor of rhetoric at Sicca, in Numidia, towards the end of the third century. It was owing to certain dreams which he had that he became desirous of embracing Christianity. For this purpose he applied to the bishops to be admitted into the church. But they, remembering the violence with which he had always opposed the true faith, had some distrust of him; and before they would admit him, insisted on some proofs of his sincerity. In compliance with this demand, he wrote against the Gentiles: wherein he has refuted the absurdities of their religion, and ridiculed their false gods. In this treatise he has employed all the flowers of rhetoric, and displayed great learning: but from an impatience to be admitted into the body of the faithful, he is thought to have been in too great a hurry in composing his work, and thence it is that there does not appear in this piece such an exact order and disposition as could be wished; and not having a perfect and exact knowledge of the Christian faith, he published some very dangerous errors. Mr Bayle remarks, that his notions about the origin of the soul, and the cause of natural evil, and several other important points, are highly pernicious. St Jerome, in his epistle to Paulinus, is of opinion that his style is unequal and too diffuse, and that his book is written without any method; but Dr Cave thinks this judgement too severe, and that Arnobius wants neither elegance nor order in his composition. Vossius styles him *the Varro of the ecclesiastical writers*. Du Pin observes that his work is written in a manner worthy of a professor of rhetoric: the turn of his sentiments is very oratorical; but his style is a little African, his expressions being harsh and inelegant. We have several editions of this work of Arnobius against the Gentiles, one published at Rome in 1542, at Basil in 1546 and 1560, at Paris in 1570, at Antwerp in 1582, and one at Hamburgh in 1610, with notes by Gebhard Elmenhostius, besides many others. He wrote also a piece entitled *De Rhetoricæ Institutione*; but this is not extant.

ARNOLD, of Brescia, in Italy, distinguished himself by being the founder of a sect which opposed the wealth and power of the Roman clergy. He went into France, where he studied under the celebrated Peter Abelard. Upon his return to Italy, he put on the habit of a monk, and opened his invectives in the streets of Brescia. The people crowded round him. He told them he was sent to reform abuses, to pull down the proud and to exalt the humble. He then pointed his declamation against the bishops, against the clergy, against the monks, and finally against the Roman pontiff himself: to the laity only he was indulgent. Churchmen, said he, who hold benefices, bishops who have domains, and monks that have possessions, will all be damned. His hearers shouted approbation. These things, continued he, belong to the prince; he may give them to whom he pleases, but he must give them to the laity. It is on their tithes, and the voluntary contributions

Arnold. contributions of the people, that those sons of God must live: they must be frugal, continent, and mortified.

The church of Brescia was soon thrown into the greatest confusion, and the people, already prejudiced against their ministers, threatened to overturn their altars. The sacred writings he urged in support of his assertion, and from them he denounced the vengeance of heaven against the violators of the law. Indeed, nothing could be more glaringly offensive than the ostentatious parade of the bishops and great abbots, and the soft and licentious lives of the monks and clergy.

In 1139 was celebrated a grand council at Rome. Arnold was cited to appear before it. His accusers were the bishop of Brescia, and many others, whom he had ridiculed and insulted. Nor from his judges could he look for much indulgence. He was found guilty, and sentenced to perpetual silence. Upon this he left Italy, crossed the Alps, and found a refuge in Zurich.

Though Arnold had quitted Italy, yet had his opinions taken deep root, and Rome itself was infected by them. Irritated by the conduct of their master Innocent II. the Roman people assembled in the capitol. It was proposed that the power of the pontiff, which they called exorbitant, should be restrained: this was carried: then suddenly, inspired as it were by the genius of the place, they moved that the senate, which for years had been abolished, should be restored. The proposition was received with the loudest acclamations. Innocent in vain opposed the bold design; there was a magic in it which spread irresistibly, and for a moment seemed to rouse the fallen spirit of the nation. The pope viewed with horror the reverse of fortune which threatened the tiara; to be shorn of his mighty power, and to become the mere shepherd of the Christian people, was a thought too afflicting: he fell sick and died.

Under his two immediate successors Celestin and Lucius, whose reigns were but of a few months, the Romans pursued their darling object. They waited on the latter, and, in an imperious tone, demanded the restitution of all the honours and civil rights which had been usurped from the people. The prince of the senate, said they, whom we have chosen, will best administer the important trust; the tithes and offerings of the faithful will sufficiently answer all the exigencies of your holiness: It was thus that our ancient bishops lived. Lucius survived this event but a few days. His successor was Eugenius III. the friend and disciple of the renowned Bernard. The night before his consecration the senators assembled, and it was agreed, that either he should solemnly confirm all their proceedings, or they would annul his election. This resolution was notified to him. He called together his friends; and it was their advice, that he should neither accede to the extravagant demands, nor expose himself, by a refusal, to the fury of the populace. He therefore silently withdrew from Rome, and retired to a neighbouring fortress. Here the ceremony of his consecration was performed.

Arnold, who in banishment had contemplated the effects of his admonitions on the minds of the Romans, and the success which seemed to follow their exertions, was now informed that the pope had retired, and the gates of the capital were open to receive him: it was likewise suggested to him, that his presence was more than ever necessary, to give energy to their resolves, form to their plans, and stability to their undertakings. Arnold took fire at the news; an unusual swell of enthusiasm filled his breast; and he fancied that, like Junius Brutus, he was called at once to give liberty to Rome. At his appearance a new stream of vigour animated the citizens; they called him their friend and deliverer. The Brescian walked amongst them; his deportment was humble, his countenance emaciated, his address affable, and he spoke to them of moderation, submission, of obedience. With the nobles and new senators he held another language; though to them also he was mild and diffident, speaking much of virtue and of respect for religion and the laws. But no sooner was he sensible of his own real influence, and saw the length to which the revolters had already carried their designs, than he threw aside the mask, and appeared in his own character, daring, impetuous, self-sufficient, vain. He harangued the people: he talked of their forefathers the ancient Romans, who, by the wisdom of their senate and the valour of their armies, had conquered nations and subdued the earth. He dwelt on the names and the achievements of the Bruti, the Gracchi, and the Scipios; and of these men, said he, are you not the children? He advised, that the capitol be instantly repaired; that the equestrian order be restored; that the people have their tribunes; that dignity attend the senate; that the laws, which had been silent and neglected, be revived in all their vigour. He spoke of the pope as of a deposed and banished tyrant: "But should you again be disposed (continued he) to admit him within these walls; first fix your own rights and determine his. He is but your bishop: let him therefore have his spiritual jurisdiction. The government of Rome, its civil establishments, and its territories, belong to you. These you will keep if you have the spirit of men and the hearts of Romans." Fired by this harangue, the people, headed by the most disaffected of the nobles, publicly attacked the few cardinals and churchmen who remained in the city; they set fire to the palaces; and they compelled the citizens to swear obedience to the new government. Moderate men, who saw the folly of the attempt, were shocked at these excesses of popular phrenzy; but it was in vain to oppose the torrent: they submitted, looking forward with some curiosity to the termination of an event which had begun in extravagance, and must end in disappointment. Arnold.

Eugenius till now had viewed, with some concern, the wild derangement of his people: but when it seemed that their eyes opened to their own excesses, he could be inactive no longer. He excommunicated the ringleaders of the faction; and at the head of his troops, who were chiefly composed of Tiburtini, a people always hostile to the Romans, he marched against the enemy. His friends within the walls, who were numerous, co-operated with his designs, and in a few days overtures for peace were made to the pontiff. He acceded to them, but on condition that they should annul the arrangements they had made, and if they would have senators, that they should acknowledge

all

Arnold || Arnoldus.

all their power was from him. The people were satisfied, and they threw open the gates, through which Eugenius entered, amid the acclamations of a fawning and inconstant multitude. Before this event Arnold had retired; but he left behind him many friends strongly attached to his person and principles. Of himself we hear little more till the reign of Adrian our countryman; when, on account of fresh tumults, he and his adherents were excommunicated, and Rome was threatened with an interdict unless they expelled the whole party from their walls. This they did. The Arnoldists retired with their champion into Tuscany, where he was received as a prophet and honoured as a saint. His enemies, however, prevailed; he was made prisoner, and conducted under a strong escort to Rome. In vain was great interest made to save his life; he was condemned and executed, and his ashes thrown into the Tiber, lest the people should collect his remains and venerate them as the relicks of a sainted martyr.

"Such was Arnold of Brescia; a man (says Mr Berington *), whose character, whose principles, and whose views, we perhaps should be disposed to admire, had his life been recorded by unprejudiced historians, and not brought down to us drawn in the blackest colours which party, bigotted zeal, and enthusiasm, could lay on. He was rash, misjudging, and intemperate, or never would he have engaged in so unequal a contest. The view of such a phenomenon in the 12th century excites a pleasing admiration. To attack the Roman pontiff and his clergy in the very centre of their power, required a more than common share of fortitude: to adopt a settled scheme of restoring to its pristine glory the republic of Rome, demanded a stretch of thought comprehensive and enterprising; and to forego the ease and indulgence of a dissipated age, for the reformation of manners and the suppression of what he thought usurped dominion, argued a character of mind disinterested, generous, and benevolent. But, Arnold, like other reformers, went too far; and passion soon vitiated undertakings which were begun perhaps with motives the most laudable.—The readiness with which the Roman people embraced this plan of lowering the jurisdiction of the pontiff, and restraining it within those bounds which the true spirit of Christianity had fixed, at once shows that they could reason justly, and that they considered the unbounded sway of the triple crown, to which reluctantly they submitted, as an assumed prerogative, to which violence or misconstruction, and not Christian right, had given efficacy."

* *Hist. of the lives of Abelard and Heloisa.*

ARNOLDISTS, in church history, a sect so called from their leader Arnold of Brescia. See the preceding article.

ARNOLDUS, GOTHOFREDUS, pastor and inspector of the churches of Perleberg, and historiographer to the king of Prussia, was born at Annaburg in the mountains of Misnia in 1666. He was a zealous defender of the Pietists, a sect among the German Protestants, and composed a great number of religious works; particularly an *Ecclesiastical History*, which exposed him to the resentment of the divines; and another giving an account of the doctrines and manners from the first ages, in which he frequently animadverts upon Cave's Primitive Christianity. He died in 1714. Various are the opinions concerning Arnoldus in Germany; some of his own countrymen and profession extolling him to the skies as a saint of the last century, and setting an inestimable value upon his works; while others pronounce damnation upon him as an arch-heretic, and condemn his writings as heterodox.

Arnoldus || Arnway.

ARNON, in *Ancient Geography*, a brook running between the borders of the Moabites and Ammonites on the other side Jordan (Moses, Joshua): Josephus calls it a river rising on the borders of Arabia, and at length falling into the Dead sea. It is also called the river of Gad, as appears 2 Sam. xxv. 5. compared with 2 Kings x. 33.

ARNOT. See BUNIUM, BOTANY *Index*.

ARNOTTO, the same with Anotta. See ANOTTA and BIXA, BOTANY *Index*.

ARNSTADE, a town of Germany, in Thuringia, on the river Gera. E. Long. 11. 3. N. Lat. 50. 54.

ARNULPH, or ERNULPH, bishop of Rochester in the reign of Henry I. He was born in France, where he was some time a monk of St Lucian de Beauvais. The monks led most irregular lives in this monastery; for which reason he resolved to quit it, but first took the advice of Lanfranc archbishop of Canterbury, under whom he had studied in the abbey of Bec, when Lanfranc was prior of that monastery. This prelate invited him over to England, and placed him in the monastery of Canterbury, where he lived a private monk till Lanfranc's death. When Anselm came to the archiepiscopal see, Arnulph was made prior of the monastery of Canterbury, and afterwards abbot of Peterborough. In 1115, he was consecrated bishop of Rochester, which see he held nine years, and died in March 1124, aged 84.

Arnulph wrote, 1. A piece in Latin concerning the foundation, endowment, charters, laws, and other things relating to the church of Rochester: it is generally known by the title of *Textus Roffensis*, and is preserved in the archives of the cathedral church of Rochester. 2. An Epistle in Answer to some Questions of Lambert abbot of Munster; and 3. An Epistle on Incestuous Marriage.

ARNUS, now *Arno*, a very rapid river of Tuscany, which it divides, and in its course washes Florence and Pisa; rising in the Apennines, to the east of Florence, near a village called *S. Maria della Gratie*, on the borders of Romagna, 15 miles to the west of the sources of the Tiber; and then turning southwards towards Arretium, it is there increased by the lakes of the Clanis; after which it runs eastward, dividing Florence into two parts, and at length washing Pisa, falls eight miles below it into the Tuscan sea.

ARNWAY, JOHN, a clergyman distinguished by his benevolence and loyalty to King Charles I. was descended from a very good family in the county of Salop, from which he inherited a considerable estate. He was educated at Oxford; and, having received holy orders, obtained the rectories of Hodnet and Ightfield, where he distinguished himself by his piety and exemplary charity: for it was his custom to clothe annually 12 poor people, and every Sunday to entertain as many at his table, not only plentifully, but with intimacy and respect. The civil war breaking out, he preached against rebellion, and raised and clothed eight troopers for the service of King Charles I. upon which his house

was

Arnway ‖ Arpagius.

was plundered by the parliament's army. He then went to Oxford to serve the king in person, which subjected him to a new train of misfortunes: for his estate was soon after sequestrated, and himself imprisoned till the king's death; after which he went to the Hague, where he published, 1. The Tablet, or the Moderation of Charles I. the Martyr; and, 2. An Alarm to the Subjects of England. He at last went to Virginia, where he died in 1653.

AROBE. See ARROBAS.

AROLEO, an American weight, equal to 25 of our pounds.

AROMA PHILOSOPHORUM, denotes either saffron, or the aroph of Paracelsus; as *aroma germanicum* denotes elecampane. See AROPH.

AROMATA, in *Ancient Geography*, a town of Lydia, famous for its generous wines; and hence the appellation, (Strabo). Also the name of a trading town and promontory of Ethiopia, at the termination of the Sinus Avalites of the Red sea, (Arrian).

AROMATIC, an appellation given to such plants as yield a brisk fragrant smell, and a warm taste; as all kinds of spices, &c. See MATERIA MEDICA.

ARONA, a town of Italy, in the duchy of Milan, with a strong castle. It stands on the lake Maggiore. E. Long. 8. 25. N. Lat. 45. 41.

ARONCHES, a town of Portugal, in Alentejo, on the confines of Spain, seated on the river Caro. It is well fortified, and has about 500 inhabitants. W. Long. 5. 16. N. Lat. 14. 39.

AROOL, a town of the empire of Russia, in the Ukraine, seated on the river Occa. E. Long. 38. 15. N. Lat. 51. 48.

AROPH, a contraction of *aroma philosophorum;* a name given to saffron.

AROPH Paracelsi, a name given to a kind of chemical flowers, probably of the same nature with the Ens Veneris, elegantly prepared by sublimation from equal quantities of lapis hæmatites and sal ammoniac.

AROPH is also a term frequently used by Paracelsus in a sense synonymous with *lithontriptic*.

AROSBAY, a town of the East Indies, on the coast of the island of Madura, near Java. E. Long. 14. 30. N. Lat. 9. 30.

AROURA, a Grecian measure of 50 feet. It was more frequently used for a square measure of half the plethron. The Egyptian aroura was the square of 100 feet.

ARPAD, in *Ancient Geography*, is thought to have been a city of Syria. It was always placed with Hamath, (2 Kings xviii. 34. xix. 13. Isaiah x. 9. xxxvi. 19. xxxvii. 13. Jerem. xlix. 25.) Sennacherib boasts of having reduced Arpad and Hamath, or of having destroyed the gods of these two places. Hamath is known to be the same with Emesa; and it is thought that Arpad is the same with Arad or Arvad, as it is sometimes called in Hebrew. See ARAD.

ARPAGIUS, or HARPAGIUS, among the ancients, a person who died in the cradle, at least in early youth. The word is formed from the Greek ἁρπαζω, *I snatch*. The Romans made no funerals for their *arpagii*. They neither burnt their bodies, nor made tombs, monuments, or epitaphs for them; which occasioned Juvenal to say,

——Terra clauditur infans
Et minor igne rogi.

Arpagius ‖ Arragon.

In after times it became the custom to burn such as had lived to the age of 40 days, and had cut any teeth; and these they called Αρπακτοι or Αρπαγμενοι, q. d. *rapti, ravished*. The usage seems to have been borrowed from the Greeks; among whom, Eustathius assures us, it was the custom never to bury their children either by night or full day, but at the first appearance of the morning; and that they did not call their departure by the name of *death*, but by a softer appellation, Ημεραις αρπαγη, importing that they were ravished by Aurora, or taken away to her embraces.

ARPENT, signifies an acre or furlong of ground; and according to the old French account in Doomsday-book, 100 perches make an arpent. The most ordinary acre, called *l'arpent de France*, is 100 perches square: but some account it but half an acre.

ARPHAXAD, the son of Shem and father of Salah. Arphaxad was born in the year of the world 1658, a year after the deluge, and died in the year of the world 2096, at the age of 438 years, (Gen. xi. 12. &c.).

ARPI. See *ARGOS Hippium*.

ARPINAS, or ARPINO, JOSEPH CÆSAR, a famous painter, born in the year 1560, at the castle of Arpinas, in the kingdom of Naples. He lived in great intimacy with Pope Clement VIII. who conferred upon him the honour of knighthood, and bestowed on him many other marks of his friendship. In the year 1600, he went to Paris with Cardinal Aldobrandin, who was sent legate to the French court on the marriage of Henry IV. with Mary of Medicis. His Christian majesty gave Arpinas many considerable presents, and created him a knight of St Michael. The colouring of this painter is thought to be cold and inanimate; yet there is spirit in his designs, and his compositions have somewhat of fire and elevation. The touches of his pencil being free and bold, give therefore pleasure to connoisseurs in painting: but they are generally incorrect. What he painted of the Roman history is the most esteemed of all his works. The following pieces of this master were in the late royal collection of France, viz. the Nativity of our Saviour, Diana and Acteon, the Rape of Europa, and a Susanna. He died at Rome in 1640.

ARPINUM, a town of the Volsci, a little to the east of the confluence of the rivers Liris and Fibrenus, in the Terra di Lavora; now decayed, and called *Arpino*. It was the native place of Cicero, and of Caius Marius, (Sallust).

ARQUA, a town of Italy, in the Paduan, and territory of Venice, remarkable for the tomb of Petrarch. E. Long. 11. 43. N. Lat. 45. 43.

ARQUEBUS. See HARQUEBUS.

ARQUES, a town of Normandy, now the department of the Lower Seine, in France, seated on a small river of the same name. E. Long. 1. 30. N. Lat. 49. 54.

ARRACHEE, in *Heraldry*, a term applied to the representations of plants torn up by the roots.

ARRACK. See ARACK.

ARRAGON, a province of Spain, bounded on the north by the Pyrenean mountains, which separate it

Aragon, Arraignment.

from France; on the west by Navarre and the two Castiles; on the south, by Valencia; and on the east, by Catalonia. It is in length about 180 miles, and in breadth 149; but the land is mountainous, dry, sandy or stony, badly cultivated, and worse peopled. However it does not want rivers; for besides the Ebro, which crosses it in the middle, there are the Xalo, the Cinea, the Galego, and the Arragon. The air is pure and wholesome; and there are mines of iron, and some say of gold. The most fertile parts are about the rivers: for there the land produces corn, wine, oil, flax, hemp, various fruits, and a small quantity of saffron, besides large flocks of sheep, and plenty of game in the woods.

The Arragonese have the character of being bold, courageous, and well bred; but positive in their opinions, and bigotted in their religion. These were the first of the Spaniards that threw off the Moorish yoke. Saragossa is the capital of this province; and the other chief towns are Balbastro, Jaca, Sarazona, Haesca, Calatajud, Albarrazin, Trevel, Daroca, and Boria.

ARRAIGNMENT, in *Law*, the arraigning or setting a thing in order, as a person is said to arraign a writ of novel disseisin, who prepares and fits it for trial.

ARRAIGNMENT is most properly used to call a person to answer in form of law upon an indictment, &c.

When brought to the bar, the criminal is called upon by name to hold up his hand; which though it may seem a trifling circumstance, yet is of this importance, that by the holding up of his hand *constat de persona*, and he owns himself to be of that name by which he is called. However it is not an indispensable ceremony; for being calculated merely for the purpose of identifying the person, any other acknowledgement will answer the purpose as well: therefore, if the prisoner obstinately and contemptuously refuses to hold up his hand, but confesses he is the person named, it is fully sufficient.

Then the indictment is to be read to him distinctly in the English tongue (which was law, even while all other proceedings were in Latin), that he may fully understand his charge. After which it is to be demanded of him, whether he be guilty of the crime whereof he stands indicted, or not guilty?

When a criminal is arraigned he either stands mute, or confesses the fact, or else he pleads to the indictment.

1. If he says nothing, the court ought *ex officio* to impannel a jury to inquire whether he stands obstinately mute, or whether he be dumb *ex visitatione Dei*. If the latter appears to be the case, the judges of the court (who are to be of counsel for the prisoner, and to see that he hath law and justice) shall proceed to the trial, and examine all points as if he had pleaded not guilty. But whether judgment of death can be given against such a prisoner, who hath never pleaded, and can say nothing in arrest of judgment, is a point yet undetermined.

If he be found to be obstinately mute (which a prisoner hath been held to be that hath cut his own tongue), then, if it be on an indictment of high treason, it hath long been clearly settled, that standing mute is equivalent to a conviction, and he shall receive the same judgment and execution.

The English judgment of penance for standing mute was as follows: That the prisoner be remanded to the prison from whence he came, and put into a low dark chamber; and there be laid on his back, on the bare floor, naked, unless where decency forbids; that there be placed upon his body as great a weight of iron as he could bear, and more; that he have no sustenance, save only, on the first day, three morsels of the worst bread; and, on the second day, three draughts of standing water that should be nearest to the prison door; and in this situation this should be alternately his daily diet, *till he died*, or, as anciently the judgment ran, *till he answered*.

Arraignment

It hath been doubted whether this punishment subsisted at the common law, or was introduced in consequence of the statute Westm. I. 3 Edw. I. c. 12. which seems to be the better opinion. For not a word of it is mentioned in Glanvil or Bracton, or in any ancient author, case, or record (that hath yet been produced), previous to the reign of Edward I.: but there are instances on record in the reign of Henry III. where persons accused of felony, and standing mute, were tried in a particular manner, by two successive juries and convicted: and it is asserted by the judges in 8 Henry IV. that, by the common law before the statute, standing mute on an appeal amounted to a conviction of the felony. This statute of Edward I. directs such persons, "as will not put themselves upon inquests of felonies before the judges at the suit of the king, to be put into hard and strong prison (*soient mys en la prisone fort et dure*) as those which refuse to be at the common law of the land." And, immediately after this statute, the form of the judgment appears in Fleta and Britton to have been only a very strait confinement in prison, with hardly any degree of sustenance; but no weight is directed to be laid upon the body, so as to hasten the death of the miserable sufferer: and indeed any surcharge of punishment on persons adjudged to penance, so as to shorten their lives, is reckoned by Horne in the Mirror as a species of criminal homicide. It also clearly appears by a record of 31 Edw. III. that the prisoner might then possibly subsist for 40 days under this lingering punishment. It is therefore imagined that the practice of loading him with weights, or, as it is usually called, *pressing him to death*, was gradually introduced between 31 Edward III. and 8 Henry IV. at which last period it first appears upon the books; being intended as a species of mercy to the delinquent, by delivering him the sooner from his torment: and hence it is also probable, that the duration of the penance was then first altered; and instead of continuing *till he answered*, it was directly to continue *till he died*, which must very soon happen under an enormous pressure.

The uncertainty of its original, the doubts that were conceived of its legality, and the repugnance of its theory (for it rarely was carried into practice) to the humanity of the laws of England, all concurred to require a legislative abolition of this cruel process, and a restitution of the ancient common law; whereby the standing mute in felony, as well as in treason and in trespass, amounted to a confession of the charge.

2. If the prisoner make a simple and plain confession, the court hath nothing to do but to award judgment: but it is usually very backward in receiving and recording

Arraignment, Arran.

cording such confession, out of tenderness to the life of the subject; and will generally advise the prisoner to retract it, and,

3. Plead to the indictment; as to which, see the article *Plea of Indictment*.

ARRAN, an island of Scotland, in the frith of Clyde, between Kintyre and Cunningham. Of this island the best description we have is that given by Mr Pennant in his Tour through Scotland, vol. ii. 172—184.

"Arran, or properly *Arr-inn*, or, 'the island of mountains,' seems not to have been noticed by the ancients, notwithstanding it must have been known to the Romans, whose navy, from the time of Agricola, had its station in the *Glottæ Estuarium*, or the frith of Clyde. Camden, indeed, makes this island the Glotta of Antonine, but no such name occurs in his Itinerary: it was therefore bestowed on Arran by some of his commentators. By the immense cairns, the vast monumental stones, and many relicks of Druidism, this island must have been considerable in very ancient times. Here are still traditions of the hero Fingal, or Fin Mac Coul, who is supposed here to have enjoyed the pleasures of the chase; and many places retain his name: but I can discover nothing but oral history that relates to the island till the time of Magnus the Barefooted, the Norwegian victor, who probably included Arran in his conquests of Kintyre. If he did not conquer that island, it was certainly included among those that Donald Bane was to cede; for it appears that Acho, one of the successors of Magnus, in 1263, laid claim to Arran, Bute, and the Cumbrays, in consequence of that promise: the two first he subdued, but the defeat he met with at Largs soon obliged him to give up his conquests. Arran was the property of the crown. Robert Bruce retired thither during his distresses, and met with protection from his faithful vassals. Numbers of them followed his fortunes; and after the battle of Bannockburn, he rewarded several, such as the Maccooks, Mackinnons, Macbrides, and Maclouis, or Fullertons, with different charters of lands in their native country. All these are now absorbed by this great family, except the Fullertons, and a Stewart, descended from a son of Robert III. who gave him a settlement here. In the time of the Dean of the isles, his descendant possessed Castle Douan; and *he and his bluid*, says the Dean, *are the best men in that countrey*. About the year 1334, this island appears to have formed part of the estate of Robert Stewart, great steward of Scotland, afterwards Robert II. At that time they took arms to support the cause of their master; who afterwards, in reward, not only granted at their request an immunity from their annual tribute of corn, but added several new privileges, and a donative to all the inhabitants that were present. In 1456, the whole island was ravaged by Donald earl of Ross and lord of the Isles. At that period, it was still the property of James II.; but in the reign of his successor James III. when that monarch matched his sister to Thomas lord Boyd, he created him earl of Arran, and gave him the island as a portion. Soon after, on the disgrace of that family, he caused the countess to be divorced from her unfortunate husband; and bestowed both the lady and island on Sir James Hamilton, in whose family it continues to this time, a very few farms excepted.

Arran.

"Arran is of great extent, being 23 miles from Sgreadan Point north to Beinnean south; and the number of inhabitants is about 7000, who chiefly inhabit the coasts; the far greater part of the country being uninhabited by reason of the vast and barren mountains. Here are only two parishes, Kilbride and Kilmorie; with a sort of chapel of ease to each, founded in the last century, in the golden age of this island, when it was blessed with Anne duchess of Hamilton, whose amiable disposition and humane attention to the welfare of Arran render at this distant time her memory dear to every inhabitant. The principal mountains of Arran are, Goatfield, or Gaoilbheinn, or "the mountain of the winds," of a height equal to most of the Scottish Alps, composed of immense piles of moorstone, in form of wool packs, clothed only with lichens and mosses, inhabited by eagles and ptarmigans; Beinbharrain, or "the sharp-pointed;" Ceum-na-caillich, "the step of the carline or old hag;" and Grianan-Athol, that yields to none in ruggedness. The lakes are, Loch-jorsa, where salmon come to spawn; Lochtana; Loch-nah-jura, on the top of a high hill; Loch-mhachrai; and Loch-knoc-a-charbeil, full of large eels. The chief rivers are, Abhan-mhor, Moina mhor, Slondrai-machrei, and Jorsa; the two last remarkable for the abundance of salmon.

"The quadrupeds are very few; only otters, wild cats, shrew mice, rabbits, and bats: the stags, which used to abound, are now reduced to about a dozen. The birds are, eagles, hooded crows, wild pigeons, stares, black game, grous, ptarmigans, daws, green plovers, and curlews. It may be remarked, that the partridge at present inhabits this island, a proof of the advancement of agriculture.

"The climate is very severe: for besides the violence of wind, the cold is very rigorous; and snow lay here in the valleys for 13 weeks of the last winter. In summer the air is remarkably salubrious; and many invalids resort here on that account, and to drink the whey of goats milk.

"The principal disease here is the pleurisy: smallpox, measles, and chincough, visit the island once in seven or eight years. The practice of bleeding twice every year seems to have been intended as a preventive against the pleurisy; but it is now performed with the utmost regularity at spring and fall. The duke of Hamilton keeps a surgeon in pay; who at those seasons makes a tour of the island. On notice of his approach, the inhabitants of each farm assemble in the open air; extend their arms; and are bled into a hole made in the ground, the common receptacle of the vital fluid. In burning fevers, a tea of *wood sorrel* is used with success, to allay the heat. An infusion of *ramsons*, or *allium ursinum*, in brandy, is esteemed here a good remedy for the gravel.

"The men are strong, tall, and well made; all speak the Erse language, but the ancient habit is entirely laid aside. Their diet is chiefly potatoes and meal; and during winter, some dried mutton or goat is added to their hard fare. A deep dejection appears in general though the countenances of all; no time can be spared for amusement of any kind; the whole being given for procuring the means of paying their rent, of laying in their fuel, or getting a scanty pittance of meat and clothing.

Arran. "The leases of farms are 19 years. The succeeding tenants generally find the ground little better than a *caput mortuum;* and for this reason: Should they at the expiration of the lease leave the lands in a good state, some avaricious neighbours would have the preference in the next setting, by offering a price more than the person who had expended part of his substance in enriching the farm could possibly do. This induces them to leave it in the original state. The method of setting a farm is very singular: each is commonly possessed by a number of small tenants; thus a farm of 40l. a-year is occupied by 18 different people, who by their leases are bound, conjunctly and severally, for the payment of the rent to the proprietor. These live in the farm in houses clustered together, so that each farm appears like a little village. The tenants annually divide the arable land by lot; each has his ridge of land, to which he puts his mark, such as he would do to any writing; and this species of farm is called *run-rig*, (i. e.) ridge. They join in ploughing; every one keeps a horse or more; and the number of those animals consumes so much corn, as often to occasion a scarcity; the corn and pease raised being (much of it) designed for their subsistence, and that of the cattle, during the long winter. The pasture and moor land annexed to the farm is common to all the possessors. All the farms are open. Enclosures of any form, except in two or three places, are quite unknown: so that there must be a great loss of time in preserving their corn, &c. from trespass. The usual manure is sea-plants, coral and shells. The run-rig farms are now discouraged: but since the tenements are set by roup or auction, and advanced by an unnatural force to above double the old rent, without any allowance for enclosing, any example set in agriculture, any security of tenure by lengthening the leases, affairs will turn retrograde, and the farms relapse into their old state of rudeness; migration will increase (for it has begun), and the rents be reduced even below their former value: the late rents were scarce 1200l. a-year; the expected rents 3000l.

"The produce of the island is oats; of which about 5000 bolls, each equal to nine Winchester bushels, are sown, 500 of beans, a few pease; and above 1000 bolls of potatoes are annually set: notwithstanding this, 500 bolls of oat meal are annually imported, to subsist the natives.

"The live stock of the island is 3183 milch cows; 2000 cattle, from one to three years old; 1058 horses; 1500 sheep; and 500 goats: many of the two last are killed at Michaelmas, and dried for winter provision, or sold at Greenock. The cattle are sold from 40s. to 50s. per head, which brings into the island about 1200l. per annum: I think that the sale of horses also brings in about 300l. Hogs were introduced here only two years ago. The herring fishery round the island brings in 300l. the sale of herring nets 100l. and that of thread about 300l. for a good deal of flax is sown here. These are the exports of the island; but the money that goes out for mere necessaries is a melancholy drawback.

"The women manufacture the wool for the clothing of their families; they set the potatoes and dress and spin the flax. They make butter for exportation, and cheese for their own use.

"The inhabitants in general are sober, religious, and industrious; great part of the summer is employed in getting peat for fuel, the only kind in use here; or in building or repairing their houses, for the badness of the materials requires annual repairs: before and after harvest, they are busied in the herring fishery; and during winter the men make their herring nets; while the women are employed in spinning their linen and woollen yarn. The light they often use is that of lamps. From the beginning of February to the end of May, if the weather permits, they are engaged in labouring their ground: in autumn they burn a great quantity of fern to make kelp. So that, excepting at new-year's day, at marriages, or at the two or three fairs in that island, they have no leisure for any amusements: no wonder then at their depression of spirits.

Arran Arras.

"Arran forms part of the county of Bute, and is subject to the same sort of government: but, besides, justice is administered at the baron's bailie-court, who has power to fine as high as 20s.; can decide in matters of property not exceeding 40s.; can imprison for a month; and put delinquents into the stocks for three hours, but that only during day-time. In this island there are many of those rude antiquities or monuments called *cairns*, *druidical circles*, &c. See CAIRNS. See also BUTESHIRE, SUPPLEMENT.

ARRANGEMENT, or RANGEMENT, the disposition of the parts of a whole in a certain order.

The modern philosophy shows us, that the diversity of the colours of bodies depends entirely on the situation and arrangement of the parts, which reflect the light differently; the diversity of tastes and smells on the different arrangements of the pores, which render them differently sensible; and the general diversity of bodies on the different arrangement of their parts. The happy arrangement of words makes one of the greatest beauties of discourse.

ARRAS, a large town in France, capital of the department of Pas de Calais. It is seated on a mountain; and the parts about it are full of quarries, where they get stone for building. It is divided into two parts, the town and the city. The abbot of St Vedast is lord of the town, and the bishop of Arras of the city, which is the least part. They are divided by a strong wall, a large fosse, and the little river Chrinchron, which 100 paces below falls into the Scarp. They are both well fortified, enclosed by high ramparts, and by double deep fosses, which in several places are cut out of the rock. It has four gates, and a strong citadel with five bastions, and contained 18,872 inhabitants in 1815. The most remarkable places are, the great square where the principal market is kept; this is full of fine buildings, with piazzas all round it like those of Covent-garden. Not far from this is the lesser market, which contains the town-house, a very noble structure, with a high tower covered with a crown, on the top of which is a brazen lion, which serves for a vane. In the midst of this market is the chapel of the Holy Candle, which the Papists pretend was brought by the Virgin Mary herself above 600 years ago, when the city was afflicted with divers diseases, and every one that touched the candle was cured: it is kept in a silver shrine. This chapel has a spire steeple, adorned with several statues. The cathedral church of Notre-Dame stands in the city: it is a very large Gothic building, extremely

Arras || Arrest.

extremely well adorned; the tower is very high, and has a fine clock embellished with little figures in bronze, which represent the passion of Jesus Christ; they pass before the bell to strike the hours and half hours. In this church there is a silver shrine, enriched with pearls and diamonds, which contains a sort of wool, which they call *manna*, that they say fell from heaven in the time of a great drought, almost 1400 years ago: they carry it very solemnly in procession when they want rain. The abbey-church of St Vedast is the greatest ornament of Arras, it being adorned with a fine steeple, and seats for the monks of admirable workmanship; the pulpit is of brass, fashioned like a tree, supported by two bears of the same metal, sitting on their hind legs; there are little bears in different postures coming to climb up the tree. The chimes are remarkable for the different tunes which they play. It is from this city that the tapestry called *arras hangings* takes its denomination. E. Long. 2. 56. N. Lat. 50. 17.

ARRAS, or *Araxes*, is also the name of a river of Georgia, which discharges itself into the Caspian sea.

ARRAY, in *Law*, the ranking or setting forth of a jury, or inquest of men impannelled on a cause.

Battle-Array, the order or disposition of an army, drawn up with a view to engage the enemy. See ARMY.

ARRAYERS, or ARRAGERS, ARRAITORES, is used in some ancient statutes, for such officers as had care of the soldiers armour, and saw them duly accoutred in their kinds. In some reigns, commissioners have been appointed for this purpose. Such were the commissioners of array appointed by King Charles I. in the year 1642.

ARREARS, the remainder of a sum due, or money remaining in the hands of an accountant. It likewise signifies the money due for rent, wages, &c. or what remains unpaid of pensions, taxes, &c.

ARRENTATION, in the forest laws, implies the licensing the owner of lands in a forest to enclose them with a low hedge and a small ditch, in consideration of a yearly rent.

ARREOYS, a secret society of a very singular kind, in Otaheite. See SUPPLEMENT.

ARREST, in *English Law*, (from the French word *arrester*, to *stop* or *stay*), is the restraint of a man's person, obliging him to be obedient to the law; and is defined to be the execution of the command of some court of record or office of justice. An arrest is the beginning of imprisonment; where a man is first taken, and restrained of his liberty, by power or colour of a lawful warrant.

Arrests are either in *civil* or *criminal* cases.

1. An arrest in a *civil cause* is defined to be the apprehending or restraining one's person by process in execution of the command of some court.

An arrest must be by corporal seizing or touching the defender's body; after which the bailiff may justify breaking open the house in which he is, to take him: otherwise he has no such power; but must watch his opportunity to arrest him. For every man's house is looked upon by the law to be his castle of defence and asylum, wherein he should suffer no violence. Which principle is carried so far in the civil law, that, for the most part, not so much as a common citation or summons, much less an arrest, can be executed upon a man within his own walls. Peers of the realm, members of parliament, and corporations, are privileged from arrests; and of course from outlawries. And against them the process to enforce an appearance must be by summons and distress *infinite*, instead of a *capias*. Also clerks, attorneys, and all other persons attending the courts of justice (for attorneys being officers of the court, are always supposed to be there attending) are not liable to be arrested by the ordinary process of the court, but must be sued by bill (called usually a *bill of privilege*), as being personally present in court. Clergymen performing divine service, and not merely staying in the church with a fraudulent design, are for the time privileged from arrests, by statute 50 Edw. III. c. 5. and 1 Rich. II. c. 16.; as likewise members of convocation actually attending thereon, by statute 8 Hen. VI. c. 1. Suitors, witnesses, and other persons, necessarily attending any courts of record upon business, are not to be arrested during their actual attendance, which includes the necessary coming and returning. Seamen in the king's service are privileged from arrests for debts under 20l. (1 Geo. II. c. 14. and 14 Geo. II. c. 38.); and soldiers or marines are not liable to arrests for a debt of less than 10l. (30 Geo. II. c. 6. 11.). And no arrest can be made in the king's presence, nor within the verge of his royal palace, nor in any place where the king's justices are actually sitting. The king hath moreover a special prerogative (which indeed is very seldom exerted), that he may by his *writ of protection* privilege a defendant from all personal and many real suits, for one year at a time, and no longer; in respect of his being engaged in his service out of the realm. And the king also by the common law might take his creditor into his protection, so that no one might sue or arrest him till the king's debt was paid: but by the statute 25 Edw. III. c. 19. notwithstanding such protection, another creditor may proceed to judgment against him, with a stay of execution, till the king's debt be paid; unless such creditor will undertake for the king's debt, and then he shall have execution for both. And, lastly, By statute 29 Car. II. c. 7. no arrest can be made, nor process served, upon a Sunday, except for treason, felony, or breach of the peace.

Arrest

2. An arrest in a *criminal cause* is the apprehending or restraining one's person, in order to be forthcoming to answer an alleged crime. To this arrest all persons whatsoever are, without distinction, equally liable; and doors may be broken open to arrest the offender: but no man is to be arrested, unless charged with such a crime as will at least justify holding him to bail when taken. There is this difference also between arrests in civil and criminal cases, that none shall be arrested for debt, trespass, or other cause of action, but by virtue of a precept or commandment out of some court; but for treason, felony, or breach of the peace, any man may arrest with or without warrant or precept. But the king cannot command any one by word of mouth to be arrested; for he must do it by writ, or order of his courts, according to law: nor may the king arrest any man for suspicion of treason, or felony, as his subjects may; because if he doth wrong, the party cannot have an action against him.

Arrests by private persons are in some cases commanded. Persons present at the committing of a felony

Arrest ‖ Arrhephoria.

lony must use their endeavours to apprehend the offender, under penalty of fine and imprisonment; and they are also, with the utmost diligence to pursue and endeavour to take all those who shall be guilty thereof out of their view, upon a hue and cry levied against them. By the vagrant act, 17 Geo. II. c. 5. every person may apprehend beggars and vagrants; and every private person is bound to assist an officer requiring him to apprehend a felon.

In some cases likewise arrests by private persons are rewarded by law. By the 4 and 5 William and Mary, c. 8. persons apprehending highwaymen, and prosecuting them to a conviction, are entitled to a reward of 40l.; and if they are killed in the attempt, their executors, &c. are entitled to the like reward. By the 6 and 7 William III. c. 17. persons apprehending counterfeiters and clippers of the coin, and prosecuting them to conviction, are entitled to 40l.

By 5 Ann. c. 31. persons who shall take any one guilty of burglary, or the felonious breaking and entering any house in the daytime, and prosecute them to conviction, shall receive the sum of 40l. within one month after such conviction.

With regard to arrests by public officers, as watchmen, constables, &c. they are either made by their own authority, which differs but very little from the power of a private person; or they are made by a warrant from a justice of peace. See WARRANT.

ARREST of Judgment, in *Law*, the assigning just reason why judgment should not pass: as, Want of notice of the trial; a material defect in the pleading; when the record differs from the deed impleaded; when persons are misnamed; where more is given by the verdict than is laid in the declaration, &c. This may be done either in criminal or civil cases.

ARRESTMENT, in *Scots Law*, signifies the securing of a criminal till trial, or till he find caution to stand trial, in what are called *bailable crimes*. In civil cases, it signifies either the detaining of strangers, or natives *in meditatione fugæ*, till they find caution *judicio sisti*, or the attaching the effects of a stranger in order to found jurisdiction. But, in the most general acceptation of the word, it denotes that diligence by which a creditor detains the goods or effects of his debtor in the hands of third parties till the debt due to him be either paid or secured. See LAW.

ARRESTO FACTO SUPER BONIS, &c. a writ brought by a denizen against the goods of aliens found within this kingdom, as a recompense for goods taken from him in a foreign country.

ARRESTS, in *Farriery*, mangy tumours upon a horse's hinder legs, between the ham and the pastern.

ARRETIUM, (Cicero, Cæsar); *Arrhetium*, (Ptolemy); *Urbs Arrhetinorum*, (Polybius); one of the twelve ancient towns of Tuscany, near the Arnis and Clanis, situated in a pleasant valley. Now *Arezzo*, 42 miles east of Florence. E. Long. 13. 18. N. Lat. 43. 15.

ARRHABONARII, a sect of Christians, who held that the eucharist is neither the real flesh or blood of Christ, nor yet the sign of them; but only the pledge or earnest thereof.

ARRHEPHORIA, a feast among the Athenians, instituted in honour of Minerva, and Herse daughter of Cecrops. The word is composed of ἀρρήτων, *mystery*, and φέρω, *I carry*; on account of certain mysterious things which were carried in procession at this solemnity.—Boys, or, as some say, girls, between seven and twelve years of age, were the ministers that assisted at this feast, and were denominated ἀρρηφόροι. This feast was also called *Hersiphoria*, from the daughter of Cecrops, already mentioned.

Arrhephoria ‖ Arrow.

ARRIAN, a famous philosopher and historian under the emperor Hadrian and the two Antonines, was born at Nicomedia in Bithynia. His great learning and eloquence procured him the title of *The second Xenophon*, and raised him to the most considerable dignities at Rome, even the consulship itself. We have four books of his Dissertations upon Epictetus, whose scholar he had been; and his History of Alexander the Great, in seven books, is greatly admired by the best judges.

ARRIEGE, a department in the south of France, at the foot of the Pyrenees, and named from a river which flows through it. The southern part is covered with mountains, which afford pasture to great quantities of cattle; in the northern parts corn of all kinds, and vines, are cultivated. There are mines of iron, copper, silver, lead, and coal. There are a few manufactures of cottons and woollens. The superficial extent of the department is 529,540 hectares, and its population in 1815 was 222,936. Foix is the chief town.

ARRIERE, the hinder or posterior part of any thing.

ARRIERE Ban, in the French customs, was a general proclamation, whereby the king summoned to war all that held of him, both his vassals, i. e. the noblesse, and the vassals of his vassals.

ARRIERE Fee, or *Fief*, is a fee dependent on a superior one. These fees commenced, when the dukes and counts, rendering their governments hereditary in their families, distributed to their officers parts of the royal domains which they found in their respective provinces, and even permitted those officers to gratify the soldiers under them in the same manner.

ARROBAS, or AROBAS, a weight used in Spain, Portugal, and the foreign dominions of both. The arrobas of Portugal, is also called *arata*, and contains thirty-two Lisbon pounds; that of Spain contains twenty-five Spanish pounds. In Peru it is called *arruse*.

ARROE, a small island of Denmark, in the Baltic sea, a little south of the island of Funen. It is eight miles in length, and about two in breadth; and produces corn, aniseed, black cattle, and horses. It has three parishes, the most considerable of which is Kopin. It stands at the south side of the island, in the bottom of a bay, and has a port with some trade. E. Long. 9. 40. N. Lat. 55. 20.

ARROJO DE ST SERVAN, a town of Spain, in Estremadura. W. Long. 5. 20. N. Lat. 38. 40.

ARRONDEE, in *Heraldry*, a cross, the arms of which are composed of sections of a circle, not opposite to each other so as to make the arms bulge out thicker in one part than another; but the sections of each arm lying the same way, so that the arm is everywhere of an equal thickness, and all of them terminating at the edge of the escutcheon like the plain cross.

ARROW, a missive weapon of offence, slender, pointed,

Arrow || Arsinoe.

pointed, and barbed, to be cast or shot with a bow. See ARCHERY.

ARROW-Makers, are called *fletchers;* and were formerly, as well as bowyers, persons of great consequence in the commonwealth.

Arrow-heads and quarrels were to be well boched or brased, and hardened at the points with steel; the doing of which seems to have been the business of the arrow-smith.

ARROW-Head. See SAGITTARIA, BOTANY *Index.*

ARROW-Root. See MARANTA, BOTANY *Index.*

ARSACES, otherwise MITHRIDATES, a king of the Parthians, spoken of in the first book of Maccabees, xiv. 2. He considerably enlarged the kingdom of Parthia by his good conduct and valour. See PARTHIA.

ARSCHIN, in commerce, a long measure used in China to measure stuffs. Four arschins make three yards of London.

ARSENAL, a royal or public magazine, or place appointed for the making and keeping of arms, necessary either for defence or assault. Some derive this word from *arx*, a *fortress;* others from *ars*, denoting a *machine;* others again from *arx* and *senatus*, because this was the defence of the senate: but the more probable opinion derives it from the Arabic *darsenaa*, which signifies *arsenal.*

The arsenal of Venice is the place where the galleys are built and laid up. The arsenal of Paris is that where the cannon or great guns are cast.

ARSENIC. See MINERALOGY and CHEMISTRY *Index.*

ARSENIUS, a deacon of the Roman church, of great learning and piety. He was pitched upon by the pope to go to the emperor Theodosius, as tutor to his son Arcadius. Arsenius arrived at Constantinople in the year 383. The emperor happening one day to go into the room where Arsenius was instructing Arcadius, his son was seated, and the preceptor standing; at this he was exceedingly displeased, took from his son the imperial ornaments, made Arsenius sit in his place, and ordered Arcadius for the future to receive his lessons standing uncovered. Arcadius, however, profited but little by his tutor's instructions, for some time after he formed a design of despatching him. The officer to whom Arcadius had applied for this purpose, divulged the affair to Arsenius, who retired to the deserts of Scete, where he passed many years in the exercises of the most strict and fervent devotion. He died there, at 95 years of age.

ARSHOT, a town of the Austrian Netherlands, situated about 14 miles east of the city of Mechlin, in E. Long. 4. 45. N. Lat. 51. 5.

ARSINOE, in *Ancient Geography*, a town of Egypt, on the west side of the Arabian gulf, near its extremity, to the south of Hieropolis, (Strabo, Ptolemy); called *Cleopatris* by some. Another Arsinoe, a town of Cilicia, (Ptolemy); and the fifth of that name in Cilicia, (Stephanus); with a road or station for ships, (Strabo). A third Arsinoe, in the south of Cyprus, with a port between Citium and Salamis, (Strabo). A fourth, an inland town of Cyprus, called *Marium* formerly, (Stephanus). A fifth in the north of Cyprus, between Acamas and Soli, (Strabo); so called from Arsinoe, a queen of Egypt, Cyprus being in the hands of the Ptolemies. A sixth Arsinoe, a maritime town of Cyrene, formerly called *Teuchira.* A seventh Arsinoe, in the Nomos Arsinoites, to the west of the Heracleotes, on the western bank of the Nile, formerly called *Crocodilorum Urbs*, (Strabo); the name *Arsinoe* continued under Adrian, (Coin). Ptolemy calls this Arsinoe an inland metropolis, and therefore at some distance from the Nile, with a port called *Ptolemais.* An eighth Arsinoe, a maritime town of Lycia; so called by Ptolemy Philadelphus, after the name of his consort, which did not hold long, it afterwards recovering its ancient name *Patara*, (Strabo). A ninth, a town of the Troglodytæ, near the mouth of the Arabian gulf, which towards Ethiopia is terminated by a promontory called *Dire*, (Ptolemy). This Arsinoe is called *Berenice*, and the third of that name in this quarter, with the distinction *Epideres;* because situated on a neck of land running out a great way into the sea.

Arsinoe || Art.

ARSIS and THESIS, in *Music*, is a term applied to compositions in which one part rises and the other falls.

ARSMART. See PERSICARIA, BOTANY *Index.*

ARSON, in *English Law*, is the malicious and wilful burning of the house or outhouse of another man; which is felony at common law.

This is an offence of very great malignity, and much more pernicious to the public than simple theft: because, first, it is an offence against that right of habitation which is acquired by the law of nature as well as by the laws of society; next, because of the terror and confusion that necessarily attends it; and, lastly, because in simple theft the thing stolen only changes its master, but still remains *in esse* for the benefit of the public; whereas, by burning, the very substance is absolutely destroyed. It is also frequently more destructive than murder itself, of which too it is often the cause: since murder, atrocious as it is, seldom extends beyond the felonious act designed, whereas fire too frequently involves in the common calamity persons unknown to the incendiary, and not intended to be hurt by him, and friends as well as enemies.

ARSURA, in ancient customs, a term used for the melting of gold or silver, either to refine them, or to examine their value.—The method of doing this is explained at large in the Black Book of the Exchequer, ascribed to Gervaise, in the chapter *De officio Militis Argentarii*, being in those days of great use, on account of the various places and different manners in which the king's money was paid.

ARSURA is also used for the loss or diminution of the metal in the trial. In this sense, a pound was said *tot ardere denarios*, to lose so many pennyweights.

ARSURA is also used for the dust and sweepings of silversmiths, and others, who work in silver, melted down.

ART is defined by Lord Bacon, a proper disposal of the things of nature by human thought and experience, so as to answer the several purposes of mankind; in which sense *art* stands opposed to *nature.*

Art is principally used for a system of rules serving to facilitate the performance of certain actions; in which sense it stands opposed to *science*, or a system of speculative principles.

Arts are commonly divided into *useful* or *mechanic*, *liberal* or *polite.* The former are those wherein the *hand*

Arts. *hand* and *body* are more concerned than the mind; of which kind are most of those which furnish us with the *necessaries* of life, and are popularly known by the name of *trades;* as baking, brewing, carpentry, smithery, weaving, &c.—The latter are such as depend more on the labour of the mind than that of the hand; they are the produce of the *imagination*, their essence consists in *expression*, and their end is *pleasure*. Of this kind are poetry, painting, music, &c.

1 Origin and progress of useful arts. *Kames's Sketches*, Sk. V.

Progress of the ARTS. Some useful arts must be nearly coeval with the human race; for food, clothing, and habitation, even in their original simplicity, require some art. Many other arts are of such antiquity as to place the inventors beyond the reach of tradition. Several have gradually crept into the world without an inventor. The busy mind, however, accustomed to a beginning in things, cannot rest till it finds or imagines a beginning to every art. The most probable conjectures of this nature the reader may see in the historical introductions to the different articles.

In all countries where the people are barbarous and illiterate, the progress of arts is extremely slow. It is vouched by an old French poem, that the virtues of the loadstone were known in France before the year 1180. The mariner's compass was exhibited at Venice anno 1260, by Paulus Venetus, as his own invention. John Goya of Amalfi was the first who, many years afterward, used it in navigation; and also passed for being the inventor. Though it was used in China for navigation long before it was known in Europe, yet to this day it is not so perfect as in Europe. Instead of suspending it in order to make it act freely, it is placed upon a bed of sand, by which every motion of the ship disturbs its operation. Hand-mills, termed *querns*, were early used for grinding corn: and when corn came to be raised in greater quantity, horse-mills succeeded. Water-mills for grinding corn are described by Vitruvius. Wind-mills were known in Greece, and in Arabia as early as the seventh century; and yet no mention is made of them in Italy till the fourteenth. That they were not known in England till the reign of Henry VIII. appears from a household book of an earl of Northumberland, cotemporary with that king, stating an allowance for three mill-horses, "two to draw in the mill, and one to carry stuff to and from the mill." Water-mills for corn must in England have been of a later date. The ancients had mirror-glasses, and employed glass to imitate crystal vases and goblets; yet they never thought of using it in windows. In the 13th century, the Venetians were the only people who had the art of making crystal glass for mirrors. A clock that strikes the hours was unknown in Europe till the end of the 12th century. And hence the custom of employing men to proclaim the hours during night; which to this day continues in Germany, Flanders, and England. Galileo was the first who conceived an idea that a pendulum might be used for measuring time; and Huygens was the first who put the idea in execution, by making a pendulum clock. Hook, in the year 1660, invented a spiral spring for a watch, though a watch was far from being a new invention. Paper was made no earlier than the 14th century; and the invention of printing was a century later. Silk manufactures were long established in Greece before silk-worms were introduced there. The manufacturers were provided with raw silk from Persia: but that commerce being frequently interrupted by war, two monks, in the reign of Justinian, brought eggs of the silk-worm from Hindostan, and taught their countrymen the method of managing them.—The art of reading made a very slow progress. To encourage that art in England, the capital punishment for murder was remitted, if the criminal could but read, which in law language is termed *benefit of clergy*. One would imagine that the arts must have made a very rapid progress when so greatly favoured: but there is a signal proof of the contrary: for so small an edition of the Bible as 600 copies, translated into English in the reign of Henry VIII. was not wholly sold off in three years. The people of England must have been profoundly ignorant in Queen Elizabeth's time, when a forged clause added to the 20th article of the English creed passed unnoticed till about 50 years ago. Arts.

The discoveries of the Portuguese on the west coast of Africa, is a remarkable instance of the slow progress of arts. In the beginning of the 15th century, they were totally ignorant of that coast beyond Cape Non, 28 degrees north latitude. In 1410, the celebrated Prince Henry of Portugal fitted out a fleet for discoveries, which proceeded along the coast to Cape Bajadore in 28 deg. but had not courage to double it. In 1418, Tristan Vaz discovered the island Porto Santo; and the year after, the island Madeira was discovered. In 1439, a Portuguese captain doubled Cape Bajadore; and the next year the Portuguese reached Cape Blanco, lat. 20 degrees. In 1446, Nuna Tristan doubled Cape de Verd, lat. 14. 40. In 1448, Don Gonzallo Vallo took possession of the Azores. In 1449, the islands of Cape de Verd were discovered for Don Henry. In 1471, Pedro d'Escovar discovered the island St Thomas and Prince's island. In 1484, Diego Cam discovered the kingdom of Congo. In 1486, Bartholomew Diaz, employed by John II. of Portugal, doubled the Cape of Good Hope, which he called *Cabo Tormentoso*, from the tempestuous weather he found in the passage.

2 Causes which advanced the progress of arts.

The exertion of national spirit upon any particular art, promotes activity to prosecute other arts. The Romans, by constant study, came to excel in the art of war, which led them naturally to improve upon other arts. Having, in the progress of society, acquired some degree of taste and polish, a talent for writing broke forth. Nevius composed in verse seven books of the Punic war; besides comedies, replete with bitter raillery against the nobility. Ennius wrote annals, and an epic poem. Lucius Andronicus was the father of dramatic poetry in Rome. Pacuvius wrote tragedies. Plautus and Terence wrote comedies. Lucilius composed satires, which Cicero esteems to be slight and void of erudition. Fabius Pictor, Cincius Alimentus, Piso Frugi, Valerius Antias, and Cato, were rather annalists than historians, confining themselves to naked facts, ranged in order of time. The genius of the Romans for the fine arts was much inflamed by Greek learning, when free intercourse between the two nations was opened. Many of those who made the greatest figure in the Roman state commenced

Arts. menced authors; Cæsar, Cicero, &c. Sylla composed memoirs of his own transactions, a work much esteemed even in the days of Plutarch.

The progress of art seldom fails to be rapid, when a people happen to be roused out of a torpid state by some fortunate change of circumstances. Prosperity, contrasted with former abasement, gives to the mind a spring, which is vigorously exerted in every new pursuit. The Athenians made but a mean figure under the tyranny of Pisistratus; but upon regaining freedom and independence, they were converted into heroes. Miletus, a Greek city of Ionia, being destroyed by the king of Persia, and the inhabitants made slaves, the Athenians, deeply affected with the misery of their brethren, boldly attacked the king in his own dominions, and burnt the city of Sardis. In less than 10 years after, they gained a signal victory at Marathon; and, under Themistocles, made head against that prodigious army with which Xerxes threatened utter ruin to Greece. Such prosperity produced its usual effects: arts flourished with arms, and Athens became the chief theatre for sciences, as well as for fine arts. The reign of Augustus Cæsar, which put an end to the rancour of civil war, and restored peace to Rome, with the comforts of society, proved an auspicious era for literature; and produced a cloud of Latin historians, poets, and philosophers, to whom the moderns are indebted for their taste and talents. One who makes a figure rouses emulation in all: one catches fire from another, and the national spirit is everywhere triumphant: classical works are composed, and useful discoveries made in every art and science. With regard to Rome, it is true, that the Roman government under Augustus was in effect despotic: but despotism, in that single instance, made no obstruction to literature, it having been the policy of that reign to hide power as much as possible. A similar revolution happened in Tuscany about three centuries ago. That country having been divided into a number of small republics, the people, excited by mutual hatred between small nations in close neighbourhood, became ferocious and bloody, flaming with revenge for the slightest offence. These republics being united under the great duke of Tuscany, enjoyed the sweets of peace in a mild government. That comfortable revolution which made the deeper impression by a retrospect to recent calamities, roused the national spirit, and produced ardent application to arts and literature. The restoration of the royal family in England, which put an end to a cruel and envenomed civil war, promoted improvements of every kind; arts and industry made a rapid progress among the people, though left to themselves by a weak and fluctuating administration. Had the nation, upon that favourable turn of fortune, been blessed with a succession of able and virtuous princes, to what a height might not arts and sciences have been carried! In Scotland, a favourable period for improvement was the reign of the first Robert, after shaking off the English yoke; but the domineering spirit of the feudal system rendered every attempt abortive. The restoration of the royal family mentioned above, animated the legislature of Scotland to promote manufactures of various kinds: but in vain; for the union of the two crowns had introduced despotism into Scotland, which sunk the genius of the people, and rendered them heartless and indolent. Liberty, indeed, and many other advantages, were procured to them by the union of the two kingdoms; but the salutary effects were long suspended by mutual enmity, such as commonly subsists between neighbouring nations. Enmity gradually wore out, and the eyes of the Scots were opened to the advantages of their present condition; the national spirit was roused to emulate and to excel; talents were exerted, hitherto latent; and Scotland at present makes a figure in arts and sciences above what it ever made while an independent kingdom. Arts.

Another cause of activity and animation, is the being engaged in some important action of doubtful event; a struggle for liberty, the resisting a potent invader, or the like. Greece, divided into small states frequently at war with each other, advanced literature and the fine arts to unrivalled perfection. The Corsicans, while engaged in a perilous war for defence of their liberties, exerted a vigorous national spirit; they founded a university for arts and sciences, a public library, and a public bank. After a long stupor during the dark ages of Christianity, arts and literature revived among the turbulent states of Italy. The Royal Society in London, and the Academy of Sciences in Paris, were both of them instituted after civil wars that had animated the people and roused their activity.

As the progress of arts and sciences toward perfection is greatly promoted by emulation, nothing is more fatal to an art or science than to remove that spur, as where some extraordinary genius appears who soars above rivalship. Mathematics seem to be declining in Britain; the great Newton, having surpassed all the ancients, has not left to the moderns even the faintest hope of equalling him; and what man will enter the lists who despairs of victory!

In a country thinly peopled, where even necessary arts want hands, it is common to see one person exercising more arts than one: in several parts of Scotland, one man serves as a physician, surgeon, and apothecary. In every populous country, even simple arts are split into parts, and each part has an artist appropriated to it. In the large towns of ancient Egypt, a physician was confined to a single disease. In mechanic arts that method is excellent. As a hand confined to a single operation becomes both expert and expeditious, a mechanic art is perfected by having its different operations distributed among the greatest number of hands: many hands are employed in making a watch, and a still greater number in manufacturing a web of woollen cloth. Various arts or operations carried on by the same man, invigorate his mind; because they exercise different faculties; and as he cannot be equally expert in every art or operation, he is frequently reduced to supply want of skill by thought and invention. Constant application, on the contrary, to a single operation, confines the mind to a single object, and excludes all thought and invention: in such a train of life, the operator becomes dull and stupid, like a beast of burden. The difference is visible in the manners of the people: in a country where, from want of hands, several occupations must be carried on by the same person, the people are knowing and conversable: in a populous country, where manufactures flourish, they are ignorant and unsociable. The same effect is equally visible in countries where an

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art or manufacture is confined to a certain class of men. It is visible in Indostan, where the people are divided into casts, which never mix even by marriage, and where every man follows his father's trade. The Dutch lint-boors are a similar instance: the same family carries on the trade from generation to generation; and are accordingly ignorant and brutish even beyond other Dutch peasants. The inhabitants of Buckhaven, a sea-port in the county of Fife, were originally a colony of foreigners, invited hither to teach our people the art of fishing. They continue fishers to this day, marry among themselves, have little intercourse with their neighbours, and are dull and stupid to a proverb.

3 Progress of the *fine arts.*

Useful arts pave the way to fine arts. Men upon whom the former had bestowed every convenience, turned their thoughts to the latter. Beauty was studied in objects of sight; and men of taste attached themselves to the fine arts, which multiplied their enjoyments, and improved their benevolence. Sculpture and painting made an early figure in Greece; which afforded plenty of beautiful originals to be copied in these imitative arts. Statuary, a more simple imitation than painting, was sooner brought to perfection: the statue of Jupiter by Phidias, and of Juno by Polycletes, though the admiration of all the world, were executed long before the art of light and shade was known. Apollodorus, and Zeuxis his disciple, who flourished in the 95th Olympiad, were the first who figured in that art. Another cause concurred to advance statuary before painting in Greece, viz. a great demand for statues of their gods. Architecture, as a fine art, made a slower progress. Proportions, upon which its elegance chiefly depends, cannot be accurately ascertained, but by an infinity of trials in great buildings: a model cannot be relied on; for a large and a small building, even of the same form, require different proportions.

4 Literary composition.

From the fine arts mentioned, we proceed to literature. It is agreed, among all antiquaries, that the first writings were in verse, and that writing in prose was of a much later date. The first Greek who wrote in prose was Pherecides Syrus: the first Roman was Appius Cæcus, who composed a declamation against Pyrrhus. The four books of the Chatah Bhade, which is the sacred book of Hindostan, are composed in verse stanzas; and the Arabian compositions in prose followed long after those in verse. To account for that singular fact, many learned pens have been employed; but without success. By some it has been urged, that as memory is the only record of events where writing is unknown, history originally was composed in verse for the sake of memory. This is not satisfactory. To undertake the painful task of composing in verse, merely for the sake of memory, would require more foresight than ever was exerted by a barbarian: not to mention that other means were used for preserving the memory of remarkable events; a heap of stones, a pillar, or other object that catches the eye. The account given by Longinus is more ingenious. In a fragment of his treatise on verse, the only part that remains, he observes, "that measure or verse belongs to poetry, because poetry represents the various passions with their language; for which reason the ancients, in their ordinary discourse, delivered their thoughts in verse rather than in prose." Longinus thought, that anciently men were more exposed to accidents and dangers, than when they were protected by good government and by fortified cities. But he seems not to have adverted, that fear and grief inspired by dangers and misfortunes, are better suited to humble prose than to elevated verse. It may be added, that however natural poetical diction may be when one is animated with any vivid passion, it is not supposable that the ancients never wrote nor spoke but when excited by passion. Their history, their laws, their covenants, were certainly not composed in that tone of mind.

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An important article in the progress of the fine arts, which writers have not sufficiently attended to, will perhaps explain this mystery. The article is the profession of a bard, which sprung up in early times before writing was known *, and died away gradually as writing became more and more common †.

* See the article *Writing.*

† See *Bard.*

The songs of the bards, being universal favourites, were certainly the first compositions that writing was employed upon: they would be carefully collected by the most skilful writers, in order to preserve them in perpetual remembrance. The following part of the progress is obvious. People acquainted with no written compositions, but what were in verse, composed in verse their laws, their religious ceremonies, and every memorable transaction that was intended to be preserved in memory by writing. But when subjects of writing multiplied, and became more and more involved; when people began to reason, to teach, and to harangue; they were obliged to descend to humble prose: for to confine a writer or speaker to verse in handling subjects of that nature would be a burden unsupportable.

5 History.

The prose compositions of early historians are all of them dramatic. A writer destitute of art is naturally prompted to relate facts as he saw them performed: he introduces his personages as speaking and conferring; and he himself relates what was acted, and not spoke. The historical books of the Old Testament are composed in that mode; and so addicted to the dramatic are the authors of those books, that they frequently introduce God himself into the dialogue. At the same time, the simplicity of that mode is happily suited to the poverty of every language in its early periods. The dramatic mode has a delicious effect in expressing sentiment, and every thing that is simple and tender. Read, as an instance of a low incident becoming, by that means, not a little interesting, Ruth i. 8. to iv. 16.

The dramatic mode is far from pleasing so much in relating bare historical facts. Read, as an example, the story of Adonijah in 1 Kings i. 11—49.

In that passage there are frequent repetitions; not however by the same person, but by different persons, who have occasion in the course of the story to say the same things; which is natural in the dramatic mode, where things are represented precisely as they were transacted. In that view, Homer's repetitions are a beauty, not a blemish; for they are confined to the dramatic part, and never occur in the narrative.

But the dramatic mode of composition, however pleasing, is tedious and intolerable in a long history. In the progress of society new appetites and new passions arise; men come to be involved with each other

Arts. in various connexions; incidents and events multiply, and history becomes intricate by an endless variety of circumstances. Dialogue accordingly is more sparingly used, and in history plain narration is mixed with it. Narration is as it were the ground work; and dialogue is raised upon it, like flowers in embroidery. Homer is admitted by all to be the great master in that mode of composition.

The narrative mode came in time so to prevail, that in a long chain of history, the writer commonly leaves off dialogue altogether. Early writers of that kind appear to have very little judgment in distinguishing capital facts from minute circumstances, such as can be supplied by the reader without being mentioned. The history of the Trojan war by Dares Phrygius is a curious instance of that cold and creeping manner of composition. The Roman histories before the time of Cicero are chronicles merely. Cato, Fabius Pictor, and Piso, confined themselves to naked facts. In the Augustæ Historiæ Scriptores we find nothing but a jejune narrative of facts, commonly of very little moment, concerning a degenerate people, without a single incident that can rouse the imagination or exercise the judgment. The monkish histories are all of them composed in the same manner.

The dry narrative manner being very little interesting or agreeable, a taste for embellishment prompted some writers to be copious and verbose. Saxo-Grammaticus, who in the 12th century composed in Latin a history of Denmark surprisingly pure at that early period, is extremely verbose and full of tautologies. Such a style, at any rate unpleasant, is intolerable in a modern tongue, before it is enriched with a stock of phrases for expressing aptly the great variety of incidents that enter into history.

The perfection of historical composition which writers at last attain to after wandering through various imperfect modes, is a relation of interesting facts, connected with their motives and consequences. A history of that kind is truly a chain of causes and effects.

The history of Thucydides, and still more that of Tacitus, are shining instances of that mode.

6 Eloquence. Eloquence was of a later date than the art of literary composition; for till the latter was improved there were no models for studying the former. Cicero's oration for Roscius is composed in a style diffuse and highly ornamented; which, says Plutarch, was universally approved, because at that time the style of Asia, introduced into Rome with its luxury, was in high vogue. But Cicero, in a journey to Greece, where he leisurely studied Greek authors, was taught to prune off superfluities, and to purify his style, which he did to a high degree of refinement. He introduced into his native tongue a sweetness, a grace, a majesty, that surprised the world, and even the Romans themselves. Cicero observes with great regret, that if ambition for power had not drawn Julius Cæsar from the bar to command legions, he would have become the most complete orator in the world. So partial are men to the profession in which they excel. Eloquence triumphs in a popular assembly; makes some figure in a court of law composed of many judges, very little where there is but a single judge, and none at all in a despotic government. Eloquence flourished in the republics of Athens and of Rome; and makes some figure at present in a British house of commons. Arts.

7 Tragedy. The Greek stage has been justly admired among all polite nations. The tragedies of Sophocles and Euripides, in particular, are by all critics held to be perfect in their kind, excellent models for imitation, but far above rivalship. If the Greek stage was so early brought to maturity, it is a phenomenon not a little singular in the progress of arts. The Greek tragedy made a rapid progress from Thespis to Sophocles and Euripides, whose compositions are wonderful productions of genius, considering that the Greeks at that period were but beginning to emerge from roughness and barbarity into a taste for literature. The compositions of Eschylus, Sophocles, and Euripides, must have been highly relished among a people who had no idea of any thing more perfect. We judge by comparison, and every work is held to be perfect that has no rival. It ought at the same time to be kept in view, that it was not the dialogue which chiefly enchanted the Athenians, nor variety in the passions represented, nor perfection in the actors; but machinery and pompous decoration, joined with exquisite music. That these particulars were carried to the greatest height, we may with certainty conclude from the extravagant sums bestowed on them: the exhibiting a single tragedy was more expensive to the Athenians than their fleet or their armies in any single campaign.

One would imagine, however, that these compositions were too simple to enchant for ever: as variety in action, sentiment, and passion, is requisite, without which the stage will not continue long a favourite entertainment: and yet we find not a single improvement attempted after the days of Sophocles and Euripides. The manner of performance, indeed, prevented absolutely any improvement. A fluctuation of passion and refined sentiments would have made no figure on the Grecian stage. Imagine the discording scene between Brutus and Cassius in Julius Cæsar to be there exhibited, or the handkerchief in the Moor of Venice: how slight would be their effect, when pronounced in a mask, and through a pipe? The workings of nature upon the countenance, and the flexions of voice expressive of various feelings, so deeply affecting in modern representation, would have been entirely lost. If a great genius had arisen with talents for composing a pathetic tragedy in perfection, he would have made no figure in Greece. An edifice must have been erected of a moderate size: new actors must have been trained to act with a bare face, and to pronounce in their own voice. And after all, there remained a greater miracle still to be performed, viz. a total reformation of taste in the people of Athens. In one word, the simplicity of the Greek tragedy was suited to the manner of acting; and that manner excluded all improvements.

8 Comedy. With respect to comedy, it does not appear that the Greek comedy surpassed the tragedy in its progress toward perfection. Horace mentions three stages of Greek comedy. The first well suited to the rough and coarse manners of the Greeks, when Eupolis, Cratinus, and Aristophanes wrote. These authors were not ashamed to represent on the stage real persons, not even disguising their names; of which we have a striking instance in a comedy of Aristophanes, called *The Clouds*, where Socrates is introduced, and most contemptuously,

Arts. temptuously treated. This sort of comedy, sparing neither gods nor men, was restrained by the magistrates of Athens, so far as to prohibit persons to be named on the stage, This led writers to do what is done at present: the characters and manners of known persons were painted so much to the life, that there could be no mistake; and the satire was indeed heightened by this regulation, as it was an additional pleasure to find out the names that were meant in the representation. This was termed the *middle comedy*. But as there still remained too great scope for obloquy and licentiousness, a law was made, prohibiting real events or incidents to be introduced upon the stage. This law happily banished satire against individuals, and confined it to manners and customs in general. Obedient to this law are the comedies of Menander, Philemon, and Diphilus, who flourished about 300 years before the Christian era. And this is termed the *third* stage of Greek comedy. The comedies of Aristophanes which still remain, err not less against taste than against decency. But the Greek comedy is supposed to have been considerably refined by Menander and his contemporaries. Their works, however, were far from perfection, if we can draw any conjecture from their imitator Plautus, who wrote about a century later. Plautus was a writer of genius; and it may be reasonably supposed that his copies did not fall much short of the originals, at least in matters that can be faithfully copied; and he shows very little art, either in his compositions or in the conduct of his pieces. With respect to the former, his plots are wondrous simple, very little varied, and very little interesting. The subject of almost every piece is a young man in love with a music girl, desiring to purchase her from the procurer, and employing a favourite slave to cheat his father out of the price; and the different ways of accomplishing the cheat is all the variety we find. In some few of his comedies the story rises to a higher tone, the music girl being discovered to be the daughter of a freeman, which removes every obstruction of a marriage between her and her lover. In the conduct of his pieces there is a miserable defect of art. Instead of unfolding the subject in the progress of the action, as is done by Terence, and by every modern writer, Plautus introduces a person for no other end but to explain the story to the audience. In one of his comedies, a household god is so obliging as not only to unfold the subject, but to relate before-hand every particular that is to be represented, not excepting the catastrophe.

The Roman theatre, from the time of Plautus to that of Terence, made a rapid progress. Aristotle defines comedy to be "an imitation of light and trivial subjects, provoking laughter." The comedies of Plautus correspond accurately to that definition: those of Terence rise to a higher tone.

Nothing is more evident than the superiority of Terence above Plautus in the art of writing; and, considering that Terence is a later writer, nothing would appear more natural, if they did not copy the same originals. It may be owing to genius that Terence excelled in purity of language and propriety of dialogue; but how account for his superiority over Plautus in the construction and conduct of a play? It will not certainly be thought, that Plautus would imitate the worst constructed plays, leaving the best to those who should come after him. This difficulty does not seem to have occurred to any of the commentators. Had the works of Menander and of his cotemporaries been preserved, they probably would have explained the mystery; which for want of that light will probably remain a mystery for ever. Arts.

9 Epopee. Homer has for more that 2000 years been held the prince of poets. Such perfection in an author who flourished when arts were far short of maturity, is truly wonderful. The nations engaged in the Trojan war are described by him as in a progress from the shepherd state to that of agriculture. Frequent mention is made in the Iliad of the most eminent men being shepherds. Andromache, in particular, mentions seven of her brethren who were slain by Achilles as they tended their father's flocks and herds. In that state, garments of woollen cloth were used; but the skins of beasts, the original clothing, were still worn as an upper garment; every chief in the Iliad appeared in that dress. Such indeed was the simplicity of this early period, that a black ewe was promised by each chief to the man who would undertake to be a spy. In times of such simplicity, literature could not be far advanced; and it is a great doubt, whether there was at that time a single poem of the epic kind for Homer to imitate or improve upon. Homer is undoubtedly a wonderful genius, perhaps the greatest that ever existed: his fire, and the boldness of his conceptions, are inimitable. But in that early age, it would fall little short of a real miracle, to find such ripeness of judgment, and correctness of execution, as in modern writers are the fruits of long experience and progressive improvements during the course of many centuries. Accordingly, that Homer is far from being so ripe, or so correct, cannot escape the observation of any reader of taste and discernment. One striking particular is, his digressions without end, which draw our attention from the principal subject. Diomedes, for instance, meeting with Glaucus in the field of battle, and doubting from his majestic air, whether he might not be an immortal, inquires who he was, declaring that he would not fight with a god. Glaucus lays hold of this very slight opportunity, in the very heat of action, to give a long history of his family. In the mean time the reader's patience is put to a trial, and his ardour cools. Again, Agamemnon desiring advice how to resist the Trojans, Diomedes springs forward; but before he offers advice, gives the history of all his progenitors, and of their characters, in a long train. And, after all, what was the sage advice that required such a preface? It was, that Agamemnon should exhort the Greeks to fight bravely. At any rate, was Diomedes so little known, as to make it proper to suspend the action at so critical a juncture, for a genealogical history? There is a third particular which justly merits censure; and that is, an endless number of minute circumstances, especially in the description of battles, where they are most improper. The capital beauty of an epic poem is, the selection of such incidents and circumstances as make a deep impression, keeping out of view every thing low or familiar. An account of a single battle employs the whole fifth book of the Iliad and a great part of the sixth: yet in the whole there is no general action; but unknown warriors, whom we never heard of before, killed at a distance with an arrow or a javelin;

Arts. lin; and every wound described with anatomical accuracy. The whole seventeenth book is employed in the contest about the dead body of Patroclus, stuffed with minute circumstances, below the dignity of an epic poem. In such scenes the reader is fatigued with endless particulars; and has nothing to support him but the melody of Homer's versification. Arts.

10 Causes of the decline of the fine arts.

Having traced the progress of the fine arts toward maturity, in a summary way, the decline of these arts comes next in order. An art, in its progress toward maturity, is greatly promoted by emulation; and, after arriving at maturity, its downfal is not less promoted by it. It is difficult to judge of perfection but by comparison; and an artist, ambitious to outstrip his predecessors, cannot submit to be an imitator, but must strike out something new, which, in an art advanced to ripeness, seldom fails to be a degeneracy. This cause of the decline of the fine arts may be illustrated by various instances. The perfection of vocal music is to accompany passion, and to enforce sentiment. In ancient Greece, the province of music was well understood; which being confined within its proper sphere, had an enchanting influence. Harmony at that time was very little cultivated, because it was of very little use: melody reaches the heart, and it is by it chiefly that a sentiment is enforced, or a passion soothed; harmony, on the contrary, reaches the ear only; and it is a matter of undoubted experience, that the most melodious airs admit but of very simple harmony. Artists, in later times, ignorant why harmony was so little regarded by the ancients, applied themselves seriously to its cultivation; and they have been wonderfully successful. But they have been successful at the expence of melody; which in modern compositions, generally speaking, is lost amid the blaze of harmony. These compositions tickle the ear by the luxury of complicated sounds, but seldom make any impression on the heart. The Italian opera, in its form, resembles the Greek tragedy, from which it is evidently copied; but very little in substance. In the latter, music being made subservient to sentiment, the dialogue is nervous and sublime: in the former, the whole weight is laid on music; and the dialogue, devoid of sentiment, is weak and spiritless. Restless man knows no golden mean, but will be attempting innovations without end. By the same ambition, architecture has visibly declined from its perfection. The Ionic was the favourite order when architecture was in its height of glory. The Corinthian order came next; which, in attempting greater perfection, has deviated from the true simplicity of nature; and the deviation is still greater in the Composite order. With respect to literary productions, the first essays of the Romans were very imperfect. We may judge of this from Plautus, whose compositions are abundantly rude, though much admired by his cotemporaries, being the best that existed at that time. The exalted spirit of the Romans hurried them on to the grand and beautiful; and literary productions of all kinds were in perfection when Augustus reigned. In attempting still greater perfection, the Roman compositions became a strange jumble of inconsistent parts: they were tumid and pompous; and, at the same time, full of antitheses, conceit, and tinsel wit. Every thing new in the fine arts pleases, though less perfect than what we are accustomed to; and, for that reason, such compositions were generally relished. We see not by what gradual steps writers, after the time of Augustus, deviated from the patterns that were before them; for no book of any moment after that time is preserved till we come down to Seneca, in whose works nature and simplicity give place to artificial thought and bastard wit. He was a great corrupter of the Roman taste; and after him nothing was relished but brilliant strokes of fancy, with very little regard to sentiment: even Virgil and Cicero made no figure in comparison. Lucan has a forced elevation of thought and style very difficult to be supported; and, accordingly, he sinks often into puerile reflections; witness his encomium on the river Po; which, says he, would equal the Danube, had it the same number of tributary streams. Quintilian, a writer of true and classical taste, who was protected and encouraged by Vespasian, attempted to stem the tide of false writing. His rhetoric is composed in an elegant style; and his observations contain every delicacy of the critical art. At the same time flourished Tacitus, possessing a more extensive knowledge of the nature of man than any other author, ancient or modern, if Shakespeare be not excepted. His style is original, concise, compact, and comprehensive; and, in what is properly called his *history*, perfectly correct and beautiful. He has been imitated by several, but never equalled by any. Brutus is said to be the last of the Romans for love of liberty: Quintilian and Tacitus may be said to be the last of the Romans for literary genius. Pliny the younger is no exception; his style is affected, turgid, and full of childish brilliancy. Seneca and Pliny are proper examples of writers who study show more than substance, and who make sense yield to sound. The difference between these authors and those of the Augustan age, resembles the difference between Greek and Italian music. Music, among the Greeks, limited itself to the employment to which it is destined by nature, viz. to be the handmaid of sense, to enforce, enliven, or sweeten a sentiment. In the Italian opera, the mistress is degraded to be handmaid; and harmony triumphs with very little regard to sentiment.

Another great cause that precipitates the downfal of every fine art is despotism. The reason is obvious; and there is a dismal example of it in Rome, particularly with regard to eloquence. We learn from a dialogue accounting for the corruption of the Roman eloquence, that in the decline of the art it became fashionable to stuff harangues with impertinent poetical quotations, without any view but ornament merely; and this also was long fashionable in France. It happened unluckily for the Romans, and for the world, that the fine arts were at their height in Rome, and not much upon the decline in Greece, when despotism put an end to the republic. Augustus, it is true, retarded their fall, particularly that of literature; it being the policy of his reign to hide despotism, and to give his government an air of freedom. His court was a school of urbanity, where people of genius acquired that delicacy of taste, that elevation of sentiment, and that purity of expression, which characterise the writers of his time. He honoured men of learning, admitted them to his table, and was bountiful to them. It would be painful to follow the decline of the fine arts in Rome to their

Arts. their total extirpation. The tyranny of Tiberius, and of subsequent emperors, broke at last the elevated and independent spirit of the brave Romans, reduced them to abject slavery, and left not a spark of genius. The science of law is the only exception, as it flourished even in the worst of times: the Roman lawyers were a respectable body, and less the object of jealousy than men of power and extensive landed property. Among the Greeks also, a conquered people, the fine arts decayed; but not so rapidly as at Rome: the Greeks, farther removed from the seat of government, being less within the reach of a Roman tyrant. During their depression, they were guilty of the most puerile conceits: witness verses composed in the form of an axe, an egg, wings, and such like. The style of Greek authors, in the reign of the emperor Adrian, is unequal, obscure, stiff, and affected. Lucian is the only exception that may be made.

We scarcely need any other cause but despotism, to account for the decline of statuary and painting in Greece. These arts had arrived at their utmost perfection about the time of Alexander the Great; and from that time they declined gradually with the vigour of a free people; for Greece was now enslaved by the Macedonian power. It may in general be observed, that when a nation becomes stationary in that degree of power which it acquires from its constitution and situation, the national spirit subsides, and men of talents become rare. It is still worse with a nation that is sunk below its former power and pre-eminence; and worst of all when it is reduced to slavery. Other causes concurred to accelerate the downfal of the arts mentioned. Greece, in the days of Alexander, was filled with statues of excellent workmanship; and there being little demand for more, the later statuaries were reduced to heads and busts. At last the Romans put a total end both to statuary and painting in Greece, by plundering it of its finest pieces; and the Greeks, exposed to the avarice of the conquerors, bestowed no longer any money on the fine arts.

* Petronius Arbiter. The decline of the fine arts in Rome is by a * writer of taste and elegance ascribed to a cause different from any above mentioned, a cause that overwhelms manhood as well as the fine arts wherever it prevails; and that is opulence, joined with its faithful attendants avarice and luxury. "In ancient times (says he), when naked virtue had her admirers, the liberal arts were in their highest vigour; and there was a generous contest among men, that nothing of real and permanent advantage should long remain undiscovered. Democritus extracted the juice of every herb and plant; and, lest the virtue of a single stone or twig should escape him, he consumed a lifetime in experiments. Eudoxus, immersed in the study of astronomy, spent his age upon the top of a mountain. Chrysippus, to stimulate his inventive faculty, thrice purified his genius with hellebore. To turn to the imitative arts; Lysippus, while labouring on the form of a single statue, perished from want. Myron, whose powerful hand gave to the brass almost the soul of man and animals,—at his death found not an heir! Of us of modern times what shall we say? Immersed in drunkenness and debauchery, we want the spirit to cultivate those arts which we possess. We inveigh against the manners of antiquity; we study vice alone; and vice is all we teach. Where now is the art of reasoning? Where astronomy? Where is the right path of wisdom? What man now-a-days is heard in our temples to make a vow for the attainment of eloquence, or for the discovery of the fountain of true philosophy? Nor do we even pray for health of body, or a sound understanding. One, while he has scarce entered the porch of the temple, devotes a gift in the event of the death of a rich relation; another prays for the discovery of a treasure; a third for a ministerial fortune. The senate itself, the exemplary preceptor of what is good and laudable, has promised a thousand pounds of gold to the capitol; and, to remove all reproach from the crime of avarice, has offered a bribe to Jupiter himself. How should we wonder that the art of painting has declined, when, in the eyes both of the gods and men, there is more beauty in a mass of gold than in all the works of Phidias and Apelles."—In England, the fine arts are far from such perfection as to suffer by opulence. They are in a progress, it is true, toward maturity; but they proceed in a very slow pace. Arts.

There is still another cause that never fails to undermine a fine art in a country where it is brought to perfection, abstracting from every one of the causes above mentioned. It is remarked a little above, that nothing is more fatal to an art or to a science than a performance so much superior to all of the kind as to extinguish emulation. This remark is exemplified in the great Newton, who having surpassed all the ancients, has not left to his countrymen even the faintest hope of rivalling him; and to that cause is attributed the visible decline of mathematics in Great Britain. The same cause would have been fatal to the arts of statuary and painting among the Greeks, even though they had continued a free people. The decay of painting in modern Italy is, probably, owing to the same cause: Michael Angelo, Raphael, Titian, &c. are lofty oaks that bear down young plants in their neighbourhood, and intercept from them the sunshine of emulation. Had the art of painting made a slower progress in Italy, it might have there continued in vigour to this day. Velleius Paterculus says judiciously, "Ut primo ad consequendos quos priores ducimus accendimur; ita, ubi aut præteriri aut æquari eos posse desperavimus, studium cum spe senescit; et quod adsequi non potest, sequi desinit: præteritoque eo in quo eminere non possimus, aliquid in quo nitamur conquirimus."

The decline of an art or science proceeding from the foregoing cause, is the most rapid where a strict comparison can be instituted between the works of different masters. The superiority of Newton above every other mathematician can be ascertained with precision; and hence the sudden decline of that science in Great Britain. In Italy a talent for painting continued many years in vigour, because no painter appeared with such superiority of genius as to carry perfection in every branch of the art. As one surpassed in designing, one in colouring, one in graceful attitudes, there was still scope for emulation. But when at last there was not a single perfection but what one or other master had excelled in, from that period the art began to languish. Architecture continued longer in vigour than painting, because the principles of comparison in the former are less precise than in the latter. The artist who

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who could not rival his predecessors in an established mode, sought out a new mode for himself, which, though perhaps less elegant or perfect, was for a time supported by novelty.

11 Useful arts less subject to decline.

Useful arts will never be neglected in a country where there is any police; for every man finds his account in them. Fine arts are more precarious. They are not relished but by persons of taste, who are rare; and such as can spare great sums for supporting them are still more rare. For that reason, they will never flourish in any country, unless patronized by the sovereign, or by men of power and opulence. They merit such patronage, as one of the springs of government: and a capital spring they make, by multiplying amusements, and humanizing manners; upon which account they have always been encouraged by good princes.

12 Theory of the polite arts.

General Theory of the Polite Arts. The essence of the polite arts, as before observed, consists in *expression*. The end of these arts is *pleasure;* whereas the end of the sciences is *instruction* and *utility*. Some of the polite arts, indeed, as eloquence, poetry, and architecture, are frequently applied to objects that are useful, or exercised in matters that are instructive, as we shall show more particularly in their proper place; but in these cases, though the ground-work belongs to those sciences which employ the understanding, yet the expression arises from the inventive faculty. It is a picture that is designed by Minerva, to which the Muses add the colouring, and the Graces the frame. This union forms therefore the perfection of the art, according to that sententious and well known precept of Horace:

Omne tulit punctum, qui miscuit utile dulci.

13 What arts so denominated.

Under the denomination therefore, of Polite Arts, we comprehend, 1. Eloquence; 2. Poetry; 3. Music; 4. Painting; 5. Sculpture; 6. Graving; 7. Architecture; 8. Declamation; 9. Dancing. Particular descriptions of these arts are given under their respective names. This branch of the present article is intended as a general introduction to them; and, as such, will be occasionally referred to.

There is one very essential reflection, which it appears to us proper to make in the first place, on the polite arts in general. All the rules in the world are not sufficient to make a great poet, an able orator, or an excellent artist; because the quality necessary to form these, depends on the natural disposition, the fire of genius, which no human art can confer, but which is the pure gift of heaven. The rules, however, will prevent a man from being a bad artist, a dull orator, or a wretched poet; seeing they are the reflections of the greatest masters in those arts, and that they point out the rocks which the artist should shun in the exercise of his talents. They are of use, moreover, in facilitating his labours, and in directing him to arrive by the shortest and surest road at perfection. They refine, strengthen, and confirm his taste. Nature, abandoned to herself, has something constantly wild and savage. Art, founded on just and sagacious rules, gives her elegance, dignity, and politeness; and it is impossible to sacrifice properly to the Graces, without knowing the incense that is pleasing to them.

14 Use of precepts.

Beauty is the object of all the polite arts. It is not, however, so easy, as it may seem, to give a clear and determinate idea of what we precisely mean by that term *. Many able writers, who have treated expressly on the subject, have shown that they were totally ignorant of what it was. It is one of these expressions that we comprehend immediately, that present us with a clear and precise idea, that leave a distinct impression on our minds, when it is simply written or pronounced; but which philosophers envelope in darkness, when they attempt to elucidate it by definitions and descriptions; and the more, as mankind have different ideas of beauty, their opinions and tastes being as various as their understandings and physiognomies. We may say, however, in general, that beauty results from the various perfections of which any object is susceptible, and which it actually possesses; and that the perfections which produce beauty consist principally in the agreeable and delightful proportions which are found, 1. Between the several parts of the same object; 2. Between each part and the whole together; 3. Between the parts and the end or design of the object to which they belong. *Genius*, or invention, is that faculty of the mind by which beauty is produced. *Taste* †, disposition, or rather the natural sensation of the mind refined by art, serves to guide the genius in discerning, embracing, and producing, that which is beautiful of every kind. From whence it follows, that the general theory of the polite arts is nothing more than the knowledge of what they contain that is truly beautiful and agreeable; and it is this knowledge, this theory, which modern philosophers call by the Latin name of *æsthetica*.

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15 *Beauty, genius, taste,* what.

* See the article *Beauty*.

† See *Taste*.

It should be constantly remembered, that the essence of the polite arts consists in expression. This expression lies sometimes in the words, and sometimes in the pen; sometimes in sounds and their harmony, and at others in corporeal attitudes; sometimes in the pencil or in the chisel, and at others in the graver; sometimes in a proper disposition or judicious employment of the mechanic arts, and at others merely in their manner of acting. From whence arise those arts that we have mentioned, and which are described in their order.

16 First general rule.

The general theory of the polite arts, or *esthetics*, necessarily supposes, therefore, certain rules; but these general rules are of no great number. The first is, That whoever would devote himself to the polite arts, should above all things *consult his genius;* divest himself of self-love; and examine if he be a true son of Apollo, and cherished by the Muses: for

> In vain, rash author, dost thou strive to climb,
> By lofty verse, Parnassus' height sublime,
> If heaven does not by secret powers inspire,
> Or if thy natal star darts not poetic fire.

This precept with regard to poetry in particular, is applicable to all the polite arts in general: for their most happy success is founded on *imagination*. By this term, we understand, in general, a faculty of the mind, a particular genius, a lively invention, a certain subtle spirit, which gives a facility in discovering something new. But it is necessary also to describe just bounds to this term *new*, which must not be here taken in an absolute sense. Solomon wisely remarks, that, even in his time, *there was nothing new under the*

17 *Imagination* what.

18 *Novelty* and *Invention.*

Arts. *the sun.* In fact, all that exists, and all that is capable of being discovered in the known world, has already been discovered. The fine arts in their imitations of nature, in their expressions, can borrow images, figures, comparisons, from those things only that exist and are known. As there have been from the beginning of the world to our days, millions of authors in each of the polite arts, almost all the possible combinations of the various subjects have been produced by their lively imaginations; and when we hear the ignorant part of mankind talk of a work of wit or of art *that is entirely new*, that offers ideas which were before utterly unknown, that had never entered into the brain of any other man, we should refer such assertions to the class of popular errors: and reflect on those stories we every day hear of certain empirics, who pretend to be alone possessed of marvellous methods of cure by means of simples; as if there were any plant, any stalk of grass that grows in our world, that can have escaped the researches of botanists. But the novelty, of which we here speak, consists in the ingenious use of combinations of all the various objects of nature, that are new, happy, and agreeable, that have not yet been exhausted, and which appear even to be inexhaustible; and of the use which the artist makes of all new discoveries, which he turns to his advantage by a judicious application. Invention therefore supposes a considerable fund of preliminary knowledge, such as is capable of furnishing ideas and images, to form new combinations. But there is no art by which invention itself can be produced; for that, as we have already said, is the gift of heaven; and it is an endowment which we cannot even make use of whenever we please. We would rather say, therefore, that invention consists in producing, in works of genius, *that which is unexpected;* an object, a harmony, a perfection, a thought, an expression of which we had no idea, that we could not foresee, nor hope to find, where the artist has so happily placed it, and where we perceive it with delight. This idea appears applicable to such of the polite arts as affect the mind by the hearing as well as by the sight; and it is a matter that is highly essential.

19 2d Rule, Improvement of taste. The second rule is, That every artist ought incessantly to labour in the improvement of his *taste;* in acquiring that sensible, refined, and clear discernment, by which he will be enabled to distinguish the real beauties in each object, the ornaments that are agreeable to it, and the proportions and relations that subsist among the several parts: and by this faculty, he will be regulated in the employment of his natural talents. This labour consists not only in the profound reflections he will make on the properties of objects, as they relate to the fine arts, but also in a constant, assiduous study of the grand models of beauty.

20 3d, Imitation of nature. The third rule to be observed in the practice of the polite arts, is *the imitation of nature.* Every object in the universe has its peculiar nature, of which the artist should never lose sight in his manner of treating it. In vain will he otherwise ornament his work with the most refined and most brilliant strokes; for, if nature be not justly imitated, it will for ever remain imperfect. The sublime Homer has sometimes sinned against this rule: for, as the gods have a nature peculiar to themselves, it cannot be a just imitation when we attribute to them passions that are scarcely pardonable in mortals, and make them frequently converse in a language that is at once vulgar and ridiculous. It was not to imitate nature, to put in the mouth of a hero, at the moment of a decisive battle, a harangue that must become tedious by its excessive length, and which certainly could not have been heard by the thousandth part of a numerous army: but we have already touched upon some of the faults that are strewed over the poems of that great man; to multiply or dwell upon them would be ungrateful. We must, however, observe that this imitation of nature, which appears at first view so simple and so easy, is of all things the most difficult in practice; and that it requires a discernment so sagacious, and an expression so happy, as is rarely bestowed by heaven on mortal man. Arts.

21 4th, Perspicuity. *Perspicuity* forms the fourth rule of expression. In all the fine arts, in general, an obscure, perplexed, ambiguous, and elaborate expression, is always bad. The true striking beauty must be manifest and perceptible to the most ignorant of mankind as well as the most learned. Those are even false or inferior beauties that have occasion for a covering, a kind of veil that may make them appear greater than they really are: true beauty wants no veil, but shines by its native lustre. From the union of the true imitation of nature with perspicuity of expression arises that *truth* which is so essential in the productions of the fine arts.

22 5th, Elevation of sentiment. In all the polite arts, and in all the subjects they embrace, there must necessarily reign an elevation of sentiment, that expresses each object in the greatest perfection of which it is susceptible; that imitates nature in her most exalted beauty. This makes the fifth general rule. The design of the fine arts being to excite pleasure by the expression of that which is beautiful, every artist should raise himself above his subject; and, choosing the most favourable light wherein to place it, should there embellish it with the greatest, most noble, and beautiful ornaments, that his own genius can suggest; still, however, observing a strict imitation of nature.

23 6th, The sublime to be endeavoured after. From the observation of these two last rules results the *sublime*, which is the union of the greatest perspicuity with the strictest truth and most exalted elevation possible. It is necessary to remark here, that the most simple and common subjects are susceptible of a sublime that is agreeable to their nature. An idyl or landscape may be as sublime in their kinds as an epic poem or a history piece. When Moses begins the book of Genesis, with these words, *In the beginning God created the heaven and the earth;* or when he tells us, that God said, *Let there be light, and there was light;* these expressions are sublime in the highest degree, because they are perfectly clear, true, and elevated. Every author should therefore endeavour after the sublime * in every subject that he undertakes; and this makes the sixth and last general rule in the practice of the polite arts. But if he cannot attain to this, it is, however, indispensably necessary that he constantly make use of expressions that are *noble and refined.* Every thing that is *low*, *indecent*, or *disagreeable*, is naturally repugnant to the sublime. See the articles Arts, *Fine*, and Drama, in the Supplement.

* See the article Grandeur and Sublimity.

Art

Art ‖ Artaxerxes.

ART is also an appellation given to several superstitious practices, as, *St Anselm's art*, *St Paul's art*, &c. *Art and Part*, in *Scots Law*. See ACCESSORY.

ARTA, by some called *Larta*, a town of Lower Albania, in Turkey in Europe, with a Greek archbishop's see. It is a pretty large town, and contains, according to Mr Hobhouse, about 5000 inhabitants, of which less than a fourth are Mahometans. It had formerly a castle, but this has been suffered to fall to decay. Arta is situated at the distance of seven or eight miles from the gulf to which it gives name. The neighbouring grounds produce grapes, tobacco, oats, and maize; and there is some little trade in wool, cotton, cloths, &c. E. Long. 21. 15. N. Lat. 39. 20.

ARTABA, an ancient measure of capacity used by the Persians, Medes, and Egyptians.

The Persian artaba is represented by Herodotus as bigger than the Attic medimnus by three Atic chœnixes: from which it appears that it was equal to $6\frac{3}{4}$ Roman modii; consequently that it contained $166\frac{2}{3}$ pounds of wine or water, or $126\frac{2}{3}$ pounds of wheat. The Egyptian artaba contained five Roman modii, and fell short of the Attic medimnus by one modius; consequently held $133\frac{1}{3}$ pounds of water or wine, 100 pounds of wheat, or 60 of flour.

ARTABANUS, the name of several kings of Parthia. See PARTHIA.

ARTABAZUS, the son of Pharnaces, commanded the Parthians and Chorasmians in the famous expedition of Xerxes. After the battle of Salamis, he escorted the king his master to the Hellespont with 60,000 chosen men; and after the battle of Platæa, in which Mardonius engaged contrary to his advice, he made a noble retreat, and returned to Asia with 40,000 men under his command.

ARTAXATA, the royal residence and metropolis of Armenia Major (Strabo, Pliny, Juvenal), and built according to a plan of Hannibal, for King Artaxias, after whom it was called. It was situated on an elbow of the river Araxes, which formed a kind of peninsula, and surrounded the town like a wall, except on the side of the isthmus, but this side was secured by a rampart and ditch. This town was deemed so strong, that Lucullus, after having defeated Tigranes, durst not lay siege to it; but Pompey compelled him to deliver it up without striking a blow. It was then levelled with the ground; but the Armenians have a tradition, that the ruins of it are still to be seen at a place called *Ardachat*. Sir John Chardin says, that it has the name of *Ardachat* from Artaxias, whom in the East they call *Ardechier*. Here are the remains of a stately palace which the Armenians take to be that of Tiridates who reigned in the time of Constantine the Great. One front of this building is but half ruined, and there are many other fine antiquities which the inhabitants call *Tact Tradat*, that is, the throne of Tiridates. Tavernier also mentions the ruins of Artaxata between Erivan and Mount Ararat, but does not specify them. The ancient geographers mention another city of the same name, likewise situated on the Araxes, but in the northern part of Media, known among the ancients by the name of *Acropatia*.

ARTAXERXES, the name of several kings of Persia. See PERSIA.

Artedi ‖ Artemidorus.

ARTEDI, PETER, an eminent naturalist, was born in Sweden in the year 1705, in the province of Angermania. Although his parents were poor, yet it appears they found means to give him a liberal education, and with this view they sent him to the college of Hurnesand. Intending to embrace the ecclesiastical profession, he went in 1724 to Upsal; but being fond of the study of natural history, he yielded to the bent of inclination, and directed his attention towards medicine. In natural history he made rapid progress, and soon arose to considerable eminence, particularly in the knowledge of *Ichthyology*. His reputation for natural knowledge was high when Linnæus arrived at Upsal in the year 1728. A lasting friendship was formed between these two great men. Confining his botanical studies to the umbeliferous plants, he suggested a new mode of classification; but Artedi was much better acquainted with chemistry than botany. His attention was chiefly directed to ichthyology, the classification of which he greatly reformed, and new-modelled upon philosophical principles. This arrangement added greatly to his reputation as a naturalist. When the two friends were about to leave Upsal, Linnæus to go to Lapland, and Artedi to England, they reciprocally bequeathed to each other their manuscripts and books upon the event of death. In the year 1735, they, however, met again at Leyden, where Artedi was introduced to Seba, and employed in preparing for the press the third volume of that eminent naturalist's *Thesaurus*, which chiefly related to fishes. Artedi formed the resolution, as soon as that work was finished, to return to his native country, to publish the fruits of his own labours; but unfortunately as he was returning home from Seba's house on the evening of September 27. 1735, the night being dark, he fell into the canal and was drowned. According to agreement, his manuscripts came into the hands of Linnæus, and he published his *Bibliotheca Ichthyologica*, and *Philosophia Ichthyologica*, together with a life of the author, at Leyden in the year 1738. (*Gen. Biog.*).

ARTEDIA. See BOTANY *Index*.

ARTEMIDORUS, famous for his Treatise on Dreams. He was born at Ephesus, but took upon him the surname of *Daldianus* in his book, by way of respect to his mother country Daltis. He styled himself *the Ephesian* in his other performances. He not only bought up all that had been written concerning the explication of dreams, which amounted to many volumes; but he likewise spent many years in travelling, in order to contract an acquaintance with fortune-tellers; he also carried on an extensive correspondence with all the people of this sort in the cities and assemblies of Greece, Italy, and the most populous islands; collecting at the same time all the old dreams, and the events which are said to have followed them. The work which he wrote on dreams consisted of five books: the first three were dedicated to one Cassius Maximus; and the last two to his son, whom he took a good deal of pains to instruct in the nature and interpretation of dreams. This work, though filled with frivolous observations, contains some things that are interesting. It was first printed in Greek at Venice in 1518; and Rigaltius published an edition at Paris, in Greek and Latin, in 1603, and added some notes. Artemidorus wrote also a treatise upon Auguries, and an-

Artemidorus || Artemisium.

other upon Chiromancy; but they are not extant. He lived under the emperor Antoninus Pius.

ARTEMISIA, wife of Mausolus, king of Caria, has immortalized herself by the honours which she paid to the memory of her husband. She built for him in Halicarnassus, a very magnificent tomb, called the *Mausoleum*, which was one of the seven wonders of the world, and from which the title of *Mausoleum* was afterwards given to all tombs remarkable for their grandeur; but she died of regret and sorrow before the Mausoleum was finished. She appointed panegyries to be made in honour of him, and proposed a prize of great value for the person who should compose the best. He died about the end of the 106th Olympiad, 351 years before the Christian era.

ARTEMISIA, queen of Caria, and the daughter of Ligdamis, marched in person in the expedition of Xerxes against the Greeks, and performed wonders in the sea-fight near Salamis, 480 years before the Christian era. Being pursued by an Athenian vessel, she attacked one of the Persian ships, commanded by Demasithymus, king of Calyndus, her enemy, and sunk it; on which the Athenians, thinking that her ship was on the side of the Greeks, ceased their pursuit; but Xerxes was the principal person imposed upon in this affair; for believing she had sunk an Athenian vessel, he declared, that "the men had behaved like women, and the women like men." Xerxes intrusted her with the care of the young princes of Persia, his sons, when, agreeably to her advice, he abandoned Greece, in order to return to Asia. These great qualities did not secure her from the weakness of love: she was passionately fond of a man of Abydos, whose name was Dardanus, and was so enraged at his neglect of her, that she put out his eyes while he was asleep. The gods in order to punish her for this, inspired her with a still stronger passion for him; so that the oracle having advised her to go to Leucas, which was the usage of desperate lovers, she took the leap from thence, and was interred at that place.—Many writers confound this Artemisia with the former, the wife of Mausolus.

ARTEMISIA, *Mugwort*, *Southernwood*, and *Wormwood*. See BOTANY *Index*.

ARTEMISIUM, in *Ancient Geography*, a promontory on the north-east of Eubœa, (called *Leon* and *Cale Acte* by Ptolemy), memorable for the first sea engagements between the Greeks and Xerxes.

The Grecian fleet was stationed in the harbour; while that of the Persians, too numerous for any harbour to contain, had anchored in the road that extends between the city of Castanæa and the promontory of Sepias, on the coast of Thessaly.

The first line of their fleet was sheltered by the coast of Thessaly; but the other lines, to the number of seven, rode at anchor, at small intervals, with the prows of the vessels turned to the sea. When they adopted this arrangement, the waters were smooth, the sky clear, the weather calm and serene: but on the morning of the second day after their arrival on the coast, the sky began to lower; the appearance of the heavens grew threatening and terrible; a dreadful storm succeeded, and for three days raged with unabating fury. Four hundred galleys were destroyed by its violence, besides a vast number of storeships and transports. Eight hundred ships of war, however, besides innumerable vessels of burden, sailed into the Pegasean bay, and anchored in the road of Apheté, which at the distance of a few miles, lies directly opposite to the harbour of Artemisium. Artemisium.

The Grecians had posted centinels on the heights of Eubœa to observe the consequence of the storm, and to watch the motions of the enemy. When informed of the disaster which had befallen them, they poured out a joyous libation, and sacrificed with pious gratitude, to "Neptune the Deliverer." From *Gillies's History of Greece.*

The Persians, however, being recovered from the terrors of the storm, prepared for battle; and as they entertained not the smallest doubt of conquering, they detached 200 of their best sailing vessels round the isle of Eubœa, to intercept the expected flight of the enemy through the narrow Euripus.

About sunset the Grecian fleet approached in a line; and the Persians met them with the confidence of victory, as their ships were still sufficiently numerous to surround those of their opponents. At the first signal the Greeks formed into a circle, at the second they began the fight. Though crowded into a narrow compass, and having the enemy on every side, they soon took 30 of their ships, and sunk many more. Night came on, accompanied with an impetuous storm of rain and thunder; the Greeks retired into the harbour of Artemisium; the enemy were driven to the coast of Thessaly.

By good fortune, however, rather than by design, the greatest part of the Persian fleet escaped immediate destruction, and gained the Pegasean bay; but the ships ordered to sail round Eubœa met with a more dreadful disaster. They were overtaken by the storm, after they had adventured further from the shore than was usual with the wary mariners of antiquity. Clouds soon intercepted the stars, by which alone they directed their course; and after continuing during the greatest part of the night the sport of the elements, they all perished miserably amidst the shoals and rocks of an unknown coast.

The morning arose with different prospects and hopes to the Persians and the Greeks. To the former it discovered the extent of their misfortunes; to the latter it brought a reinforcement of 53 Athenian ships. Encouraged by this favourable circumstance, they determined again to attack the enemy, at the same hour as on the preceding day, because their knowledge of the coast and their skill in fighting their ships rendered the dusk peculiarly propitious to their designs. At the appointed time, they sailed towards the road of Apheté; and having cut off the Cilician squadron from the rest, totally destroyed it, and returned at night to Artemisium.—The Persian commanders being deeply affected with their repeated disasters, but still more alarmed at the much-dreaded resentment of their king, they determined to make one vigorous effort for restoring the glory of their arms. By art and stratagem, and under favour of the night, the Greeks had hitherto gained many important advantages. It now belonged to the Persians to choose the time for action. On the third day at noon, they sailed forth in the form of a crescent, which was still sufficiently

Artemisium || Arthur.

ficiently extensive to enfold the Grecian line. The Greeks, animated by former success, were averse to decline any offer of battle; yet it is probable that their admirals, and particularly Themistocles, would much rather have delayed it to a more favourable opportunity. Rage, resentment, and indignation, supplied the defect of the barbarians in skill and courage. The battle was longer, and more doubtful, than on any former occasion; many Grecian vessels were destroyed, five were taken by the Egyptians, who particularly signalized themselves on the side of the barbarians, as the Athenians did on that of the Greeks. The persevering valour of the latter at length prevailed, the enemy retiring, and acknowledging their superiority, by leaving them in possession of the dead and the wreck. But the victory cost them dear; since their vessels, particularly those of the Athenians, were reduced to a very shattered condition; and their great inferiority in the number and size of their ships, made them feel more sensibly every diminution of strength.

ARTEMISIUM, a town of Oenotria, (Stephanus): now *S. Agatha*, in the Hither Calabria, on the river Pisaurus, or la Foglia, distant eight miles from the Tuscan sea.—Another of the Contestani, in Spain, (Strabo); otherwise called *Dianium*: now *Denia*, on the sea coast of Valencia.

ARTERIOTOMY, the opening an artery, with design to procure an evacuation of blood. See SURGERY.

ARTERY, in *Anatomy*, a conical tube or canal which conveys the blood from the heart to all parts of the body. See ANATOMY.

ARTHRITIS, in *Medicine*, the GOUT. See the *Index* subjoined to MEDICINE.

ARTHRODIA, in *Natural History*, a genus of imperfect crystals, found always in complex masses, and forming long single pyramids, with very short and slender columns.

ARTHRODIA, in *Anatomy*, a species of articulation, wherein the flat head of one bone is received into a shallow socket in the other. The humerus and scapula are joined by this species of articulation.

ARTHUR, the celebrated hero of the Britons, is said to have been the son of Uthor Pendragon king of Britain, and to have been born in 501. His life is a continued scene of wonders. It is said that he killed four hundred and seventy Saxons with his own hand in one day; and, after having subdued many mighty nations, and instituted the order of the Knights of the Round Table, died A. D. 542, of wounds which he received in battle. The most particular detail of his story and his exploits is that given by Geoffroy of Monmouth: but the probable there is so blended with the marvellous and the extravagant, that not only the truth of the whole, but even the reality of Arthur's existence, has been called in question.

In this controversy, Mr Whittaker has taken much pains to vindicate the existence, and discriminate between the real and the fabulous transactions, of the British worthy. "Many of the actions (he observes) attributed to Arthur by the Welsh chronicles of Britain, are as absurd in themselves as they are spurious in their authority. Written, as those narratives were, many centuries after the facts, and being merely the authentic accounts of Arthur, embellished with the fictions and distorted by the perversions of folly; they are inconsistent equally with the state of the times, and the history of the continent and the island. And the ignorance of the forgers, and the credulity of their abettors, can be equalled only by the injudiciousness and incredulity of the opponents to both. If some accounts of Arthur and Cunobeline in these histories be certainly spurious, others are as certainly genuine. And the relations of Suetonius, Dio, and Nennius, are not to be rejected, because of the falsehoods which imposture has grafted upon them, and absurdity admitted with them.

Arthur. *History of Manchester*, vol. ii. 4th edit. p. 31. *et seq.*

"The existence of Arthur is evinced by that of the fables, which have at once annihilated his actions and his name with the misjudging critic. And the reasoner's own arguments really turn against himself, and demonstrate the point which they were intended to disprove. The annals of Wales have long laboured in Arthur's commendation. The Highlanders have long had a poetical history of his exploits in their own language. The whole island is in traditionary possession of his character; and 600 or 700 places within it are still distinguished by his name.

"The genuine actions of the chief are mentioned by his own historians, with a modesty and conciseness that is no bad argument of the truth, and with a particularity of time and place that is a good evidence of the facts. They are noticed by men, whom the death of the hero had exempted from all temptation to flattery: they are recited by persons, whom a proximity to the time had precluded from all possibility of mistake: and they are attested by the best historical authority, writers who lived cotemporary with him, authors who conversed with his warriors, and historians that wrote within a few years after him. He is spoken of as the honourable father of the British heroes by the aged Llomarch, a writer actually cotemporary with him, and some time resident at his court. One of his greater actions is incidentally recorded by Taliessin, an historical bard living under Maelwn Gwined, who was a sovereign among the Britons in the days of Arthur, Gildas, and Llomarch. Another of his considerable exploits is casually intimated by Myrdhin Wyhlt or Merlinus Caledonius, who complains of the severe treatment which he himself received from Rydderch Hael, a king cotemporary with Urien Reged, and engaged with him in a war against the Saxons on the death of Ida in 590. And all his actions are particularly recited by Nennius.

"In the *Historia Britonum* of this last author, Arthur's victories over the Saxons are thus recorded. The first battle was fought at the mouth of the river which is denominated *Glem*. The second, third, fourth, and fifth, were upon another river, that is called *Duglas*, and lies in the region Linuis. The sixth was on a stream, which bears the appellation of *Bassas*. The seventh was in the wood of Celidon, that is, in Cat Coit Celidon. The eighth was at Castle Gunnion; and the ninth was at the city of the Legion. The tenth was on the bank of the river Ribroit; the eleventh at the hill Agned Cathregonion; and the twelfth at Mount Badon. These twelve battles of Arthur are described to us in the same manner as Vortimer's three. Only the general facts are mentioned, and only the common names of places are recited, in both. And

Arthur. from the whole air and aspect of the history, the remarkable conciseness with which the notices are given, and the great ease with which the places are pointed out, the detail appears to have been drawn up at the distance only of a few years from the transactions, and when these little references were sufficiently understood."

Mr Whittaker proceeds to ascertain the scenes of Arthur's battles; after which he gives a relation of them with a surprising particularity. A severe critic might be apt to say, as Dr Kippis observes, that it requires all our faith in the author's judgment, as well as in his ingenuity and learning, not to suspect that he sometimes allows too much scope to fancy and conjecture. However, the whole of what he hath advanced is singularly curious, and deserves peculiar attention and consideration. And no one can help admiring the penetration with which he hath formed such a regular detail of facts, from the combined aid of history, romance, and tradition. According to Mr Whittaker, Arthur's principal exploits were against the northern Saxons, whilst he was only prince of the Silures, and Ambrosius was the dictator or pendragon of the Britons. "In a series probably of five campaigns, and in a succession certainly of eleven victories, this great commander had repelled the Saxons from the north of Flavia, dislodged them from all Maxima, and dispossessed them of all Valentia. And these were successes so unchequered with misfortunes, so great in themselves, and so beneficial to the public, that the name of Arthur claims the first rank in the list of military, and the better one of patriot, heroes." The twelfth battle of Arthur was fought in the south of England, after he was elected to the pendragonship, against Cerdic the Saxon. "This (says Mr Whittaker) was a most extraordinary victory, and completes the circle of Arthur's military glories." In the author's account of this prince's conduct in peace, he asserts, that "Arthur saw that an appointment was wanted, which should at once be a more regular and more honourable signature of merit; by the certainty of the honour and the greatness of the dignity, call out all the worth of all the worthy in the nation, and collect it round the throne of the pendragon. Accordingly he established a military order. It was the first that had ever been instituted in the island; and it has since been imitated by all the nations on the continent. By means of this association, Arthur raised among the provincials a general glow of ingenuous heroism, the first spirit of chivalry that ever appeared in Europe; that manly and honourable gallantry of soul, which has made him and his worthies the subject of romantic histories over all the west of it. By this, and this alone, could he have been what history represents him, the Revered Father of the British Heroes in general, even to the conclusion of the sixth century, and nearly the middle of the seventh. The order naturally survived its founder. And the members of it were denominated the Warriors of Arthur, though the persons were born half a century after his death." Mr Whittaker goes on to inform us, that under the prudent management of Arthur for 20 years together, a fair prospect dawned upon the Britons, and long scenes of future glories opened to their imaginations. "But the gay vision was destroyed at once by the commencement of a civil war. Many towns still remained in ruins, the memorial of the former wars, and the disgrace of the present. The diffused spirit of chivalry was turned upon the nation, and heroism became the tool of dissension. And the dreadful combination of civil evils was begun and consummated, at once, by the death of the renowned Arthur in battle. Thus died the incomparable hero in 542."

Ibid. p. 34.—64.

Arthur's Seat.

To these observations it may not be improper to add the following account of the discovery of Arthur's tomb, which appears to be tolerably well authenticated. Henry II. who was the first of the Plantagenet line, being, in the last year of his reign, at Pembroke, and hearing there a Welsh bard singing to his harp the story of Arthur, concluding with an account of his death, and burial in the churchyard of Glastonbury between two pyramids; the king instantly gave orders that the matter should be inquired into, and the body dug up. This was done as the king directed; and at the depth of seven feet was found a vast stone, whereon was fastened a leaden cross, with this inscription on the inside: *Hic Jacet Sepultus Inclytus Rex Arturius in Insula Avalonia*; i. e. "Here lies the famous King Arthur, buried in the isle of Avalon." Digging still lower, they found the king's body in the trunk of a tree, his beautiful queen lying by him, with long flowing hair, in colour bright as gold, which, however, sunk into dust when touched. The king's bones were very large sized; and in his skull there were ten wounds or more, all cicatrized, except that of which he died. This discovery was made in the year 1189, as Giraldus Cambrensis tells us, who saw these bones, and examined the whole matter carefully. There was also a table containing this story, set up in the monastery of Glastonbury, and the leaden cross with the inscription remained there till the dissolution of the monastery, where it was seen by the great antiquary Leland; but what is become of it since does not appear.

Of the different places above alluded to as being distinguished by our hero's name, and serving to evince his existence, the following may be mentioned as one of the principal.

Arthur's Seat, a high hill in the neighbourhood of Edinburgh, said to have been so denominated from a tradition that King Arthur surveyed the country from its summit, and had also defeated the Saxons in its neighbourhood. This hill rises by a steep and rugged ascent, till it terminates in a rocky point near 700 feet high from the base, being more than double the height of the cross on the top of St Paul's, London, which is 340 feet. On the south it is in many parts a perpendicular rock, composed of basaltic pillars regularly pentagonal or hexagonal, about three feet in diameter, and from 40 to 50 feet in height. Contiguous upon the west, and partly connected with it at the base, are Salisbury Crags, of inferior height, but exhibiting an appearance equally singular and grand. They present to the city an awful front of broken rocks and precipices, forming a sort of natural amphitheatre of solid rock; and backward from the craggy verge above, the hill forms an extensive irregular slope, the surface affording pasture to numerous flocks of sheep. The crags, besides ores, spars, rock plants, and here and there, it is said, some precious stones, afford an inexhaustible supply of stone for paving the streets

Arthur's Seat || Article.

streets and other purposes. In quarrying, a part of the crags has been worn down into a spacious shelf, having the appearance of a lofty terrace, and stretching a considerable length. From hence is a near and distinct prospect of the city, with its environs and the adjacent country. But from the pinnacle called Arthur's Seat the view is more noble and extensive. The traveller may here sit and survey at his ease the centre of the kingdom, besides having a complete view of Edinburgh and its castle, on which he looks down as if seated among the clouds. In a word, the German ocean, the whole course of the Forth, the distant Grampians, and a large portion of the most populous and best cultivated part of Scotland, form a landscape sublime, various, and beautiful.

The denomination of this hill, derived as above, has been adduced as an argument against those who dispute the existence of the British Arthur. That derivation, however, though probable, is not without uncertainty. For *Arthur's Seat* is said to be derived, or rather corrupted, from *A'rd Seir*, a "place or field of arrows," where people shot at a mark: And this not improperly; for among these cliffs is a dell or recluse valley, where the wind can scarcely reach, now called the *Hunter's Bog*, the bottom of it being a morass. The adjacent crags are supposed to have taken their name from the earl of *Salisbury*, who in the reign of Edward III. accompanied that prince in an expedition against the Scots.

ARTICHOKE. See CINARA, BOTANY *Index*.

ARTICLE, a clause or condition of a contract, treaty, &c. It is also a small part or division of a discourse, book, or writing.

ARTICLE of Death, the last pangs or agony of one just expiring.

ARTICLE of Faith, is by some defined a point of Christian doctrine, which we are obliged to believe, as having been revealed by God himself, and allowed and established as such by the church.

The thirty-nine articles were founded, for the most part, upon a body of articles compiled and published in the reign of Edward VI. They were first passed in the convocation, and confirmed by royal authority in the year 1562. They were afterwards ratified anew in the year 1571, and again by Charles I. The law requires a subscription to these articles of all persons ordained to be deacons or priests, 13 Eliz. cap. 12.; of all clergymen inducted to any ecclesiastical living, by the same statute; and of licensed lecturers and curates, 13 Eliz. cap. 12. and 13 and 14 Ch. II. cap. 4. of the heads of colleges, of chancellors, officials, and commissaries, and of schoolmasters. By 1 Will. III. cap. 12. dissenting teachers are to subscribe all, except the 34th, 35th, and 36th, and part of the 20th (and in the case of Anabaptists, except also part of the 27th); otherwise they are exempted from the benefits of the act of toleration.

ARTICLE, in *Grammar*, denotes a particle used in most languages for the declining of nouns, and denoting the several cases and genders thereof.

The use of articles arises chiefly hence, that in languages which have no different terminations, to express the different states and circumstances of nouns, there is something required to supply that office.

The Latins have no articles; but the Greeks, and most of the modern languages, have had recourse to them, for fixing and ascertaining the vague signification of common and appellative names. Article || Artificer.

The Greeks have their ὁ, the eastern tongues their *he emphaticum*; the Italians their *il*, *lo*, and *la*; the French their *le*, *la*, and *les*; the Germans their *der*, *das*, *dat*.

The English also have two articles, *a* and *the*; which being prefixed to substantives, apply their general signification to some particular things.

Some grammarians make the article a distinct part of speech; others will have it a pronoun, and others a noun adjective. See GRAMMAR.

Articles are of great service in a language, as they contribute to the more neat and precise expressing of several properties and relations, which must otherwise be lost. And hence one great advantage of such languages over the Latin, in that the article being either expressed or left out, makes an alteration in the sense, which the Latins cannot distinguish. Thus when the devil said to our Saviour, *Si tu es Filius dei*, it may either be understood, "if thou art *a* son of God," or, "if thou art *the* son of God." The Italians even prefix articles to proper names, which do not naturally need any, because they themselves signify things individually. Thus, they say, *il Ariosto*, *il Tasso*, *il Petrarcha*. Even the French join the article to the proper names of kingdoms, provinces, &c. as *la Suede*, *la Normandie*. And we likewise annex it to the names of certain mountains and rivers; as, the *Rhine*, the *Danube*, the *Alps*, &c.

ARTICULATE SOUNDS, are such sounds as express the letters, syllables, or words of any alphabet or language; such are formed by the human voice, and by some few birds, as parrots, &c.

ARTICULATION, or JOINTING, is the joining of bones together. See ANATOMY.

ARTICULATION, in *Botany*, is the connexion of parts that consist of joints or knees, such as the pods of French honeysuckles, which when ripe divide into so many parts as there are knees or joints; also those parts of plants which swell into nodes or joints, and which usually send forth branches.

ARTIFICER, a person whose employment it is to manufacture any kind of commodity, as in iron, brass, wool, &c. such are smiths, brasiers, carpenters, &c. The Roman artificers had their peculiar temples, where they assembled and chose their own patron, to defend their causes; they were exempted from all personal services. Taruntenus Paternus reckons 32 species of artificers, and Constantine 35, who enjoyed this privilege. The artificers were incorporated into divers colleges or companies, each of which had their tutelar gods, to whom they offered their worship. Several of these, when they quitted their profession, hung up their tools, a votive offering to their gods. Artificers were held a degree below merchants, and *argentarii* or money-changers, and their employment more sordid. Some deny, that in the earliest ages of the Roman state artificers were ranked in the number of citizens: others, who assert their citizenship, allow that they were held in contempt, as being unfit for war, and so poor that they could scarcely pay any taxes. For which reason they were not entered among the citizens in the censor's books; the design of the census being only to

see

Artificer || Artillery.

see what number of persons were yearly fit to bear arms, and to pay taxes towards the support of the state. It may be added, that much of the artificers business was done by slaves and foreigners, who left little for the Romans to mind but their husbandry and war. By means of the arts, the minds of men are engaged in inventions beneficial to the whole community; and thus prove the grand preservative against the barbarism and brutality, which ever attend on an indolent and inactive stupidity.

By the English laws, artificers in wool, iron, steel, brass, or other metal, going out of the kingdom into any foreign country without license, are to be imprisoned three months, and fined in a sum not exceeding one hundred pounds. And such as going abroad, and not returning on warning given by our ambassadors, &c. shall be disabled from holding lands by descent or devise, from receiving any legacy, &c. and be deemed aliens. Stat. 5. Geo. I. cap. 27. By 23 Geo. II. cap. 13. § 1. penalty is also inflicted on seducing artificers to go abroad. Ramazini has a treatise on the diseases of artificers.

ARTIFICIAL, in a general sense, denotes something made, fashioned, or produced by art, in contradistinction from the production of nature.

ARTIFICIAL is also frequently used for factitious. Thus we have artificial sal ammoniac, artificial borax, &c.

ARTIFICIAL *Fire-works* are compositions of inflammable materials, chiefly used on solemn occasions, by way of rejoicing. See PYROTECHNY.

ARTIFICIAL *Lightning*. See ELECTRICITY and LIGHTNING.

ARTIFICIAL *Lines*, on a sector or scale, are certain lines so contrived, as to represent the logarithmic sines and tangents; which, by the help of the line of numbers, will solve all questions in trigonometry, navigation, &c. pretty exactly.

ARTIFICIAL *Magnets*. See MAGNETS.

ARTIGI, indeclinable, (Pliny); *Artigis*, (Ptolemy); a town of the Turduli, in Bætica. Now *Alhama*.

ARTILLERY, in its general sense, denotes the offensive apparatus of war, particularly of the missile kind. Among the French the term was anciently appropriated to ARCHERY. In its modern acceptation it signifies fire-arms, mounted on their carriages and ready for action, with their balls, their bombs, their grenades, &c.

If we take the term in a more extensive meaning, it includes the powder, the matches, instruments for fire-works, the utensils of ordnance, the machines which facilitate their motion and transport them, the vehicles over which they traverse rivers, every thing necessary to them, and all that enters into the form of a train of artillery.

The same word, still farther extended in its meaning, likewise comprehends the men destined for the service of the *artillery;* the people who provide the artillery with materials and implements when engaged, the cannoniers, the bombardiers, the officers of every rank, and engineers of every kind.

By *artillery* is likewise understood the science which the officers of artillery ought to possess. This science teaches to know the nature of all the materials and ingredients which enter into the composition and the structure of every thing relative to the artillery, such as nitre, sulphur, charcoal; the properties of air and fire; the composition and preparation of gunpowder; the materials for fire-works; the construction, proportions, &c. of the different warlike machines; the arrangement, movement, and whole management, of cannon, &c. in the field or in sieges, in such manner, that each of them, according to the length of its tube and the diameter of its bore, may be situated in the best place and at the properest distance for execution, and that the whole train taken together may reciprocally assist and support each other with the greatest advantage. Artillery.

Artillery has undergone many changes from its origin to the present time. The artillery of the ancients were the catapulta, the balistæ, the different kinds of slings, &c. In latter ages, the Franks used the hatchet as a missile weapon, throwing it in the same manner as the Americans do theirs called the *tomahawk*. The Gascons and Genoese were excellent cross-bow men. The Swiss owed their victories to their strength and skill in the use of the pike, halberd, and espadon or two-handed sword; and the victories of Cressy, Poictiers, and Agincourt, will occasion the valour and skill of the English archers to be transmitted down to latest posterity. See ARCHERY.

The chevalier Folard was extremely attached to the ancient machines first mentioned, and seemed even to prefer them to our fire-arms; an opinion which must appear not a little extraordinary from such a person. Father Daniel might well be mistaken in the comparison which he made between the effects of ancient and modern artillery, and in his conclusion that the latter was of little use: the situation of this good father removed him from the scenes of war and the opportunities of military experience. But it is astonishing, that one so learned in the military art as the commentator of Polybius, who had ocular demonstration of the success of modern artillery, should have declared so violently against it. Whatever be the case with these authors and their maxims, it may be asserted that cannon is one of the most singular discoveries which have been made amongst men; and by little and little it has changed the whole art of war, and of consequence influenced the whole system of policy in Europe. The era of artillery is dated from the battle of Cressy in 1346, because it is only from that day that cannon were mentioned in battle. Edward III. of England successfully employed some pieces of artillery placed in the front of his army. The invention of artillery was then known in France as well as in England; but probably Philip VI. marched with so much hurry and precipitation to attack his enemy, that he left his cannon as useless encumbrances behind him. The ignorance of that age in mechanical arts considerably retarded the progress of artillery; and that of which they were then possessed was so unwieldy and imperfect, that they could not possibly discern its importance and efficacy in practice.

After the invention of gunpowder, the Spaniards were the first who armed part of their foot with muskets and harquebusses, and mixed them with the pikes. In this they were soon imitated by most other nations; though the English had not entirely laid aside their favourite weapon the long bow, and generally taken to the

Artillery. the use of fire-arms, during the reign of Queen Elizabeth.

The first muskets were very heavy, and could not be fired without a rest: they had matchlocks, and barrels of a wide bore, that carried a large ball and charge of powder, and did execution at a great distance. The musketeers on a march carried only their rests and ammunition; and had boys to bear their muskets after them, for which they were allowed great additional pay. They were very slow in loading, not only by reason of the unwieldiness of the pieces, and because they carried the powder and balls separate, but from the time it took to prepare and adjust the match; so that their fire was not near so brisk as ours is now. Afterwards a lighter kind of matchlock musket came into use; and they carried their ammunition in bandeliers, which were broad belts that came over the shoulder, to which were hung several little cases of wood covered with leather, each containing a charge of powder: the balls they carried loose in a pouch, and they had also a priming horn hanging by their side. Matchlocks were, about the beginning of this century, universally disused in Europe, and the troops were armed with firelocks; to which, much about the same time, the bayonet being added, pikes also were laid aside; which latter change, whether it was for the better or not, is a point that still admits of dispute among the best military writers, who are divided in their opinions about it, though most of them disapprove of it.

The old English writers call those large muskets *calivers;* the harquebus was a lighter piece that could be fired without a rest. The matchlock was fired by a match, fixed by a kind of tongs in the serpentine or cock, which by pulling the trigger was brought down with great quickness upon the priming in the pan, over which there was a sliding cover, which was drawn back by hand, just at the time of firing. There was a great deal of nicety and care required to fit the match properly to the cock, so as to come down exactly true on the priming, to blow the ashes from the coal, and to guard the pan from the sparks that fell from it: a great deal of time was also lost in taking it out of the cock, and returning it between the fingers of the left hand, every time that the piece was fired; and wet weather often rendered the matches useless. However, most writers allow that they were very sure, and less apt to miss fire than the firelock.

The firelock is so called, from producing fire of itself, by the action of the flint and steel. The most ancient invention of this sort is the wheel lock, which we find mentioned in Luigi Collado's Treatise of Artillery, printed at Venice, 1586, as then lately invented in Germany. This sort of lock was used till within these hundred years, especially for pistols and carabines. It was composed of a solid steel wheel, with an axis, to which was fastened a chain, which, by being wound round it, drew up a very strong spring: on pulling the trigger, the spring acting, whirled the wheel about with great velocity, and the friction of the edge of it (which was a little notched) against the stone produced the fire; the cock was made so as to bring the stone upon the edge of the wheel, part of which was in the pan, and touched the priming; they used any common hard pebble for that purpose, which served as well as flint.

These locks were inconvenient, took time to wind up (or span, as they termed it), and sometimes would not go off; an instance of which may be seen in Ludlow's Memoirs. Artillery.

When the firelock, such as we now use, was invented, we cannot ascertain; it is called by writers of about the middle of the last century, a *snaphane* or *snaphance*, which being the Dutch word for a *firelock*, seems to indicate that it is a Dutch invention, and that we took it from them. But Ward, in his Animadversions of War, printed in 1639, p. 502, after describing the exercise of the firelock, pistol, and carabine (by which he means the wheel-lock), says, that as most of our pieces go with English locks, which differ from firelocks, he shall add the method of handling them; and then gives the exercise of the snaphine carabine; by which it appears, that there was little or no difference between that and the pieces now in use. The more modern writers call it a *fusee* from the French word *fusil;* whence the name of fusileers is still continued to several of our regiments, which were the first that were armed with them on the disuse of matchlocks.

They used the musket and rest in England so late as the beginning of the civil wars, as may be seen in Col. Bariffe's Young Artillery Man, printed at London, 1643.

Figuera, in his embassy in 1518, relates, that the Persians would neither make use of infantry nor of artillery, because by them the impetuosity of attack and the facility of retreat were equally encumbered and retarded: in these expedients alone their address and their glory consisted. This method of advancing and recalling is widely different from the present conduct of war, as the artillery in armies is now prodigiously multiplied, and must be transported to every place where any body of troops whatever is destined to operate.

The length and diameter of cannon has been much diminished, which must likewise proportionably diminish their weight. It is by long practice and experience that they have discovered how much might be deduced from their magnitude in both these respects with propriety, without hurting the grand effects which, on some occasions, it is necessary they should produce, by rendering them more easy to be wielded, which was the advantage pursued by lessening their size. See further the articles CANNON, GUNNERY, and PROJECTILES.

Improvements, however, are still making, and will probably long continue to be made, in these ignivomous machines that mock the thunder, which, though they seem to be invented for the destruction of the human race and the subversion of empires, have yet by their effects rendered war less savage and less sanguinary; political alliances have been more successfully conciliated among all nations, conquests are become less frequent and less rapid, and successes in war have been more easily reduced to calculation.

The change introduced in the military art by the modern artillery, Dr Smith observes, has enhanced greatly both the expence of exercising and disciplining any particular number of soldiers in time of peace, and that of employing them in time of war. Both their arms and their ammunition are become more expensive. A musket is a more expensive machine than a javelin *Wealth of Nations*, vol. iii. p. 70.

or

Artillery. or a bow and arrows; a cannon or a mortar, than a balista or a catapulta. The powder which is spent in a modern review is lost irrecoverably, and occasions a very considerable expence. The javelins and arrows which were thrown or shot in an ancient one, could easily be lifted up again, and were besides of very little value. The cannon and the mortar are not only much dearer, but much heavier machines than the balista or catapulta, and require a greater expence, not only to prepare them for the field but to carry them to it. As the superiority of the modern artillery too over that of the ancients is very great, it has become much more difficult, and consequently much more expensive, to fortify a town so as to resist even for a few weeks the attack of that superior artillery.

In modern war the great expence of fire arms gives an evident advantage to the nation which can best afford that expence; and consequently, to an opulent and civilized, over a poor and barbarous nation. In ancient times, the opulent and civilized found it difficult to defend themselves against the poor and barbarous nations. In modern times the poor and barbarous find it difficult to defend themselves against the opulent and civilized. The invention of fire arms, an invention which at first sight appears to be so pernicious, is certainly favourable both to the permanency and to the extension of civilization.

It has to many appeared matter of surprise, that the battles of the ancients should be described with an order, perspicuity, and circumstantial minuteness, which are not to be found in the military writers of modern times. Scholars have endeavoured to explain this difference by observing the immense disproportion, in point of dignity and abilities, between the military historians of modern Europe and those of Greece and Rome. But the difficulty will be better solved, Dr Gillies thinks, by reflecting on the changes introduced into the art of war by the change of artillery; which, in military operations, form the pivot on which the whole turns. 1. From the nature of fire arms, modern battles are involved in smoke and confusion. 2. From the same cause, modern armies occupy a much greater extent of ground, and begin to act at much greater distances: which renders it more difficult to observe and ascertain their manœuvres. 3. The immense train of artillery, ammunition, &c. required in the practice of modern war, gives a certain immobility to our armies, which renders it impossible to perform, without great danger, those rapid evolutions in sight of an enemy, which so often decided the battles of the ancients. With us, almost every thing depends on the judicious choice of ground, a matter requiring great military genius, but not admitting the embellishments of historical description.

In the battles of the Greeks and Romans, the extraordinary disproportion between the numbers slain on the side of the victors and the vanquished has been observed as another remarkable circumstance. But this necessarily resulted from the nature of their arms. Their principal weapons being not missile, but manual, armies could not begin to act till they had approached so near to each other, that the conquered found themselves cut off from all possibility of retreat. In modern times, such consequences seldom take place. The use of fire arms (which often render the action itself more bloody), furnishes the defeated party with various means of retreating with considerable safety. The sphere of military action is so widely extended in modern times, that before the victors can run over the space which separates them from the vanquished, the latter may fall back, and proceed with little loss beyond their reach; and should any village, hedge, ravine, &c. be found in their way, may often check the ardour of their pursuers. Upon these considerations, the invention of gunpowder and modern artillery may be said to have saved the effusion of human blood. Equestrian engagements (since the principles on which cavalry act remain nearly the same in every age) are still distinguished by similar circumstances to those which appear so extraordinary in the battles of antiquity. Artillery, Artist.

Artillery Park, the place in the rear of both lines of an army, for encamping the artillery, which is drawn up in lines, of which one is formed by the guns; the ammunition waggons make two or three lines, 60 paces behind the guns, and 30 distant from one another; the pontoons and tumbrils make the last line. The whole is surrounded with a rope which forms the park: the gunners and matrosses encamp on the flanks; and the bombardiers, pontoon men, and artificers, in the rear.

Artillery Train, a certain number of pieces of ordnance, mounted on carriages, with all their furniture fit for marching.

Artillery Company, a band of infantry, consisting of 600 men, making part of the militia or city guard of London.

ARTIST, in a general sense, a person skilled in some art. Mr Harris defines an artist to be, "A person possessing an habitual power of becoming the cause of some effect, according to a system of various and well-approved precepts." See Art.

We are told * of a privilege granted at Vicenza to artists, like that of *clergy* in England; in virtue thereof criminals adjudged to death save their lives if they can prove themselves the most excellent and consummate workmen in any useful art. This benefit is allowed them *in favorem artis*, for the first offence, except in some particular crimes, of which coining is one; for here the greater the artist, the more dangerous the person.

* *Evel. Discourse of Medals*, p. 237, &c.

Artist (*Artista*), in an academical sense, denotes a philosopher or proficient in the faculty of arts.

In the early ages of universities, the seven liberal arts completed the whole course of study, or philosophy, as it is called: whence the masters of this faculty were denominated *artists*. What they understood by the liberal arts used to be summed up in the following Latin verse.

Lingua, Tropus, Ratio, Numerus, Tonus, Angulus, Astra.

Artist is more peculiarly used, by Paracelsus and other adepts, for a chemist or alchemist. We find frequent mention, in authors of this class, of Elias Artista, or Elias the artist, who is to come some time before the dissolution of the world, and restore and make perfect all arts and sciences, but especially the gold-making art; and usher in a truly golden age, or millennium. The lower and meaner things in this sublime art, Paracelsus observes, God has permitted to be already discovered; but for the greater and more important

Artist || Aruba.

portant matters, as the transmutation of other metals into gold, they are reserved to the coming of Elias the artist.

ARTOBRIGA, a town of Vindelicia (Ptolemy): Now *Altzburg*, in Bavaria, on the Danube, below Ingoldstadt (Aventinus): but Cluverius supposes it to be *Lebanau*, on the Saltzbach, below Lauffen, in the archbishopric of Saltzburg.

ARTOCARPUS, the BREAD-FRUIT TREE. See BOTANY *Index*.

ARTOIS, a late province of France, and one of the finest and most fertile in the whole kingdom. Formerly it was one of the 17 provinces of the Netherlands, but now belongs entirely to France, and is included in the department of the Straits of Calais. The names of *Artois*, and *Arras* its capital, are derived from the Atrebates, a people of Gallia Belgica, mentioned by Julius Cæsar. Its greatest length from north to south is about 24 leagues, and its breadth about 12, being bounded to the south and west by Picardy, to the east by Hainault, and to the north by Flanders. A considerable trade is carried on in the province in grain, flax, hops, wool, and linen cloth. The most considerable places in Artois are, Arras the capital, Bapanme, Bethune, St Venant, and St Omer.

ARTOLICA, in *Ancient Geography*, a town of the Salassii in Gallia Cispadana, at the foot of the Alps: now called *la Tuile* by the inhabitants, a hamlet of Savoy, in the duchy of Aoust, at the foot of Mount St Bernard the Less.

ARTOTYRITES, a Christian sect, in the primitive church, who celebrated the eucharist with bread and cheese, saying, that the first oblations of men were not only of the fruits of the earth, but of their flocks. The word is derived from αρτος, *bread*, and τυρος, *cheese*.

The Artotyrites admitted women to the priesthood and episcopacy; and Epiphanius tells us, it was a common thing to see seven girls at once enter into their church, robbed in white, and holding a torch in their hand; where they wept and bewailed the wretchedness of human nature, and the miseries of this life.

ARAU, in *Ancient Geography*, a town of Bætica, in the jurisdiction of the Conventus Hispalensis: now *Alclea*, a citadel of Andalusia, on the Bætis or Guadalquiver, seven leagues above Seville.

ARVALES FRATRES, in Roman antiquity, a college of 12 priests, instituted by Romulus, and chosen out of the most noble families, himself being one of that body: they assisted in the sacrifices of the ambervalia annually offered to Ceres and Bacchus, for the prosperity of the fruits of the earth; when they wore on their heads crowns made of ears of corn. The original of this institution was as follows: Acca Laurentia, Romulus's nurse, was accustomed once a-year to make a solemn sacrifice for a blessing on the fields, her 12 sons always assisting her in the solemnity; but at last losing one of her sons, Romulus offered himself to supply his place, and gave this small society the name of *Arvales fratres*. This order was in great repute at Rome: they held the dignity for life, and never lost it upon account of imprisonment, banishment, or any other accident.

ARUBA, a small uninhabited island on the coast of Terra Firma, and situated in W. Long. 70. 20. N. Lat. 12. 30.

Aruba || Arundel.

ARUCI, in *Ancient Geography*, a town of the Celtici, in the north of Lusitania, (Antonine, Inscription), called also *Aruci Novum*, to distinguish it from the following: Now supposed to be *Moura*, a small city of Portugal, near the confluence of the Ardila and Guadalquiver.

Aruci Vetus, in *Ancient Geography*, a small city of the Turdetani, in Bætica, (Ptolemy); now *Aroche*, a hamlet of Andalusia, on the confines of Portugal and Estremadura, on the river Gama, seven leagues to the east of Aruci Novum or Moura. From it a mountain, in its neighbourhood, takes the name *Arucitanus*. Now *la Sierra de Aroche*.

ARUCIA, in *Ancient Geography*, a town of Illyria, in the inland parts of Liburnia, (Ptolemy). Now *Bregna*, according to some; but *Ottoschatz*, according to others, a citadel of Morlachia.

ARVERNI, an appellation early used for the capital of the Arverni, according to the custom of the latter ages of naming towns from the people; it was formerly called *Nemossus*, (Strabo). The *Arverni*, a brave and ancient people, and one of the most powerful nations of Gaul, claimed affinity with the Romans, as descendants from Antenor, (Lucan): and after their conquest by the Romans, their ancient liberty was preserved to them on account of their bravery, (Pliny). Above 1000 years ago the town was called *Clarus Mons*, from its situation, (Valesius). Now *Clermont*, in Auvergne. E. Long. 3. 20. N. Lat. 45. 42.

ARVIL SUPPER, a feast or entertainment made at funerals, in the north part of England. Arvil bread is the bread delivered to the poor at funeral solemnities; and *arvil*, *arval*, *arfal*, are used for the burial or funeral rites; as,

> Come, bring my jerkin, Tibb, I'll to the *arvil;*
> Yon man's dea scuy seoun, it makes me marvil.
> *Yorksh. Dial.* p. 58.

ARVIRAGUS, an ancient British king who flourished in the time of the emperor Domitian. He gained a complete victory over Claudius: but being soon after besieged in the city of Winchester, he made a treaty with the Romans, and married the emperor's daughter Genuissa. This monarch lived to a good old age: he confirmed the ancient laws, enacted new ones, and liberally rewarded persons of merit.

ARUM, WAKEROBIN, or CUCKOW-PINT. See BOTANY *Index*.

ARUNDA, a town of Hispania Bætica, on the Anas or Guadiana, (Ptolemy, Pliny): Now said to be *Ronda*, in the province of Granada, on the confines of Andalusia. W. Long. 5. 40. N. Lat. 36. 26.

ARUNDEL, THOMAS, archbishop of Canterbury in the reigns of Richard II. Henry IV. and Henry V. was the second son of Robert earl of Arundel and Warren, and brother of Richard earl of Arundel, who was beheaded. At 22 years of age, from being archdeacon of Taunton he was raised to the bishopric of Ely, the 6th of April 1375, in the reign of Edward III. He was a great benefactor to the church and palace of this see; among other donations he gave a curious table of massy gold, adorned with precious

Arundel. stones, which had been given to Prince Edward by the king of Spain, and sold by the latter to Bishop Arundel. In 1386, he was appointed lord chancellor of England; two years after, he was translated to the see of York; and, in 1396, was advanced to the archiepiscopal see of Canterbury, when he resigned the chancellorship. This was the first instance of the translation of an archbishop of York to the see of Canterbury. Scarcely was he fixed in this see, when he had a contest with the university of Oxford about the right of visitation. The affair was referred to King Richard, who determined it in favour of the archbishop. At his visitation in London, he revived an old constitution, by which the inhabitants of the respective parishes were obliged to pay to their rector one halfpenny in the pound out of the rent of their houses. In the second year of his translation, a parliament being held at London, the commons with the king's leave impeached the archbishop, together with his brother the earl of Arundel, and the duke of Gloucester, of high treason. The archbishop was sentenced to be banished, and within forty days to depart the kingdom on pain of death. He retired first to France; and then to the court of Rome, where Pope Boniface IX. gave him a kind reception. About this time the duke of Lancaster (afterwards Henry IV.) was in France, having been banished by King Richard. The nobility and others, tired with the oppressions of Richard, solicited the duke to take the crown. This their request they drew up in a letter, and sent it over by faithful messengers to Archbishop Arundel, desiring him to be their advocate on this occasion with the duke. The archbishop being a fellow sufferer, gladly accepted the office; and went with the messengers to the duke at Paris, where they delivered the letters from the nobles and commons of England, and the archbishop seconded them with the best arguments he could invent. The inviting offer, after some objections which were easily obviated, the duke accepted; and upon his accession to the throne, Arundel, who had returned with him to England, was restored to his see. In the first year of this prince's reign, Arundel summoned a synod which sat at St Paul's. The next year the commons moved that the revenues of the church might be applied to the service of the public; but Arundel opposed the motion with such vigour, that it was thrown aside. In the year 1408, Arundel began to exert himself against the Lollards, or Wickliffites; and his zeal for suppressing that sect carried him to several unjustifiable severities against the heads of it, particularly against Sir John Oldcastle and Lord Cobham. He also procured a synodical constitution, which forbade the translation of the Scriptures into the vulgar tongue. This prelate died at Canterbury, Feb. 20. 1413, of an inflammation in his throat, with which he was seized (as is pretended) whilst he was pronouncing sentence upon Lord Cobham. The Lollards asserted this to be a judgment from God; and indeed Bishop Goodwin speaks in the same manner, saying, "He who had withheld from the people the word of God, the food of the soul, by the just judgement of God had his throat so closed, that he could not speak a single word, nor swallow meat or drink, and was so starved to death." He was buried in the cathedral church of Canterbury, near the west end, under a monument erected by himself in his lifetime. To this church he was a considerable benefactor; for he built the lantern-tower and great part of the nave: gave a ring of five bells, called from him *Arundel's ring*, several rich vestments, a mitre enchased with jewels, a silver gilt crosier, and two golden chalices. Arundel, Arundelian.

ARUNDEL, a borough and market town in Sussex, seated on the north-west side of the river Arun, over which there is a bridge. It has a harbour, capable of receiving ships of 200 tons, and the navigation is continued to the Thames by a canal. The river abounds in mullet of a very fine quality. The castle, which gives the title of earl to its possessors, is seated on the east of the Tame, and is reputed to be a mile in compass. It sends two members to parliament; and is 55 miles south-west-by-south of London, and ten miles east of Chichester. Arundel is the premier earldom in England, belonging to the illustrious family of Norfolk; and is the only title in England that goes along with the lands. W. Long. 0. 25. N. Lat. 50. 45. Population 2700 in 1811.

ARUNDEL Oil, in the *Materia Medica*. At Bombay, Gombroon, and Surat, in the East Indies, there grows a tree which bears a nut enclosed in a rough husk, which resembles much the horse chesnut; and the kernel of the nut yields an oil by expression, which is of a purgative nature. A tea-spoonful of it is reckoned a dose. The tree goes by the name of the *arundel tree* at Bombay, and its oil by that of the *arundel oil*. Mr Sinclair, one of the surgeons belonging to the royal regiment of artillery, who was formerly surgeon to an East India ship, gave Dr Monro of London a small bottle full of this oil, which he said was much used for the cure of the dysentery in India, and that he had given it in four recent cases of dysentery with succes. Dr Monro thinks it probable that this is the oil of the purging nuts mentioned in Dale's Pharmacologia, which are got from the tree called *lignum moluccense, pavana dictum, fructu avellanæ*, J. B. 1. 342; and *pinus Indica, nucleo purgante*, C. B. 492; and the *palma Christi Indica*, Tournefort Mat. Med.

ARUNDELIAN MARBLES, OXFORD MARBLES, or PARIAN CHRONICLE, are ancient stones (as has been supposed), whereon is inscribed a chronicle of the city of Athens, engraven in capital letters in the island of Paros, one of the Cyclades, 264 years before Jesus Christ. They take their first name from Thomas earl of Arundel, who procured them out of the East, or from Henry his grandson, who presented them to the university of Oxford.

The Arundelian marbles, in their perfect state, contained a chronological detail of the principal events of Greece during a period of 1318 years, beginning with Cecrops, before Christ 1582 years, and ending with the archonship of Diognetus, before Christ 264. But the chronicle of the last 90 years is lost; so that the part now remaining ends at the archonship of Diotimus, 354 years before the birth of Christ; and in this fragment the inscription is at present so much corroded and effaced, that the sense can only be discovered by very learned and industrious antiquaries; or, more properly speaking, supplied by their conjectures.

This chronicle, and many other relicks of antiquity, real or pretended, were purchased in Asia Minor, in Greece, or in the islands of the Archipelago, by Mr William Petty, who in the year 1624 was sent by Thomas

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Thomas earl of Arundel for the purpose of making such collections for him in the east. They were brought into England about the beginning of the year 1629, and placed in the gardens belonging to Arundel house in London.

Soon after their arrival they excited a general curiosity, and were viewed by many inquisitive and learned men; among others by Sir Robert Cotton, who prevailed upon Selden to employ his abilities in explaining the Greek inscriptions. Selden and two of his friends, Patrick Young, or, as he styled himself in Latin, *Patricius Junius*, and Richard James, immediately commenced their operations, by cleaning and examining the marble containing the Smyrnean and Magnesian league, and afterwards proceeded to the Parian chronicle. The following year Selden published a small volume in quarto, including about 39 inscriptions copied from the marbles.

In the turbulent reign of Charles I. and the subsequent usurpation, Arundel house was often deserted by the illustrious owners; and, in their absence, some of the marbles were defaced and broken, and others either stolen or used for the ordinary purposes of architecture. The chronological marble, in particular, was unfortunately broken and defaced. The upper part, containing 31 epochas, is said to have been worked up in repairing a chimney in Arundel house.

In the year 1667, the Hon. Henry Howard, afterwards duke of Norfolk, the grandson of the first collector, presented these supposed remains of antiquity to the university of Oxford.

Selden's work becoming very scarce, Bishop Fell engaged Mr Prideaux to publish a new edition of the inscriptions, which was printed at Oxford in 1676. In 1732 Mr Maittaire obliged the public with a more comprehensive view of the marbles than either of his predecessors. Lastly, Dr Chandler published a new and improved copy of the marbles in 1763, in which he corrected the mistakes of the former editors; and in some of the inscriptions, particularly that of the Parian chronicle, supplied the *lacunæ* by many ingenious conjectures.

The Arundelian marbles have generally been regarded as a curious monument of antiquity. They were, however, discovered in some instances to be inconsistent with the most authentic historical accounts; Sir Isaac Newton and several other modern philosophers paid little or no regard to them; and of late their absolute authenticity has been severely questioned in an express dissertation upon the subject, entitled *The Parian Chronicle*. In this dissertation much ingenuity as well as judgment, and a great extent of ancient learning, are displayed. His doubts, the author observes, arise from the following considerations.

I. "The characters have no certain or unequivocal marks of antiquity." The Π and Σ, which frequently occur in the form supposed to be the most ancient (viz. the perpendicular line of the Π on the right hand only half as long as that on the left, and the Σ in the form of a prostrate Ξ), are so well known, that any modern fabricator of a Greek inscription, which he intends to impose upon the world as a relick of antiquity, would most probably use them in preference to the more common and ordinary forms. But the letters in the Parian chronicle have no appearance of antiquity except this very equivocal one. They do not in the least resemble the Sigean, the Nemean, or the Delian inscriptions, which are supposed to be of a more ancient date. They differ in many respects from the letters on the Marmor Sandvicense, which, according to the learned editor of that inscription, was engraved in the year before Christ 374. They bear no sort of resemblance to the characters on the Farnesian pillars, to those of the Alexandrian manuscript, or others of a later date. They seem, continues our author, to resemble perhaps more than any other the letters of the alphabet taken by Montfaucon from the Marmor Cyzicenum at Venice. They are plain and simple in their form, and such as an ordinary stonecutter of the present age would probably make, if he were employed to engrave a Greek inscription according to the alphabet now in use. The small letters intermixed among the larger have, in the opinion of our author, an air of affectation and artifice, rather than genuine antiquity; and he is persuaded, that the antiquity of an inscription can never be proved by the mere form of the letters, because the most ancient characters may be as easily counterfeited as those which compose our present alphabets.

That the learned reader may form a competent idea of the characters in the Parian chronicle, the author has compared them with those of other inscriptions, and given what is usually termed a *fac simile*.

In regard to several *archaisms*, as they are called, in this chronicle, and which our author specifies, he contends, that no conclusion can be drawn from them in favour of its antiquity. What reason could there be, he asks, for introducing these into the Parian chronicle? We do not usually find them in Greek writers of the same age, or even in those of the most early date. The reign of Ptolemy Philadelphus, with the 21st year of which the date of the chronicle coincides, was not an age of rude antiquity with respect to the Greek language; being only 130 years after the time of Xenophon and Plato, when the Greek was spoken and written in its utmost purity and elegance: and we can scarcely suppose, that even a stonecutter, in that refined age, would have been permitted to disgrace a superb and learned monument with such barbarisms as occur in the chronicle. The archaisms, however, he remarks, are not uniformly observed in this inscription. He adduces six instances of deviation; and adds, he is almost tempted to suspect, that εμ Παρω, εμ Μαραθωνι, and other pretended archaisms, are owing to a mere affectation of antiquity, or to a corrupted dialect and pronunciation in later ages. Those archaisms, our author acknowledges, appear on other marbles: but he thinks, that, for that very reason, they would naturally be adopted by the fabricator of a supposititious inscription; and the authenticity of those inscriptions in which they appear must be established before they can be urged in opposition to the present argument.

II. "It is not probable that the chronicle was engraved for *private use*."—Our author thinks it an impossible supposition that such an expensive and cumbersome work could have been executed by a private citizen, either for his own amusement, or for the benefit of his fellow citizens. In the first place, a long inscription could not be engraved in marble without such an expence as few learned Greeks were able to afford. Or,

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Or, if its author, by an uncommon felicity, was able to erect such a literary monument, the scheme would have been useless and imprudent; as all the contents of the inscription might have been published more commodiously and effectually by the common mode of writing in use at that time.

A variety of arguments is adduced, illustrating the superiority of a manuscrpt to such an inscription as the chronicle, in a number of respects; and enforcing the improbability of its having ever been executed, either for public or private use. Much evidence from ancient history is likewise produced in support of the assertion, that the common mode of writing, in the reign of Ptolemy Philadelphus, was not on stones. It is not, however, necessary to prove, by the testimony of ancient authors, that books were written on parchment, or paper made of the Egyptian papyrus, or any such materials, before the date of the Parian chronicle. This is sufficiently evinced by the very existence of the writings of Moses, David, Solomon, and the Jewish prophets; the works of Homer, Hesiod, Anacreon, Pindar, Æschylus, Sophocles, Euripides, Herodotus, Hippocrates, Aristophanes, Thucydides, Xenophon, Plato, Demosthenes, Aristotle, &c.: And it is still more incontestably proved by the libraries which were collected in preceding ages, or about that time; such as those of Polycrates in Samos, Pisistratus and Euclides at Athens, Nicocrates in Cyprus, Euripides the poet, Aristotle the philosopher, Clearchus at Heraclea Pontica, and the most extensive and magnificent library of Ptolemy Philadelphus in Egypt, founded in or before the year 284, which in his time is said to have contained 100,000 volumes, and to have been enlarged by his successors to the amount of almost 600,000. Not long afterwards a library was founded at Pergamus by Attalus and Eumenes, which, according to Plutarch, contained 200,000. These are clear and decisive proofs that the common mode of writing in the time of Ptolemy Philadelphus was not on stones.

III. "The chronicle does not appear to have been engraved by *public authority*."

1. The first argument in support of this opinion is, that inscriptions of that kind usually begin with a particular form, as, Η ΒΟΥΛΗ ΚΑΙ Ο ΔΗΜΟΣ. 'The senate and the people;' or thus, ΕΔΟΞΕΝ ΤΗΙ ΒΟΥΛΗΙ ΚΑΙ ΤΟΙ ΔΗΜΩΙ, 'It pleased the senate and the people, &c.' But the Parian chronicle begins in the manner of a private man, speaking of his own performance in the first person singular. This argument, our author remarks, cannot be much affected by observing, that the beginning of the inscription is obliterated; for it is necessarily implied by the words now remaining.

2. The facts and dates which are mentioned in this chronicle, do not appear to have been extracted from any public records, or calculated to answer the purpose of authentic documents; as many eminent princes and magistrates are passed over without notice; in several instances, the transactions of whole centuries are omitted; and the facts, chiefly specified, are not matters of general or national importance.

3. The Parian inscription is such a one as we can hardly suppose the magistrates or the people of Paros would have ordered to be engraved. Stately sepulchres, pillars, triumphal arches, and the like, were erected to perpetuate the glory of eminent men. The remembrance of events in which nations were interested, the succession of princes, &c. were preserved in the same manner. Leagues, decrees, and laws, were likewise engraved on marble or brass, and fixed to a pillar, the walls of a temple, or other public buildings; because such inscriptions were designed for the inspection of the people, as they essentially concerned their conduct, their property, their liberty, or their lives. But, our author asks, for whom could the chronicle of Paros be intended? It contains no encomiums of any of the patriots, the heroes, or the demigods of the country, no decrees of the magistrates, no public records, no laws of state. On the contrary, it is a work of mere speculation and learning, in which the inhabitants of that island, especially the common people, had not the least interest or concern.

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These words at the beginning, αρχοντος εμ Παρῳ, would naturally lead us to suppose, that the inscription related to Paros. And, if so, it would have been natural for the author to have mentioned some of the most important occurrences in the history of that island. But, says this acute and learned critic, what scheme does our chronologer pursue on this occasion? Does he record the events and revolutions of his own country? Does he mention any of the battles, sieges, and treaties of the Parians? any of their public institutions? any of their poets, patriots, or warriors? Does he mention Archilochus, who was honoured by his countrymen, and distinguished as a poet in a general assembly of the Greeks? Not a syllable on any of these subjects! On the contrary, he rambles from place to place, and records the transactions of Athens, Corinth, Macedon, Lydia, Crete, Cyprus, Sicily, Persia, and other foreign countries with which Paros had no connexion.

In this view the inscription seems to have been as impertinent in the island of Paros, as a marble monument would be in this country, recording the antiquities of France or Spain; or one in Jamaica recording the revolutions of England. But upon supposition that the inscription is a forgery, it is easy to account for this extraordinary circumstance. A few chronological occurrences in the ancient history of Paros would not have been so interesting to the generality of readers, or so valuable in the estimation of every lover of antiquities, or, in short, so profitable to the compiler, as a general system of Grecian chronology.

IV. "The Greek and Roman writers, for a long time after the date of this work, complain that they had no chronological account of the affairs of ancient Greece." This position is confirmed by the testimony of Julius Africanus, Justin Martyr, Plutarch, Josephus, Varro, Diodorus Siculus, and others; and the following series of interrogatories is subjoined: "Thucydides, I know, lived 140 years before the chronicle is said to have been written; but if Thucydides, as well as other writers, complained that there was nothing but uncertainty in the earlier period of Grecian history, from whence can we suppose the author of this inscription collected such a clear, determinate, and comprehensive system of chronology? If he had any sources of information, which were unknown to succeeding writers, how happens it, that they should all of them overlook this most considerable, most exact, most creditable author?

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thor? Why did they omit this ancient account of their early ages? Why did they not copy his most memorable epochas? Why did they not produce his authority? or, at least, why did they not mention his opinion? Surely nothing, to all appearance, could be more elaborate, more important, or of higher authority, than a chronological table, which was thought worthy of being engraved on marble.

V. "The chronicle is not once mentioned by any writers of antiquity." This, indeed, appears a strong argument against its authenticity. Apollodorus, an Athenian, the disciple of Aristarchus the grammarian, and Panætius the philosopher, wrote a genealogical and historical work on the early ages of Greece; but, though composed 120 years after the date of the Parian chronicle, it does not contain the smallest traces of a systematical chronology. It is remarkable, too, that the chronicle of Apollodorus is quoted by Diodorus Siculus, Strabo, Plutarch, A. Gellius, Lucian, and many other writers of antiquity; while the Parian chronicle, which comprehends a more extensive period, is entirely unnoticed. It contains, however, such wonderful discoveries in ancient history, that if it had existed 264 years before the Christian era, it must have excited a general attention, and been referred to as an authority by writers of succeeding times. But we do not find, in any author of antiquity, either poet or historian, geographer or chronologer, mythologist or scholiast, the most distant allusion to the Parian chronicle; though it was such a common practice among the ancients to mention the works of their predecessors, that in many books we find references and allusions to three, four, five, six, or seven hundred different authors of every denomination.

VI. "Some of the facts mentioned in the chronicle seem to have been taken from writers of a later date." Our inquirer collates several passages in the Parian chronicle with parallel passages in Greek authors, to evince that there is, in the former, an appearance of imitation, or a stronger resemblance than such as may be supposed to arise from accident; that there are likewise some improbabilities attending the account of Deucalion, as related in the Parian chronicle; and that the names of six, and, if the lacunæ are properly supplied, the names of 12 cities appear to have been engraved on the marble, exactly as we find them in Ælian's Various History. But there is not, our author observes, any imaginable reason for this particular arrangement. It does not correspond with the time of their foundation, with their situation in Ionia, with their relative importance, or with the order in which they are placed by other eminent historians. The argument by which our author endeavours to prove that the Parian chronicle has, in this instance, copied Ælian's Various History, seems decisive of the fact. He observes, that six names may be transposed 720 different ways; and that 12 names admit of 479,001,600 different transpositions. Supposing, then, that there is no particular reason for one arrangement rather than another, it will follow, that the chance of two authors, placing them in the same order, is, in the former case, as 1 to 720; and in the latter, as 1 to 479,001,600. It is therefore, says he, utterly improbable, that these names should have been placed in this order on the marble, if the author of the inscription had not transcribed them from the historian. Arundelian.

It may indeed be urged, with regard to this similarity of arrangement in the Parian chronicle and Ælian's Various History, that the inference might be the very inverse of that which is specified by our author. But that Ælian should have seen the Parian chronicle, without once mentioning it; or that he should have exactly copied a list of towns, arranged neither according to chronological or topographical order, is indeed a supposition equally improbable with the other.

VII. "Parachronisms appear in some of the epochas, which we can scarcely suppose a Greek chronologer in the 129th Olympiad would be liable to commit." After specifying these, our inquirer asks, Would a writer of reputation and learning, in one of the most polished and enlightened eras of ancient Greece, commit such mistakes, in opposition to the positive attestations of the most accurate historians, in events of public notoriety? Would a private citizen, or a magistrate of Paros, order a crude and inaccurate series of epochas to be engraved at a great expence, and transmitted to posterity on a marble monument? It is hardly probable.

VIII. "The history of the discovery of the Parian chronicle is obscure and unsatisfactory." Our author observes, that it is attended with some suspicious circumstances, and without any of those clear and unequivocal evidences which always discriminate truth from falsehood. There are no data in the inscription by which to discover the place where the marble was erected. The place likewise where it was found is not ascertained; though the generality of writers who have had occasion to mention it have supposed that it was found in the island of Paros. If it was erected at Smyrna, as some imagine, our author asks for what purpose does the writer mention Astyanax the archon of Paros, and not one circumstance relative to Smyrna? If, adds he, it was erected at Paros, why does he not mention more archons of that city than one? or how shall we account for his profound silence with respect to all the events and revolutions which must have happened in that island, and have been infinitely more interesting to the natives than the transactions of any foreign country!

The train of circumstances by which the Parian chronicle came into the possession of Mr Petty, whom Lord Arundel had sent into the east for the purpose of collecting antiquities, as well as the subsequent conduct of Peiresc its former owner, affords our author a strong presumption, that "the inscription was actually fabricated, with the view of obtaining for it a high price, upon the pretence that it was a relick of great antiquity. It is certain, that there is something mysterious in the conduct of the first ostensible proprietors. These marbles had been totally unknown, or unnoticed, for almost 1900 years, and at last are dug out of the ground—nobody can tell us when or where!"

IX. "The literary world has been frequently imposed upon by spurious books and inscriptions, and therefore we should be extremely cautious with regard to what we receive under the venerable name of antiquity." This proposition is illustrated by a great variety

Arundelian ‖ Arusini.

riety of examples, and very properly exposes the forgeries which have disgraced the republic of letters in different ages; and although one of the more recent ones cited, namely, Ossian's poems, be a point very far indeed from being established, yet that deceptions of this kind have been practised is an unquestionable fact.

In endeavouring, towards the end of his dissertation, to investigate the time of the supposed forgery, he observes that the 16th century, and the prior part of the 17th, produced a multitude of grammarians, critics, and commentators, deeply versed in Grecian literature, and amply qualified for the compilation of such a chronological system as that of the Arundelian marbles. Above all, the science of chronology was particularly studied and investigated about that time; "Nunc fervet chronologia," says Scaliger in the year 1605, "omnes hoc ferrum excalfaciunt." Casaubon treats those persons with contempt who were unacquainted with the improvements which had been made in that department of learning after the revival of letters. Innumerable systems of chronology had been published before the year 1625: from which it was easy to extract a series of memorable events, and give the compilation a Grecian dress. "The avidity," says our author, "with which all relicks of antiquity were then collected, and the high price at which they were purchased, were sufficient inducements to any one, whose avarice or whose necessity was stronger than his integrity, to engrave his labours on marble, and transmit them to Smyrna, as a commodious emporium for such rarities."

The precise period of the fabrication, however, must still be reckoned apocryphal and uncertain. The sum of fifty guineas, which Peiresc gave to the supposed fabricator, was inadequate to such a laborious and expensive work. Upon the whole, perhaps, it would be too hasty to pronounce decisively that this famous chronicle, so long respected, is an imposition upon the public. It may, however, be safely affirmed, that the suspicions against it are extremely strong, and the objections already cited of a nature very difficult to be removed. No attempts have yet been made with this view: But under some future article, as CHRONOLOGY, MARBLES, or PARIAN *Chronicle*, we may possibly have an opportunity of resuming the subject with additional information.

ARUNDO, the REED. See BOTANY *Index*.

ARUSINI CAMPI (erroneously written *Taurasini* by Cluverius), plains in Lucania, famous for the last battle fought between the Romans and Pyrrhus. That prince being at Tarentum, and hearing that the two new consuls Curius Dentatus and Cornelius Lentulus had divided their forces, the one including Lucania and the other Samnium; he likewise divided a chosen detachment of his army into two bodies, marching with his Epirots against Dentatus, in hopes of surprising him in his camp near Beneventum. But the consul having notice of his approach, marched out of his intrenchments with a strong detachment of legionaries to meet him, repulsed his vanguard, put many of the Epirots to the sword, and took some of their elephants. Curius, encouraged by this success, marched into the Arusian fields, and drew up his army in a plain, which was wide enough for his troops, but too narrow for the Epirot phalanx to act with its full effect. But the king's eagerness to try his strength and skill with so renowned a commander, stimulated him to engage at that great disadvantage. Upon the first signal the action began; and one of the king's wings giving way, victory seemed to incline to the Romans. But that wing where the king fought in person repulsed the enemy, and drove them to their intrenchments. This advantage was in great part owing to the elephants; a circumstance which Curius perceiving, commanded a body of reserve, which he had posted near the camp, to advance and attack those animals with burning torches; which frightened and annoyed them to such a degree, that they wheeled about, broke into the phalanx, and put that body into the utmost disorder. The Romans taking advantage of this confusion, charged with such fury that the enemy were entirely broken and defeated. Pyrrhus retired to Tarentum, attended only by a small body of horse, leaving the Romans in full possession of his camp; which they so much admired, that they made it a model which they followed ever after.

Arusini ‖ Arx.

ARUSPICES, or HARUSPICES, in Roman antiquity, an order of priests who pretended to foretel future events by inspecting the entrails of victims killed in sacrifice; they were also consulted on occasion of portents and prodigies. The haruspices were always chosen from the best families; and as their employment was of the same nature as that of the augurs, they were as much honoured. Their college, as well as those of the other religious orders, had its particular registers and records.

ARX, in the ancient military art, a town, fort, or castle, for defence of a place.

The arx in ancient Rome was a distinct edifice from the capitol, though some have confounded the two. According to Ryckius, the arx, properly speaking, was a place on the highest part of the Capitoline mount, stronger and better fortified than the rest, with towers and pinnated walls: in which was also the temple of Jupiter Capitolinus.

ARX also denotes a consecrated place on the Palatine mount, where the augurs publicly performed their office. Some will have the arx to have been the augural temple; but Varro expressly distinguishes between the two.

ARX was particularly used for a public place in Rome, set apart for the operations of the augurs. In which sense arx amounts to the same with what is otherwise called *auguraculum* and *auguratorium*, and in the camp *augurale*. Out of this arx it was that the *feciales*, or heralds, gathered the grass used in the ceremony of making leagues and treaties.

ARX Britannica, a citadel of Batavia, whose foundation is seen at low water, near the old mouth of the middle Rhine: some imagine it the pharos or high tower of Caligula, as Suetonius calls it; a monument of Caligula's sham conquest of Britain. Others that it was built by Drusus, with an altar afterwards by Claudius, on his expedition into Britain. But the usual passage was from Gessoriacum; and Suetonius expressly says, Claudius passed over thence. The ancient name of this citadel, now covered by the sea, is nowhere expressed: Now commonly called *t'Huis Britten*, or *Brittenburg*; that is, *Arx Britannica*; but from what authority does not appear.

ARYTENOIDES,

Aryte-noides ‖ Asa.

ARYTENOIDES, in *Anatomy*, the name of two cartilages, which, together with others, constitute the head of the larynx. It is also applied to some muscles of the larynx.

ARYTHMUS, in *Medicine*, the want of a just modulation in the pulse. It is opposed to *eurythmus*, a pulse modulated agreeably to nature.

ARZILLA, a very ancient maritime town of Africa, in the kingdom of Fez, about five leagues from Tangiers. It is built at the mouth of a river, and inhabited by Moors and Jews, who carry on no trade. It was formerly a Roman colony; afterwards fell under the government of the Goths; and was next taken by the Mahometans. Alphonso of Portugal, surnamed the African, took it by assault in 1471, and brought away the presumptive heir of the crown. After that prince came to the throne, he besieged it, in 1508, with 100,000 men; but was obliged to abandon the undertaking. However, at length the Portuguese forsook it of their own accord. W. Long. 5. 30. N. Lat. 35. 30.

AS, in antiquity, a particular weight, consisting of 12 ounces; being the same with *libra*, or the Roman pound. The word is derived from the Greek ἑις, which in the Doric dialect is used for ἑις, *one*, q. d. an entire thing; though others will have it named *as* quasi *æs*, because made of brass.

As was also the name of a Roman coin, which was of different weights and different matter in different ages of the commonwealth. Under Numa Pompilius, according to Eusebius, the Roman money was either of wood, leather, or shells. In the time of Tullus Hostilius, it was of brass; and called *as libra*, *libella*, or *pondo*, because actually weighing a pound or 12 ounces. Four hundred and twenty years after, the first Punic war having exhausted the treasury, they reduced the *as* to two ounces. In the second Punic war, Hannibal pressing very hard upon them, they reduced the *as* to half its weight, viz. to one ounce. And, lastly, by the Papirian law, they took away half an ounce more, and consequently reduced the *as* to the diminutive weight of half an ounce: and it is generally thought that it continued the same during the commonwealth, and even to the reign of Vespasian. The *as*, therefore, was of four different weights in the commonwealth. Its original stamp was that of a sheep, ox, or sow: but from the time of the emperors, it had on one side a Janus with two faces, and on the reverse the rostrum or prow of a ship.

As was also used to denote any integer or whole. Whence the English word *ace*. Thus *as* signified the whole inheritance; whence *hæres ex asse*, the heir to the whole estate.

ASA, king of Judah, succeeded his father Abijam. He pulled down the altars erected to idols, restored the worship of the true God, and, with the assistance of Benhadad king of Syria, took several towns from the king of Israel. He died 917 years before the Christian era, and was succeeded by Jehoshaphat.

Asa, among naturalists. The writers of the later ages have formed this word *asa* from the *lasar* of the ancients, and attributed it to a gum very different from that anciently known by the name they have thus corrupted.

The asa of the ancients was an odoriferous and fragrant gum; and the asa of the after ages had so little title to this epithet, that they distinguished it by one, expressing its being of an offensive or stinking smell. The Arabian writers, according to this distinction, describe two kinds of asa, the one stinking, the other aromatic; and the modern Greeks preserved the name *asa*, or *lasar*, to the stinking gum the Latins called by that name, but added a distinctive epithet to express its smell, and called it *scardolasarum*.

Asa ‖ Asar-addon.

Asa or Assa, in the *Materia Medica*, a name given to two very different substances, called *asa-dulcis* and *asa-fœtida*.

Asa-Dulcis is the same with Benzoin.

Asa-Fœtida is the concrete juice of an umbelliferous plant growing in several parts of Asia. See Ferula, Botany and Materia Medica *Index*.

ASAPH, St, a city in Flintshire, with a bishop's see; on which account principally it deserves notice, being in itself but a poor place. As a bishopric, it is of great antiquity, and was founded about the year 560, by Kentigern, a Scotsman, bishop of Glasgow. He began the church on the banks of the river Elwy, whence it is called by the Welsh *Land Elwy*, and in Latin *Elwensis*. Kentigern returning into Scotland, left a holy man his successor, St Asaph. Who was his successor is uncertain, as there are no records that mention it; and it seems rather probable that the religious settled here had been necessitated to remove to some more peaceable abode, as the country was frequently the seat of war between the English and the Welsh. This see was formerly a very wealthy one; but its revenues were greatly lessened by the profusion of Bishop Parfew, who alienated much of the lands belonging to this bishopric.

This diocese doth not contain any one whole county; but consists of part of Denbigh, Flint (where its church is), Montgomery, and Merioneth shires, and a small part of Shropshire; wherein are 121 parishes, and 131 churches and chapels, most of which are in the immediate patronage of the bishop. This see hath but one archdeaconry, viz. that of St Asaph, which is united to the bishopric, for the better maintenance thereof. This see is valued in the king's books at 187l. 11s. 6d. but computed to be worth annually 1500l. The tenth of the clergy comes to 186l. 19s. 6¼d. To this cathedral belong a bishop, a dean, archdeacon, chancellor, &c.

ASAPPES, or Azapes, an order of soldiers in the Turkish army, whom they always expose to the first shock of any enemy: to the end that the enemy being thus fatigued, and their swords blunted, the spahis and janizaries may fall on and find an easy conquest. The word is derived from the Turkish *saph*, which signifies *rank*, from whence they have formed *asphaph*, "to range in battle." The asappes are said to be held of so little value, that they frequently serve as bridges for the cavalry to pass over in bad roads, and as fascines to fill up the ditches of places besieged. They travel on foot, and have no pay but the plunder they can get from the enemy.

ASAR-addon, or Esar-Haddon, the son of Sennacherib, succeeded his father about 712 years before the Christian era, and united the kingdoms of Nineveh and Babylon. He rendered himself master of Syria; sent a colony to Samaria; and his generals took

King-

Asarina ‖ Asbestos.

King Manasses, and carried him loaded with chains to Babylon. Asar-Addon died after a reign of 12 years.

ASARINA. See CHELONE.

ASAROTA, ασαρωτα, from α and σαιρω, *I sweep*, a kind of painted pavements in use before the invention of mosaic work. The most celebrated was that at Pergamus, painted by Sesus, and exhibiting the appearance of crumbs, as if the floor had not been swept after dinner, whence, according to Pliny, the denomination. Perrault supposes them to have been a black kind of pavements of a spongy matter.

ASARUM, ASARABACCA. See BOTANY *Index*.

ASBAMEA, a fountain of Cappadocia, near Tyana, sacred to Jupiter, and to an oath. Though this fountain bubbled up, as in a state of boiling, yet its water was cold, and never ran over, but fell back again: (Philostratus, Ammian).

ASBESTOS, a native fossil stone, which may be split into threads and filaments, from one inch to ten inches in length, very fine, brittle, yet somewhat flexible, silky, and of a grayish colour, not unlike talc of Venice. It is almost insipid to the taste, insoluble in water, and possesses the wonderful property of remaining unconsumed in the fire, which only whitens it.

The industry of mankind has found a method of working this mineral, and employing it in divers manufactures, chiefly cloth and paper. The manufacture is undoubtedly difficult enough. Pliny calls the asbestos *inventu rarum, textu difficillimum*. Wormius assures us, that the method of making cloth of asbestos is now entirely unknown. And indeed one would scarcely imagine the thing practicable, without the mixture of some other pliant matter, as wool, hemp, or flax, along with the asbestos, the filaments of this latter appearing too coarse and brittle to make any tolerable fine work. However this be, Bart. Porta assures us, that in his time the spinning of asbestos was a thing known to every body at Venice. Sig. Castagnatta, superintendant of some mines in Italy, is said to have carried the manufacture to such perfection, that his asbestos was soft and tractable, much resembling lamb skin dressed white: he could thicken and thin it at pleasure, and thus either make it into a very white skin or a very white paper.

This kind of linen cloth was chiefly esteemed by the ancients; though then better known and more common than among us, being held equally precious with the richest pearls: nor is it now of mean value, even in the country where it is most generally made, a China cover (i. e. a piece of 23 inches and three-quarters long) being worth 80 tale, i. e. 36l. 13s. 4d. Pliny says, he himself had seen napkins thereof, which, being taken foul from the table after a feast, were thrown into the fire, and by that means were better scoured than if they had been washed in water, &c. But its principal use, according to Pliny, was for the making of shrouds, for royal funerals, to wrap up the corpse, so that the ashes might be kept distinct from those of the wood, &c. whereof the funeral pile was composed: and the princes of Tartary, according to the accounts in the Philosophical Transactions, still use it at this day in burning their dead. Some of the ancients are said to have made themselves clothes of it, particularly the Brachmans among the Indians. The wicks for their perpetual lamps, according to Dr Lister, were also made of it: some to this day use it for the wicks of such lamps as they would not have any trouble with; because the asbestos never wasting, there is no occasion for shifting the wick. Septalla, canon of Milan, had thread, ropes, nets, and paper made of the asbestos. A handkerchief or pattern of the linen was long since presented to the Royal Society, a foot long and half a foot broad. This gave two proofs of its resisting fire; though, in both experiments, it lost above three drachms of its weight. When taken out red hot, it did not burn a piece of white paper on which it was laid, Mr Villette pretends that his large burning concave usually vitrifies the asbestos.

Asbestos ‖ Ascendant.

The method of preparing the incombustible paper and cloth is thus described by Ciampini: The stone is laid to soak in warm water; then opened and divided by the hands, that the earthy matter may be washed out. The ablution being several times repeated, the flaxlike filaments are collected and dried; and they are most conveniently spun with an addition of flax. Two or three filaments of the asbestos are easily twisted along with the flaxen thread, if the operator's fingers are kept oiled. The cloth also, when woven, is best preserved by oil from breaking or wasting. On exposure to the fire, the flax and the oil burn out, and the cloth remains pure and white. Probably from the dissipation of some extraneous matter of this kind proceeded the diminution of weight in the handkerchief just recited; for pure asbestos leaves nothing. The shorter filaments which separate in washing the stone may be made into paper in the common manner.

The asbestos is found in Crete and Cyprus; in Tartary; at Namur in the Low Countries; in Thuringia among the mines; in the old Noricum; in Egypt; in the mountains of Arcadia; at Puteoli; in the island of Corsica; in the island of Anglesey in Wales; in Aberdeenshire in Scotland; at Montauban in France; and in Siberia.

ASCALON, an ancient city, and one of the five satrapies or principalities of the Philistines; situated on the Mediterranean, 43 miles to the south-west of Jerusalem (Antonine), between Azotus to the north and Gaza to the south. The birthplace of Herod the Great, hence surnamed *Ascalonita* (Stephanus). Famous for its scallions, which take name from this town (Strabo, Pliny). Now *Scalona*. E. Long. 34. 30. N. Lat. 31. 30.

ASCANIUS, the son of Æneas and Creusa, succeeded his father in the kingdom of the Latins, and defeated Mezentius king of the Tuscans, who had refused to conclude a peace with him. At length he founded Alba Longa; and died about 1139 years before the Christian era, after a reign of 38 years.

ASCARIS. See HELMINTHOLOGY *Index*.

ASCENDANT, in *Astrology*, denotes the horoscope, or the degree of the ecliptic which rises upon the horizon at the time of the birth of any one. This is supposed to have an influence on the person's life and fortune, by giving him a bent and propensity to one thing more than another.

In the celestial theme, this is also called the *first house*, the *angle of the East* or *Oriental angle*, and the *significator of life*. Such a planet ruled in his *ascendant*: Jupiter was in his *ascendant*, &c. Hence the word is also used in a moral sense, for a certain superiority which

Ascendant || Ascension Island.

which one man has over another, from some unknown cause.

ASCENDANTS, in *Law*, are opposed to descendants in succession; i. e. when a father succeeds his son, or an uncle his nephew, &c. heritage is said to ascend, or go to ascendants.

ASCENDING, in *Astronomy*, is said of such stars as are rising above the horizon in any parallel of the equator.

Ascending Latitude, is the latitude of a planet when going towards the north pole.

Ascending Node, is that point of a planet's orbit, wherein it passes the ecliptic, to proceed northward. This is otherwise called the *northern node*, and represented by this character ☊.

Ascending Vessels, in *Anatomy*, those which carry the blood upwards; as the aorta ascendens. See Anatomy.

ASCENSION, in *Astronomy*, is either right or oblique. Right ascension of the sun, or a star, is that degree of the equinoctial, counted from the beginning of Aries, which rises with the sun or star in a right sphere. Oblique ascension is an arch of the equator intercepted between the first point of Aries and that point of the equator which rises together with a star in an oblique sphere.

Ascension Day, a festival of the Christian church, held ten days before Whitsuntide, in memory of our Saviour's ascension into heaven after his resurrection.

Ascension Island, a barren island on the coast of Africa, lying in W. Long. 14° 22′ 31″. S. Lat. 7° 56′. The following account is given of it by Mr Forster. "This island was first discovered in 1501, by Joaõ de Nova Galego, a Portuguese navigator, who named it *Ilha de Nossa Senhora de Conceiçao*. The same admiral on his return to Portugal in 1502, discovered the island of St Helena, which obtained that name from the day of the discovery. Ascension was seen a second time by Alfonso d'Albuquerque on his voyage to India in 1503, and then received the name it now bears; but was already at that time in the same desolate condition as at present. We sent several parties on shore, who passed the night on the watch for turtles, which came to lay their eggs on the sandy shores. The dreariness of this island surpassed all the horrors of Easter island and Terra del Fuego, even without the assistance of snow. It was a ruinous heap of rocks, many of which, as far as we could discern from the ship, seemed to be totally changed by the fire of a volcano. Nearly in the centre of the island rises a broad white mountain of great height, on which we discerned some verdure by the help of our glasses, from whence it has obtained the name of *Green Mountain*.

"We landed early in the morning among some rocks, the surf being always immensely high on the great beach; which consists of minute shell-sand, chiefly of a snowy white, very deep, dry, and intolerable to the eyes when the sun shines. We ascended among heaps of black cavernous stone, which perfectly resembles the most common lavas of Vesuvius and Iceland, and of which the broken pieces looked as if they had been accumulated by art. The lava currents cooling very suddenly, may easily be imagined to produce such an effect. Having ascended about 12 or 15 yards perpendicular, we found ourselves on a great level plain of six or eight miles in circuit; in the different corners of which we observed a large hill of an exact conical shape, and of a reddish colour, standing perfectly insulated. Part of the plain between these conic hills was covered with great numbers of smaller hillocks, consisting of the same wild and ragged lava as that near the sea, and ringing like glass when two pieces are knocked together. The ground between the heaps of lava was covered with a black earth, on which we walked very firmly; but when these heaps did not appear, the whole was a red earth, which was so loose, and in such dry minute particles, that the wind raised clouds of dust upon it. The conic hills consisted of a very different sort of lava, which was red, soft, and crumbling into earth. One of these hills stands directly in front of the bay, and has a wooden cross on its summit, from whence the bay is said to take its name. Its sides are very steep, but a path near three quarters of a mile long winds round it to the summit. After examining this remarkable country a little longer, we concluded, with a great degree of probability on our side, That the plain on which we stood was once the crater or seat of a volcano, by the accumulation of whose cinders and pumice stones the conic hills had been gradually formed: that the currents of lava which we now saw divided into many heaps, had perhaps been gradually buried in fresh cinders and ashes; and the waters coming down from the interior mountain in the rainy season, had smoothened every thing in their way, and filled up by degrees the cavity of the crater. The rocky black lava was the residence of numberless men-of-war birds and boobies, which sat on their eggs, and suffered us to come close to them.

Ascension Island.

"About eight in the evening, it being then quite dark, a small vessel came into the bay, and anchored directly within us. Captain Cook having hailed her repeatedly, received in answer that she was the Lucretia, a New York sloop, which had been at Sierra Leon, and was now come to catch turtles, in order to sell them at the windward islands of the West Indies. A lieutenant was sent on board, who learned from the master, that he had taken our ship to be a French Indiaman, and was very desirous of trading with English India ships, in which he was disappointed by the company's regulations. He dined with our officers the next day, but on the 31st at day-break left the island. On the 30th in the morning, we landed a second time; and, crossing the plain, arrived at a prodigious lava current, intersected by many channels from six to eight yards deep, which bore strong marks of being worn by vast torrents of water, but were at present perfectly dry, the sun being in the northern hemisphere. In these gullies we found a small quantity of soil consisting of a black volcanic earth, mixed with some whitish particles gritty to the touch. Here we saw some small bunches of purslane, and a species of grass (*panicum sanguineum*) which found sufficient nutriment in the dry soil. Having at last, with great fatigue, climbed over this extensive and tremendous current of lava, which was much more solid than the heaps nearer to the sea, we came to the foot of the Green Mountain, which even from the ship's place in the bay we had plainly distinguished to be of a different nature from all the rest of the country. Those parts of the lava which surrounded it were covered with a prodigious quantity

Ascension Island || Ascent.

of purslane, and a new kind of fern, *lonchites Adscensionis*, where several flocks of wild goats were feeding. The great mountain is divided in its extremities, by various clefts, into several bodies; but in the centre they all run together, and form one broad mass of great height. The whole appears to consist of a gritty tophaceous limestone, which has never been attacked by the volcano, but probably existed prior to its eruption; its sides are covered with a kind of grass, peculiar to the island, which Linnæus has named *aristida Adscensionis*. We likewise observed several flocks of goats feeding on it; but they were all excessively shy, and ran with surprising velocity along tremendous precipices, where it was impossible to follow them. The master of the New York sloop acquainted us, that there is a spring of water on one part of this mountain, which falls down a great precipice, and is afterwards absorbed in the sand. I am almost persuaded, that, with a little trouble, Ascension might shortly be made fit for the residence of man. The introduction of furze (*ulex Europæus*), and of a few other plants which thrive best in a parched soil, and are not likely to be attacked by rats or goats, would soon have the same effect as at St Helena. The moisture attracted from the atmosphere by the high mountains in the centre of the island, would then no longer be evaporated by the violent action of the sun, but collect into rivulets, and gradually supply the whole island. A sod of grasses would everywhere cover the surface of the ground, and annually increase the stratum of mould, till it could be planted with more useful vegetables.

"We returned gradually to Cross Bay, in the heat of noon, over the plain; having a space of more than five miles to traverse, where the sun burnt and blistered our faces and necks, and heated the soil to such a degree, that our feet were likewise extremely sore. About three o'clock we arrived at the water's side; and after bathing in a small cove among a few rocks, we made a signal for a boat, and were taken on board. The next forenoon we made another small excursion, in company with Captain Cook, towards the Green Mountain; but we were all of us so much fatigued, that we could not reach it. We made no new observations in the course of this day, the nature of the island being dreary beyond description in its outskirts."

ASCENSIONAL DIFFERENCE, the difference between the right and oblique ascension of the same point to the surface of the sphere.

ASCENT, in a general sense, implies the motion of a body upwards, or the continual recess of a body from the earth. The Peripatetics attribute the spontaneous *ascent* of bodies to a principle of levity inherent in them. The moderns deny any such thing as spontaneous levity; and show, that whatever *ascends*, does it in virtue of some external impulse or extrusion. Thus it is that smoke and other rare bodies *ascend* in the atmosphere; and oil, light woods, &c. in water; not by any internal principle of levity, but by the superior gravity or tendency downwards of the parts of the medium wherein they are. The *ascent* of light bodies in heavy mediums is produced after the same manner as the *ascent* of the lighter scale of a balance. It is not that such scale has an internal principle whereby it immediately tends upwards; but it is impelled upwards by the preponderancy of the other scale; the excess of the weight of the one having the same effect, by augmenting its impetus downwards, as so much real levity in the other; by reason the tendencies mutually oppose each other, and that action and reaction are always equal.

Ascent || Ascham

Ascent of Bodies on Inclined Planes, the reader will find explained under MECHANICS; *Ascent of Fluids*, under HYDROSTATICS; and *Ascent of Vapours* under the article EVAPORATION.

ASCESIS, properly denotes exercise of the body. It is formed from the verb ασκειν, used by the ancients in speaking of the sports and combats of the athletæ.

ASCESIS is also used by philosophers, to denote an exercise conducive to virtue, or to the acquiring a greater degree of virtue. This is particularly denominated the *philosophical ascesis*, because practised chiefly by philosophers, who make a more peculiar profession of improving themselves in virtue; on the model whereof the ancient Christians introduced a religious ascesis.

ASCETERIUM, in ecclesiastical writers, is frequently used for a monastery, or place set apart for the exercise of virtue and religion. The word is formed from *ascesis*, "exercise;" or *ascetra*, "one who performs exercise." Originally it signified a place where the athletæ or gladiators performed their exercises.

ASCETIC, an ancient appellation given to such persons as, in the primitive times, devoted themselves more immediately to the exercises of piety and virtue, in a retired life; and particularly to prayer, abstinence, and mortification. The word is derived from ασκεω, *exerceo*, "I exercise." Afterwards, when the monks came in fashion, this title was bestowed upon them; especially upon such of them as lived in solitude.

ASCETIC is also a title of several books of spiritual exercise.—As, the *Ascetics*, or devout exercises of St Basil, archbishop of Cæsarea in Cappadocia.

We also say the *ascetic* life, meaning the exercise of prayer, meditation, and mortification.

ASCHAFFENBURG, a town of Germany, seated on the river Maine, in the circle of the Lower Rhine, formerly belonging to the elector of Mentz, but now to the king of Bavaria. It is memorable for being the place where the king of Great Britain took up his quarters the night before the battle of Dettingen. E. Long. 9. 5. N. Lat. 49. 54.

ASCHAM, ROGER, an Englishman of considerable learning in the 16th century, was born at Kirby Wiske, a village in Yorkshire, near Northallerton. John Ascham, his father, was house-steward in the family of Scroop, and by his wife, Margaret, was connected with several respectable families. A short time before his death, Sir Anthony Winfield, having conceived a predilection for his third son Roger, took him into his family, and extended his bounty so far as to give him the advantage of a private education along with his own sons. Under a domestic tutor, he made a rapid progress in classical learning, and early discovered a great partiality for reading. The superiority of genius and docility of temper which he constantly displayed,

Ascham. displayed, induced his patron to send him to St John's college, Cambridge, in the year 1530.

The revival of Grecian and Roman literature at the period Ascham entered upon his studies, was peculiarly favourable to the natural bent of his inclination. A desire of excelling uniformly influenced his conduct, and adopting the maxim, *Qui docet, discit*, he began to teach boys the rudiments of the Greek language, as soon as he was acquainted with the elementary parts himself. His plan was approved by Pember; and under the direction of this valuable friend, he soon became acquainted with the best Greek and Latin authors. But he took particular delight in reading Cicero and Cæsar; and upon them he formed the elegance of his Latin style, which proved so honourable and so advantageous in the after part of his life.

Ascham took his first degree of bachelor of arts in the 18th year of his life, and was chosen fellow of the college about a month afterwards. The favourable disposition, however, which he manifested towards the reformed religion, was no small obstacle in the way of his preferment. He was elected master of arts in the year 1537, the 21st of his age; and about this period he began to act in the capacity of a tutor.

His reputation for Greek learning soon brought him many pupils; and these were so well instructed, that several of them afterwards arose to considerable eminence. Of these, William Grindall was one of the most distinguished, who obtained the station of master of languages to the lady Elizabeth, upon the recommendation of Sir John Cheke. It appears uncertain why Ascham himself was not appointed to that honourable station, but his partiality for the university seems, from a hint in one of his letters, to have been the cause. At that period there was no particular chair appropriated to the Greek language; but Ascham was appointed by the university to read lectures upon that language in the schools. A dispute arose in the university at that time about the pronunciation of the Greek language, in which Ascham first opposed the method observed by Sir John Cheke and Sir Thomas Smith; but, upon more mature deliberation, he adopted that method, which has ever since been practised in the English schools. Both on account of the beauty of his hand-writing, and the purity and elegance of his Latin, he was employed to write the public letters of the university.

By the advice of his friend Pember, he turned his attention to the study of instrumental music, and thereby enlivened his leisure hours, and prepared his mind for renewed exertion. In his study he also amused himself with embellishing the pages of his manuscripts with beautiful draughts; and in the field he joined in the diversion of the bow and arrow. The learned Ascham did not deem his labour improperly bestowed in writing a book entitled *Toxophilus*, in that age when the practice of fire-arms was in its infancy, and the proper use of the bow was of more importance than for mere amusement. This work was useful at that time for introducing into the English language, a more natural, easy, and truly English diction, than was formerly in use; and it also abounds with many beautiful allusions and curious fragments of English history. Ascham candidly acknowledges, that being anxious to make the tour of Italy, which was then the great republic of letters, and particularly of Grecian literature, he wished, by dedicating his book to the king, to obain a pension, to enable him to make that tour. It reflects some lustre on the benevolence of Henry VIII. that in the year 1544, he settled upon him an annual pension of 10l. which Dr Johnson, considering the circumstance of the times, estimates at the value of 100l. Upon the death of Henry, this pension was for some time discontinued, but was again renewed by Edward VI. and doubled by Queen Mary. In the same year also, Ascham obtained the appointment of orator to the university, an office which he retained with great reputation, during the period he was connected with the university. Ascham.

For some years he received an annual gratuity from Lee, archbishop of York, but to what amount is not recorded; and, in 1548, upon the death of his pupil Grindall, preceptor to the lady Elizabeth, his pupils and writings had acquired him such celebrity, that he was appointed to direct the studies of that princess. He successfully acquitted himself in that honourable charge; but two years after, from some unknown cause of dissatisfaction, he returned to the university, having taken an abrupt leave of the princess. This part of his conduct did not lessen him in the esteem of Elizabeth; for in the same year, she recalled him to court, and appointed him secretary to Sir Richard Morisine, ambassador to the emperor Charles V. In his way to London, he paid a visit to Lady Jane Gray, whom he found in her chamber, reading Plato's Phædo, in Greek, "and that," says he, "with as much delight as some gentlemen would read a merry tale in Boccace;" while the duke and duchess, and the rest of the household, were hunting in the park.

In the character of secretary to Sir Richard, besides aiding him in the management of his public affairs, he also conducted his private studies. During the mornings of four days in the week, he read with him a portion of Herodotus or Demosthenes; and, in the evenings, some pages of Sophocles or Euripides; and, on the other mornings, he wrote the letters of public business; and, on the evenings, he either wrote his own private letters, or continued his diary and remarks. While Ascham was on his travels, he made a short excursion to Italy; but was much disgusted with the manners of the people, especially of the Venetians. After his return from that tour, he favoured the world with a curious tract, entitled "A Report and Discourse of the Affairs and State of Germany," &c.

Upon the death of Edward VI. Morisine was recalled, and Ascham returned to the university. But through the interest of Bishop Gardiner, the fortune of Ascham soon took a favourable turn, who although he knew him to be a Protestant, obtained him the office of Latin secretary to the queen, with liberty to retain his university emoluments, and the additional salary of 10l. a-year. The prudence of Ascham enabled him to act a respectable part, both under the intolerant reign of Mary, and also in the most perilous situations during the reign of Elizabeth; and the readiness and elegance of his Latin style, rendered him a useful member at court. He is reported to have written, during the course of three days, 47 letters to persons in the highest ranks of life.

When the crown passed to a Protestant prince, it

Ascham ‖ Ascites.

made little alteration in the condition of Ascham, who still retained his station. He spent several hours every day in reading the learned languages with the queen; and her proficiency was equal to his labours, and it might have been expected, that his rewards would have been more ample than 20l. per annum, together with the prebend of Westwang. Some have alleged, that the queen kept him poor, because, it is said, he was addicted to cock-fighting, and in other respects extravagant; but the defects in his character should not have deprived him of the rewards due to actual services.

In consequence of a conversation which took place in the apartment of Secretary Cecil, upon the subject of education, Sir Richard Sackville, who was present, requested him to write a book on the general subject of education. This work is entitled "The Schoolmaster;" and while it displays the humanity of the author, contains many excellent instructions to the teachers of youth. This treatise was published by his widow after his death. By too close application to composing a poem, which he intended to present to the queen on the new year's day of 1569, he was seized with an illness, which proved fatal, and he died in the 53d year of his age, on the 23d of December, 1568. His death was universally lamented, and the queen expressed her regret, by saying, that, "she would rather have lost 10,000l. than her tutor Ascham." His epistles, which are valuable, both on account of their style and historical information, were published after his death, and dedicated to the queen; and his other works have since been collected into one volume by Bennet.

Roger Ascham appears to have been possessed of an amiable disposition, kind to his friends, and grateful to his benefactors. Although he was firm in his adherence to his religious opinions, yet his zeal did not carry him to excess in opposing those of other men. His talents both as a man and as a scholar were very considerable, and he deserved more ample returns for his services than were conferred upon him by those who enjoyed the benefit of his labours in the advancement of solid learning and correct taste. (*Gen. Biog.*).

ASCIBURGIUM, in *Ancient Geography*, mentioned by Tacitus, supposed to be one of the 50 citadels built on the Rhine; who adds, some imagined it was built by Ulysses. Here was a Roman camp and a garrison. To its situation on the banks of the Rhine answers a small hamlet, now called *Asburg* not far from Meurs, in the duchy of Cleves.

ASCIDIA. See HELMINTHOLOGY *Index.*

ASCII, among *Geographers*, an appellation given to those inhabitants of the earth, who at certain seasons of the year have no shadow: Such are all the inhabitants of the torrid zone, when the sun is vertical to them.

ASCITÆ, (from ασκος, a *bag* or *bottle*), in antiquity, a sect or branch of Montanists, who appeared in the second century. They were so called, because they introduced a kind of Bacchanals into their assemblies, who danced round a bag or skin blowed up: saying, they were those new bottles filled with new wine whereof our Saviour makes mention, Matth. ix. 17.—They are sometimes also called *Ascodrogitæ*.

ASCITES, in *Medicine*, the dropsy of the abdomen. See MEDICINE *Index*.

ASCLEPIA, a festival of Æsculapius the god of physic, observed particularly at Epidaurus, where it was attended with a contest between the poets and musicians, whence it was likewise called Ἱερος Αγων, *the sacred contention.*

Asclepia ‖ Asculum Apulum.

ASCLEPIAD, in *Ancient Poetry*, a verse composed of four feet, the first of which is a spondee, the second a choriambus, and the two last dactyls; or of four feet and a cæsura, the first a spondee, the second a dactyl, after which comes the cæsura, then the two dactyls; as, *Mœcenas atavis edite regibus.*

ASCLEPIADES, one of the most celebrated physicians among the ancients, was a native of Prusa in Bithynia; and practised physic at Rome, under Pompey, 96 years before the Christian era. He was the head of a new sect; and, by making use of wine and cold water in the cure of the sick, acquired a very great reputation. He wrote several books, which are frequently mentioned by Galen, Celsus, and Pliny; but they are now lost.

ASCLEPIADES, a famous physician under Hadrian, of the same city with the former. He wrote several books concerning the composition of medicines; both internal and external.

ASCLEPIAS, SWALLOW-WORT. See BOTANY *Index.*

ASCODUTÆ, in antiquity, a sect of heretics in the second century, who rejected all use of symbols and sacraments, on this principle, That incorporeal things cannot be communicated by things corporeal, nor divine mysteries by any thing visible.

ASCOLI, formerly *Asculum Apulum*, a pretty large and populous town of Italy, in the marquisate of Ancona, and territory of the church. It is a bishop's see, and seated on a mountain, at the bottom of which runs the river Fronto. E. Long. 15. 20. N. Lat. 42. 27.

ASCOLI *de Satriano*, formerly *Asculum Picenum*, an episcopal city of Italy, in the kingdom of Naples; seated on a mountain. E. Long. 15. 5. N. Lat. 42. 8.

ASCOLIA, in Grecian antiquity, a festival celebrated by the Athenian husbandmen in honour of Bacchus, to whom they sacrificed a he-goat, because it destroys the vines (*Ovid. Fast.* i. 457.); and, to show the greater indignity to an animal hated by Bacchus, the peasants, after having killed him, made a foot-ball of his skin. Virgil has beautifully described the occasion of the sacrifice and manner of celebrating the festival, *Georg.* ii. 380.

ASCRIPTITII, or ADSCRIPTITII, were a kind of villains, who, coming from abroad, settle in the lands of some new lords, whose subjects or servants they commence; being so annexed to the lands, that they may be transferred and sold with the same. Adscriptitii is sometimes also used in speaking of aliens or foreigners newly admitted to the freedom of a city or country.

ASCRIPTITII was also used in the military laws for the recruits appointed to supply the losses of the legions, called also *Accensi.*

ASCRIVIUM, in *Ancient Geography*, a town of Dalmatia, on the Sinus Rhizicus (Pliny, Ptolemy): Now *Cattaro* (Harduin); the capital of the territory of Cattaro, in Venetian Dalmatia. E. Long. 19. 20. Lat. 45. 25.

ASCULUM APULUM, in *Ancient Geography*, a town of Apulia, much mentioned in the war with Pyrrhus

Asculum Apulum || Ashby de la Zouch.

Pyrrhus (Florus, Plutarch): Now called *Ascoli;* a city of the Capitanata, in the kingdom of Naples. E. Long. 16. 30. N. Lat. 41. 15.

Asculum Picenum, in *Ancient Geography*, a town of the Piceni (Cæsar); and the capital (Florus): Now *Ascoli*, in the marquisate of Ancona, on the river Fronto. E. Long. 15. 5. N. Lat. 42. 50.

ASCYRUM, Peter's-wort. See Botany *Index.*

ASDRUBAL, the name of several Carthaginian generals. See Carthage.

ASEKI, or Asekai, the name which the Turks give to the favourite sultanas who have brought forth sons. These are greatly distinguished above others in their apartments, attendants, pensions, and honours.

ASELLUS, in *Zoology*, the trivial name of a species of oniscus. See Oniscus, Entomology *Index.*

ASGILL, John, a late humorous writer, was bred to the law, and practised in Ireland with great success. He was there elected a member of the house of commons, but was expelled for writing a treatise on the possibility of avoiding death; and being afterwards chosen a member for the borough of Bromber in Sussex, he was also on the same account expelled the parliament of England. After this, he continued 30 years a prisoner in the Mint, Fleet, and King's-bench; during which time he published a multitude of small political pamphlets, several of which were in defence of the Hanoverian succession, and against the pretender. He died in the rules of the King's-bench, in the year 1738, when he was upwards of fourscore.

ASH. See Fraxinus, Botany *Index.*

ASHANTEE, an extensive territory of western Africa, situated immediately behind the states which occupy the Gold coast. This kingdom, which was but lately known to Europeans, seems to be the most powerful, civilized, and commercial of any on the western coast of Africa. Since 1806 they have had various wars with the tribes on the coast, and from their superior courage and skill, are likely to conquer this whole region.

Ash-Hole, among chemists, is the lowest part of a furnace; and is intended to receive the ashes falling from the fire, and to give a passage to the air which is to be introduced into the furnace, to keep up the combustion.

Ash-Wednesday, the first day of Lent; supposed to have been so called from a custom in the church, of sprinkling ashes that day on the heads of penitents then admitted to penance. See Lent.

ASHBORN, a town in Derbyshire, seated between the rivers Dove and Compton, over which there is a stone bridge, in a rich soil. It is a pretty large town, and contained 2112 inhabitants in 1811. W. Long. 1. 35. N. Lat. 53. 0.

ASHBURTON, a town in Devonshire. It sends two members to parliament, and is one of the four stannery towns. It is seated among the hills, which are remarkable for tin and copper; and has a very handsome church. It contained 3053 inhabitants in 1811. It gives title of Baron to the family of Dunning. W. Long. 3. 10. N. Lat. 50. 30.

ASHBY de la Zouch, a market-town of Leicestershire, situated in W. Long. 1. 20. N. Lat. 52. 40. It had a castle which was long in the possession of the family of de la Zouch. It afterwards fell into the hands of Edward IV. who granted it to Sir Edward Hastings, created Baron Hastings, with license to make a castle of the manor-house, to which he adjoined a very high tower. It was demolished in 1648; but a great part of the tower is still standing. The town contained 3141 inhabitants in 1811.

Ashby de la Zouch || Ashmole.

ASHDOD, or Azotus. See Azotus.

ASHES, the earthly particles of combustible substances after they have been burnt.

If the ashes are produced from vegetable bodies they contain a considerable quantity of fixed salt, blended with earthy particles: and from these ashes the fixed alkaline salts called *pot-ash*, *pearl-ash*, &c. are extracted. See Chemistry *Index.*

The ashes of all vegetables are vitrifiable, and found to contain iron.—They are also an excellent manure for cold and wet grounds.

Several religious ceremonies depend upon the use of ashes. St Jerome relates, that the Jews in his time rolled themselves in ashes, as a sign of mourning. To repent in sackcloth and ashes, is a frequent expression in Scripture for mourning, and being afflicted for our sins. There was a sort of ley and lustral water made with the ashes of a heifer sacrificed upon the great day of expiation; the ashes whereof were distributed to the people, and this water was used in purifications, as often as any touched a dead body, or was present at funerals, (Numb. xix. 17.). Tamar after the injury received from her brother Amnon, covered her head with ashes, (2 Sam. xiii. 9.). The Psalmist in great sorrow says, that he had eaten ashes as if it were bread, (Ps. cii. 9.); which, however, is to be considered as an hyperbole. He sat on ashes, he threw ashes on his head; his food, his bread, was spoiled with the ashes wherewith he was covered.

The ancient Persians had a sort of punishment for some great criminals, which consisted in executing them in ashes. The criminal was thrown headlong from a tower 50 cubits high, which was filled with ashes to a particular height, (2 Mac. xiii. 5. 6.). The motion which the criminal used to disengage himself from this place, plunged him still deeper into it, and this agitation was further increased by a wheel which stirred the ashes continually about till at last he was stifled.

ASHFORD, a market town of Kent, situated about 12 miles south-west of Canterbury, in E. Long. 45. and N. Lat. 51. 15.

ASHLAR, a term used among builders; by which they mean common or free stones, as they come out of the quarry, of different lengths and thicknesses.

ASHLERING, among builders, signifies quartering, to lath to, in garrets, about two and a half or three feet high, perpendicular to the floor, up to the under side of the rafters.

ASHMOLE, Elias, an industrious English antiquarian, and an eminent philosopher of the 17th century, was born at Litchfield in 1617. Having enjoyed the advantages of a country education, he went to London at the age of 16, and resided in the family of James Paget, Esq. one of the barons of the exchequer, and then turned his attention to the law and other branches of literature. In the year 1638, he married, and commenced the business of attorney in London. When

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When the civil war began, he then being a widower, entered into the king's service in the ordnance department. When residing in the city of Oxford in that capacity, he entered Brazen Nose college, and began the study of natural philosophy, mathematics, and astronomy. Naturally inclined to grave and scientific trifles, he wandered too far into the wilds of astrological imposture, not a little encouraged by several eminent men of that age. From the same cause, he entered keenly into the secrets of masonry, and made considerable additions to the history of that sect.

When Worcester was surrendered to the parliament in 1646, Ashmole retired to London, where he became acquainted with the famous astrologers, Moore, Lilly, and Booker.

Having retired to Berkshire in the year following, he added the knowledge of botany to his other acquirements. There he became acquainted with Lady Mainwaring, a well-jointured widow, whom he married in 1649; and although her estate was sequestered on account of his loyalty, yet through the interest of Lilly and others, he again recovered his property, and afterwards settled in London, where his house became the resort of all the curious literati of the place. A taste for chemistry, or rather alchemy, was produced, by his conversation with William Blackhouse; and Ashmole, under a feigned name, published a work upon that subject. The next effort of his industry, was a collection of the manuscripts of English alchemy, which he published under the title of *Theatrum Chymicum Britannicum*, in 4to. This work was the effect of great labour and much expence; and although it procured him much fame among the learned, yet it was only a collection of *Alchemy;* and he appears to have been ignorant of real chemical knowledge. About this period, he began to number among his acquaintances, Selden, Oughtred, and Dr Wharton.

The wealth he acquired by his marriage engaged him in several disputes, and the lady herself at last made an attack upon him in chancery, but he was honourably acquitted, and the lady restored to her affectionate husband. His active industry never wearied out, and he next attended to the study of antiquity and the investigation of records. Along with Sir W. Dugdale, he about this period traced a Roman road to Litchfield. Abandoning all other pursuits, he began to make preparations for his "History of the order of the Garter;" a production which procured him lasting fame. Upon a visit to Oxford, he gave a full description of the coins bequeathed to that university by Laud; and about this time, John Tradescant, the famous gardener of Lambeth, presented him with the collection of curiosities, which both he and his father had procured.

Upon the restoration, Ashmole was greatly respected by the king, who made him Windsor herald, and employed him to give a description of the royal medals. The offices of commissioner and comptroller of excise were conferred upon him; and being called to the bar in the Middle Temple, he was afterwards admitted a fellow of the Royal Society. The university of Oxford conferred upon him the degree of doctor of physic; and several other employments and emoluments were given him, until he rose to the highest eminence in the literary world. About this time his second wife died, and he married the daughter of his friend Sir W. Dugdale. In May 1762, he addressed his great work on the order of the Garter to the king, entitled "The institution, laws, and ceremonies of the most noble order of the Garter; collected and digested into one body, by Elias Ashmole of the Middle Temple, Esq. Windsor herald at arms," folio, London, 1672. In favour of his brother-in-law, Mr Dugdale, he resigned his office of herald of Windsor; and when offered the office of garter king-at-arms, he declined it in favour of Sir W. Dugdale. About this time a fire broke out in one of the chambers of the temple adjacent to his, and consumed a library which he had been collecting during the course of thirty-three years, together with 9000 coins, and many valuable antiquities; but his manuscripts and gold medals fortunately were saved. In 1683, he sent his manuscripts and curiosities to the university of Oxford, which laid the foundation of the *Musæum Ashmoleanum*, still in Oxford. On the death of Sir W. Dugdale, he refused a second time the office which he held. At the advanced age of 76, he died, and was interred in the church of Great Lambeth. Industry, perseverance, curiosity, and accuracy, appear to have been the leading features in his character. (*Gen. Biog.*).

Ashmole, Asia.

ASIA, according to the ancients, was one of the three great divisions of the earth, and is considered by the moderns as one of the four quarters of the habitable globe. Its extent is immense; and its importance, both in a historical and in a philosophical point of view, is very great. It contains every variety of soil and climate, and is inhabited by nations which possess undoubted claims to the highest antiquity. When Europe was yet covered by deep forests, thinly inhabited by a few wild animals, or by a barbarous race of men, destitute of science, and even of the meanest of those accommodations which the progress of art now enables all classes of people to enjoy, Asia abounded with flourishing cities and populous nations, in which commerce and agriculture had reached a considerable measure of improvement.

1
The countries of Asia to be considered as connected with each other.

The revolutions which have occurred in different regions of the great Asiatic continent, occupy a great space in the general history of the human race. These revolutions have possessed this peculiar character, that when they commenced in one quarter of Asia, we most frequently find that they extended themselves, in a few years, to the remotest regions, and even sometimes into the centre of Europe. As the human mind usually derives its character from the situation in which it is placed, we shall be enabled, by attention to the soil and climate, and geographical position of the principal parts of Asia, to form some general principles from which to deduce the causes that have influenced the destiny of the nations by which it is inhabited. Without enlightened notions of general geography, history degenerates into a mere detail of romantic adventures, and no valuable progress can be made in political or in commercial science. We shall here therefore give a general description of this vast continent, considering it, as far as possible, as one great whole, the various parts of which have at times possessed an influence over each other; leaving its particular districts and countries, to be separately discussed as they occur in the arrangement of our work, unless in such in-

stances

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stances as may seem to claim special notice from the singularity of their nature, or the recentness of the period at which time they have come to the knowledge of the European nations.

2 Boundaries of Asia.

Beginning with its north-west corner adjoining to Europe, the boundary of Asia commences at Waigats straits, opposite to the island of Nova Zembla, in what is called the *Northern ocean* or *Icy sea*. From thence the boundary extends southward along the Uralian chain of mountains, which are thus accounted half European and half Asiatic. After leaving these mountains, Asia is understood by geographers, to proceed in a south-westerly direction, through the provinces of the Russian empire, till it meets the river Don, where it approaches nearest to the Wolga. Proceeding along the river Don, it enters into the Black sea, which it crosses diagonally, proceeding to the south-west through the straits of the Bosphorus, at Constantinople, and through the Propontis and Hellespont; from whence turning south it proceeds through the Archipelago, and the eastern part of the Mediterranean sea called the *Levant*, to the isthmus of Suez, a narrow neck of land of 60 miles over, which divides Asia from Africa. The remaining part of the western boundary of Asia, is formed by the Red sea or Arabian gulf, which is connected with the Arabian sea, by the strait of Babelmandel.

The southern boundary of Asia, is formed by the great Indian ocean, under a variety of names derived from the different parts of the Asiatic coast, which are washed by its waters. Along the whole of this southern boundary, the ocean and the land alternately encroach upon each other, thereby forming immense bays and gulfs of the ocean, and peninsulated tracts of land. Thus to the eastward of the straits of Babelmandel, the Indian ocean advances northward under the appellation of the Arabian sea, having the peninsula of Arabia on the west, and the western peninsula of India on the east. Penetrating still farther north, it receives the name of the gulf of Ormus, and afterwards of the Persian gulf, which advances very far in a north-westerly direction, having Arabia on the south-west, and Persia on the north-east. The same Arabian sea in its north-eastern extremity, making a slighter inroad upon the land, receives the river Indus on the east of Persia, and is called the gulf of Scindi. To the eastward of the nearest peninsula of India, the same Indian ocean forms a most extensive gulf, called the *bay of Bengal*, bounded on the east and west by the two Indian peninsulas. The farther peninsula stretches to a great distance southward under the name of *Malacca*, beyond which the boundaries of the continent assume in general an easterly direction, more especially after passing the gulf of Siam, immediately beyond Malacca and the gulf of Tonkin, on the boundaries of China and of the farther India. The Chinese empire encroaches eastward upon the great Pacific ocean, which is here the boundary of Asia. Its coasts are sufficiently regular. Its bays and gulfs are trifling when compared with those of the Indian ocean, although towards its northern extremity, the Pacific ocean, under the name of the *Yellow sea*, advances into the continent, forming to the eastward the peninsula of Corea, of moderate extent. After which this eastern ocean passing the isles of Japan, at a great distance to the north, again encroaches on the land, forming the sea or great bay of Ochotsk, which has the peninsula of Kamtschatka on its eastern side, and the country of Siberia or the mainland of Asia on the west. Beyond Kamtschatka one more gulf is formed in that direction, called the *sea of Anadyr*, terminating in the gulf of Notchen, to which succeeds the peninsula of Tschutski, stretching to the eastward, till it approaches the coast of America at the bay of St Laurence. After which, turning to the westward, the Asiatic continent is entirely bounded on its northern side by the Icy sea, forming obscure gulfs and promontories, of which little knowledge has yet been obtained, and which can never be of much importance to the human race.

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3 Extent of the Asiatic continent.

The great continent whose general outline we have thus slightly traced, must necessarily vary considerably in breadth and length, according to the points from which an estimate of its mensuration is formed. Some idea, however, may be obtained of the territory included in it, from observing that the continent of Asia, from the Hellespont at 26° of E. Long. extends to nearly 190° E. Long. at East Cape, or to the 170° of W. Long. being a line of 164° or 9500 geographic miles, allowing 60 miles to a degree. The extreme breadth of this continent, from the south cape of Malacca, in 2° of N. Lat. to Cape Severo Vostochnoi, in 77° N. Lat. amounts to about 4500 geographic miles. Hence the length of the continent of Asia is not less than 7583 British miles, and its breadth from south to north is about 5250.

4 Relative position of the nations of Asia.

That the relative situation of the nations inhabiting this continent may be rightly understood, it is necessary to remark that the centre of Asia consists of an immense and irregular plain, which is elevated to a vast height above the surrounding countries, and extends some thousand miles in every direction. This elevated region or high level of land, stands aloft like a table, and is supported by a crest or front of lofty and precipitous rocks, which overlook in every direction the surrounding regions. The high level, or elevated territory, which these rocks surround and seem to uphold on all sides, constitutes the proper country of Tartary. The climate, even in latitude 27°, which elsewhere is extremely hot, is here very cold, and the soil is barren. In some directions, to the extent of 1000 miles, nothing is to be found but frightful deserts, covered with moving sands, which at times are carried aloft, as in Arabia and Africa, by the winds. They are rendered passable by ridges of mountains which divide them; and the summits of these mountains are covered with perpetual snow. Even where the soil seems more favourable, only the hardiest plants and trees can flourish in this barren region, whose inhabitants have in all ages remained in the pastoral state, subsisting by the produce of their flocks and herds, without engaging in the labours of agriculture.

5 High region in the centre of Asia.

6 Distribution of the countries of Asia.

This vast upland tract, which is probably the highest region of the old hemisphere, and which forms the largest extent of continued elevated land upon the globe, contains in general the tract or countries of the Kalmucs, of the Mongols, Thibet, and Eastern Turkestan, or the original country of the Turks. From the borders of this tract in the centre of Asia, the great rivers of that continent descend towards the ocean in every direction; such as the *Oxus* and *Jaxartes*

on,

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on the west, the *Amur* on the east, the *Ganges* and *Burrampooter* on the south, and the *Oby* and *Jenisea* on the north. The countries that surround this tract are, therefore, justly considered by Major Rennel and others, as a kind of inclined planes or hanging levels, or descents along the skirts of it, seeing the waters flow so regularly and uninterruptedly from it, as from a common centre, to all the surrounding seas. On the south of this elevated region, are the vast countries of India, descending gradually to the great southern or Indian ocean. They receive from their exposure the fiercest rays of a tropical sun, and are sheltered by the rocky front of the high country behind them from every northern blast. On the west of the elevated tract, are the countries which formed the ancient Persian empire, and which, in like manner, descend gradually, though more irregularly, towards the setting sun, and the territory of Europe. On the east of the high table, or elevated central region, is the immense empire of China, descending with its rivers towards the great Pacific or Eastern ocean. On the north of the same region is Siberia, descending gradually to the Icy sea. The high country to the south intercepts from Siberia the heated air which might otherwise advance towards it from a more fervid climate, while its gradual descent towards the north exposes it unprotected to every blast that may ascend from the icy regions of the pole, and thus the climate is rendered as much too cold in proportion to its latitude, as India is too hot. The soil, however, of Siberia, is in many places equal in fertility to that of almost any other country of the globe, and it has only been prevented from rising into importance, by the intolerable severity of a long winter, which has always operated as a tax upon the industry of its inhabitants, to prevent any great increase of population. Its rivers are bound up during half the year, under a covering of almost impenetrable ice; and the ocean into which they flow, can at no season be navigated with safety, a circumstance which banishes those resources which an extensive commerce might afford, to compensate the evils of the climate.

Geog. of Herodot.

7 Alluvions of the Asiatic rivers.

It may here be remarked, that the rivers which descend towards the south, from the high centre of Asia, through countries subject to periodical rainy seasons, have by their *alluvions*, or by carrying down immense quantities of mud and earth, formed vast fertile plains near the sea coasts, similar in their nature to the Delta, or rich valley of Lower Egypt. Accordingly, in the south of Asia, from Persia to China; near the mouths of the Indus, the Ganges, and other rivers, immense tracts of level country are found, which are periodically overflowed, and which, aided by the warmth of the climate, exhibit a degree of fertility in all the productions of the vegetable world, of which in our temperate and colder regions we have little conception.

8 Boundaries of the high level.

The high level of which we have now spoken, which is of so much importance both to the geography and to the history of Asia, is bounded, as already mentioned, on all sides by a crest or ridge of mountains, adjoining to which are lesser chains of hills, which gradually subside in the neighbouring low countries. The great ridge called *Imaus* by the ancients, or the *Indian Caucasus*, is properly the crest or front of the western declivity towards Persia. The part of this crest or the front of the high level towards the south was anciently called *Emodus*, and sometimes also *Imaus*, of which it is a continuation. The modern name is *Hindoo-Kho*.—The northern front of the high territory which overlooks the Baikal lake, and the whole length of Siberia, is of immense extent, and is usually called by historians the *Altaic* ridge or chain. The appellation of the front of the same high country towards China is little known to European geographers, but it forms in itself nothing more than a continuation of the ridges of Imaus and Altai surrounding the high country of Tartary.

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9 Chain of mountains proceeding from the high level.

This high country or elevated level, which may with propriety be called *Grand Tartary*, sends forth in different directions various ramifications of itself, or chains of mountains, to the utmost extremities of Asia. Thus it sends forth eastward a chain of mountains to the gulf of Corea to the northward of Pekin. This chain appears like a continuation of the Altaic mountains, which may thus be considered as proceeding from the 70° to the 140° of east longitude, or about 5000 miles. Another mountainous chain proceeds north-eastward to the gulf or sea of Ochotsk opposite Kamtschatka. A similar ridge, called the *Uralian chain*, proceeds to the north-west, and terminating in the vicinity of Nova Zembla, within the polar circle, has already been mentioned as one of the boundaries which divide Asia from Europe. Another chain, better known to both ancient and modern writers, proceeds from Imaus, or the front of the great high level, westward, under the celebrated name of *Mount Taurus*, and terminates in the Mediterranean sea at the peninsula of Lesser Asia. This important ridge has on the one side, or to the south, a great part of the ancient Persian empire, and on the north the great salt lake called the *Caspian sea*, and also the Black sea, with the high country of Georgia between them, which anciently received the appellation of the *Grecian Caucasus*.

10 Western Tartary.

A great tract of low country which lies to the east and to the north of the Caspian, and proceeds westward along the shores of the Black sea, also receives from modern geographers the appellation of *Tartary*, and was anciently denominated *Scythia*. Hence what is called *Tartary* must be regarded as consisting of two very distinct tracts of country situated upon very different levels. Eastern Tartary, lying beyond the mountains of Imans and southward of the mountains of Altai, constitutes the high level or elevated central region of Asia; whereas the country called *Tartary* situated upon the Caspian and the Black seas, now sometimes called *Russian Tartary*, is not only situated upon a lower level, but instead of consisting of a horizontal plane, it lies upon a south exposure, and its rivers, such as the Wolga and the Don, descend southward into the Caspian and the Black seas, which are placed along the northern basis of the ridge of mountains anciently denominated *Taurus*. Beyond the sources of the Don and the Wolga, however, the country begins to descend towards the polar circle and the Icy sea, like the rest of Siberia, of which it partakes the name.

11 Asia divided into civilized and barbarous.

In all ages Asia might be divided into two regions; the civilized, containing men who cultivated the soil and lived in cities; and the barbarous, whose inhabitants subsisted by hunting or by the pastoral life. To the

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the former belonged the three countries which descend from the elevated region of Asia on the east, the south, and the west, forming the empires of China, of India, and the ancient Persian empire, extending to the Hellespont. To the barbarous or uncivilized nations have always belonged the far more extensive tracts of Siberia, of High Tartary, and of the Western or Lower Tartary, which lies to the north of the Caspian sea, of Mount Caucasus, and of the Black sea. On the south-west of Asia also a different race of barbarians, engaged in a great measure in a similar life of pasturage, under the denomination of *Arabs*, have occupied an immense portion of territory; and both of these classes of barbarians, the Tartars of the east and north, and the Arabs of the south-west, have at times acted a most important part in the affairs of Asia, and even of Europe; and by their movements have decided the destiny of nations.

12 Knowledge of Herodotus concerning Asia.

The knowledge of the ancients concerning Asia appears to have been extremely limited. Herodotus, like all the ancient writers, admitted the existence of a northern ocean, upon the shores of which the Hyperboreans were supposed to exist, a peaceful race of men, upon whom nobody made war, and who never disturbed the tranquillity of other nations. He was also acquainted with the existence of various Scythian, or, as we now call them, *Tartar* tribes, inhabiting the country to the north of the Black sea and the Caspian, and upon the river Jaxartes, which he understood to flow into the lake Aral to the eastward of the Caspian. But Herodotus did not believe in the existence of an eastern ocean, or that Asia was in that quarter bounded by the sea. He also extended Europe indefinitely to the east, including all in that division of the globe that lies to the northward of Mount Caucasus and the Caspian sea. To the eastward of what he called Asia, that is, the Persian empire, he considered India as the last inhabited country, asserting, that "the Indians are the people of Asia that are nearest the east and the place of the rising sun." Beyond India he confessed that he knew nothing. "As far as India (says he) Asia is well inhabited; but from India eastward the whole country is one vast desert, unknown and unexplored." In these times, therefore, it is certain that the Greeks knew nothing of the vast empire of China and its dependencies, or of the peninsula beyond the Ganges, which forms the eastern division of India. Indeed it would appear that the elevated region of Tartary formed in these early times an impenetrable barrier which divided the western nations of Asia from those on the east. Neither does it appear that Herodotus was well acquainted with the southern frontiers even of Persia and Arabia. The whole Arabian sea, including the Arabic gulf, was called the *Erythrean* or *Red sea*; but he does not seem to have known that the sea bordering upon the ancient kingdom of Persia or Persia Proper, is itself nothing more than a gulf like that which divides Arabia from Egypt and Ethiopia, to which the name of *Red sea* is now exclusively confined.

13 The Macedonian expedition falsified the geography of Asia.

It is a circumstance not a little singular, that the visit of Alexander the Great to India through Persia did by no means extend the limits which preceding geographers had assigned to Asia. A correct knowledge of the coast of the conquered empire of Persia was indeed acquired, but neither to the east nor to the north was any knowledge gained. The high ridge of Imaus, forming the front of the elevated region of Tartary, was denominated by the geographers of Alexander the *Indian Caucasus*, probably from some obscure notion, that this ridge was a continuance of the mountains of that name between the Euxine and Caspian seas. Beyond India also he admitted of no tract of land whatever, thus making India the most eastern country of Asia, and consequently of the whole earth, although Herodotus had placed a vast desert beyond it. But it is probable that this diminution of territory to the eastward might be a sacrifice to the vanity of Alexander, who wished to imagine, and to make others believe, that he had approached the world's boundary. In another point also the geography of Asia was falsified by the followers of this conqueror. Herodotus had rightly described the Caspian sea as a great lake, but the followers of Alexander imagined they had discovered it to be a gulf of the northern ocean. With this ocean, therefore, they were under the necessity of supposing it to communicate by a narrow channel; a circumstance which led them to limit the continent to a very trifling extension northward. The knowledge which Herodotus possessed concerning the unconnected state of the Caspian in respect of other seas being thus lost, its geographical position as a lake remained unknown in the times of Eratosthenes, Strabo, and Pliny. It was, however, regained in the age of Ptolemy, who restored its form of a lake, but under such dimensions and proportions as demonstrate that the smaller lake, called *Aral*, which is 200 miles to the eastward, was mistaken for a part of it.

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14 Mount Taurus of the ancients.

The most remarkable feature in the ancient Greek and Roman descriptions of Asia, that is, of the country to the westward of Imaus, and to the south of the Caspian sea, is the high ridge of mountains which they in general denominated *Taurus*. This ridge was to them as it were a line of separation between two worlds, the civilized and the barbarous; or two climates, the warm and fertile, and the cold and barren. As Taurus, however, is at times broken into distinct chains of mountains which occasionally alter their general direction, various names were ascribed to particular parts of it, such as Niphates, Caspius, Paropamisus, Caucasus, Emodus, &c. The general chain, however, or the Taurus of the ancient geographers, originated in the south-west extremity of what they called *Asia Minor*, that is, the small part of Asia embraced between the Euxine or Black sea on the north, the straits of the Hellespont and the Dardanelles on the west, and the Levant or eastern part of the Mediterranean sea on the south. The ridge of Taurus was understood to pass eastward through lesser Asia at no great distance from the shores of the Levant. From thence, in its course eastward, it separated Armenia from Mesopotamia, the two countries called *Media* from each other, and the greater Media from the narrow tract along the southern border of the Caspian sea. Opposite to the south end of the Caspian its inferior ridges were divided by a vast chasm called the *Caspian straits*, which was with the ancients an important geographical point, being supposed to be in the same parallel with Issus and Rhodes. This remarkable chasm or strait formed the best road or passage from Media, Mesopotamia, and the western

15 The Caspian strait.

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western countries in general, to Parthia, Hyrcania, Aria, and others on the east, because by it considerable deserts to the south might be avoided. Alexander the Great passed through it in his way from Rages towards Aria and Baetria. It is at present called the *strait of Khoward*, from a town or district in the neighbourhood, and is almost due north from Ispahan: it is eight miles through, and is in general not more than 40 yards in breadth. Pliny says, that it is only wide enough for a carriage, and modern writers have said that where it is narrowest and most winding, a litter can scarcely pass. The mountains are very lofty on each side. The bottom is upon the whole flat, and at certain seasons a considerable stream of salt water flows along it towards the desert on the south.

After having passed the south-east corner of the Caspian, Taurus proceeding farther eastward, was understood by the ancients, and represented, as separating the countries of Parthia, Margiana, and Bactria, on the north, from those of Aria, Drangiana, and the north-western provinces of India, watered by the heads of the Indus. Here Taurus was known to meet the lofty ridge of Imaus, which we have already mentioned as the western front of the elevated region that forms the centre of Asia. But as this general account of the opinions of the ancients concerning the course of these mountains can give little idea of the general level of the countries through which they pass, we shall here notice more particularly the elevation of these countries, and the way in which they are divided from each other. In doing so we shall chiefly follow the authority of the learned and accurate Major Rennel; and we prefer the use of ancient appellations to the names assigned to these provinces by the barbarians who now inhabit or rather wander over them.

16 Elevation or level of countries westward from Imaus.

We have said, that from Imaus, or from the high region of central Asia, or Great Tartary, the country descends gradually towards the west, forming what was called *Asia* by the ancients, but what was in truth little more than the Persian empire. In departing from Imaus, however, the country is very elevated, and various ridges occur, which gradually, after assuming a variety of forms, unite in the ridge which terminates far to the west at the extremities of the Lesser Asia, and was called *Mount Taurus*, as already stated. In their progress the valleys or ordinary country near these mountains gradually becomes lower as it proceeds towards the west, and the mountains themselves decline in height. Even in the west, however, the mountains appear not a little elevated.

17 Most westerly territory lowest.

Returning from the west, or beginning with the peninsula of Asia or Asia Minor, which is enclosed on three sides by the Mediterranean, Ægean, and Euxine seas, it is to be remarked that even this tract acquires speedily a considerable elevation; but the southern part of Lesser Asia towards the Mediterranean is by far the highest, being the proper Taurus itself, rising abruptly from the neighbourhood of the sea-coast, and turning the courses of the principal waters towards the Euxine sea on the north.

18 Second portion higher.

The next portion of territory is still more elevated, extending from the Euxine to the Caspian sea. To the north it sends forth a tract of very mountainous country called *Caucasus*, or the modern Georgia, which overlooks the Sarmatian plains, or, in other words, the desert of Astracan, and the country of the Tartars called *Don Cossacs*, being the low lands on the north both of the Euxine and Caspian seas. Southwards this high region, which is a part of the Taurus of the ancients, overlooks the vast low countries, in which are contained the kingdoms or states of Syria, Mesopotamia, Assyria, and Babylonia, and even the great Arabian desert. The ancient divisions of this high region were called Cappadocia, Armenia, Pontus, Colchis, Iberia, Albania, the country of the Carduchians, and a part of Media. It seems to be the highest continued tract of territory in Western Asia, giving rise to the rivers Euphrates, Tigris, Cyrus, Araxes, Hypanis or Kuban, and Phasis, which flow from it in different directions towards the Euxine or Caspian seas, or the Persian gulf. It is worthy of remark, that in the higher parts of this region two great salt lakes are to be found.

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19 Eastern tract highest.

Advancing eastward is a third portion of still more elevated territory, extending from the Caspian sea to the lofty Imaus, or western crest of the great Asiatic highlands. This third region is still higher than the two former parts of the tract of Mount Taurus. Its breadth is very various. Its western quarter is limited by the approach towards each other of the Caspian and Persian seas; but the high country expands to a much greater breadth beyond the Caspian, till it is again narrowed on its approach to Imaus by two valleys, along the one of which flows the river Indus to the south, and along the other the Oxus to the north-west, anciently terminating in the Caspian sea, but now in the sea or lake of Aral. Of this third portion of the high country of Western Asia the northern part between the Caspian sea and Mount Imaus contains the ancient Parthia, Margiana, and Sogdiana, which overlook towards the north the low countries of Western Tartary, in that quarter called *Chorasmia*, and the seats of the Massagetæ (the ancient Magog) at the Jaxartes. The middle part of the high country contains Aria and Baetriana, adjoining on the east to Mount Imaus. The southern part of the same elevated region contains Persia Proper, Carmania, Arachosia, &c. which towards the Persian gulf are bordered by the low tract of maritime Persia. The highest continuous ridge of this territory is that which passes by the south-east of the Caspian sea and Hyrcania, between Drangiana on the south and Aria on the north, and from thence between Baetriana and the provinces of India; where, as it approaches Imaus, which, as already stated, is the front of a yet more elevated region, it swells to an immense magnitude and height, and is covered with snow annually till the month of August.

20 Lateral ridges of Taurus.

From this tract of elevated country, which we have thus described as gradually increasing in height from the Mediterranean to Mount Imaus, various lateral ridges project towards the south, forming between them different hollow basons or low countries. But these southern projections are not equal in altitude to the great chain that proceeds from west to east. The most westerly of these cross ridges is that which begins from the body of Taurus, near the place where it is crossed by the Euphrates, at the northern extremity of Syria. The ridge proceeds to the south, inclining to the west, and forms a kind of mound or dam, skirting the eastern shore of the Mediterranean, under the names

Asia. names of Amanus, Lebanon, &c. Having passed the Mediterranean and the southern border of Palestine, it advances to the eastern coast of the Red sea, where it spreads out, and forms the centre of Arabia, finally terminating in what is called *Arabia Felix*, or the southern part of the Arabian peninsula. Asia.

Farther to the east another ridge proceeds towards the south, which was called by the Greeks *Zagros*, and advances to the neighbourhood of the Persian gulf. Between this last ridge on the east, and the former, or Syrian ridge, on the west, and Taurus on the north, is a great valley or tract of low country that formed the ancient empire of Assyria, which was guarded in this manner by a wall of mountains on three sides, and by the Persian gulf and the Arabian desert on the south. It is watered by the fertilizing streams of the Tigris and Euphrates, upon which Nineveh and Babylon formerly stood. To the eastward the country becomes more dry and elevated. Passing through Media, a great salt desert occupies the centre of the country, having Persia Proper on the south, and Parthia on the north; and continuing still to ascend, the mountains become more numerous and less regular, in proportion as they approach Imaus. These regions, however, are of great importance in ancient history as the seats of civilization and of empire, though they are now sunk into obscurity, and a prey in a great measure to tribes of barbarians, who wander over them with their flocks and herds, and reside in tents. The eastern part of the countries known to the ancients as Asia, or rather as the Persian empire, still retains that name; but to the westward of the Euphrates Asia belongs to Turkey, excepting the great country or peninsula of Arabia, of which we shall here take some general notice.

21 Arabia. This country is worthy of the utmost attention in a historical point of view, on account of the influence which its inhabitants have had upon a great part of the nations of Asia, and consequently upon a large portion of the human race. They have contrived to extend themselves farther over the world than almost any other people, and have preserved in all situations more strongly than other nations, their language, religion, manners, and peculiar customs. From the river Senegal, on the west coast of Africa, to the Indus, colonies of Arabs are to be met with, and also from the heads of the Euphrates on the north to the island of Madagascar. Even the Tartar hordes have scarcely occupied a wider extent on the globe.

22 Boundaries of Arabia. Arabia, properly so called, is that great peninsula formed by the Red sea, or Arabic gulf, on the west, the Indian ocean, or Arabian sea, on the south, and the Persian gulf on the north-east. Accordingly, the ancients appear to have comprehended under the name of Arabia, the whole tract lying between those seas and a line drawn from the point of the Persian gulf to that of the Arabic gulf. This line, however, was never the real boundary of the country, which appears to have at all times extended northwards to a great distance, and to have been limited on one side by the river Euphrates, and on the west by Syria, Palestine, and the isthmus of Suez. Thus Arabia may be regarded as a vast but irregular triangle. From the northern point at Beles, where Xenophon and the Greeks first passed the Euphrates, to the straits of Babelmandel, is a line of 1500 miles, forming the western side of the triangle, while its southern basis presents a front of 1000 miles to the Indian ocean. The medium breadth of the peninsula from Bassora on the Persian gulf to Suez on the Red sea is upwards of 700 miles. The entire surface of the country, therefore, exceeds France or Germany in a fourfold proportion. Being situated from 13° to 30° of N. Lat. and of consequence partly between the tropics, its climate must necessarily be regarded as hot. In some provinces, indeed, the heat is excessive; but in this country, as in others, the degrees of elevation of the soil produce effects upon the temperature which set aside all calculations that might be founded upon the general principle of the vicinity or remoteness of the torrid zone. To understand the varieties of climate that exist in Arabia, it is necessary to attend to the form and aspect of its surface. The whole centre of the Arabian peninsula, or interior country, consists of a succession of mountains. Around the foot of these mountains, adjacent to the sea-coast, is a belt of flat ground. This belt surrounds the whole of the Arabian peninsula. It proceeds along the shores of the Red sea, of the Indian ocean, and of the Persian gulf. Even the desert of Syria on the north may be considered as a part of this belt. It extends everywhere to the distance of about two days journey from the sea, and is denominated *Tehama* by the Arabs. This belt of flat land is dry and sandy, and presents one unvaried picture of desolation. It bears every mark of having been anciently a part of the bed of the sea. Its bottom soil is a grayish clay, with a large proportion of sand, and having remains of marine animals interspersed to a great distance from the shore. It contains large strata of salt, which in some places even rise up into hills. Its regular inclination towards the sea indicates that it has emerged gradually; and the sea seems still continuing to recede. The banks of coral are still increasing, and coming nearer to the shore, so as to render the navigation round Arabia every day more and more dangerous. The sand accumulated by the billows gradually fills up the intermediate space, and joins these beds of coral to the continent. This recession of the sea, however, or conquest over the watery element, has produced little advantage to man. The Tehama is everywhere a frightful desert of sand, diversified only by naked rocks, with nothing to soften the force of the sun's rays, and in which all vegetation is burnt up. The drought is so extreme in these flat plains, that whole years pass without rain; and the torrents which descend from the hills, which occupy the interior of the country, are lost among the sands long before they can reach the sea.

In the interior country, the soil and climate are very different. The great ranges of lofty mountains attract vapours, which, descending in abundant rains, cool the air, and quicken vegetation. The cold occasioned by the height of the country produces falls of snow, but this never lies long upon the ground. While the inhabitants of the plains suffer by heat, those of the hills are obliged to wrap themselves in pelices; but as the hills or mountains are by no means of the primary order in point of elevation, ice and steady frost seem to be unknown. The soil, however, is as much diversified as in other countries; but the figure of the hills is unfavourable to their fertility. They are in general

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so craggy and precipitous as to afford little space or soil for vegetable productions, the best part of the soil being continually washed away by the waters. Hence the culture of the land is difficult and expensive. Terraces must be formed, and the soil carefully preserved and accumulated upon them; so that, upon the whole, no part of Arabia can with any propriety be denominated rich or fertile. In the southern division of it, called by the ancients, by way of eminence, *the Happy*, or *Arabia Felix*, the inhabitants are at once industrious and poor. The desert between Syria and the Euphrates, or that part of Arabia which extends to the northward of the peninsula, is altogether incapable of improvement by culture. A wide level of sand is only intersected by sharp mountains destitute of verdure, which render more powerful by reflection the intense rays of an almost tropical sun. The rare and hardy plants, the tamarind, or the acacia, that strike their roots into the clefts of the rocks, are nourished by the dews of night. A grove of date trees, or a green pasture, attracts a small colony of Arabs; and a well of water is a place of importance and of resort.

Yet this desert is not destitute of a tolerable number of inhabitants. They rear the camel, a strong and patient beast of burden, which subsists on the most stunted and withered roots, or upon herbs of the gourd species, which abound in the driest countries. Neither are they destitute of horned cattle, and goats and sheep; and naturalists consider this as the native country of the horse, which is the peculiar favourite of the Arabians.

23
Two classes of Arabs.

Properly speaking, there are two kinds or classes of Arabs; the one sedentary, that is, living in cities, or attached to husbandry, and the other, wandering in the pastoral state, called *Bedouins*. The Arabs settled in cities, and especially in sea-port towns, of which there are several on the coasts of the peninsula, have lost somewhat of their distinctive national manners by their intercourse with strangers; but the Bedouins, who live in tents, and are divided into tribes or clans, retain the customs and manners of their earliest ancestors. They are the genuine Arabs, and possess in the aggregate all those characteristics of which the other branches of the nation exhibit different shades and degrees. It is the difference in their ways of living that constitutes the great distinction between the different tribes. The genuine and nobler Arabs disdain husbandry, as an employment by which they would be degraded. They maintain no domestic animals but sheep, camels, and horses. Hence it is known, that Mahomet, the founder of their religion, belonged to a noble tribe or race, because he was a dealer in camels. Some tribes are even mentioned contemptuously by their countrymen, because they keep cows or dromedaries; and the peasants who cultivate the soil are accounted the lowest class. Even among the tribes which apply to agriculture, the chiefs live always in tents, and leave the culture of their grounds to their subjects, whose dwellings are miserable huts.

In the interior of Arabia, towards the Indian ocean, which is chiefly the quarter capable of being cultivated, some governments exist of a considerable extent; such as Yemen and Hadramant, and Oman. In these the people are of a mild and civilized character. A stranger travels unprotected and alone with as much safety as in any country in Europe. The only danger of imposition or of ill usage occurs in the sea-port towns, from the officers of government. Here also the religion of Mahomet exhibits a less intolerant aspect than in Turkey, Africa, or almost any other country. Indeed it is not a little singular, that while this religion extended itself to the pillars of Hercules, to the mouths of the Ganges, and to the extreme regions of Tartary, several tribes of native Arabs, secure in the fastnesses of their rugged mountains, regarded it with indifference or contempt. Some tribes in the interior could never be subdued by the power of the caliphs, and retain the worship of the heavenly bodies, as in the times of their ancestors. Even a tribe of Jews has existed for ages amidst these inaccessible mountains, though the most odious of mankind in the eyes of the surrounding Mahometans.

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The Bedouins, or wandering Arabs, who constitute the body of the nation, are divided into an endless variety of tribes. Their chiefs, whether high or low, are denominated *schiecks*. These schiecks or nobles are very numerous, and the plebeians are invariably actuated and guided by them: They are both shepherds and soldiers. The dignity of schieck is hereditary, but is not confined to the order of primogeniture. The petty schiecks, who form the hereditary nobility, choose the grand schieck of any district out of the reigning family, without regarding the degree of his propinquity to his last predecessor. They pay him little or no revenue, and the other schiecks are rather his equals than his subjects. If dissatisfied with his government, they depose him, or go away with their cattle, and join another tribe. These emigrations, which happen not unfrequently, produce great revolutions among the tribes. Even the peasants possess a similar privilege. Though understood to be slaves, they may quit the service of a master with whom they are dissatisfied, and choose another. It was remarked, in the time of the Romans, that the Arabs were at once addicted to robbery and to commerce; a fact which holds true to this day. They become the faithful servants of the merchant, who hires them to conduct him through the desert; while at the same time they are extremely apt to consider the property of unprotected travellers as an object which they may lawfully seize. But it may also be remarked, that we are sometimes apt to consider as robbery what the Arabs view in another light. Every grand schieck, or schieck of schiecks, as he is called, considers himself as the absolute lord of his whole territory, and exacts duties upon all goods carried through his dominions. The Europeans are wrong when they suppose the sums paid by travellers to the grand schiecks to be a ransom to redeem them from pillage. On the contrary, it is regarded by the Arab nobles in no other light than as the duties levied in other countries by princes for the support of the government. The southern part of Arabia, called by the ancients *Arabia Felix*, has at times been subdued by strangers; but the Bedouins, who live in tents in the desert, do not appear to have ever been effectually conquered. In a contest with them, much is hazarded, and little can be won. Their horses and camels, which in eight or ten days can perform a march of 400 or 500 miles, disappear before a victorious army. The secret waters of the desert elude

the

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the search of the invader, and his troops are consumed by hunger, thirst, and fatigue, in the pursuit of an invisible foe, who mocks his efforts, and at all times finds safety in the midst of a burning solitude.

24 How far connected with foreign states.

Notwithstanding the memory of their ancient independence, even the wandering Arabs are frequently tempted to settle near towns, or in fertile provinces; which has in different ages brought them into subjection to the sovereigns of these provinces. Their neighbours, also, such as the Persians, the princes of the Greek empire, and the modern Turks, have contrived to acquire an influence over some of the tribes, by sowing dissensions among the great families, and espousing the cause of pretenders to the dignity of grand schieck. Accordingly the Turks allege that they are the sovereigns of Arabia; but this is no more than a vain-glorious assertion, which is so far from being true, that they find it necessary to pay the usual tribute to the schiecks when their caravans pass through the desert to Mecca. The tribes who live near the road keep the wells open, permit the passage of merchandise, and escort the caravans. Quarrels, indeed, often occur, in which the rapacity of the Bedouins is seldom more remarkable than the insolence of the Turks, who regard all the Arabs as rebels. The famous Ali Bey, when he conducted the Egyptian caravan, would not pay all the duties on his way to Mecca, but promised to pay the rest on his return, but forgot his promise. On the year following the Arabs assembled in greater numbers, and obliged the captain of the caravan to pay both for himself and Ali Bey. The Turks exclaimed against this as an act of robbery; yet the Arabs had only done themselves justice. The conduct of Abdalla, pacha of Damascus, who commanded the Syrian caravan in 1756, was still more odious. When the schiecks of the tribe of Harb came to meet him to receive the stipulated toll, he gave them a friendly invitation to visit him; but instead of paying the toll, he cut off their heads, and sent them to Constantinople, as a proof of his victory over the rebel Arabs. The stroke which they had thus suffered, by the death of their chiefs, hindered them from attempting any thing in revenge, on either that or the following year: The caravans travelled in triumph to Mecca, and the Turks boasted of the valour and prudence of Abdallah Pacha. But in the third year the Arabs avenged the slaughtered schiecks, and, with an army of 80,000 men, raised out of all the tribes, routed the Turks, and pillaged the caravan.—Thus the Arabs, notwithstanding their internal divisions, consider themselves on extraordinary occasions as one nation. A certain subordination even subsists among the tribes: The petty tribes being unable to defend themselves, place themselves under the protection of the greater, and are governed by their laws; and thus are powerful tribes formed by the union of several small tribes.

25 Character and food of the people.

The climate and barren soil of their country has a considerable influence on the general character of the Arabians. They are an extremely sober and frugal nation, which produces in them an appearance of leanness and stinted growth. The usual articles upon which the better sort subsist are, rice, pulse, milk, and butter: mutton is their most common species of butcher's meat, but they seldom eat of it, as all kinds of animal food are accounted unwholesome in these hot countries. The common people have little other food than a kind of bread made of *durra*, a sort of coarser millet, by kneading it with camels milk, oil, butter, or grease: They also use barley bread. Like the other natives of the warm regions of Asia, they have less restlessness or natural desire for exercise than the natives of the colder countries of Europe; and this inactivity is, no doubt, increased by their general habits of abstinence and extreme frugality with regard to food. They are astonished when they observe the quantity of all kinds of meat that Europeans devour at a meal, and account them guilty of the most odious gluttony; for they themselves, at least the wandering Arabs, are not only taught from their youth to live upon little, but even to accommodate themselves to any kind of food. Hence locusts are in common use among them, and have a considerable influence upon their condition. Immense clouds of these animals sometimes descend upon a district, and produce the greatest mischief, by destroying the whole verdure. They darken the air, and appear at a distance like clouds of smoke. The noise of their flight is stunning, like that of a waterfall. Every thing that is green is wasted by them; but corn, either ripe or nearly so, is too hard for their use. The Arabs of the desert convert this scourge to their advantage. They roast the locusts alive, and devour them eagerly; or they kill and dry them, and store them up for use: This food is said to be by no means unwholesome. The Jews of Arabia assert, that the fowls, of which the Israelites ate so largely in the wilderness or desert, were only clouds of locusts; and they ridicule our translators, for supposing that they found quails where quails never were.

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26 Their conduct towards women.

In Arabia polygamy was always tolerated, and is permitted by the law of Mahomet; but the Arabians are, in general, too poor to avail themselves of the privilege of possessing a plurality of wives. The law, however, has this effect, that it often induces the rich to give their daughters to poor men in preference to those who are wealthy. The marriage articles are made out before the cadi or judge. The wife's property is secured to her even during the marriage, so that she becomes absolute mistress of her husband's house; and he, having no separate property, can have no means of bringing another wife into the family. All women, however, in Arabia, live in a most retired manner. They receive no visits from strangers of the other sex. In the houses of the rich the front apartments belong to the men, and those behind to the women. In the houses of persons of inferior rank, destitute of a variety of apartments, when the husband carries a stranger to his house, he enters before him, and calls aloud, *tarik*, retire; upon which the women instantly disappear, and even his most intimate friends never see one of them. Their notions of the delicacy necessary to be observed, with regard to women, is extreme. It is accounted unpolite to salute a woman, or even to look her steadfastly in the face. In the neighbourhood of the city of Barra, an adventure occurred which displays in strong colours the jealousy of the Arabians in whatever concerns the other sex. A man of eminence, belonging to the tribe of Montesidsi, had given his daughter in marriage to an Arab of the tribe of Korne. Shortly after the marriage a schieck of an inferior tribe asked him in a coffeehouse, whether

27 Jealousy.

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whether he was father of the handsome young wife of such a one, whom he named? The father supposing his daughter's honour ruined, immediately left the company to stab her. At his return from the execution of this inhuman deed, he who had so indiscreetly put the question, was gone. Breathing nothing now but vengeance, he sought him everywhere; and not finding him, killed in the mean time several of his relations, without sparing even his cattle or servants. The offender offered the governor of Korne a great sum, if he would rid him of so furious an adversary. The governor sent for him who had been offended, and endeavoured by threats and a show of the apparatus of punishment to force him to a reconciliation; but the vengeful Arab would rather meet death than forego his revenge. Then the governor, to preserve a man of such high honour, soothed him to an agreement, by which the first aggressor gave his daughter, with a handsome portion, in marriage to him whom he had offended. But the father-in-law durst never after appear before his son-in-law.

28 Their vindictive spirit.

Revenge is indeed among the Arabs a most ungovernable sentiment. In some of the states of the southern part of the peninsula the government is strong enough to restrain private revenge, and to assume to itself the punishment of crimes, as in other civilized countries; but over a great part of Arabia, the relations of a person slain are allowed to accept a composition in money, to require the murderer to surrender himself to justice, or to avenge themselves on him or his family. The passion of avarice is often found to afford, among barbarians, the best means of subduing animosity; but in many places among the Arabians it is accounted disgraceful to take money for the shedding of blood, which, by their laws of honour, can be expiated only by blood. Their refined malice even refuses to be satisfied by the destruction of the assassin either by their own hands or by the hand of public justice; for this would be to deliver from an unworthy member a family which deserves no such favour from them: hence they revenge themselves, as custom allows, by substituting an innocent to the guilty person, and seek an opportunity of slaying the chief or the most considerable person of the race of him by whom they have been injured. When a murder has been committed, therefore, the two families are in continual fears till some one or other of the murderer's family be slain. Till this occur no reconciliation can take place, and the quarrel is occasionally renewed. If in the contest a man of the murdered person's family happen to fall, there can be no peace till two others of the murderer's have been slain, and there are instances of such family feuds lasting forty years.

Nor is the point of honour confined to such cases as those we have now mentioned. The noble Bedouins carry their pride higher than even our barbarous ancestors seem to have done. If one schieck says to another, with a serious air, "thy bonnet is dirty," or "the wrong side of thy turban is out," nothing but blood can wash away the reproach; and not merely the blood of the offenders, but that also of all the Arabs of his family. An insult offered to the beard of an Arab is regarded with equal indignation, and produces equal resentment.

When these capital points, however, are avoided, the Arabs are understood to be by no means quarrelsome. They take a pride in preserving their coolness of temper against reproachful language. When a dispute happens suddenly to arise among them, they make much noise, and are apt to forget themselves, and to proceed to extremities; but should an indifferent person calmly say to them, "think of God and his prophet," they instantly make an effort to resume their tranquillity, and a reconciliation is effected. If this contest cannot be settled at once, they choose arbitrators, to whose decision they submit. Asia.

29 Manners.

The manners of the Arabs are grave and serious. As soon as boys attain to five or six years of age, they pass whole days together in their father's company, and are indeed allowed to be as seldom out of it as possible. Being thus always under the eyes of persons advanced in life, they acquire a pensiveness and gravity of manners, and an air of recollection, at a very early age. Their imaginations being accustomed to barren deserts and bare rocks, are apt to acquire a gloomy cast; but in Yemen or Arabia Felix, where the soil is more fertile and the population more considerable, they posses sufficient vivacity of character, and are extremely fond of society. In the towns of Syria in which they settle, they are far more cheerful and fond of amusement than the Turks. Both there and in Arabia Felix they are fond of frequenting coffee-houses and public markets.

30 Literature.

In the earliest ages the Arabians were always accounted admirers of poetry, and were accustomed to celebrate in verse the military exploits of their chiefs. The genius and merit of a rising poet was rewarded by the applause of his own and of the kindred tribes; and they regarded him as a herald risen up to immortalize their renown. Before the days of Mahomet there existed an institution which the fanaticism of his first followers abolished. An annual fair was held, to which the most distant or hostile tribes resorted, and which lasted thirty days. For some time before and after this fair, amounting in all to two, or as some say, to four months, a general truce took place; during which every public and private quarrel was suspended throughout the whole extent of Arabia. This truce was sanctioned by the laws of honour; and, as a breach of it was attended with perpetual infamy, every sword was religiously sheathed while it lasted. At this great market not only corn and wine, but also eloquence and poetry were exchanged. The prize was disputed by the emulation of the bards, and the victorious performance was deposited in the archives of the prince; and, on some extraordinary occasions, inscribed in letters of gold, and suspended in the temple of Mecca, which even in these early times was a place of national pilgrimage. Generosity and valour formed the favourite theme of the songs of the Arabian poets; and their keenest satire or bitterest reproach against a despicable race, consisted of the affirmation, that the men knew not how to give, nor the women to deny. Such a festival, resembling, in some measure, the Olympic games of the Greeks, must have possessed considerable influence in humanizing the manners of the people. As the northern part of Arabia was situated in the very centre of the most civilized nations of antiquity, whose caravans must have been continually passing through it; its inhabitants, therefore, could not fail

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at a very early period, to acquire some portion of that information which an acquaintance with intelligent strangers brings along with it. As a commerce with India appears at a very early period to have been carried on by sea from the southern parts of the peninsula, it is probable that such a portion of literature as might be requisite for conducting its transactions would be cultivated by the Arabians in a very distant antiquity. Literature however was never diffused to any great extent in this peninsula. In the northern parts, indeed, or in the Syrian desert, where the Roman and Persian empires flourished on each side, the Arabian city of Palmyra appears to have received and cultivated the learning and the arts of Greece; and at a future period, when the successors of Mahomet carried their dominion into other countries, in which they settled and pursued the arts of peace, the Arabian conquerors cultivated various branches of literature. At all times, however, the desert itself, or the native country of the Arabians, has exhibited an illiterate race of men. At present their youth are not indeed entirely neglected. The chiefs of the desert can frequently read and write, and in the cities many of the lowest of the people possess these qualifications. They have schools in their mosques for the education of the poor; and in great towns there are schools to which persons in better circumstances send their sons; but no girls attend the public schools, being privately taught at home by women. The Arabians can scarcely be said to possess any science. Astronomy is somewhat valued by them, but only in subserviency to astrology, a science highly esteemed and very lucrative in the East, though prohibited by the Mahometan law. From their ignorance they are indeed extremely fond of what are called the *occult sciences*, which are supposed to enable their possessors to become familiar with genii, and to oblige them to obey their pleasure, to teach how to command the winds and seasons, to cure the bites of serpents and many diseases or infirmities. A great part, however, of these occult sciences have appeared to strangers to be nothing more than tricks, which the credulity of the people induces individuals to practise upon them. The Arabians are also extremely superstitious. It frequently happens that a town has been reared on the spot which it occupies, merely in consequence of its having been the dwelling place of some Mahometan hermit or saint. In this way the city of Loheia was founded. Its founder and patron was a saint called *Schieck Sælei*, who spent his days in a hut on the shore of the Red sea. A house of prayer was afterwards raised over his tomb, and some devout persons imagining it would be a great happiness to live near the remains of so holy a person, built huts around it. Nearly at the same time the sea having retreated from a neighbouring harbour, an accident which is always happening on the Arabian coast, the inhabitants deserted it, and settled at Loheia, which is now a well-frequented port. In the same way the city of Beit el Fakeh originated around the tomb of a saint called *Achmed ibn Musa*. Some devout persons built themselves cottages round his tomb, and the harbour of Galeska being about the same time choaked up, the inhabitants of that city removed thither. This saint was a great worker of miracles. A Turkish pacha, who had been for 20 years a captive in Spain, where he was bound with ponderous chains to two large stones, long and vainly invoked the aid of different saints. Last of all he bethought himself of the great Achmed, and invoked him also in his turn. The saint stretched out his hand from his tomb; and at that very instant, in the presence of many witnesses, the pacha arrived from Spain, bearing with him his chains and the stones to which they were fixed. This miracle took place not many years ago, on the eve of the festival of the saint; and the Arabs regard it as authenticated by unexceptionable evidence, notwithstanding all prayers or invocations to saints are strictly prohibited by the Koran. Another miracle performed by Ismael Mulk, the patron saint of the city of Tacæs, is easily accounted for. Two beggars had asked charity from the dola or governor of Tacæs, but only one of them had tasted of his bounty. The other went upon this to the tomb of Ismael Mulk to implore his aid. Ismael, who, when alive, had been very charitable, stretched his hand out of the tomb, and gave the beggar a letter containing an order on the dola to pay the beggar an hundred crowns. Upon examining this order with the greatest care, it was found that Ismael Mulk had written it with his own hand, and sealed it with his seal. The governor could not refuse payment, but to avoid all subsequent trouble from such bills of exchange, he had a wall built inclosing the tomb.

31 Superstitions.

In the southern parts of Arabia the posterity of the saints are treated with as much respect as is shewn to the descendants of Mahomet at Mecca, which is very great. Every person who can number a reputed saint among his ancestors, is dignified with the title of Schieck, and accounted an ecclesiastic by birth. Families thus find it their interest to establish, by every possible means, the sanctity of the person from whom they are descended, and to maintain the authenticity of the miracles ascribed to him. In this manner, in spite of the Koran, which is strictly unitarian, the superstitious worship of saints is daily extending its influence among the Arabs, and feigned miracles are consequently multiplying, so that they may be said in some measure to be relapsing into the polytheism of their ancestors. At the same time it is to be observed, that within these forty years a sort of reformation of religion has been attempted, and even accomplished, in a part of the central or mountainous country of Arabia, by one Abdul Wahheb, in whose family a sovereignty of considerable extent has been established. He taught that God, as the creator and governor of the world, is the only proper object of worship. He forbade the invocation of saints, and the very mention of the name of Mahomet, or of any other prophet, in prayer, as practices savouring of idolatry. He forbade the making of vows to obtain deliverance from danger, as a crime against providence. He represented Moses, Mahomet, Jesus Christ, who were respected by his countrymen as prophets, as merely great men, whose history might be read with improvement; denying that any book was ever written by divine inspiration, or brought down from heaven by the angel Gabriel.

32 Hospitality and charity.

In thinly peopled countries men can afford to be hospitable to strangers, because they see them seldom. In Arabia, however, this virtue is still more valued than elsewhere. Poverty is a misfortune very general among

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among the people of this country; and when travelling through their deserts they are apt to suffer great hardships both from hunger and thirst. Hence among them kindness to strangers, and charity to the poor, are the most popular of all virtues, and a breach of the sacred laws of hospitality is productive of the most indelible dishonour. The rapacity of even an Arabian robber is checked by the influence of this law, and an enemy is safe with those who have consented to taste along with him a morsel of bread. On the whole it appears that the inhabitants of this great territory, though in general barbarians, are yet of a mixed character. A part of them have in every age participated the civilization of the countries in their neighbourhood; and though the tribes of the desert have been always in some measure independent, and governed only by their own fancy or prejudices, yet they have always acknowledged a connexion with the rest of the nation that reside in towns, or that cultivate the soil. Though labouring under a degree of that tendency to indolence which is common to rude nations, yet their poverty and the hardships to which they are inured, prepare them for the toils of war, and render them capable of enterprise.

33 Persia.

Of the present Persian empire, in a general view of Asia, it is unnecessary to take much notice. Both sides of the Persian gulf are to some distance possessed by the Arabs, and the interior provinces have sunk into decay under a long succession of military usurpations. Cultivation is in a great measure confined to the near neighbourhood of a few towns; and a considerable part of the open country is used for the pasturage of the cattle of wandering hordes of barbarians that have descended from Tartary, and that now occupy these seats of ancient civilization and riches.

We have already remarked, that between the Persian gulf on the south, and the Caspian sea on the north, but nearest to the Caspian, a chain of mountains, the celebrated Taurus of the ancients, proceeds from the straits of the Dardanelles eastward to the front of the high central region of Asia called *Imaus*. After passing the Caspian sea and the Persian gulf, these mountains widen to a great extent, and the middle ridge, as it reaches Imaus, becomes very elevated. This middle ridge appears to be crossed by no rivers, and accordingly the streams which descend from itself, or from Imaus on the northern side of it, proceed in a north-westerly direction to the Caspian or the lake Aral. These are chiefly the Oxus and the Jaxartes. To the south of the middle ridge of Taurus, the rivers descend southward to the Arabian sea or Indian ocean. The principal river that descends southward from the western or

34 River Sind or Indus.

south-western front of Imaus is the river Sind or Indus, the upper branches of which approach very near to those of the Oxus; and it may be proper here to remark that the present commerce between the Russian empire and India proceeds in this channel. The merchants, after leaving the Caspian sea, travel in caravans or bodies up the river Oxus and down the river Indus. In the mountainous country near the western and south-western front of Imaus, are several beautiful valleys, which in all ages have been the admiration of travellers. Among these we may mention between Imaus and the Caspian, the valley or country of Sogdia with its capital Samarcand. This country was in ancient times accounted by the orientals a terrestrial paradise, possessing all the fertility of a torrid climate with the salubrity of the coldest regions. Not less remarkable, upon the south-western front of Imaus, on one of the heads of the river Indus, is the valley of Cashmere, which in every age has been the happy valley of the Indian poets, or the paradise of Hindoostan. It is of an oval form, about 80 miles in length and 40 in breadth, and is supposed to have been once filled with water, which having burst its mound, left this valley fertilized to the most distant ages by the mud which had been deposited in it. The emperors of Hindoostan frequently visited it to forget the cares of government, and to collect new health and vigour from the salubrity of the air and the beauties of the place. In 1664 Aurengzebe went thither for this purpose from Agra his Indian capital. M. Bernier attended in quality of physician to one of his omrahs. The train of the emperor was extremely splendid. The heats on the march were dreadful, as the lofty mountains that skirt the front of the high region of Tartary prevent the cool air of the north from descending to refresh the parched plains of India. A vast mountain called *Bember* divides Cashmere from India. The southern side of this mountain is steep and arid. The procession encamped in the channel of a large torrent dried up, full of sand and stones, which were burning hot. "After passing the Bember (says M. Bernier) we pass from a torrid to a temperate zone: for we had no sooner mounted this dreadful wall of the world, I mean this high, steep, black, and bald mountain of Bember, than in descending on the other side, we found an air that was pretty tolerable, fresh, gentle and temperate. But that which surprised me more in these mountains was to find myself in a trice transported out of the Indies into Europe. For seeing the earth covered with all our plants and shrubs, except hyssop, thyme, marjoram, and rosemary, I imagined I was in some of our mountains of Auvergne in the midst of a forest of all kinds of trees, pines, oaks, elms, plane-trees. And I was the more astonished, because in all those burning fields of Indostan, whence I came, I had seen almost nothing of all that.

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35 Cashmere.

"Among other things relating to plants this surprised me, that one and a half days journey from Bember I found a mountain that was covered with them on both sides, but with this difference, that on the side of the mountain that was southerly towards the Indies there was a mixture of Indian and European plants, and on that which was exposed to the north I observed none but European ones, as if the former had participated of the air and temper of Europe and the Indies, and the other had been merely European." The same traveller proceeds in this description of this valley or kingdom of Cashmere. "Thousands of cascades descend from the surrounding mountains of this enchanting plain, and forming rivulets meandring through all parts, render it so fair and fruitful, that one would take this whole kingdom for some great evergreen garden, intermixed with villages and boroughs discovering themselves between trees, and diversified by meadows, fields of rice, corn, and divers other legumes, of hemp and saffron, all interlaced with ditches full of water, with channels, with small lakes and rivulets here and there. Up and down everywhere are also

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also seen some of our European plants, flowers, and all sorts of our trees, as apples, pears, prunes, apricots, cherries, nuts, vines. The particular gardens are full of melons, skirrets, beets, radishes, all sorts of our pot-herbs, and of some we have not."

This delightful spot is surrounded by the mountains adjoining to Imaus, which are of vast height and rude aspect, perpetually covered with snow. At the foot of the exterior chain of mountains is an inner circle of hills, which abound in trees, grass, and various sorts of vegetation, and which are full of all kinds of cattle, as cows, sheep, goats, gazelles, and musks. The exterior mountains are so lofty and cold, that the pioneers of Aurengzebe were obliged to cut through a glaciere, or a great mass, as Bernier calls it, of icy snow. The capital is sometimes called *Cashmere*, sometimes *Sirinagur*, and sometimes *Nagas*. It is in N. Lat. 34. 12. on the banks of a celebrated river, the *fabulosus Hydaspes* of the ancients. Its current is smooth, and it is navigable in Cashmere by small boats. The town was in Bernier's time three quarters of a French league long on both sides of the river, and extending from it along a navigable canal to a small but beautiful lake. The houses are built of wood, four stories or more in height. The lower story is for the cattle, the next for the family, and the third and fourth serve as warehouses. The roofs are planted with tulips, which have a most beautiful effect in the spring. Every part of the country exhibits the remains of palaces, pavilions, and gardens, formed there by the emperors of Hindoostan. The periodical rains which almost deluge the rest of India, are excluded from Cashmere by the height of the mountains; and it experiences only light showers, which, however, are sufficient to feed the thousands of cascades which descend into the valley from every part of the stupendous and romantic bulwark of mountains by which it is encircled. The horses of this country are small, hardy, and sure-footed. The cows are black and ugly, but yield abundance of milk and excellent butter. They have also a kind of sheep which is used to carry burdens. The elk is mentioned as one of the wild animals that inhabit the woods at the base of the snowy mountains in the neighbourhood.

Cashmere is famous for its manufacture of shawls made of the wool of the broad-tailed sheep of Thibet, whose fleeces, in fineness, beauty, and length, are said to exceed all others in the world. The Cashmerians engross this article, and have factors in all parts of Thibet for buying up the wool, which is sent into Cashmere and worked into shawls of the highest value. The Indian emperor Akbar, who conquered this country in 1585, greatly encouraged this manufacture, and introduce it into Lahore. The natural colour of the wool is said to he gray tinged with red, but sometimes it is quite white.

The Cashmerians are accounted an ingenious people, fond of poetry, and having a language of their own. They are industrious mechanics, and the various articles of their workmanship are sent to all parts of India. They are celebrated for the fineness of their features and their admirable complexions. They look like Europeans, and neither resemble their neighbours of Tartary nor of India, having nothing of the flat noses and small eyes of the Tartars, nor of the black colour of the Indians. In the time of Bernier the Indian courtiers were extremely solicitous to obtain Cashmerian women, to have children by them whiter than the natives of Hindoostan, that they might pass for the true Mogul breed of the same race with their monarch.

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As already mentioned, India consists of two peninsulas, one to the westward and the other to the eastward of the Ganges. The western peninsula is overlooked from the north, by that part of the chain of Imaus or Emodus which constitutes the southern front of the region of Tartary. In the south-western side of this high region the rivers Ganges and Indus have their source. After advancing westward to no great distance from the Indus, the river Ganges turns towards the south, and afterwards traverses almost the whole breadth of the peninsula in an easterly direction, till at last it proceeds south into the bay or gulf of Bengal. The Indus, rising in the south-western part of Tartary, called *Cashgar*, descends in a south but somewhat westerly course, till it enters the Arabian sea by various channels to the northward of the bay of Cutch. At its mouth it has a broad delta or tract of fertile land, like the Nile in Egypt, formed by its own alluvions, or the deposition of mud brought down from the high country by the periodical floods to which it is subject. To a great distance from the sea it flows, like the Nile, along a fertile valley enriched by its inundations. Parallel to the channel of the river, after it has received all its tributary streams, run two chains of mountains, by which its course is directed, and its valley is separated from other countries. Beyond the mountains, on the east, extends a sandy desert of 200 miles in breadth, by which the valley of the Indus is shut out from the rest of India. The whole course of this river amounts to nearly 1000 miles. It has an uninterrupted navigation from the sea, for flat-bottomed vessels of nearly 200 tons, as high as the city of Lahore, at the distance of about 650 miles. The current of the Indus must be rapid, as vessels frequently fall down the river from Lahore in 12 days; but the ascending passage requires six or seven weeks.

36 Sources of the Ganges and Indus.

As the Indus and the Ganges nearly peninsulate or enclose western India on the north, in a manner similar to that in which it is enclosed by the ocean on the south, we shall take some farther notice of the course of the Indus. This river is the most westerly of India. Before it enters the narrow tract already mentioned between the mountains, which run parallel to its course, it is formed by the contribution of a variety of streams, which have their sources in the rugged country adjacent to high Tartary. These rivers, whose union forms the Indus, water a large and fertile territory, a part of which appears to have belonged to the ancient Persian empire of Darius Hystaspes. Various great and populous cities have in different ages stood upon these streams, in what is called the Panjab, or country of the five rivers, which consists of spacious and fertile plains. Alexander the Great reached these plains, and they formed the scene of his exploits against Porus and other Indian kings. Here also ended the progress of the Macedonian conqueror. He built a fleet of vessels, and descended the river with his army; an attempt which he is said to have been induced to make, from a notion that he had found out the head of the Nile. As in his time it was not known to the Greeks

37 Indus described.

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that any other river in the world, excepting that of Egypt, contained crocodiles, the discovery of crocodiles in the river Indus, suggested the notion in these times, when geography was so little understood, that there might be some communication between this river and the great river of Africa. Arrian says, that Alexander had even written to his mother an account of his discovery of the head of the Nile. But the voyage down the river pointed out the mistake, as it brought him to the ocean.

38 Delta of the Indus.

The lower parts of the Indus, or the fertile but swampy land near its mouth, was in the time of the ancients unhealthy and hot in the extreme. This rich delta or triangle of land is of great extent, each side of the triangle being 115 miles in length. The mouth of the river was well known at a very early period. Not only did Nearchus, the admiral of Alexander the Great, sail from it to the Persian gulf; but at a much earlier period, Darius Hystaspes, from curiosity to ascertain the place at which the Indus met the ocean, built, according to Herodotus, a fleet on the borders of Scythia, that is, of Tartary, high up the river, and gave the command of it to Scylax, a Grecian of Caryandra, an able sailor. He was directed to be attentive to discoveries on both sides; and when he reached the mouth, to sail westward, and that way to return home. He executed his commission; passed the straits of Babelmandel; and in thirty months from the time he sailed from Caspatyrus, landed safely in Egypt, at the place from whence it is said, that Necho sent his Phœnicians to circumnavigate Africa, by its now well-known promontory the Cape of Good Hope. This expedition took place in the 12th year of Darius, and in the year 509 before the Christian era.

The delta or low country is still extremely unhealthy. The heats are so violent, in consequence of the vicinity of the sandy deserts, that it is found necessary to ventilate the houses occasionally, by means of apertures in the tops like chimneys. When the hottest winds prevail, the windows that are closely shut exclude the warmer current of the air, while the more elevated part of the atmosphere being cooler, descends through the chimneys. The soil depends for its fertility entirely upon the overflowings of the river; and it sometimes happens that a single shower does not fall during three years. There are no trees upon the delta; but in the drier parts the soil is covered with brushwood. The city of Tatta stands in the delta, upon the western branch of the river, about 65 miles from the sea, which is the distance to which the tide ascends. The British had at one period a factory here, for the purpose of transmitting the English broad cloths to the high countries around the sources of the Indus. Beyond Tatta, various towns are formed along the fertile banks of this river, during its whole progress between the parallel ranges of mountains, which are distant from its banks from 30 to 40 miles. In latitude 29° 8′, on the eastern side, the Indus is joined

39 River Setlege.

by the river Setlege or Hysudrus; and it is to be remarked, that in consequence of the sandy deserts by which the lower parts of the Indus are surrounded, this is the first river that falls into it, in a tract of 520 miles from the sea. The river Setlege is the southern boundary of the Panjab already mentioned, which having from time immemorial been a most fertile and populous region, and at the same time the frontier of India towards the north-west, has been the scene in different ages of the most dreadful massacres, by the celebrated destroyers of mankind, Alexander the Great, Timur or Tamerlane, and Kouli Khan. The river Setlege rises at the foot of Mount Imaus, and is joined by another stream, called the *Beyah* or *Hyphasis*. Both of them pass through a fertile tract of country.

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40 Chunaub.

About 50 miles above the discharge of the Setlege, another river, called the *Chunaub* or *Acesines*, falls into the Indus. On the southern banks of the Chunaub, in latitude 30° 34′ stands the city of Moultan, the capital of a province, in a country very fertile in cotton, and also in sugar, opium, brimstone, galls, and abounding in camels, which animals also are reared in great numbers on the lower parts of the Indus. This city is remarkable for being the principal residence of the Banians, an hereditary cast or tribe, who employ themselves solely in commerce, and are the merchants or brokers of India. Their chief resides here, but they form settlements in every commercial town of India; and they send colonies to the trading towns of Arabia and Persia, and even as far as Astracan. As these die away or incline to return home, a supply is sent from India of unmarried young men. As no females attend them, they live at Astracan and some other places, with Tartarian women: but the contract lasts only during their residence. They are highly esteemed for the integrity of their dealings, and are trusted to a great extent by Europeans and other strangers, as well as by the natives. They are the bankers of India; and the confidence reposed in them is one of the means by which the civilization of that country has been preserved amidst its revolutions and the sanguinary wars of its princes. No prince has ever offered violence to the Banians, with the view of extorting from them their treasures, without speedily finding himself undone. His officers have instantly conspired against him, because by robbing the Banians, or bankers in whose hands their money was deposited, he ultimately plundered the very persons who supported his power, and had the readiest access to his person. About 160 miles above Moultan, is Lahore, the capital of the Seiks, a set of religionists who venerate the ox like the Hindoos, but who are pure Monotheists and Predestinarians, worshipping God without the use of images. They form a sort of aristocratical republic. They can raise 100,000 cavalry, and they have of late become very formidable. They are a kind of Indian reformers, hostile both to the government and the religion of the country. They admit of proselytes, and have no casts or division into distinct hereditary professions. In their territory a vast mountain of rock salt is found, which is cut into dishes, plates, and stands for lamps.

41 Capital of the Banians.

42 Behut.

Between Lahore and Moultan, the Chunaub is joined by the Behut, or the *fabulosus Hydaspes*, which flows, as already mentioned, from the romantic Cashmere. A little above the mouth of the Chunaub, the Indus receives an obscure river, the Lucca, from the territory on the north-west, called *the kingdom of Candahar*. The city of Candahar, situated in N. Lat. 33. E. Long. 67. 15. was anciently a place of much importance, being the gate of India, with respect to Persia, and the great magazine of Indian and Persian goods.

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goods. Somewhat higher, that is, more northerly, two tributary streams enter the Indus, called the *Cow* or *Cophenes*, and the *Kameh* or *Gurdus*. On the former stands the city of Ghizni, and on the latter is Cabul. This last city is in N. Lat. 34. 36. and E. Long. 68. 58. near the foot of the Indian Caucasus, or Imaus. It stands in so happy a climate, that it produces the fruits both of the temperate and torrid zones, though it is in the near neighbourhood of mountains, whose summits are covered with perpetual snow. The Indian historians speak of it with raptures. Cabul is the residence of the kings of Candahar. It has at all times been of much importance, as the frontier of India towards the river Oxus, which flows into the Caspian sea, and towards Tartary. In ancient times, it always was a great commercial magazine, as well as an important fortress. To this day, it is on the direct road by which the commerce of the southern parts of the Russian empire is carried on with India. It is at present noted for its vast fairs of horses and cattle, the first of which are brought hither by the Usbec Tartars; and merchants resort to these markets from Persia, China, and Tartary. Near the mouth of the river Kameh, the city of Attock stands upon the Indus. Attock signifies *forbidden;* this being the original boundary of Hindoostan, towards the north-west, which the Hindoos were prohibited to pass. Here the river is three quarters of a mile broad, and the water is cold, and the stream rapid and turbulent, having much black sand suspended in it. To this place the Indus descends from the lofty mountains of Imaus, and the high region of Tartary. The remainder of its course, therefore, lies through a country little known, and so rude in its soil and climate, as scarcely to admit even of the most slender population.

Returning to the ocean, it is to be observed, that the most eastern of the branches into which the Indus is divided towards its mouth, flows into the bay or gulf of Cutch, which advances far into the country, receiving the river Puddar. This river, and the bay into which it flows, form one side of the fertile peninsula of Guzerat, the other side of the same peninsula being contiguous to the gulf of Cambay. The western parts of the peninsula of Guzerat are mountainous and woody. The rest is extremely rich, and once famed for a very considerable commerce of its productions. Here stood, in former times, on the promontory of Guzerat in the neighbourhood of Diu, one of the last remaining possessions of the Portuguese in India, the great temple or pagoda of Sumnat. It was destroyed in the eleventh century by Mahmud, the greatest of the princes of that race of Tartars called *Turks*. He was the sovereign of Ghizni, which we have already noticed as a town in the kingdom of Candahar, upon one of the streams that fall into the Indus from the north-west. Being a most fanatical Mahometan, he undertook 12 holy wars, as they were called, against the unbelieving nations of India. Lahore, Moultan, and Delhi, were compelled to open their gates to him, and he at last reached and conquered the rich peninsula or kingdom of Guzerat. On the payment of a tribute, the rajahs preserved their dominions, and the people their lives and fortunes; but to the religion of the country Mahmud was inexorable. Many hundred temples or pagodas were levelled with the ground.

43 Bay of Cutch.

44 Pagoda of Sumnat.

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Many thousand idols were demolished; and the servants of the Arabian prophet were stimulated, and rewarded, by the precious materials of which they were composed. The pagoda of Sumnat was at this time conspicuous beyond all the retreats of Indian superstition. Its magnificence and its destruction deserve well to be noticed, as indicating the character of two Asiatic nations: the riches and devout superstition of the one, and the furious fanaticism which the other had been able to diffuse over a great part of the world. This pagoda, or temple, was endowed with the revenue of 2000 villages; 2000 Brahmins were consecrated to the service of the deity, whom they washed each morning and evening with water from the distant Ganges. The subordinate ministers consisted of 300 musicians, 300 barbers, and 500 dancing girls, conspicuous for their birth or beauty. Three sides of the temple were protected by the ocean: the narrow isthmus was fortified by a natural or artificial precipice, and the city and adjacent country were peopled by a nation of fanatics. They confessed the sins and the punishment of Kinnoge and Delhi; but they boasted, that if the impious stranger should presume to approach their holy precincts, he would surely be overwhelmed by a blast of the divine vengeance. By this challenge the faith of Mahmud was animated to a personal trial of the strength of this Indian deity. Fifty thousand of his worshippers were pierced by the spears of the Moslems; the walls were scaled; the sanctuary was profaned; and the conqueror aimed a blow of his iron mace at the head of the idol. The trembling Brahmins are said to have offered ten millions sterling for his ransom; and it was urged by the wisest counsellors, that the destruction of a stone image would not change the hearts of the Gentoos, and that such a sum might be dedicated to the relief of the true believers: "Your reasons," replied the sultan, "are specious and strong; but never in the eyes of posterity shall Mahmud appear as a merchant of idols." He repeated his blows, and a treasure of pearls and rubies, concealed in the belly of the statue, explained in some degree the devout prodigality of the Brahmins. The fragments of the idol were distributed to Gazna, Mecca, and Medina. Bagdad listened, says the historian, to the edifying tale; and Mahmud was saluted by the caliph, with the title of *Guardian of the fortune and faith of Mahomet*. *Gibbon*, vol. v.

45 City of Cambay.

Adjoining to the peninsula of Guzerat, and at the bottom of the gulf of Cambay, stands the city of that name, which once was the capital of a considerable kingdom. It is situated in a great manufacturing country, which furnishes large quantities of coarse unbleached cotton cloth, for Persia, Arabia, Egypt, and Abyssinia; also blue cloths for the same countries, and for the English and Dutch trade on the western coast of Africa; likewise blue and white checks to be used as mantles in Arabia and Turkey, some coarse, and others enriched with gold; muslins for turbans, gauzes, mixed stuffs of silk and cotton, and shawls made of the Cashmerian wool. This country also sends annually to Surat, Bengal, China, Persia, and Arabia, immense quantities of raw cotton, as well as rich embroideries of various kinds.

46 Form of the peninsula of Hindoostan.

From the bottom of the gulf of Cambay, the peninsula of western India may be said to begin in the strict-

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est sense; as a line of coast here commences, which proceeds without interruption, or any considerable bending, to Cape Comorin, the southern part of the peninsula, after which the coast suddenly turns to the north-east; and the bay of Bengal bounds the peninsula on the east. From Cambay to Cape Comorin, the western coast of the peninsula may be divided into three unequal parts. The first extends from the most advanced part of the gulf southward, a little beyond the city of Surat. The second tract of coast, which is more extensive than this, in a fourfold proportion, is called *the coast of Concan*, or *the pirate coast*. To the southward of this, the coast of the peninsula, all the way to Cape Comorin, receives the appellation of the *Malabar coast*. The first of these divisions, lying upon the eastern shore of the gulf of Cambay, consists of a low country, into which the rivers descend from the upper part of the peninsula of Hindostan. After passing Surat, however, the physical structure of the peninsula assumes a peculiar character well worthy of attention. The Concan and Malabar coasts which form almost the whole of the western shores of the peninsula are extremely low, and a narrow stripe of level land, of from 40 to 50 miles in breadth, runs along the coast of Surat to Cape Comorin. At the back of this stripe of low land, a chain of mountains runs

47 Ghauts.

parallel to the sea shore. They are called *the Ghauts*, and rise to a surprising height, opposing to the west a lofty wall of rugged and precipitous rocks. The whole chain seems one continued crest or wall, inaccessible to the summit, unless by paths which have been worked by the hand of man, and which cannot be ascended, even by a single traveller, without the fatiguing labour of many hours. From the root of these rocks, the plain towards the sea is variegated with small hills, which gradually descend into a level and fertile country, blest with a cool and healthy air. The small hills near the foot of the Ghauts are clothed with forests of the most valuable timber; and from the sides of the mountains magnificent cataracts descend, forming torrents which facilitate the conveyance of the timber to the sea coast.

The word *Ghauts* signifies *passes;* but this name has been given to the whole front of rocks which overlooks the western coast. At the summit of the Ghauts the country is level, and consists of an elevated tract of fertile and populous plains, which are supported to the west by the Ghauts, as by the walls of a terrace formed on an immense scale. The country, however, begins gradually to descend towards the east; and accordingly from Surat to Cape Comorin, the great rivers of the peninsula uniformly flow from the Ghauts eastward, and form considerable tracts of low rich land upon that coast, which receives the appellation of the *Coromandel coast*. Thus the western peninsula of India must be considered as resembling a plane, gradually inclining towards the east, and supported on the west by a long chain of lofty rocks.

In the north-western quarter of the peninsula, the

48 Nerbudda river.

two most considerable rivers that flow into the gulf of Cambay, are the Nerbudda, in N. Lat. 23. 10. E. Long. 82. 10. which runs a course of 700 miles, from the centre of the northern part of the peninsula; and

49 Tapti.

the river Tapti, upon which stands the celebrated city of Surat, in N. Lat. 21. 11. This city has long been well known as a place of great commerce. It is the port from which the Mahometan pilgrims sail on their way to Mecca. The oldest British factory in India is in this city, and it is still a place of the first commercial importance. Wheat grows in great abundance in the surrounding country, of equal quality with that of Europe, though it scarcely flourishes farther to the south.

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On the coast of Concan, or the Pirate coast, is the island of Bombay, containing a celebrated British settlement which need not here be noticed. The Pirate coast contains a great variety of harbours, and is thus described by Mr Rennel: "Perhaps there are few coasts so much broken into small bays and harbours, and that at the same time have so straight a general outline. This multitude of small ports, uninterrupted view along shore, and elevated coasts favourable to distant vision, have fitted this coast for the seat of piracy; and the alternate land and sea breezes that prevail during a great part of the year, oblige vessels to navigate very near the shore. No wonder then that Pliny should notice them in his time, as committing depredations on the Roman East India trade; and although a temporary check has been given them in the destruction of Angria's fleets, &c.; yet we may expect they will continue the practice while commerce lasts. They are protected by the shallowness of their ports and the strength of the country within. As pirates, they have greater natural advantages than those of Barbary, who being compelled to roam far from their coast, have expensive outsets: here the prizes come to their own doors, and the cruizers may be secure in port until the prey is discovered."

50 Coast of Concan, or Pirate coast.

In ancient times the Romans were obliged to put on board their merchant ships a number of archers to defend them against the attacks of these pirates. In modern times the pirates have made a considerable figure, particularly under a chief called *Angria*, who was subdued by the English, and his port Gheriah taken. They sometimes use vessels of 300 tons with three masts; but, in general, they are of 150 tons and only two masts. Their cannon are six and nine pounders. They make prize of all that do not condescend to purchase their passports. As the British trade in these seas is carried on in large vessels, it does not suffer from the pirates; but the ships of the Indians are much exposed to their enterprises. It is said, that the celebrated Hyder Ally established a sea port upon this coast, at the town of Mangalore, with a view of accomplishing a most grand but visionary plan. He had formed the project not only of becoming sovereign of the Indian seas, but even retaliating on the British the invasions they had made into India. To become a naval power, he invited shipwrights from all countries, and under them trained his own subjects. He had heard something of the effects of frost in cold climates, and had formed some strange ideas of the solidity and strength, or hardness, of the waters of the European seas. Under the notion, therefore, of combating against oceans of ice, he strengthened his ships with planks of great thickness. But his port was twice taken by British detachments. In 1786 a fleet from Bombay brought away from it nine great ships and several

51 Mangalore. Hyder Ally's project of invading England.

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veral lesser ones. In 1781, he had nearly finished six ships of the line, and several frigates and sloops of war, when the port of Mangalore was again captured.

52 Water snakes show the vicinity of the Pirate coast.

It is to be observed, that the approach to this coast was formerly thought very dangerous. Ships were hurried forward by so rapid a current, that they could neither keep their reekoning, nor distinguish the coast during the rainy season. Many vessels were consequently lost. These misfortunes have eeased, since an observation was made of a fact noticed by Arrian in ancient times, that in the Indian ocean, at a certain distance from land, many water serpents, from 12 to 13 inches in length, are to be seen rising above the surfaee of the water. When these serpents are seen, they indicate that the coast is precisely two degrees distant. This coast of Concan was aneiently denominated the *Lymirica regio*. It was greatly frequented by Roman merchants, and is thus spoken of by Arrian: "Originally they performed only coasting voyages from harbour to harbour, sailing from Cana, on the coast of Arabia Felix, till Hippalus, an adventurous seaman, having considered the situation of the harbours and the form of the sea, found out a navigation through the ocean, at the season in which the winds blow with us from the sea, and the west-south-west wind prevails in the Indian oeean, which wind is called *Hippalus*, from the first discoverer of that navigation. From that time till now, some sail in a direct course from Cana, others from the harhour of the Aromati: they who sail for Lymirica make a longer stay; others who steer for Barygasa or Scythia, stay not above three days; they spend the rest of the time in completing their usual voyage."

53 Malabar coast.

Southward of Mangalore, all the way to Cape Comorin, this shore receives the appellation of the *Malabar coast*. It contains several towns, the first of whieh is Tellieherry: from the shore to the Ghauts, the country here and elsewhere is extremely beautiful. Pepper is the chief article of commerce; but coffee is also enltivated. There are varions other towns of note, partieularly Mahi, originally a French settlement, Calicut, Canganore, Cochin, and Ajenga. The interior of the level eountry, to the foot of the Ghauts, is covered with fine forests, both here and in Conean, which contain that most valuable of all treasures for the navigation of the Indian sea, the teek wood, whieh deserves partieular attention. It is an evergreen, and esteemed a saered tree. The Gentoos repair or build their pagodas with this timber only, when timber is at all used. Its property of resisting the worm, which in these climates is so destruetive to all ships, renders it of the utmost importanee. Mr Rennel speaks in the following terms of it: "I cannot close this account, without remarking the unpardonable negligence we are guilty of in delaying to build teek ships of war for the use of the Indian seas. They might be freighted home without the eeremony of regular equipment, as to masts, sails, and furniture, which might be calculated just to answer the purpose of the home passage at the best season, and erews could be provided in India. The letter annexed, which was written with the best intentions nine or ten years ago, will explain the circumstance of the same case. Teek ships of forty years old and upwards, are no uncommon objects in the Indian seas, while an European built ship is ruined there in five years. The ships built at Bombay are the best, both in point of workmanship and materials, of any that are constructed in India; and although fourth rates are mentioned only in the letter, there is no doubt that third rates may be construeted, as there is a choiee of timber. The Spaniards build capital ships in their foreign settlements. The East India Company have a teek ship on her fourth voyage at present, which ship has wintered in England; therefore, any objection founded on the effects of frost on the teek timber is done away.

54 Teek wood.

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"Frequent have been the opportunities I have had of observing how very rapid the decay of ships built of European timber is in the East Indies; and, on the contrary, how durable the ships are that are built of the wood of that country, namely, the teek, which may not be improperly styled *Indian oak*. The number of ships of war that were ruined in those seas during the late war (1757 to 1762,) may be admitted as a proof of the former remark; and the great age of the ships built in India may serve to prove the latter. What I mean to infer from this for your lordships use is, that ships of war under third rates may be construeted in India, and, with moderate repairs, last for ages; whereas a ship of European construetion can remain there but a very few years; to whieh disadvantage may be added, that of losing, in the mean time, the services of the ships that are sent to relieve the worn-out ones.

55 Laccadive isles.

To the westward of the Malabar coast, at the distance of several leagues, are the Laccadive isles. They extend from latitude 10° to 12° 50′ north. They are supposed to be the isles mentioned by Ptolemy, under the title of *Insulæ numero* 19; though in fact they are 32 in number. They are small, and covered with trees. They have some trade. They export the produet of the eocoa trees, that is to say, the oil extracted from the nut, and eordage formed of the rind. They also export dried fish to the continent of India, and receive rice in return. Ambergrease is frequently found floating near these islands. At a eonsiderable distanee from the Laccadives are the Maldive islands. They extend from N. Lat. 1. to 7. 25. From their number, Ptolemy calls them *Insulæ* 1378. The natives make the number of their isles amount to 12,000. They are divided into 13 provinees under one king, whose subjects are miserably poor. He assumes, however, the magnificent title of *sultan of the Maldives, king of* 13 *provinces and* 12,000 *isles*: But these isles, whatever their number may be, are extremely trifling. A fishery, however, is earried on in their vicinity; and they produce cocoa nuts, which, with the cordage produeed from that useful tree, are sold upon the western coast of India. These isles are chiefly worthy of notice, on account of one artiele obtained from them; this is the eowry, a small species of shell, the *cypræa moneta* of Linnæus. These shells, whieh appear to be produced in the Maldives alone, have been used as current coin for ages past in different parts of the world. The shells are collected twice in the month, at the full and new moon, by the women, who wade into the sea for that purpose up to their middle. They are packed up in parcels of 12,000 each, and are used as current money among the poor in Bengal. As provisions are exceedingly cheap in that country, it is found absolutely

56 Maldives.

57 Cowry shells.

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solutely necessary to employ, for the use of the common people, something less valuable than any coin formed of metal. These shells or cowries serve this purpose. One cowry is rated in Bengal at the hundredth and sixtieth part of a penny. Eighty cowries make a pun; and from 50 to 60 puns are equal to a rupee, or four shillings and sixpence British money. In Africa, in the country of the negroes, upon the rivers Niger, Senegal, and Gambia, these cowries also pass as current money; but at about ten times the value that they bear in Bengal. Hence, the English, French, and Dutch, are induced to purchase them in India, and to bring them to Europe, from whence they are afterwards exported for the purposes of trade; and thus, an useless shell, brought from the miserable islands of which we are now speaking, comes to be ultimately employed to purchase the persons of men.

58 Cape Comorin.

Cape Comorin is the most southern part of this peninsula, and consequently of Hindostan. It is in N. Lat. 8°. A little to the north of this cape, the Ghauts terminate. The sea adjacent to it is considered by the natives as sacred, and persons resort thither to perform ablutions and lustrations. From this point the land turns towards the north-east, along the gulf of Manara, which is between the main-land and the island of Ceylon. This island was known to the ancients, by the name of *Taprobana*. Pliny treats very particularly concerning it, and the Arabian geographers of a later age give it the name of *Serendib*. It is rich in almost all mineral productions excepting the diamond, and possesses a fertile soil. On account of the cinnamon which it produces, the Portuguese made themselves masters of the whole of its ports. In 1656, they were expelled by the Dutch; who had been invited thither by the monarch of the island, to rescue him from the state of dependance in which he was held by the Portuguese. The emperor repaid the Dutch in cinnamon, all the expence of their efforts in his favour; and in return speedily found himself in the same dependant state as before his victories over the Portuguese. The cunning Dutchmen obtained from him a grant of coast, round the island, 12 miles in breadth, reckoning from the sea; and under pretence of defending him from foreign invasions, they fortified every one of his ports. Having thus hemmed in his majesty, these good allies had it at all times in their power, by refusing to sell him salt, to compel him and his subjects to submit to any terms they were pleased to dictate.

59 Ceylon.

It is to be observed, that the natives of this island differ totally in their language, and in a considerable degree in their religion, from the inhabitants of the neighbouring continent. They are worshippers of Budho or Gaudma, who they believe came upon earth for the salvation of mankind. They have many pagodas or temples, which are richly carved. Between the island of Ceylon and the continent, at the narrowest part of the strait, is a chain of rocks which runs entirely across the channel. The length of the chain is about 30 miles, but the whole is frequently interrupted by narrow passages, which however are extremely shallow. It is very probable that this succession of rocks, at some period, formed part of an isthmus, which united Ceylon to the continent. Pliny takes notice of the greenish cast of this shallow part of the channel, of its being filled with shrubs, that is, with corals. On each side of the chain of rocks, the water does not exceed for some distance the depth of 13 or 14 feet. The chain of rocks which we have now mentioned, is called by the Mahometans *Adam's Bridge*. Their tradition is, that our common father, after his transgression, was cast down from paradise, which they understand to have been celestial, and not terrestrial as we do; that he fell upon Ceylon; but that afterwards this bridge was made by angels, to enable him to pass over to the continent. The highest mountain of the island, which is of a conical form, is called *Adam's Peak*. On the summit is a flat stone, with an impression resembling a human foot, which is two feet long. The Mahometans say that it is the mark of Adam's foot; that he fell from paradise on this summit, and that Eve fell near Judda in Arabia. They were separated 200 years, after which he found his wife, and conducted her to his old retreat in Ceylon, where he died and was buried, and where two large tombs remain, which are visited by Mahometan pilgrims. But the Pagan inhabitants of the island ascribe the mark of the foot to their great deity Buddo, Budho, or Gaudma, when he ascended into heaven. To this summit therefore they also make pilgrimages, and here they offer sacrifices, which, by an ancient custom, descriptive of a very tolerant spirit, they give to the Mahometan pilgrims.

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60 Adam's bridge.

61 Adam's Peak.

62 Ceylon relinquished to Britain.

This fine island, with the valuable spices and other riches which abound in it, is now relinquished by the Dutch in favour of the British: and it remains to be seen, whether the natives will find their independence increased by this new alteration of the protectors of their coast, and the purchasers of their cinnamon; or whether the monarch and his people will not as usual be kept under controul, by the aid of the monopoly of salt, an article of immense importance in hot climates where vegetable food is chiefly used.

From Cape Comorin north-eastward to Cape Calmere, in N. Lat. 10° 20′, is above 220 miles. The country is watered by frequent streams from the north-west, that is, descending from the eastern side or summit of the Ghauts. At Cape Calmere what is properly called the *Coromandel coast* begins. In the southern part of it is the pearl fishery, which has been well known and practised during several ages.

63 Coromandel coast.

64 River Cavery.

Around Cape Calmere, is the delta of the river Cavery, which proceeding from the south of the Ghauts, near the western shore of the peninsula, there forms an extensive tract of low and fertile land, well suited to the cultivation of rice, the grain best suited to hot climates. This delta formed what was called the *kingdom of Tanjore*, now a province belonging to the British East India Company. The river is at one place divided by an island called *Seringham*, upon which are two pagodas or Indian temples, one of which is perhaps the most famed in Hindostan for its sanctity, magnitude, and the vast resort of pilgrims, who go to it from all quarters. Mr Orme gives the following description of this sacred retreat. "It is composed of seven square enclosures one within the other, the walls of which are 20 feet high, and four feet thick. These enclosures are 350 feet distant from one another, and each has four large gates with a high tower, which are placed, one in the middle of each side of the enclosure, and opposite to the four cardinal points. The outward wall is near four miles in circumference, and its gateway to the

65 Pagoda of Seringham.

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the south is ornamented with pillars, several of which are single stones 35 feet long, and nearly five in diameter; and those which form the roof are still larger. In the inmost enclosures are the chapels. About half a mile to the east of Seringham, and nearer to the Cavery than the Coleroon, is another large pagoda called *Jumbakistna*, but this has only one enclosure. The extreme veneration in which Seringham is held, arises from a belief that it contains the identical image of the god Wistchnu, which used to be worshipped by the god Brachma. Pilgrims from all parts of the peninsula come here to obtain absolution, and none come without an offering of money; and a large part of the revenue of the island is allotted for the maintenance of the Brahmins who inhabit the pagoda; and these with their families formerly composed a multitude not less than 40,000 souls, maintained without labour by the liberality of superstition. Here, as in all the other great pagodas of India, the Brahmins live in a subordination which knows no resistance, and slumber in a voluptuousness which knows no wants; and sensible of the happiness of their condition, they quit not the silence of their retreats to mingle in the tumults of the state, nor point the brand, flaming from the altar, against the authority of the sovereign, or the tranquillity of the government."

66 Tranquebar and Pondicherry.

Upon the same coast is situated the small Danish settlement of Tranquebar; to the northward of which is Pondicherry, a settlement formerly belonging to the French, but now permanently annexed to the British possessions. Near Pondicherry, the bird called the *vulture* is frequently found. This animal is well known to feed upon dead or putrid carcases. A singular circumstance concerning it has been observed in every age in the eastern countries, that though very rare in a particular quarter, yet when two hostile armies approach to give battle to each other, the air is suddenly seen filled with multitudes of them, flying with their usual sluggish wing, from every quarter, to partake of the carnage. Hence in former times they were supposed to possess a prophetic instinct, or presage of battle, which led them to seek the spot of future slaughter three days before the event. To this opinion Milton alludes, when he compares the great enemy of mankind to one of these birds.

67 Vultures.

——"As when a flock
Of ravenous fowl, though many a league remote,
Against the day of battle, to a field
Where armies lie encamp'd, come flying, lur'd
With scent of living carcases design'd
For death, the following day, in bloody fight;
So scented the grim feature, and upturn'd
His nostril wide into the murky air,
Sagacious of his quarry from afar."

Paradise Lost, book x. l. 273.

Between Pondicherry and Madras, the river Paliar enters the sea. Upon this river, about 66 miles above its mouth, stands the city of Arcot, the *Arcati regia Sorœ* of Ptolemy, and *Soro-mandalam*, corrupted into the modern *Coromandel*, giving name to the whole coast.

68 Krishna.

At a considerable distance to the north is the great river Kistnah or Krishna, in Lat. 15. 43. It rises near the western Ghauts, and like all the other rivers of this extensive coast annually overflows a vast tract of country. Into the north side of this river, in Lat. 16. 20. flows a great stream called the *river Beema*, which also rises at the head of the Ghauts, within 50 miles of the other side of the peninsula. It runs a course of 350 miles. To the north of the river Krishna is the celebrated and once powerful kingdom of Golconda, abounding in corn, rice, cattle, sheep, and every necessary of life; also in fish, which are found in the numerous rivers, which in some places are in a great measure formed by art. Dams are made across the hollows between hills sometimes half a league in length. These are filled during the rainy season; and the inhabitants introduce the water as it is wanted into the lower country, which, assisted by the heat of this climate, produces prodigious fertility.

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69 Godavery.

The river Godavery is the next great stream upon this eastern coast of the peninsula. Like the others, it rises near the western coast, and flows towards the east. It is joined by another great river called the *Bain-gonga*. The delta of this river is of vast fertility, enriched by the soil brought down by the periodical inundations. To this river succeeds a flat coast, which, unlike the more southerly parts of this eastern side of the peninsula, has behind it, at some distance inland, a barren lofty chain of rude and almost inaccessible mountains. The part of the coast betwixt the sea and these mountains is called the *Circars*. To the northward the country descends regularly towards the east, as throughout the rest of the peninsula. In general, however, it is soft and morassy, though fertile. This country was known in the time of Pliny. It is now called *Orissa* or *Orixa*, and was in his time said to be the seat of the *Gangaridæ Calingæ*, whose monarch was very powerful, being able to bring into the field 70,000 foot, 1000 horse, and 500 elephants. Beyond this part of the Indian territory, at some distance, the mouths of the Ganges begin, forming the extremity of the bay of Bengal, and of the eastern side of this peninsula.

70 Ganges.

The Ganges is the most celebrated of all the eastern rivers, being in every part of its course held sacred by the original inhabitants of the country. It periodically overflows an immense extent of fertile territory, formed by the deposition of mud, which in the course of ages it has brought down from the higher country. Compared to this mighty stream, the Egyptian Nile sinks into insignificance, and the fertility which it produces is trifling. So completely is the whole of this country formed by the alluvions of its river, that there is not a stone quarry on the banks of the Ganges for the space of 500 miles. The depth of the river to that distance is 30 feet. Immediately at the mouth, however, it is obstructed by the mud brought down by its own floods, so that its eastern or true channel cannot be entered by large vessels. The channel called the *Hoogley river*, upon which the city of Calcutta stands, is the most useful of its mouths, being that which is entered by large vessels, though even at the mouth of this branch great danger is experienced from numbers of longitudinal banks at its entrance, formed by the mud or sand brought down and deposited there by the waters of the river. There are some other branches also which may be entered during the rainy season, or at its close. At the great

71 Hoogley.

tract

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tract which faces the bay is a collection of flat islands, divided by a labyrinth of canals covered with trees, and forming altogether a forest as large as the principality of Wales. The head of the delta is 220 miles from the sea in a straight line. The numerous channels which pass through it in every direction, form a complete inland navigation along the lower parts. Ships sail amidst a forest divided into numberless isles by a continual labyrinth of channels, so various in breadth that a vessel has at one time her masts almost entangled in trees, while at another she passes uninterruptedly along a capacious river beautifully sheltered with woods. The woods, however, are dreadfully infested by tigers, to which the pious Hindoos, when coming on a pilgrimage, to wash themselves in the sacred stream, are apt to fall a prey.

72 Source of the Ganges.

It has been already mentioned, that this great river rises in the southern part of the high central region of Asia. Its source is a small stream which issues from under a mass of snow accumulated on the south side of the Himmalaya mountains, between 31° and 32° of north latitude, and 78° and 79° of east longitude. From thence the Ganges proceeds to a considerable distance westward, among mountains, after which it precipitates itself into a deep chasm, from which, at a great distance, it escapes, and enters at once, as from a second source, into the vast and fertile plains of Hindoostan. Through these it runs navigable with an easy and smooth current 1320 miles, till it reaches the sea. The place at which it emerges through a gap or division of the lofty Imans, or southern front of Tartary, is called *Hurdwar*. In this neighbourhood the mountains are covered with lofty spires of ice, overlooking the torrid plains of India. Into the Ganges flow multitudes of great rivers from each side, which give a matchless inland navigation. It receives in its course through the plains eleven rivers, some of which are equal in size to the Rhine, and none less than the Thames. It maintains 30,000 boatmen by the carriage of salt and food for ten millions of people in the province of Bengal, and all this independent of its fisheries, and of its different exports and imports. Where it passes through valleys which require not the aid of its inundations to assist the fertility of the soil, the country is defended by vast dikes, which are kept up at an enormous expence. One branch of the Ganges is thus confined for the extent of 70 miles, so that when the river is full, passengers in ships and boats look down on each side as from a lofty eminence into the adjacent country. Its waters are periodically increased by the tropical rains, and by the melting of the snows in the mountains of Tartary adjacent to its source; it then assumes the appearance of a sea of almost boundless extent. When the rains subside the water quickly passes away, and in its stead there suddenly ascends to view a fertile country, which, by the rapidity of tropical vegetation, is almost instantly covered with corn fields and other plantations, some of the islands of the Ganges producing three or four crops yearly.

73 Jumna.

The most important of the rivers which join the Ganges is the Jumna from the south. It proceeds through a very fertile country; and Delhi and Agra, the ancient Mogul capitals, are situated upon it. Though the waters of the Ganges are in every part held sacred, yet they are doubly so at their junction with the Jumna, which is also accounted sacred. The city, which stands at the junction or forks of the two rivers, is therefore called *Allahabad* or *the City of God*. At some distance below this is the city and district of Benares, the great seat of the Hindoo sciences, in which the Brahmins instruct immense numbers of pupils in their religion, contained in books written in, what is now a dead language, the Sanscrit. Many other great cities stand upon this river, of which it is unnecessary here to take notice. The whole country naturally enjoys extreme fertility, and being possessed by an industrious people it abounds with inhabitants.

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74 Bootan.

To the north-east of Bengal, which is the province at the mouth of the Ganges, the high country of Bootan is situated, near the foot of the mountains that overlook the plains of Hindoostan. Here the great chain of Emodus, caped with eternal snow, shows itself to the inhabitants of Hindoostan, over the lesser hills which guard its approach. On the eastward of the Ganges the river Burrampooter also falls into the bay of Bengal. This river is superior to the Ganges in size and in extent of course. It rises, like it, in the southern part of the high regions of Tartary, but flows eastward; and as its channel lies among rugged rocks and mountains, inhabited only by scattered and barbarous tribes, it is of little renown, and till lately was unnoticed by strangers, though its mouth is close to the mouth of the Ganges. It has only been discovered to be a first-rate river so late as the year 1765. Beyond the lower part of the Burrampooter, Hindoostan speedily terminates to the east, at a narrow chain of mountains running from north to south, the last province receiving the appellation of *Chittagong*. This province proceeds only to a short distance southward along the eastern shore of the bay of Bengal.

75 Burrampooter.

The great country of Hindoostan, from the Panjab and the course of the Indus on the west, to the lower part of the Burrampooter and Chittagong on the east, and from the front of Tartary on the north to Cape Comorin on the south, has undoubtedly from the most distant ages been one of the most fertile and populous regions on the globe. Its civilization runs back to the remotest periods, and the monuments of ancient magnificence which it exhibits are innumerable. When Alexander the Great invaded the western part of it, he found it, as it now is, filled with an industrious, wealthy, and civilized people, possessing the same religion and manners as at present. In its original state it does not appear that India, like China, was ever united under one government, unless when subjected to a foreign yoke. It would seem to have been divided into a great number of independent principalities, and it has always had a tendency to fall back into that state, a circumstance which has rendered its different parts an easy prey to foreigners. The Hindoos are a mild and humane people; but they are at the same time an extremely inactive, timid, and feeble race of men, patient of insults and injustice, so that all invaders have been able to subdue them. A Tartar conquest introduced the Mahometan religion and a feudal government into their country, and changed their language for that of Persia, though to this day the Mahometans are only as one to ten of the population. The British also coming from an island of the Western ocean, have, with a handful of men, been able to become their masters. A remnant, indeed, of Hindoo independence exist

76 Character of the Hindoos.

Asia. exists in what are called the *Mahratta states*, upon the summit of the Ghauts in the western part of the peninsula; but this independence they will not probably be long able to preserve. Even in the ordinary exertions of life, the Hindoos act like men destitute of energy. As carpenters, for example, they perform their work with much neatness and dexterity, but they employ small and light tools, which to men of a more vigorous character and habit, appear contemptible; and when an ordinary beam is to be turned over, an assistant labourer must give his aid, of which an European workman would not perceive the necessity; but the Hindoos living in a country in which labour is extremely cheap, are accustomed to supply by numbers their own deficiency of energy of mind, or of strength of body.

A general imbecility of character seems indeed to mark this nation, or an incapacity to make any vigorous effort of self-command. In matters of intellect they are slaves of imagination and of education. On the banks of the Ganges, in a fertile climate, in which human life is easily sustained, and the constitution naturally prone to indolence, a superstition has been invented which seems to have proved a source of the greatest misfortunes to the nation. Not only is the imagination filled, and the exercise of the understanding injured, by endless legends or tales about the transfiguration of their divinities, but a set of ceremonies and regulations is introduced which places every part of life under controul. The whole people are divided into tribes or hereditary casts. A member of one of these casts cannot marry into a different cast without contracting impurity, and being for ever dishonoured or driven out of his tribe. A Hindoo is not permitted by his religion to eat with a stranger, or even to drink water that has been drawn by impure hands, that is to say, by persons belonging to a different cast. One cast only, the Rajaputes, are permitted to eat animal food, but the rest are compelled by their religion to live upon vegetables alone. Endless minute observances in their eatings are also imposed upon them, founded on the notion of the possibility of contracting pollution in this way. Thus are the Hindoos, though a mild and humane race, rendered in the most ordinary actions of life, the most unsocial as well as the most irrational of mankind. Being occupied at every moment by some religious ceremony or other, and filled with the dread of pollution, they appear contemptible to those strangers whom they avoid as profane or impure. From the impossibility, in this manner imposed upon them, of uniting in any respect with the Tartars who conquered their country, they have sunk into a degraded and despised race; whereas, could they have united or mingled with the invaders, they must speedily have become as one people, and the evils resulting from conquest would gradually have been forgotten. They have persevered for ages in the same intellectual errors, because they have got possession of their imaginations, and because they want energy to cast off any habit or train of thought to which they have once submitted.

The Hindoos appear to be no less destitute of self-command in their active than in their intellectual powers. Hence arises the unbounded superiority in all military enterprises which the Europeans possess over them. The attack of their armies is thus described by an ingenious writer: "It may perhaps afford some measure of gratification to European curiosity, to be informed, that the undisciplined troops of Asia, generally inflamed with *bang* and other intoxicating drugs, pour forth, as they advance, a torrent of menacing and abusive language on their adversaries. Every expression of contempt and aversion, every threat, fitted to make any impression of terror, or to excite ideas of horror, that custom readily presents or inventive fancy can suggest, accompanies the utmost ferocity of looks, voice, and gesture. A murmuring sound, with clouds of dust, announces their approach, while they are yet at the distance of several miles. As they advance, their accents are more and more distinctly heard, until at last, with their eyes fixed and weapons pointed at some individual, they devote him, with many execrations, to destruction, giving his flesh, like the heroes in Homer and the Philistine warriors, to the dogs, and the birds of the air, and the beasts of the field. The numbers of the Asiatic armies, the ferocity of their manner, and the novelty of their appearance, would unnerve and overcome the hearts of the small European bodies that are opposed to them in the field of battle, if experience had not sufficiently proved how much the silence of discipline excels barbarian noise, and uniformity of design and action, the desultory efforts of brutal force, acting by starts, and liable to the contagion of accidental impression." Asia.

Indeed the superiority of Europeans over Hindoos is so great, that it is never balanced by almost any difference in point of numbers. If a body of European troops is only sufficiently numerous to cover a tolerable extent of ground, so that one part of them may rest while the other is on guard, and that advantage may be taken of the victory when gained, the event of the war is uniformly unfavourable to the feeble natives of this region. There seems to exist a defect in their moral nature, to which military discipline cannot afford a remedy. An European gentleman, though a stranger to the use of arms, if called upon by what he accounts his honour or his duty, is able, with an unchanging countenance, to meet the hazard of instant death, and can take the chance of giving or receiving destruction with little passion, and without exhibiting the external symptoms either of anger or of fear. The case is different with the mild and timid inhabitants of Hindoostan; they cannot meet danger with coolness and recollection, but are under the necessity of working themselves into a rage, which enables them to rush upon perils which they are unable calmly to encounter. Thus their fury is irregular and fruitless, like that of men under the influence of intoxication; while at the same time, if their passion decline for an instant, they are seized with sudden terror, and under its influence sometimes rush into greater perils than they wished to avoid. They possess throughout their country fortresses situated upon elevated and precipitous mountains, or surrounded by works of art of inconceivable solidity and strength. Many of these fortresses, under defence, would prove absolutely impregnable, and in this ardent climate, the armies of their northern invaders might perish miserably before them, but these fortresses the Hindoos have been utterly unable to defend. They cannot long remain coolly and without passion on the defensive; in some moment or other of weakness they become

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become panic-struck, and all is lost. They cast themselves headlong from the summit of the walls, and sometimes, having murdered their wives and children, they cast themselves upon the weapons of their antagonists; finding death in this manner, though the agitation that accompanies their blind fury prevents them from finding revenge for their calamities.

77 What advantages arise from an intercourse with Hindoostan.

In every age, the inhabitants of Hindoostan, who want nothing from the rest of mankind, have received the gold and silver of other nations in return for the precious productions of their favoured soil: the sugar, the spices, the gems, and the valuable manufactures of the country, have at all times been sought, either by commerce or by conquest. But excepting these productions of nature, or of art, it does not appear that any valuable advantages can be derived from an intercourse with the people. Notwithstanding the high antiquity of their civilization, they are inferior in every branch of science to ourselves. Their moral and political speculations are extremely trifling, so far at least as has hitherto been discovered. Their poetry may have its beauties, but it undoubtedly equals not the productions of the north-western regions, that is, of Europe. It is probable, that the only branch of valuable knowledge which could be improved by an intercourse with the people of these countries is, that which concerns the construction of different machines, or the performance of processes connected with the various parts of manufacturing, agricultural, or domestic economy. They are understood to possess several machines of wonderful simplicity, and to perform many processes in an easier and less expensive mode than we are accustomed to do in Europe. They used, from time immemorial, the drill-plough, which with us is a late invention. Their hand-mills for grinding grain are at once simple and effectual; as also their process of distillation. It ought to be recollected by the European nations, that they are but of yesterday when compared with the Hindoos; though we have outrun them in the career of intellect, or of general science, yet the improvement of the processes and instruments connected with the economy of ordinary life requires various successive experiments, which can only be performed during a great length of time, especially if these processes are not usually performed by persons conversant in the highest walks of literature. All newly invented machines and processes are apt to be complex, expensive, and imperfect. It is only after repeated trials and alterations that they are reduced to that simplicity which constitutes their excellence. Ample leisure has been allowed for these trials and improvements in the civilized nations of the East; and the simplicity of their machines, which deducts from their apparent importance, ought to be regarded as their perfection. They were probably invented by more ingenious men than those who now use them, and they probably had the same imperfections by which ours are at present affected: but succeeding generations gradually improved them, and they have at last come down into the possession of a degenerate race, incapable of discerning the value of tools in whose construction there is no seeming intricacy, though their gradual progress to the present state may have required much exertion from successive minds possessed of great energy and ingenuity. We may take the liberty to suggest, therefore, to such of our countrymen as have occasion to reside for any length of time among this ancient people, that one of the most valuable services which they can perform to society in Europe might consist of executing and transmitting accurate descriptions of the different tools and machinery made use of by the Hindoos, and of the processes used by them in the different branches of their domestic economy and management. The discovery of the ancient code of Roman law at Amalfi in Italy, together with the introduction of Grecian literature after the taking of Constantinople by the Turks, gave to the European nations immense assistance in their progress to civilization, by exhibiting to them the practices and the sentiments of a former enlightened age, and thereby abridging their labour in the pursuit of intellectual improvement. A similar aid, or abridgement of the labours of invention, would in all probability be derived from a minute acquaintance with the practices and machinery employed with success during so many ages in the economy of Hindostan.

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78 Eastern peninsula of India.

Leaving this mild, but timid and feeble race of men, we pass to the eastern peninsula of India, a narrow part of which stretches under the name of Malacca to within two degrees of the equator. Before advancing to the main land, however, we may notice towards the south-eastern part of the bay of Bengal a group of isles called the *Andamans*, chiefly remarkable on account of the singular people by whom they are inhabited. They are the northern division of a number of small islands, stretching from 10° 32′ to 13° 40′ N. Lat. and from 90° 6′ to 92° 9′ E. Long.: the southern division of these isles is called the *Nicobars*, inhabited by a mild and inoffensive people. What is called the *Great Andaman*, the chief of the northern division of islands, is 140 miles in length, and 20 in breadth. A settlement was established upon it by the British in 1793, and convicts are transported thither from Bengal. All that voyagers have related of uncivilized life is said to fall short of the barbarism of the people of Andaman. The ferocious natives of New Zealand, or the shivering half-animated savages of Terra del Fuego, are in a state of refinement, compared to these islanders. The population of the Great Andaman, and its dependencies amounts to little more than 2000 souls, whose sole occupation it is to rove along the margin of the sea in quest of a precarious meal of fish, which during the tempestuous season they often seek in vain. In stature, the Andamaners seldom exceed five feet. Their limbs are disproportionably slender, their bellies protuberant, with high shoulders and large heads; and, strange to find in this part of the world, they are a degenerate race of negroes, with woolly hair, flat noses, and thick lips. Their eyes are small and red; their skin of a deep sooty black; whilst their countenances exhibit the extreme of wretchedness, a mixture of famine and ferocity. They go quite naked, and are insensible of any shame from exposure. Two young women, allured by the temptation of fish, were secured, and brought on board a ship at anchor in the harbour. The captain treated them with great humanity: They soon got rid of all fear of violence, except what might be offered to their chastity, which they guarded with unremitting vigilance. Although they had a small apartment allotted to themselves, and had no real cause for apprehension,

79 Andaman isles.

Symes's Embassy to Ava.

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Although their principal food consists of fish, yet they eagerly seize on whatever else presents itself: lizards, guanas, rats, and snakes, supply a change of repast. The vegetable diet of the Andamaners consists of the natural produce of the woods, in which the researches of Europeans find little that is palatable or nutritious. The fruit of the mangrove is principally used, having often been found in their deserted habitations, steeping in an embanked puddle of water. As they have no pot or vessel that can bear the action of fire, they cannot derive much advantage from such esculent herbs as the forests may contain; indeed, their extenuated and diseased figures too plainly indicate the want of wholesome nourishment. Unhappily for them, the cocoa-nut, which thrives in the utmost luxuriance in the neighbouring isles, is not to be found here; but they are extremely fond of it; and whenever a nut was left in their way by the settlers, it was immediately carried off with much apparent satisfaction.

There are several sorts of trees on the island; among which are, the *ficus religiosa* or banyan tree, the almond tree, and the oil tree; which latter grows to a great height, and from it a very useful oil is thus produced:—A horizontal incision being made in the trunk, six or eight inches deep, a chip fourteen or fifteen inches long is cut at right angles, and the surface of the incision being hollowed and filled with live coals, the turpentine, or wood oil, exudes copiously from the top of the wound. The peniagre tree is also found, and is well adapted for the knees of ships; and the iron tree, of stupendous size, whose timber almost bids defiance to the axe of the wood-cutter; the red wood, which makes beautiful furniture, little inferior to fine mahogany. Besides these, there are numberless creepers and rattans which surround the stems of the larger trees, and, interwoven with each other, form so thick a hedge, that it is impossible to penetrate far into the forests, but by the slow and laborious process of cutting a road.

It is a sort of historical mystery how a race of negroes should be found here, a people so widely differing, not only from all the inhabitants of that vast continent in which the island of Andaman is embayed, but also from the natives of the Nicobar islands, which are immediately contiguous to it. Some have supposed, that a Portuguese vessel, early in the sixteenth century, laden with slaves from Africa, may have been cast on these shores, and that the present Andamaners are the descendants of such as escaped drowning. This conjecture, however, is proved to be erroneous, from an account of the Andamaners given by two Mahometan travellers, long before the navigation of these seas by Europeans. But an accident similar to that now suggested may possibly, at some period or other, have occurred to an Arabian vessel, as that people are known to have sailed upon the Indian ocean as early as the seventh century; and they not only explored the continent of India as far as the Chinese sea, but likewise gained a knowledge of most of the Eastern islands.

Returning from these islands to the province called *Chittagong*, which forms the extremity on the east of the British East India Company's possessions, as well as the boundary in that quarter of the territory of Hindoostan, we enter upon the farther or eastern peninsula

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of India. From Chittagong, proceeding southward along the eastern shores, the coast is fertile and rich for a considerable distance within land, forming the ancient kingdom of Aracan. Parallel to the coast runs a chain of lofty and precipitous mountains, forming the boundary of Aracan to the eastward. Beyond these mountains eastward is a level and fertile country, containing rivers which, descending from the regions of High Tartary already mentioned, descend southward along the peninsula, fertilizing the soil by their periodical floods, and forming at their mouths a great extent of low and fertile territory, or delta land. The country to the south-east of Aracan is called *Pegu*; that to the east has long been called *Ava* by Europeans, from the name of the former capital, but is called by the people of the country *Birmah*, and the people themselves *Birmans*. This last people, the Birmans, have recently subdued both of the kingdoms called *Pegu* and *Aracan*, and form at the present period a rising empire of great importance in the east, and well deserving our attention. Though their territories are only divided from those of the British East India Company by a narrow chain of mountains, and at one place by a trifling river called the *Naaf*, yet it was only very lately that they were at all known to the Europeans in that quarter as a neighbouring power of any consideration, our connexion with them having formerly been merely in the way of commerce carried on from their southern ports, near the mouth of the bay of Bengal. The following circumstance gave rise to farther inquiries concerning them:—The trade of Aracan had suffered by the attacks of some robbers, or pirates, who infested the rivers near the coast. They conveyed their plunder across the river Naaf into the Chittagong province, where, being secured from pursuit under the protection of the British flag, they disposed of their spoils to advantage, and lived at ease till returning want impelled them to resume their predatory excursions. On its being ascertained that three of the most distinguished of the robbers had sought refuge in the British districts, the king or emperor of the Birmans sent one of his officers into the East India Company's territories at the head of 5000 men, with injunctions to the commander to bring with him the delinquents, dead or alive, and not to return without them. To support this detachment, an army of 20,000 men was held in readiness at Aracan.

80 Aracan.

81 Birmah.

82 Birman army enters the British territory in India.

Senee Nunda Kiozo, the Birman chief, having crossed the river Naaf, and encamped within the Company's territory on the western bank, sent a letter to the British magistrate of Chittagong, acquainting him of the reasons for the inroad; that the seizure of the delinquents was his sole object, without harbouring any design of hostility against the English. At the same time he declared, that, till the delinquents were given up, he would not depart from the Company's territory. In confirmation of this threat, he fortified his camp with a stockade. These matters being reported to the British government at Calcutta, the refugees were ordered to be apprehended and kept in custody; and, in the mean time, detachments of Europeans, and of Indian troops in their service, called *Sepoys*, with proper artillery, were sent to the spot under Major General Erskine. On the approach of General Erskine, the Birman general sent a flag of truce to propose terms of accommodation, stipulating for the surrender of the fugitive pirates as the basis of the agreement. It was replied, that no proposal could be listened to while the Birmans continued on the British territory; that, unless they departed from it in a limited time, force would be used; but that, if they would withdraw peaceably, the subject of their complaints would be discussed. On receiving this answer, the Birman chief, with a manly confidence in the character of his antagonists, which commanded respect, personally waited on General Erskine, and stated the nature of his instruction, the enormity of the offenders, and the outrages they had committed. General Erskine assured him that the British government had no desire to afford an asylum to robbers; that it had no objection to do jostice; but insisted, that in the first instance, the Birmans ought to retire peaceably from the British territory. The Birman general, in consequence of these assurances, professed his reliance on General Erskine, and agreed to withdraw his troops. The retreat was conducted in the most orderly manner; and so strict was the discipline of the Birman army, that not one irregular act was committed while they remained within the Company's territory. The charges against the refugees were afterwards investigated, and their guilt being clearly established, they were delivered over to their own laws, by whose sentence two out of the three underwent capital punishment.

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This event called the attention of the British government in India towards the Birmans, a people evidently of a superior character to the Hindoos, whose territory was in their vicinity, and with whom, by their southern ports, a very extensive commerce had within a few years sprung up; which, in the single article of teek-wood, already required an annual return of Indian commodities to the amount of 200,000l. sterling. It therefore appeared a matter of importance to enter into something in the nature of a commercial treaty with this power, at least to the effect of obtaining regular protection for our merchants when visiting their ports. With this view, and to obtain farther intelligence concerning the nature of the government, the character of the people, and the advantages to be derived from intercourse with them, the governor-general of Bengal, Sir John Shore, sent by sea to the principal Birman port a regular embassy; at the head of which was Michael Symes, Esq. then a captain in the British army. From the information obtained and published in consequence of this embassy, the following account of the Birmans and their empire is extracted.

83 British embassy to the Birmans. Vide *Symes's Embassy.*

As already noticed, the Birman empire extends along the western coast of the eastern peninsula of India, or forms the eastern side of the bay of Bengal. It approaches the frontier of China on the north-east, and is limited on the north by the rugged and mountainous country which forms the south-eastern front of the high region of Tartary, being a continuation to this quarter of the great chain of Imaus. From the foot of that elevated region, this, like the western peninsula of India, descends gradually to the south, and the rivers proceed in that direction till the largest of them terminate near Cape Negrais in the south-eastern quarter of the bay of Bengal, where the coast turns suddenly eastward to a considerable distance; after which it proceeds as formerly to the south. The principal

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cipal towns of the Birman empire stand upon the rivers; and the British embassy sailed up the chief river, the Irrawaddy or Erabatty, to a great distance, till they reached Ummerapoora, the present capital of the Birman dominions.

84 History of the Birmans.

The Birmans and the people of Pegu have long been rival states. The Birmans, though formerly subject to the king of Pegu, revolted about the middle of the sixteenth century, and appear to have acquired a superiority over the Peguers which continued down to about the year 1740. At that period a war took place, which was prosecuted on both sides with savage ferocity; but as the Peguers, living to the southward near the mouth of the navigable rivers already mentioned, had a considerable intercourse with European traders, from whom they could purchase better arms than are manufactured in the east, they gradually obtained a superiority, and gained several victories over the Birmans in the years 1750 and 1751. These advantages were so vigorously prosecuted, that in the year 1752 the Birman capital Ava was invested. The Birmans, dispirited by repeated defeats, and probably ill commanded, after a short siege Diveepdee, the last of a long line of kings, was made prisoner with all his family, except two sons who escaped to Siam. Beinga Della, king of Pegu, left his brother Apporaza as governor of Ava, and carried to Pegu the captive Birman king. Thus a complete conquest appeared to be effected. The landholders and principal inhabitants of the country round Ava submitted, and took an oath of allegiance to the king of Pegu, who in an insolent proclamation, announced the annexation of the Birman country to the Pegu monarchy. In the mean time,

85 Alompra first of the present dynasty.

a Birman of low extraction, Alompra, aspired to become the deliverer of his country. He had submitted like the rest, and was continued by the conqueror in the command of an inconsiderable village, Monchaboo. Here he had no more than 100 devoted followers, upon whose intrepidity and fidelity he could rely. This village, like most of the Birman towns, was surrounded by a stockade. This he strengthened and repaired, without awakening any suspicion in the Pegu conquerors, who never suspected that so inconsiderable a person would attempt a rebellion. In Alompra's village of Monchaboo there were no more than 50 Pegu soldiers, who treated the Birmans with great arrogance: Taking advantage of the indignation excited by some particular act of indignity, Alompra encouraged his followers to attack the Pegu soldiers, and he put every one of them to the sword. Even after this act of rebellion, Alompra disguised his intention with a view

86 Alompra's rebellion.

to gain time. He wrote to the brother of the Pegu king Apporaza, who had been left governor of Ava, expressing much humility and regret for what had happened, professing his fidelity to the Pegu government, and representing the massacre as the result of an accidental quarrel between the Pegu soldiers and the people of his village. These assurances prevented vigorous measures from being taken with sufficient speed against him. Apporaza, having pressing bussiness at Pegu, left Ava under the government of his nephew Dotachew, with instructions to keep Alompra as a prisoner. Accordingly about a thousand men were sent to occupy Alompra's turbulent village, and to send himself to Ava. They expected no opposition, and came ill prepared for it. They were not a little disconcerted to find the gates of the stockade around the village shut against them on their arrival, which was late in the evening; and at daybreak next morning they were suddenly attacked and routed by the Birmans. Alompra, having thus involved a small party of his countrymen in rebellion against their conquerors, represented to them that there no longer existed for them any safety but in victory; that they would never be forgiven, and must resolve to conquer or perish. He invited the Birmans of the neighbouring towns to join his standard, and he found a small number who were willing to embrace his apparently desperate fortunes: with these he adopted the sudden resolution of marching towards Ava the Birman capital, before the numerous detachments of Peguers that were scattered over the provinces could be recalled for its defence. As he advanced, fame magnified his numbers. The governor of Ava, who had no more than 3000 men, was disconcerted; and, despairing of success, deserted that city with his troops, and a few of his countrymen who remained behind him were put to death by the populace. Instead of advancing in person, Alompra

87 Alompra's success.

now sent his second son Shembuan to take possession of Ava. These events occurred in autumn 1753. In consequence of his first success Alompra's reputation became unbounded. His countrymen everywhere revolted, and attached themselves to him as their deliverer. The Pegu king was alarmed for the northern districts of his own territory, in which the Birman population exceeded that of the Peguers. A large force was collected under Apporaza the Pegu king's brother. It consisted of an army, and of a numerous fleet of war boats, which sailed up the Irrawaddy to reduce the insurgents. He laid siege to Ava, where Shembuan held out 40 days, till his father Alompra advanced to his aid. Apporaza raised the siege, and went to encounter Alompra. The contest was chiefly confined to the fleet; the armies only skirmishing on shore. Shembuan having advanced from the fort of Ava to attack the rear of the Peguers, they gave way and fled with precipitation, suffering great slaughter in their retreat. The Peguers, enraged by these misfortunes, put to death the dethroned monarch of the Birmans, together with all the principal men of his nation, to the amount of several hundreds, that were in their power, under pretence that they had been detected in a plot against their conquerors. This only rendered the mutual hatred of the nations more violent; and in several towns the Birmans rose upon the Pegu garrisons, and massacred the whole of them.

88 Alompra aspires to royalty.

In the mean time Alompra continued to improve his fortune, and avowedly endeavoured to establish in his own person the sovereignty of his country. When the son of the late king attempted to return, he drove him back to his asylum among the Siamese. Towards the end of the year 1754 the Pegu king Beinga Della, with a considerable army, laid siege to Prome, a frontier town defended by a solid wall, a deep ditch, and a strong stockade. The Birmans successfully resisted a general assault, and the Peguers had recourse to a blockade. Alompra sent 36 war boats to the assistance of the town, which stands upon a river; the commander of these threw himself with a considerable supply of men and provisions into the town, and sent back his boats, only a few of which were taken. After

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a farther delay of six weeks, Alompra arrived in person and attacked the Peguers both by land and water. Instead of keeping up a fire of musquetry as usual, the boats closed, and after a desperate engagement, the Peguers abandoned the siege. The tide of success was now so completely turned, that the war was become defensive on the part of the king of Pegu. He retired to his capital, which being near the sea-coast, the contest became a kind of maritime warfare in the mouths and creeks of the rivers; which last are extremely numerous in the low delta land near their mouth. At this time both the French and English were in possession of factories in the Pegu country, and both the Peguers and Birmans solicited the assistance of the strangers, being abundantly sensible that a few ships of burden furnished with guns would give a vast advantage to either party, in a contest against the war boats used in their country. In the course of the year 1755 both the French and English appear to have entered secretly into separate negociations with each of the parties, and to have promised aid to each of them. Both of them ultimately broke faith with Alompra, and joined the people of Pegu. Notwithstanding this assistance, the Birman leader continued to enjoy a career of success. He was victorious on land, and the aid of the foreigners by water only produced a slight degree of embarassment. At one time three English ships and one French ship assisted the Pegu force, consisting of 200 armed boats, while 10,000 men marched along with them as a land force; but the Birmans disconcerted the attack by a stratagem. With considerable ingenuity they constructed fire-rafts, consisting of a number of boats fastened together, and filled with combustibles. These rafts were floated with a strong spring tide to where the European ships lay at anchor, and directed with such skill and effect as to oblige them to slip their cables and remove, the French ship narrowly escaping destruction. Alompra at last succeeded in cutting off the communication between Pegu and the sea. A French ship coming to the assistance of the Peguers was taken by surprise; and as her papers proved the object of her voyage, her officers were put to death by the order of Alompra: other foreigners, however, particularly the English, taken in the important Pegu town of Syriam, were suffered to depart unmolested, though he had sufficient reason to complain of their countrymen. Alompra was at last, in consequence of his success in every quarter, enabled to lay siege to Pegu itself, the capital of his enemies. It was situated on an extensive plain, surrounded with a high solid wall, flanked by small towers, and strengthened on each face by demibastions equidistant. A broad ditch contained about three feet depth of water, and the pagoda of Shoemadoo, which will be afterwards described, served as a citadel. Circumvallation is a favourite mode of warfare with the Birmans, as they are almost destitute of cannon, and therefore trust rather to famine than to force. Having invested Pegu, and erected numerous stockades both to hem in the town, and to secure his own army against external attack, Alompra, in the month of January 1757, resolved to wait patiently till the want of supplies should bring the city into his power. After a siege of two months the numerous population of Pegu became mutinous in consequence of want. The king summoned a council of his family and chiefs, and proposed to sue for peace, on condition of being allowed to govern his country, consenting to do homage for it to the Birman monarch. The proposal was accepted by Alompra; but, as a preliminary, the Pegu king was under the necessity of surrendering to the conqueror his only unmarried daughter. For some days the peace seemed restored, and the besiegers and the besieged mingled with each other in amity; but Alompra, probably with a treacherous intention, having introduced some soldiers in disguise into the town, they were seized and put to death by order of the king of Pegu's nephew Choupavea. Hostilities recommenced, and at last the king of Pegu, who appears to have been a timid man, privately admitted the Birmans into the city, on condition that his own life should be spared; the town itself was delivered up to plunder.

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89 Pegu taken.

Alompra, thus successful, extended his power over several surrounding provinces, and rendered Monchaboo, his original residence, the seat of imperial government. While upon an expedition to Cassay, a northern province of his empire, the Peguers revolted, but were defeated on his return. On this occasion he was led to suspect, that the persons belonging to a British settlement at the island of Negrais, had given assistance to the revolters: They were suddenly attacked, therefore, by his orders, in October 1759, and most of them destroyed. A few escaped in two vessels, the Shaftesbury and the Victoria. Alompra next made war upon his neighbours on the east, the Siamese, accusing them of assisting his enemies of Pegu, and of raising conspiracies against his authority. He undertook an expedition against the capital of Siam; the enemy harassed his march, but did not hazard a decisive engagement. In a month he reached the vicinity of the metropolis, which prepared to sustain a siege; but here the career of Alompra terminated. He was taken ill of a mortal disease, said to be a species of scrophula. He foresaw his end, and gave orders for an immediate attack; but he died on the 15th of May 1760, before he reached his capital. He was deeply regretted by his people, who admired his talents and his success, and regarded him as their deliverer from a foreign yoke. He is represented as having performed no less service to his country by the laws which he enacted, than by the battles which he fought. In particular, he reformed the administration of justice, prohibited magistrates to sit in judgment, unless in a public place, and required every decree to be registered. He also issued edicts against gaming, and the use of spirituous liquors, in his dominions.

90 Massacre of the British.

91 War with Siam.

92 Death of Alompra.

The Birman law vests the right of succession in the eldest heir male; but, upon the death of Alompra, his second son, Shembuan, made an attempt to seduce the army and to seize the throne. Receiving little support, he submitted to his eldest brother, Namdogee Praw, who, at the request of their common mother, received him into favour. One of Alompra's generals, called *Nuttoon*, was a more dangerous rival. A division of the army under his command seized upon the city of Ava. He expected succours from Siam, but was disappointed; and being besieged in Ava, he was reduced to great distress. He tried to make his escape; but was taken and put to death with most of his adherents. The destruction of Nuttoon did not put an end to

93 Alompra succeeded by his eldest son Namdogee Praw.

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to the disturbances that agitated the Birman empire. A younger brother of Alompra, who held a considerable government, aspired to independence; but he also was taken in his fortress, after a siege of three months. His life was spared, but he was kept a close prisoner. Namdogee Praw died at his capital in March 1764, of the same disease that brought his father to the grave, leaving one son, Momien, an infant. Shembuan, the second son of Alompra, now seized the government as king; and the child of his elder brother was educated in religious obscurity, as a rhahan or priest. Shembuan's first undertaking was a war against the Siamese, whose country, in the year 1766, he entered at different points with three armies; which, after some resistance, effected a junction. Having approached the capital, a general battle was fought, in which the Birmans were successful, and invested the capital of Siam. Each party had some artillery, which was of little service; and the Birmans had recourse to blockade, which, as already noticed, is their favourite system of warfare. After a two months siege, the king of Siam secretly made his escape. The city capitulated, and a Siamese governor was appointed, who swore allegiance, and engaged to pay tribute to the Birman monarch.

94 Shembuan obtains the throne.

95 Invades Siam.

96 The Chinese invade Birmah.

In the beginning of the year 1767, a Chinese army invaded the Birman empire. Shembuan prepared to meet this danger; and it appears that, in consequence of the numerous wars in which they had recently been engaged, the Birmans were enabled to act upon this occasion with a considerable degree of military skill and energy. They formed two separate armies, one consisting of 10,000 infantry and 2000 cavalry, was sent to meet the invaders. They accordingly advanced, and encamped within eight miles of the Chinese army. On the following day, an action took place, in which the Birmans were worsted and retired. The Chinese, elated by their success, pressed eagerly forward, and were in this manner drawn to a considerable distance into the country. In the mean time, a second Birman army, amounting to 30,000 men, had taken a circuitous road, and got into the rear of the Chinese. The army in front now made a stand, and the invaders found themselves hemmed in on all sides. The Tartar cavalry, on whose activity the Chinese army depended for provisions, would no longer venture out either to procure supplies or to protect convoys. The Birmans now attacked their enemy with impetuosity, who resisted with a resolution founded on despair. The conflict lasted three days, and the Chinese at last attempted to cut their way through the weakest part of the Birman line. This attempt proved fatal. The Birmans, sure of being reinforced, maintained their ground till the troops of both their armies arrived to their assistance. The Chinese now sunk under the pressure of an attack from numbers which were increasing every hour. The carnage was dreadful, as the Birmans are extremely ferocious and unrelenting in war. Of the Chinese army not a man returned to his native country. About 2500 were preserved from the sword and conducted to the Birman capital, where they were employed in such occupations as they understood, without any other reward for their labour than a bare subsistence.

Meanwhile, Shembuan's successes against the Siamese were attended with no permanent advantage. His armies were no sooner recalled than his authority was openly disregarded. He sent one of his generals once more into their country; but he met with such opposition as compelled him to retreat and to demand reinforcements. This last request was complied with, in a manner that produced a serious danger. One of the viceroys of the southern parts of the empire was commanded to raise the necessary supplies; but as his jurisdiction was inhabited chiefly by families of Peguers, he had no sooner assembled his recruits and placed arms in their hands, than they became conscious of their own strength, and were seized with a desire to regain their empire. They rose upon their Birman officers and companions, and commenced an indiscriminate slaughter. It was not till after an army of 20,000 men was assembled, with 24 pieces of cannon, besides a great number of war boats, that they could be subdued. While this struggle was going on in the lower part of the empire against the people of Pegu, now considered as rebels, Shembuan followed out a plan of conquest to the north-west, in the country called *Cassay*. His troops even penetrated within what are called the *Himmaleh hills*, which form a continuation of the lofty Imaus, and which descending towards the extremity of the bay of Bengal, seem to be a barrier raised by nature to protect the unwarlike inhabitants of Hindoostan from the more hardy natives of the east. Shembuan lost a great number of troops in attacking the chiefs or rajahs of these hilly countries, but at last succeeded in subduing a great number of them, though the conquest could be of little utility, as possession of these rude territories could scarcely be retained.

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On his return from this north-western expedition, Shembuan went southward to visit his Pegu territories, which had so recently been involved in civil war. On this occasion he pretended to discover that the old king of Pegu, who had been taken by Alompra, and had remained all this while in prison, had engaged in some kind of conspiracy. In consequence of an accusation to this effect, the dethroned monarch underwent the form of a trial, was condemned and put to death. Many persons of rank, of the race of the Peguers, were also put to death on this occasion, under pretence that they had given countenance or aid to the late rebellion.

97 Old king of Pegu put to death.

These were among the last transactions of Shembuan's life. He died in the city of Ava, about the middle of spring, in the year 1776. He was succeeded by his son Chenguza, who appears in every respect to have been incapable of exercising dominion with any tolerable degree of propriety. He degraded his father's most respectable officers, and plunged into the most shameful debauchery, which he avowed openly by repealing the edict against the use of spirituous liquors. He put to death a younger brother, from jealousy of his ambition, employed himself wholly in hunting, and left public affairs to be managed by favourites. He also put to death one of his uncles, kept another of them close prisoner, and watched vigilantly a third of them, who affected to live in the most inoffensive obscurity. In a fit of jealousy he also put to death his wife in a public and open manner, and having at last rendered himself both odious and terrible, a conspiracy was

98 Death of Shembuan.

99 Chenguza succeeds to the throne.

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was formed against him, at the head of which was his uncle Minderagee Praw, the result of which was, that the latter obtained possession of the throne, and Chenguza, deserted by all the world, was killed by the father of the wife whom he had put to death, though the slayer was afterwards also put to death, under pretence of having shed royal blood contrary to the express letter of the law of the Birmans.

100 Minderagee succeeds to the throne.

Shembuan Mia Shean Minderagee Praw, the fourth son of the deceased Alompra, thus succeeded to the possession of the empire. In the first days of the conspiracy, a pretence had been made that the object of it was to raise to the throne Momien, the only child of Namdogee Praw the eldest son of Alompra; but this pretence was speedily laid aside, and in eleven days after his accession to the throne, he was put to death. Minderagee Praw, notwithstanding the manner in which he obtained the sovereignty, is understood to have governed well, and he was upon the throne when the British envoy, Captain Symes visited that country. While he led a private life, however, this monarch is represented as having imbibed much of the superstition that so strongly characterizes every form of religion in the east. During his days of leisure he had directed much of his attention to astronomy, and became a thorough believer in judicial astrology. Some few Brahmins had for ages been accustomed to emigrate from Cassay and Aracan, to Ava, where, on account of their superior knowledge, they were employed as professors of science. A college was established and lands appropriated for its support. These Brahmin doctors composed almanacks, calculating eclipses; and from their intercourse with the planets, pronounced the propitious hour and season to attempt any momentous undertaking. Long before his elevation, these Brahmins had foretold to Minderagee Praw the fortune that awaited him. The accomplishment of their prophecy confirmed their influence over him. He appointed a certain number to be his chaplains, who, on court days, arrayed in white robes and standing round the throne, chaunt a solemn benediction in melodious recitative. This ceremony is performed as soon as the king ascends the imperial seat, and before the commencement of public business. Prompted by the persuasions of his counsellors, Minderagee resolved to withdraw the seat of government from Ava, and to found a new city.

101 New capital Ummerapoora.

The site fixed on for the projected settlement was judicious: about four miles north-east of Ava, there is a deep and extensive lake called *Toungemann*, formed by the influx of the river during the monsoon, through a narrow channel, which afterwards expands and displays a body of water a mile and a half broad, and seven or eight miles long. This lake first takes a northerly direction, nearly parallel with the river; it afterwards curves to the south-east, in a lessening sheet, and diminishes to a morass favourable to the culture of rice. When filled by the periodical rains, the lake with the river on one side, encloses a dry and healthy peninsula, on which *Ummerapoora*, the name given to the new city, now stands. Buildings in the Birman country are composed for the most part of wood; and water carriage being here convenient, the old town was speedily demolished, and the present capital rose from its materials; whilst such was the assiduity used in removal, that Ummerapoora became, in a short time, one of the most flourishing and well built cities of the east. The fort likewise, which is spacious and regular, is completely fortified after the Asiatic manner. A lofty rampart, protected by a parapet, and strengthened by bastions composed of excellent masonry, is further secured by a deep and broad ditch, faced with brick and filled with water: the gateways are guarded by cannon, and retrenchments defend the passes of the ditch. The new monarch soon resolved to extend his dominions westward, by the conquest of Aracan. This country, as already mentioned, is situated to the westward of Ava, along the shore of the bay of Bengal, but the direct road is embarrassed by a chain of mountains 56 miles in breadth. The road is so difficult that an enterprising people might easily have defended the passes against any superiority of number; but the Birman king knew too well the indolent character of the king of Aracan, and the unwarlike disposition of his subjects, to dread any vigorous opposition. This country, however, had never been completely conquered: the Moguls on the west, the Peguers on the east, and the Portuguese from Europe, had at different times carried their arms into the heart of the country, but after these passing inroads Aracan had always recovered its independence. The difficulty of conquest, on the present occasion, consisted chiefly of finding a way into a country so well defended by nature. The range of lofty mountains, already mentioned, nearly encircles it on the east. From the southern quarter at Negrais, Aracan could only be invaded by water, through the many rivers that intersect the country adjacent to the sea. From the side of Chittagong, entry into Aracan must be effected by a march along the sea beach, which is interrupted by several channels, that owe their waters chiefly to the action of the tide. The coast, however, is extremely well adapted to commerce, by the various large and well cultivated islands which it possesses, and the variety of channels by which vessels can pass into the country, which to the mountains is everywhere low and well watered. The trade of Aracan has not indeed been very considerable. It is confined to salt, bees wax, elephants teeth, and rice. This latter article is produced in such abundance, that it might be improved into a lucrative branch of commerce. Possession of Aracan and its islands is not only coveted by the Birmans, on account of the fertility of the soil, but also from the protection it might afford to their boats, which navigating along the coast make an annual voyage to Chittagong and Calcutta, where they dispose of the produce of their country, and in return bring back cloth and the commodities of India.

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102 Invasion and conquest of Aracan.

In the year 1783, the Birmans accomplished their intended invasion, by attacking Aracan in different detachments, a part of which crossed the mountains, while others went round by water. After a naval engagement, which terminated in favour of the invaders, the king of Aracan took flight with his family; but being closely pursued, he was taken prisoner, and conducted to the Birman capital, where he was treated with humanity, but died in the course of a year. The town and port of Aracan fell after a faint resistance. The booty found in it was considerable, but on nothing was a higher value placed, than on an image of burnished brass of the god of the Birmans, called *Gaudma*, or *Boodh*,

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Boodh, or *Budhoo*. The figure is about 10 feet high in the customary sitting posture, with the legs crossed, the left hand resting on the lap and the right pendent. This image is believed to be an original resemblance, taken from life, and is so highly venerated, that pilgrims have for centuries come from the remotest countries, even Ceylon, China, and Japan, where the supremacy of Gaudma is acknowledged, to pay their devotions at the feet of his brazen representative. There were also found five images of Rakuss, the dæmon of the Hindoos, of the same metal and stature. These were valued as guardians of the sanctity of the idol. A singular piece of ordnance was also found of enormous dimensions, composed of huge bars of iron beaten into form. This ponderous cannon measured 30 feet in length, two feet and a half in diameter at the mouth, and 10 inches in the calibre; it was transported to Ummerapoora by water, and deposited in the yard of the royal palace, where it is now preserved as a military trophy; it is mounted on a low carriage supported by six wheels, and is covered from the weather by a wooden pent-house. Gaudma and his infernal guards were, in like manner, conveyed by water to the capital, with much pomp and superstitions parade.

103 Aracan now a Birman province.

Since this period Aracan, with its dependencies, has constituted a province of the Birman empire, and is governed by a maywoon or viceroy. Birman troops are distributed in the different towns, and lands were granted to many Birmans, on condition that they should come with their families and settle in the country. The valuable acquisition of Aracan did not satisfy the ambition of Minderagee Praw, and he speedily turned his arms against the Siamese, his neighbours on the south-east. From the year 1785 to 1793, he carried on against them a very sanguinary war, in which he suffered a considerable number of defeats, though the Siamese could make no progress against him upon his own territory. At length the Siamese proposed a negociation, which terminated in a treaty of peace, very favourable to the Birman interests, as the Siamese consented to relinquish to them a considerable extent of territory to the southward, on the western side of the peninsula.

104 Extent of the Birman empire.

The result of all these acquisitions is, that the Birman empire upon the whole, at present, appears to include the space between 9° and 26° N. Lat. and between 92° and 107° E. Long. from Greenwich, or about 1050 geographical miles in length, and 600 in breadth. These are stated as the ascertainable limits taken from the Birman accounts, though it is thought that their territories stretch still farther to the north; but it must be remarked, that in the southern parts the breadth often varies, and is in many places very inconsiderable. On the whole, however, they possess a territory superior in extent to the German empire. But their perpetual wars, especially their sanguinary contests with Pegu and Siam, have greatly depopulated their country: and here, as in every other part of the world, it has been found, that war, while it ruins the vanquished, is seldom the source of internal prosperity to the victorious nation. From what can be discovered, there is no reason to believe that their present population, including Aracan, exceeds 17,000,000. Yet the soil of the southern provinces of the Birman empire is remarkably fertile, and produces as luxuriant crops of rice as are to be found in the finest parts of Bengal; but extensive plains, on which the vestiges of former culture and population are abundant, remain without a single house or inhabitant, having been desolated by the ravages of war, during the contests of the Birmans and Peguers, so that the finest territories in the world have in many places of this empire become, for a time at least, the undisputed domain of the wild beasts of the forest. In the northern parts of the empire, the country becomes irregular and mountainous; but the plains and valleys, particularly near the rivers, are exceedingly fruitful. They yield good wheat, and the various kinds of small grain which grow in warm climates, with the different sorts of esculent vegetables: sugar canes, tobacco of superior quality, indigo, cotton, and the different tropical fruits in perfection, are all natural products of this favoured land.

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105 Climate.

The climate of every part of the Birman empire is said to testify its own salubrity by the best of all criterions, the appearance and figure of the natives, who appear equal in strength and activity to any other race of men in the world. The seasons are regular, and the extremes of heat and cold are seldom experienced; at least the duration of that intense heat, which immediately precedes the commencement of the rainy season, is so short, that it incommodes but for a very little time. During the residence of the British embassy in the country, only one man was lost by disease. Another met an accidental death: in wandering through the woods he became the prey of a tiger.

106 Teek wood.

One of the most valuable productions of this empire is the teek tree, which grows in vast abundance in the southern parts of the empire, near the great rivers. This article alone renders a free commerce with the Birmans of vast importance to the British settlements in India. Teek wood, so absolutely necessary for the navigation of the eastern seas, cannot be conveyed from the Malabar to the Coromandel coast of the western peninsula of India, or to Calcutta, but at an expence so great as to preclude the attempt. This wood grows indeed on the banks of the river Godaverry, but the impediments to procuring it from that quarter have hitherto been found insurmountable. Hence a great part of British India depends for ship-timber upon the Birman empire. Most other descriptions of timber are also found in this empire; on the banks of the river Irravady a large log of fir was seen by Doctor Buchanan, one of the gentlemen belonging to the embassy. He was informed by the natives that it had been washed down by the torrents from a mountainous part of the country northward of the capital, where it grows in abundance and of considerable magnitude. It is called *tænys*. The turpentine is extracted from it, and turned to use, but the wood is considered as of little value on account of its softness. It will probably hereafter be brought to market in India, as top-gallant-masts and yards made of teek are thought too heavy, and European and American spars are often bought for these purposes at a very exorbitant price.

107 Animals.

On account of the depopulation of various parts of the country by war, the wild animals have multiplied to a great extent. The most troublesome of these are tigers, which infest all the forests, and what are called *jungles* or woody thickets near the banks of torrents, so as to render it dangerous to enter them: wild elephants

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also abound, and occupy the forests in great numbers. These powerful animals, allured by the early crops of rice and sugar cane, make predatory excursions in large troops, and do much mischief, destroying more than they devour. The peasantry have often to lament the destruction of their most exposed plantations in consequence of these inroads. Herds of deer are frequently seen, and horses and cattle are reared in abundance by the people. They have also large herds of buffaloes, which have a powerful antipathy to a red or scarlet colour, and are so extremely fierce, that the tigers dare not attack them.

The two peninsulas of India are the native countries of the peacock, and also of our barn-door fowl; the latter abound in the jungles or thickets, and are well known to sportsmen in India. They differ little from the barn-door fowl in Europe, except that the wild sort are all similar in colour; a dark red, with black breast and legs: their flesh is very delicate.

108 Minerals.

The Birman empire abounds in minerals. Near the frontiers of China they have mines of gold and silver; there are also mines of gold, silver, rubies, and sapphires, at present open on a mountain near the river Keenduem; but the most valuable, and those which produce the finest jewels, are in the vicinity of the capital. Precious stones are found in several other parts of the empire. The inferior minerals, such as contain iron, tin, lead, antimony, arsenic, sulphur, &c. are met with in great abundance; amber, of a consistence unusually pure and pellucid, is dug up in large quantities near the principal river. Gold likewise is discovered in the sandy beds of streams which descend from the mountains; diamonds and emeralds are not found in any part of the Birman empire, but it affords amethysts, garnets, very beautiful chrysolites, jasper, loadstone, and marble. This last is equal in quality to the finest marble of Italy, and admits of a polish that renders it almost transparent; but it is not allowed to be sold in its rude state or in blocks, being held sacred, and used only for the purpose of manufacturing images of Gaudma.

109 Petroleum wells.

They have also wells of petroleum, which were visited by the British envoy, who describes his journey to them in the following terms: "Doctor Buchanan partook of an early dinner with me, and when the sun had descended so low as to be no longer inconvenient, we mounted our horses to visit the celebrated wells that produce the oil, an article of universal use throughout the Birman empire. The face of the country was cheerless and sterile; the road, which wound among rocky eminences, was barely wide enough to admit the passage of a single cart; and in many places the track in which the wheels must run, was a foot and a half lower on one side than the other: there were several of these lanes, some more circuitous than others, according to the situation of the small hills among which they led: vehicles going and returning were thus enabled to pursue different routes, except at particular places, where the nature of the ground would only admit of one road; when a cart came to the entrance of such a defile, the driver hallooed out to stop any that might interfere with him from the opposite side, no part being sufficiently wide for two carts to pass. The hills, or rather hillocks, were covered with gravel, and yielded no other vegetation than a few stunted bushes. The wheels had worn ruts deep into the rock, which seemed to be rather a mass of concreted gravel than hard stone, and many pieces of petrified wood lay strewed about. It is remarkable, that wherever these petrifactions were found, the soil was unproductive, and the ground destitute of verdure. The evening being far advanced, we met but few carts; those which we did observe were drawn each by a pair of oxen, and of a length disproportionate to the breadth, to allow space for the earthen pots that contained the oil. It was a matter of surprise to us how they could convey such brittle ware, with any degree of safety, over so rugged a road; each pot was packed in a separate basket, and laid on straw; notwithstanding which precaution, the ground all the way was strewed with the fragments of the vessels and wet with oil; for no care can prevent the fracture of some in every journey. As we approached the pits, which were more distant than we had imagined, the country became less uneven, and the soil produced herbage; it was nearly dark when we reached them, and the labourers had retired from work. There seemed to be a great many pits within a small compass; walking to the nearest, we found the aperture about four feet square, and the sides, as far as we could see down, were lined with timber; the oil is drawn up in an iron pot, fastened to a rope, passed over a wooden cylinder which revolves on an axis supported by two upright posts; when the pot is filled, two men take the rope by the end, and run down a declivity which is cut in the ground to a distance equivalent to the depth of the well; thus, when they reach the end of their track, the pot is raised to its proper elevation; the contents, water and oil together, are then discharged into a cistern, and the water is afterwards drawn off through a hole at the bottom. Our guide, an active intelligent fellow, went to the neighbouring house and procured a well-rope, by means of which we were enabled to measure the depth, and ascertained it to be 37 fathoms, but of the quantity of oil at the bottom we could not judge; the owner of the rope, who followed our guide, affirmed that when a pit yielded as much as came up to the waist of a man, it was deemed tolerably productive; if it reached to his neck it was abundant; but that which rose no higher than the knee was accounted indifferent: when a well is exhausted, they restore the spring by cutting deeper into the rock, which is extremely hard in these places where the oil is produced. Government farm out the ground that supplies this useful commodity; and it is again let to adventurers, who dig wells at their own hazard, by which they sometimes gain, and often lose, as the labour and expence of digging are considerable. The oil is sold on the spot for a mere trifle; I think two or three hundred pots for a tachal or half-a-crown. The principal charge is incurred by the transportation and purchase of vessels. We had but half gratified our curiosity when it grew dark, and our guide urged us not to remain any longer, as the road was said to be infested with tigers that prowled at night among the rocky uninhabited ways through which we had to pass; we followed his advice, and returned, with greater risk, as I thought, of breaking our necks from the badness of the road than of being devoured by wild beasts. At ten o'clock we reached our boats without any misadventure."

110 Character of the Birmans.

The Birmans are very far from being in a state of intellectual darkness. Though they have not explored

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the depths of science, nor reached to excellence in the finer arts, yet they have an undeniable claim to the character of a civilized and well instructed people. Their police is better regulated than in most European countries. In their natural dispositions they are high-spirited, active, impatient and irascible; but at the same time they are friendly and hospitable to strangers, and their manners are rather expressive of manly candour than of courteous dissimulation: a knowledge of letters is so widely diffused, that there are no mechanics, few of the peasantry, or even the common watermen, usually the most illiterate class, who cannot read and write in the vulgar tongue; few, however, are versed in their books of science, which containing many Shanscrit terms, and being often written in the Pali text, are (like the Hindoo Shasters) above the comprehension of the multitude. The Birmans are not shackled by any prejudices of casts like the Hindoos, restricted to hereditary occupations, or forbidden to participate with strangers in every kind of social connexion. Hence it is probable, that if a respite is allowed them from foreign wars, their progress in improvement will be rapid. They are a very sober people, and though the activity of their character renders them fond of amusements, yet multitudes of them are seen assembled together upon their public festivals, without one act of intemperance being committed, or a single instance of intoxication being perceived.

111 Women.

The laws or customs of the Birmans with regard to women contain a strange mixture of reason and of absurdity; on the one hand the women are allowed entire freedom, and are considered as of much importance, while in other respects they are treated with great contempt. The Birmans encourage all strangers to marry Birman wives; even slaves taken in war who comply with this invitation, acquire considerable privileges. This custom, in which these people agree with the wisest and best governed nations of antiquity, is singular among the civilized countries of the east, and peculiarly remarkable in a people surrounded by kingdoms where women are kept inviolably sacred from the sight and converse of strangers, and where the exclusive system of casts or tribes admits neither of civil nor religious proselytism. Even the public prostitutes in China are prohibited from having intercourse with strangers. The Hindoo women of rank are no less inaccessible, and admission into a respectable cast is not to be obtained by money. The Birmans, on the contrary, sensible that the strength of an empire consists in its population, admit to their society men of all religions and complexions, Pagans or Jews, Mahometans or Christians, the disciples of Confucius or the worshippers of fire; the children of whom, born of a Birman woman, are understood to be natural-born subjects of the state, and are entitled to the same protection and privileges as if they had sprung from a line of Birman ancestry. Accordingly the jealousy which prompts the eastern nations to immure their women within the walls of a haram, and to surround them with guards, seems scarcely to have any influence over the minds of this extraordinary people. Birman wives and daughters are not concealed from the sight of men, and are suffered to have as free intercourse with the world as the rules of European society admit. A man can only marry one wife; but it appears that their men of rank take a second in the character of a concubine, who is by law, however, obliged to attend and obey the lawful wife as a servant. Women are accounted of such political importance, that great care is taken to prevent their being conveyed out of the country. The law in this point is very rigorous; every ship, before she receives her clearance, is diligently searched by the officers of the customhouse; even if their vigilance were to be eluded, the woman would be quickly missed, and it would soon be discovered in what vessel she had gone, nor could that ship ever return to a Birman port but under penalty of confiscation of the property, and the infliction of a heavy fine and imprisonment on the master: female children also, born of a Birman mother, are not suffered to be taken away. Men are permitted to emigrate; but they think that the expatriation of women would impoverish the state, by diminishing the sources of its population.

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On the other hand, women are treated in many respects as not belonging to the same scale of creation as men; the evidence of a woman is not received as of equal weight with that of a man, and a woman is not suffered to ascend the steps of a court of justice, but is obliged to deliver her testimony on the outside of the roof. The lower class of Birmans make no scruple of selling their daughters, or even their wives, to strangers who come to reside among them for a short time, and none of the parties are understood to be dishonoured by the connexion. When the master of a family incurs debts which he cannot pay, his wife and daughters may be sold as slaves for payment of his creditors. Near the great towns is a place, called *tackally*, in the suburbs, assigned to common prostitutes, who are under the controul of a public superintendant. He frequently purchases the unfortunate women who are sold for the payment of the debts of their relations, and makes gain by the prostitution of them.

Still, however, domestic society is on a very different footing among the Birmans from that in which it is placed among the other eastern nations, and the women take a much more active share in the superintendance of all affairs, as appears from the following anecdote, which fell under the observation of the British embassy, in the neighbourhood of whose residence a large ship was building for the governor of Maindu. "If this ship was not composed of prime materials, the building at least was well attended to; every morning the governor's wife crossed the river in her husband's barge, attended by two or three female servants: after landing, she commonly took her seat on one of the timbers in the yard, and overlooked the workmen for some hours; after which she returned home, and seldom missed coming back in the evening to see that the day's task had been completed. The slip on which the ship was built happened to be contiguous to our first habitation, a circumstance that caused us to remark her constant visits; curiosity, however, did not prompt her, or any of her attendants, to come within our precincts, whilst decorum deterred us from making advances towards an acquaintance. Her husband never accompanied her, and she did not seem to require his aid. Women in the Birman country are not only good housewives, but likewise manage the more important mercantile concerns of their husbands, and attend to their interests in all out-door transactions: they are industri-

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ous to the greatest degree, and are said to be good mothers, and seldom from inclination unfaithful wives."

112 Marriages.

Marriages among the Birmans are not contracted till the parties attain the age of puberty. The contract is purely civil, and the priests have no interference in it. When a young man is desirous to marry a girl, his mother, or nearest female relation, first makes the proposal in private. If the suit be successful, a party of his friends proceed to the house of the parents of the maiden, and adjust the dowry. On the morning of the bridal-day the bridegroom sends to the bride three loongees, lower garments; three tubbecks, or sashes; and three pieces of white muslin; also such jewels, ear-rings, and bracelets, as his circumstances admit of. A feast is prepared by the bride's parents, and formal writings are executed. The new-married couple eat out of the same dish. The bridegroom presents the bride with some pickled tea, which she accepts, and returns the compliment, which terminates the ceremony.

113 Politeness.

The Birmans are extremely polite, but at the same time unceremonious in their manners. Their form of demonstrating respect consists of assuming a sitting or low posture. Accordingly, when persons of rank visited the East India Company's ambassador, they no sooner came into the apartment than they instantly took to themselves chairs and sat down, while their attendants assumed a low posture, by resting upon their hams in the eastern manner. Though the embassy was at first received with considerable distrust by the government, yet the members of which it was composed were treated with the utmost politeness and personal respect, both by persons in office and by all ranks of people. The curiosity with which they were visited when at Pegu is thus described:—"Our hall in the morning was generally crowded, as every person of distinction in Pegu paid us the compliment of a visit, except the maywoon, who, within the precincts of his own government, where he represents the king, never returns a visit. Numbers both of men and women, prompted by harmless curiosity, surrounded the paling of the enclosure from morning till night: Those of a better class usually came in, some previously asking permission; but many entered without it. Perfectly free from restraint among themselves, the Birmans scruple not to go into your house without ceremony, although you are an utter stranger. To do them justice, however, they are not at all displeased at your taking the same freedom with them. This intrusion is confined wholly to your public room: they do not attempt to open a door; and where a curtain dropped denotes privacy, they never offer to violate the barrier. On entering the room, they immediately descend into the posture of respect. Of all our customs, none seemed to surprise them more than the preparations for dining: the variety of utensils, and our manner of sitting at a table, excited their wonder. They never took any greater liberty than merely to come into the room, and sit down on the floor: they meddled with nothing, and asked for nothing; and when desired to go away, always obeyed with cheerfulness. Had untold gold been placed before them, I am confident not a piece would have been purloined." The behaviour of these people at another of their towns is thus mentioned: "The news of the mission had reached the place before we arrived, and excited a general curiosity to see the boomien of the colars, or the general of the strangers, as they were pleased to denominate me. Not only the better class of the inhabitants of Mecaday came to visit us, but likewise people of condition from all the towns and villages twenty miles round: I have sometimes received eight or ten different companies in a morning. When a party wished to be introduced, a message was sent to ask permission; which being obtained, they entered the room in a crouching position, and sat down on their heels, men and women alike. They always brought a gift of something, whatever they supposed might be acceptable; tobacco, onions, fine rice, &c. No company presented themselves empty handed: it would not have been respectful. Of course, their offerings drew from me a suitable return; such as, fillets of Indian muslin to the women, and a Cossembuzar silk handkerchief to the men. Several parties of women came unaccompanied by their husbands, or any of their male friends; and, according to the notions entertained by them, there was nothing indecorous in it: They were unconscious of any thing but an innocent desire to gratify curiosity and manifest respect. Women of a better class were always accompanied by a train of female attendants; and, like the sex everywhere, were more lively, good humoured, and inquisitive than the men."

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114 Amusements.

Among the public amusements of this people are mentioned boxing-matches, fireworks, processions, exhibitions of dancing; as also plays and puppet-shows.

115 Chess.

Persons of rank among them are fond of chess. This game is held in high estimation among the superior ranks: the board they use is exactly similar to ours, containing 64 squares, and their number of troops the same, 16 on each side; but the names, the power, and disposal of them, differ essentially. The king and his minister (a queen is never introduced by the orientals) are mounted on elephants: these are defended by two castles or *yettay;* two knights on horseback, *mene;* two officers on foot, one called *meem*, the other *chekey;* and eight *maundelay* or foot soldiers. The forces of each party are arranged on three lines, by which eight squares remain unoccupied: none of the pieces possess equal force with our queen; and this restricted operation renders the Birman mode of playing more complex and difficult than ours. The Birmans affirm that it is a game of high antiquity, and that it is acknowledged and authorized by their sacred writings, although every play of chance is prohibited. This testimony confirms the opinion of the late Sir William Jones, that chess was invented in India, and is not, as generally imagined, of Persian origin. The Birmans call it *chedreen*, a word that bears some resemblance to the name which is given to the game in most other parts of the world.

116 Throwing water on the last day of the year.

One of their amusements deserves attention, chiefly on account of its singularity and the good temper which it indicates. It is thus described by Mr Symes, who held the place of ambassador:—"On the 12th of April, the last day of the Birman year, we were invited by the maywoon to bear a part ourselves in a sport that is universally practised throughout the Birman dominions on the concluding day of their annual cycle. To wash away the impurities of the past, and commence the new year free from stain, women on this day are accustomed to throw water on every man they meet,

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meet, which the men have the privilege of retorting. This license gives rise to a great deal of harmless merriment, particularly among the young women, who, armed with great syringes and flaggons, endeavour to wet every man that goes along the street, and in their turn receive a wetting with perfect good humour. Nor is the smallest indecency ever manifested in this or in any other of their sports. Dirty water is never cast. A man is not allowed to lay hold of a woman, but may fling as much water over her as he pleases, provided she has been the aggressor; but if a woman warns a man that she does not mean to join in the diversion, it is considered as an avowal of pregnancy, and she passes without molestation.

"About an hour before sunset we went to the maywoon's, and found that his lady had provided plentifully to give us a wet reception. In the hall were placed three large china jars, full of water, with bowls and ladles to fling it. Each of us, on entering, had a bottle of rose water presented to him, a little of which we in turn poured into the palm of the maywoon's hand, who sprinkled it over his own vest of fine flowered muslin. The lady then made her appearance at the door, and gave us to understand that she did not mean to join in the sport herself, but made her eldest daughter, a pretty child in the nurse's arms, pour from a golden cup some rose-water mixed with sandel wood, first over her father, and then over each of the English gentlemen: this was a signal for the sport to begin. We were prepared, being dressed in linen waistcoats. From ten to twenty women, young and middle aged, rushed into the hall from the inner apartments, who surrounded and deluged without mercy four men, ill able to maintain so unequal a contest. The maywoon was soon driven from the field; but Mr Wood having got possession of one of the jars, we were enabled to preserve our ground till the water was exhausted: It seemed to afford them great diversion, especially if we appeared at all distressed by the quantity of water flung in our faces. All parties being tired, and completely drenched, we went home to change our clothes, and in the way met many damsels who would willingly have renewed the sport; they, however, were afraid to begin without receiving encouragement from us, not knowing how it might be taken by strangers; but they assailed Baba-sheem and his Birman attendants with little ceremony. No inconvenient consequences were to be apprehended from the wetting; the weather was favourable, and we ran no risk of taking cold. Having put on dry clothes, we returned to the maywoon's, and were entertained with a dance and puppet show that lasted till even."

117 Dress.

The court dress of the Birman nobles is represented as very becoming. It consists of a long robe of flowered satin or of velvet, reaching to the ankles, with an open collar and loose sleeves. Over this there is a scarf, or flowing mantle, that hangs from the shoulders, and on their heads they wear high caps of velvet, either plain, or of silk, embroidered with flowers of gold, according to the rank of the owner. Ear-rings are worn by the men; and some persons of condition use tubes of gold about three inches long, and as thick as a large quill, which expands at one end like the mouth of a speaking trumpet. Others wear a heavy mass of gold, beaten into a plate, and rolled up. This lump of metal forms a large orifice in the lobe of the ear, and drags it down by the weight to the extent of sometimes of two inches. Men of rank wear in common dress a tight coat, with long sleeves made of muslin, or of extremely fine nankeen, which is manufactured in the country; also a silk wrapper that encircles the waist. The working class are usually naked to the middle, but in the cold season, a mantle or vest of European broad cloth is highly prized. The women tie their hair in a bunch on the top of the head. They bind it round with a fillet, the ornaments of which express the rank of the wearer. A short shift, reaching to the pit of the stomach, and drawn tight by strings, supports the breasts. Over that is a loose jacket, with close sleeves. Round their waist they roll a long piece of silk or cloth, which reaching to their feet, and sometimes trailing on the ground, encircles them twice, and is then tucked in. When women of condition go abroad, they wear a silk sash resembling a long shawl, which crosses their bosom, and is cast over the shoulders, so as to flow gracefully on each side. The lowest class of females often wear only a single garment in the form of a sheet, which, wrapped round the body, and tucked under the arm, crosses their breasts, which it scarcely conceals, and descends to their ankles. Thus when they walk, the lower part of the cloth, where it overlaps, is opened by the protrusion of the leg, and displays to a side view as high as the middle of the thigh. Indeed, every woman when walking must shew a great part of her leg, as the lower part of their dress is never closed by a seam. Women in full dress stain the palms of their hands and their nails of a red colour, by means of a vegetable juice, and strew on their bosoms powder of sandel wood, or of a bark called by them *sunneka*, with which some rub their faces. Both men and women tinge the edges of their eyelids and their teeth with black.

118 Persons of the people.

The Birmans in their features have a nearer resemblance to the Chinese than to the natives of Hindoostan. The women, especially in the northern parts of the empire, are fairer than the Hindoo females, but not so delicately formed. They are inclined to corpulence, and their hair is black, long, and coarse. The men are athletic and active, but not tall. They have a very youthful appearance, from the custom of plucking out the hair of their beards instead of shaving. Girls are taught at an early age to turn their arms in such a manner as to make them appear distorted. When the arm is extended, the elbow is inverted, the inside of the joint being protruded, and the external part bending inwards.

119 Religion.

With regard to religion, the Birmans are a sort of Hindoos; not votaries of Brahma, but sectaries of Boodh; which latter is admitted by Hindoos of all descriptions to be the ninth avatar or descent of the deity in his capacity of preserver. He reformed the doctrines contained in the vedas, and severely censured the sacrifice of cattle, or depriving any being of life. He is called the author of happiness: his place of residence was discovered at Gaya in Bengal, by the illustrious Amara, renowned amongst men, "who caused an image of the supreme Boodh to be made, and he worshipped it: Reverence be unto thee in the form of Boodh; reverence be unto thee, lord of the earth; reverence be unto thee an incarnation of the deity, and

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and eternal one; reverence be unto thee, O God, in the form of mercy!"

Gotma, or Gantum, according to the Hindoos of India, or Gaudma, among the inhabitants of the more eastern parts, is said to have been a philosopher, and is by the Birmans believed to have flourished above 2300 years ago. He taught in the Indian schools the heterodox religion and philosophy of Boodh. The image that represents Boodh is called *Gaudma* or *Gantum*, which is now a commonly received appellation of Boodh himself: This image is the primary object of worship in all the countries situated between Bengal and China. The sectaries of Boodh contend with those of Brahma for the honour of antiquity, and are certainly far more numerous. The Cingalese, that is, the original inhabitants of Ceylon, are Boodhists of the purest source; and the Birmans acknowledge to have originally received their religion from that island. It was brought, say the rhahaans, first from Zehoo (Ceylon) to Aracan, and thence was introduced into Ava, and probably into China; for the Birmans assert with confidence that the Chinese are Boodhists.

This is a curious subject of investigation; and the concurrent testimony of circumstances, added to the opinions of the most intelligent writers, seem to leave little doubt of the fact. It cannot, however, be demonstrated beyond the possibility of dispute, till we shall have acquired a more perfect knowledge of Chinese letters, and a readier access to their repositories of learning. Little can at present be added to the lights cast on the subject by the late Sir William Jones, in his discourse delivered to the Asiatic society on the Chinese. That great man has expressed his conviction in positive terms, that "Boodh was unquestionably the Fo of China," and that he was also the god of Japan, and the Woden of the Goths; an opinion which corresponds with, and is perhaps grafted on, the information of the learned and laborious Kæmpfer, corroborated afterwards by his own researches. On whatever grounds the latter inference rests, it will not tend to weaken the belief of his first position, when I observe that the Chinese deputies, on the occasion of our introduction to the seredan, or high priest of the Birman empire, prostrated themselves before him, and afterwards adored an image of Gaudma with more religious fervour than mere politeness or acquiescence in the customs of another nation would have excited. The bonzes also of China, like the rhahaans of Ava, wear yellow, as the sacerdotal colour; and in many of their customs and ceremonies there may be traced a striking similitude.

120 Laws.

The laws of the Birmans are connected with their religion, being contained in what they call the *Derma Sath*, or *Sastra*, which is one of many commentaries on the writings of Menu, to whom, according to the Hindoos, the sacred principles of their law were revealed by divine authority.

The Sastra provides specifically for almost every case of crime that can be committed, and adds a copious chapter of precedents and decisions to guide the inexperienced. The Birmans agree with the Hindoos in one benevolent doctrine, the sinfulness of depriving any creature of life to satisfy a carnivorous appetite; but the Birmans do not carry this branch of their religion to any scrupulous length, like the timid and superstitious natives of the western peninsula. Merely to eat flesh is not deemed a crime by the Birmans; but he who eats it is not exempt from sin, unless the creature died a natural death, or was slain by accident, or by other hands. But in every thing that concerns religion the Birmans are abundantly liberal. The prohibition to kill animals as objects of food is nowhere very scrupulously observed, except by the rhahaans or priests. In times of danger, or in consequence of superstition, the king and his viceroys sometimes issue proclamations, enjoining obedience to the sacred law; but these produce little other effect than to cause the animals for a short time to be killed with more secrecy than usual; and wherever foreigners are in question, both the government and the people are abundantly tolerant. The maywoon of Pegu, who sent to the embassy large supplies of fruit, rice, oil, tamarinds, and spices, did not indeed offer any butchers meat for the use of the table; but they were allowed to purchase and kill whatever they wanted, such as, fowls, kid, and venison. When they had advanced farther into the country, a private intimation was given to the ambassador, that there would be no crime if a servant of his should kill a fat bullock when he met one; that it would be ascribed to accident, and reparation might be made to the owner, who would think himself amply recompensed for his loss by two tachals, about six shillings; and the beast being dead, there could be no sin in eating it, but that a public sanction could not previously be given to slaughter one. The Birmans never quarrel with a stranger on account of his religion. Their principal sea-port, Rangoon, has long been the asylum of insolvent debtors from the different settlements of India. It is crowded with foreigners of desperate fortunes, who find from the Birmans a friendly reception, and carry on a petty trade, which affords a decent subsistence to those who act with prudence. Here are to be found fugitives from all countries of the east, and of all complexions: Malabars, Moguls, Persians, Parsees, Armenians, Portuguese, French, and English all mingle here, and are engaged in various branches of commerce. The members of this discordant multitude are not only permitted to reside under the protection of government, but likewise enjoy the most liberal toleration in matters of religion: They celebrate their several rites and festivals, totally disregarded by the Birmans, who have no inclination to make proselytes. In the same street may be heard the solemn voice of the muezzin, calling pious Islamites to early prayers, and the bell of the Portuguese chapel tinkling a summons to Romish Christians. Processions meet and pass each other without giving or receiving cause of offence. The Birmans never trouble themselves about the religious opinions of any sect, nor disturb their ritual ceremonies, provided they do not break the peace, or meddle with their own divinity, Gaudma; but if any person commit an outrage, which the mussulmans in their zeal for the true faith will sometimes do, the offender is sure to be put into the stocks; and if that does not calm his turbulent enthusiasm, they bastinado him into tranquillity.

121 Religious toleration.

122 Rhahaans or priests.

The rhahaans, or priests, are a kind of monks who live in cloisters, profess celibacy, and abstain from every sensual indulgence. The prescribed punishment for a rhahaan detected in an act of incontinence, is expulsion

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expulsion and public disgrace. The delinquent is seated on an ass, and his face daubed with black paint, interspersed with spots of white. He is thus led through the streets, with a drum beating before him, and afterwards turned out of the city. The juniors only go abroad by the permission of the superior or prior of the convent. They are dressed in a long loose cloak, and yellow is the only colour worn by them. The rhahaans never dress their own victuals, holding it an abuse of time to perform any of the common functions of life, which, so long as they occupy, must divert them from the abstract contemplation of the divine essence. They receive the contributions of the laity ready cooked, and prefer cold food to hot. At the dawn of the morning they begin to perambulate the town, to collect supplies for the day: Each convent sends forth a certain number of its members, who walk at a quick pace through the streets, supporting with the right arm a blue lackered box, in which the donations are deposited; these usually consist of boiled rice mixed with oil, dried and pickled fish, sweetmeats, fruit, &c. During their walk they never cast their eyes to the right nor to the left, but keep them fixed on the ground; they do not stop to solicit, and seldom even look at the donors, who appear more desirous to bestow than the others to receive. The rhahaans eat but once a-day, at the hour of noon. A much larger quantity of provisions being commonly procured than suffices for the members of the convent, the surplus is disposed of as charitably as it was given, to the needy stranger, or the poor scholars who daily attend them to be instructed in letters, and taught their moral and religious duties.

123 Kioums, or monasteries.

In their choice of a residence, the rhahaans commonly select the most retired spots they can find, where shady trees, particularly the tamarind and banyan, protect them from the noonday sun. Their monasteries are different from common houses; they are made entirely of wood; the roof is composed of different stages supported by strong pillars; the inside comprehends one large hall; the whole house is open at the sides, and no private apartments are allowed: Publicity is the prevailing system of Birman conduct, and they admit of no secrets either in church or state. All kioums or monasteries, whether in town or country, are seminaries for the education of youth, in which boys of a certain age are taught their letters, and instructed in moral and religious duties. To these schools the neighbouring villagers send their children, where they are educated *gratis*, no distinction being made between the son of the peasant, and of him who wears the tsaloe or string of nobility. A piece of ground contiguous to the grove is enclosed for a garden, where they sow vegetables and plant fruit trees; the Indian sweet potato and the plantain, being the most nutritious, are principally cultivated. The charity of the country people supplies them abundantly with rice, and the few necessaries which their narrow wants require. Abstracted from all worldly considerations, they do not occupy themselves in the common concerns of life: they never buy, sell, or accept of money. Formerly there were nunneries of virgin priestesses, who, like the rhahaans, wore yellow garments, cut off their hair, and devoted themselves to chastity and religion; but the Birman government has long since abolished these societies, and refuses to allow women, under pretence of religion, to be withdrawn from the performance of the important duty of contributing to support and increase the population of the state.

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124 Temples.

The Birmans are extremely magnificent in the structure of their temples; that of Shoemadoo, at the ancient city of Pegu, is most remarkable. We shall therefore give the description of it at full length: "The object in Pegu that most attracts and most merits notice, is the noble edifice of Shoemadoo or the golden supreme. This extraordinary pile of buildings is erected on a double terrace, one raised upon another. The lower and greater terrace is about 10 feet above the natural level of the ground, forming an exact parallelogram: the upper and lesser terrace is similar in shape, and rises about 20 feet above the lower terrace, or 30 above the level of the country. I judged a side of the lower terrace to be 1391 feet; of the upper 684. The walls that sustained the sides of the terrace, both upper and lower, are in a ruinous state; they were formerly covered with plaster wrought into various figures. The area of the lower is strewed with the fragments of small decayed buildings; but the upper is kept free from filth, and is in tolerable good order. There is reason to conclude, that this building and the fortress are coeval, as the earth of which the terraces are composed, appears to have been taken from the ditch; there being no other excavation in the city, or in its neighbourhood, that could have afforded a tenth part of the quantity.

125 Temple of Shoemadoo.

"The terraces are ascended by flights of stone steps, which are now broken and neglected. On each side are dwellings of the rhahaans raised on timbers four or five feet from the ground. These houses consist only of a large wall; the wooden pillars that support them are turned with neatness; the roofs are covered with tiles, and the sides are made of boards; and there are a number of bare benches in every house, on which the rhahaans sleep; but we saw no other furniture.

"Shoemadoo is a pyramidical building composed of brick and mortar, without excavation or aperture of any sort, octagonal at the base, and spiral at top; each side of the base measures 162 feet; this immense breadth diminishes abruptly, and a similar building has not unaptly been compared in shape to a large speaking trumpet.

"Six feet from the ground there is a wide projection that surrounds the base, on the plane of which are 57 small spires of equal size, and equidistant; one of them measured 27 feet in height, and 40 in circumference at the bottom. On a higher ledge there is another row, consisting of 54 spires of similar shape and measurement.

"A great variety of mouldings encircle the building, and ornaments somewhat resembling the fleur-de-lys surround the lower part of the spire; circular mouldings likewise girt it to a considerable height, above which there are ornaments in stucco not unlike the leaves of a Corinthian capital: And the whole is crowned by a tee or umbrella, of open iron-work, from which rises a rod with a gilded pennant.

"The tee or umbrella is to be seen on every sacred building that is of a spiral form; the raising and consecration of this last and indispensable appendage is an act

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act of high religious solemnity, and a season of festivity and relaxation. The present king bestowed the tee that covers Shoemadoo. It was made at the capital; and many of the principal nobility came down from Ummerapoora to be present at the ceremony of its elevation.

"The circumference of the tee is 56 feet; it rests on an iron axis fixed on the building, and is farther secured by large chains strongly rivetted to the spire. Round the lower rim of the tee are appended a number of bells, which, agitated by the wind, make a continual jingling.

"The tee is gilt, and it is said to be the intention of the king to gild the whole of the spire. All the lesser pagodas are ornamented with proportionable umbrellas of similar workmanship, which are likewise encircled by small bells.

"The extreme height of the edifice, from the level of the country, is 361 feet, and above the interior terrace 331 feet.

"On the south-east angle of the upper terrace there are two handsome saloons or kioums lately erected, the roofs composed of different stages, supported by pillars; we judged the length of each to be about 60 feet, and the breadth 30; the ceiling of one is already embellished with gold leaf, and the pillars are lackered; the decoration of the other is not yet completed. They are made entirely of wood; the carving on the outside is laborious and minute; we saw several unfinished figures of animals and men in grotesque attitudes, which were designed as ornaments for different parts of the building. Some images of Gaudma, the supreme object of Birman adoration, lay scattered around.

"At each angle of the interior and higher terrace there is a temple 67 feet high, resembling in miniature the great temple; in front of that, in the southern corner, are four gigantic representations in masonry of Palloo or the evil genius, half beast half human, seated on their hams, each with a large club on the right shoulder. The Pundoo who accompanied me, said that they resembled the Rahuss of the Hindoos. These are guardians of the temple.

Nearly in the centre of the east face of the area are two human figures in stucco beneath a gilded umbrella; one standing represents a man with a book before him, and a pen in his hand; he is called *Thasiamee*, the recorder of mortal merits and mortal misdeeds; the other, a female figure kneeling, is Maha Sumdera, the protectress of the universe, so long as the universe is doomed to last; but when the time of general dissolution arrives, by her hand the world is to be overwhelmed and everlastingly destroyed.

"A small brick building, near the north-east angle, contains an upright marble slab, four feet high, and three feet wide: there is a long legible inscription on it. I was told it was an account of the donations of pilgrims of only a recent date.

"Along the whole extent of the north face of the upper terrace there is a wooden shed, for the convenience of devotees who come from a distant part of the country. On the north side of the temple are three large bells of good workmanship, suspended nigh the ground between pillars; several deers horns lie strewed around; those who come to pay their devotions first, take up one of the horns and strike the bell three times, giving an alternate stroke to the ground: this act I was told is to announce to the spirit of Gaudma, the approach of a suppliant. There are several low benches near the foot of the temple on which the person who comes to pray places his offering, commonly consisting of boiled rice, a plate of sweetmeats, or cocoa nut fried in oil: when it is given, the devotee cares not what becomes of it; the crows and wild dogs often devour it in presence of the donor, who never attempts to disturb the animals. I saw several plates of victuals disposed of in this manner, and understood it to be the case with all that was brought.

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"There are many small temples on the areas of both terraces, which are neglected and suffered to fall into decay. Numberless images of Gaudma lie indiscriminately scattered. A pious Birman who purchases an idol, first procures the ceremony of consecration to be performed by the rhahaans; he then takes his purchase to whatever sacred building is most convenient, and there places it within the shelter of a kioum, or in the open ground before the temple; nor does he ever again seem to have any anxiety about its preservation, but leaves the divinity to shift for itself. Some of those idols are made of marble that is found in the neighbourhood of the capital of the Birman dominions, many are formed of wood and gilded, and a few are of silver. The latter, however, are not usually exposed and neglected like the others. Silver and gold are rarely used, except in the composition of household gods.

"On both the terraces are a number of white cylindrical flags raised on bamboo poles; these flags are peculiar to the rhahaans, and are considered as emblematic of purity and of their sacred functions. On the top of the staff there is a henza or goose, the symbol both of the Birman and Pegu nations.

"From the upper projection that surrounds the base of Shoemadoo, the prospect of the circumjacent country is extensive and picturesque; but it is a prospect of nature in her rudest state: there are few inhabitants, and scarcely any cultivation. The hills of Martaban rise to the eastward, and the Sitang river, winding along the plains, gives an interrupted view of its waters. To the northward about 40 miles are the Galadzet hills, whence the Pegu river takes its rise; hills remarkable only for the noisome effects of their atmosphere. In every other direction the eye looks over a boundless plain, chequered by a wild intermixture of wood and water."

The temple of Shoemadoo appears to be the largest in the Birman dominions. At the same time, they have many others formed upon a similar plan and of great extent. Of one of these we shall take notice, on account of the coincidence between its name, and the name of a Pagan temple mentioned in the sacred Scriptures. It is to be observed, that in the Birman tongue the word *shoe*, signifies *golden;* and the name of the temple to which we allude, is called *Shoedagon*, or *the temple of the golden Dagon*. It is thus described: "The temple of Shoedagon or Dagonng, about two miles and a half north of Rangoon, is a very grand building, although not so high by 25 or 30 feet as that of Shoemadoo at Pegu. It is much more ornamented; the terrace on which it stands is raised on a rocky eminence, considerably higher than the circumjacent

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jacent country. It is ascended by above 100 stone steps that have been suffered to fall into decay. The situation renders Shoedagon a conspicuous object at the distance of many miles. The tee and the whole of the spire are richly gilded, which, when the sun shines, exhibit a singularly splendid appearance.

"The small auxiliary buildings are yet more numerous than those that surround the base of the Pegu temple. Perceiving that several of these were in a ruinous state, whilst the foundations of others were just laid, and some half finished, I asked, why they did not repair the damages of the old before they erected new ones, and was told, that to mend a decayed praw or temple, though an act of piety, was not so meritorious as to erect a new one; that sometimes the old ones were repaired by those who were unwilling or unable to be at the expence of a complete building; but this entirely depended on the means or inclination of the donor.

"The borders of the terrace on which the temple is raised are planted with shady trees in regular rows: From this eminence there is a beautiful and extensive prospect; the Pegu and Rangoon rivers are seen winding through a level woody country, and the temple of Syriam, little inferior to those that have been described, stands near the junction of the streams. The rainy monsoon had now set in, and inundations were formed in several places. It would have been a more pleasing, though perhaps less picturesque scene, had the plains been cleared and the fields laid out for cultivation: we could observe few marks of improvement; woods, lakes, and rivers, presented themselves on every side."

126 Private buildings.

But although the Birmans display sufficient magnificence in their temples and public buildings, their private houses are constructed of very simple and cheap materials. Their king has even prohibited brick or stone to be used in the construction of any private house, from an apprehension, it is said, that if people were allowed to erect brick houses, they might erect brick fortifications to the danger of the state. It is not improbable, however, that the prohibition is owing to another cause. In the hot climates, where the soil is fertile, if the population happen to be defective, it is extremely difficult to prevent the whole country from being overrun with forests, which is at present in a great degree the case in the Birman dominions. One of the easiest modes of subduing these forests, consists of adopting the measure now mentioned, of prohibiting the use of brick or stone for private buildings. In other respects, however, the houses are built with sufficient attention to conveniency, and are all raised from the ground, either on wooden posts or bamboos, according to the size of the building; so that the lower floor is above the ground. The monasteries of the rhahaans, and the habitations of the higher ranks, are usually elevated six or eight feet, and those of the lower classes from two to four. The walls of the houses are made of boards or mats, supported on bamboos or posts. One inconvenience, however, attends them all, that from their being composed of such combustible materials, the inhabitants are under continual dread of fire, against which they take every precaution. The roofs are lightly covered; and at every door stands a long bamboo with an iron hook at the end to pull down the thatch. There is also another pole with an iron grating at the extremity to suppress flame by pressure. Almost every house has earthen pots filled with water, standing ready on the roof; and a number of firemen patrole the streets during the night to put out all fires and lights after a certain hour.

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127 Temporary houses.

It is customary when the king, or when persons of high rank travel, to erect temporary habitations for them, and this was done in honour of the British embassy. These temporary houses are thus described; "The materials of which these houses are made, are always easy to be procured; and the structure is so simple, that a spacious and by no means an uncomfortable dwelling, suited to the climate, may be erected in one day. Our habitation, consisting of a small room to each, and a hall, open to the north, in little more than four hours was in readiness for our reception. Fifty or sixty labourers completed it in that time; and, on emergency, could perform the work in much less. Bamboos, grass for thatching, and the ground rattan, are all the materials requisite; not a nail is used in the whole edifice; a row of strong bamboos from eight to ten feet high are fixed firm in the ground, which describe the outline, and are the supports of the building; smaller bamboos are then tied horizontally, by strips of the ground rattan, to these upright posts; the walls, composed of bamboo mats, are fastened to the sides with similar ligaments; bamboo rafters are quickly raised, and a roof formed, over which thatch is spread in regular layers, and bound to the roof by filaments of rattan; a floor of bamboo grating is next laid in the inside, elevated two or three feet above the ground; this grating is supported on bamboos, and covered with mats and carpets: this ends the process, which is not more simple than effectual. When the workmen take pains, a house of this sort is proof against very inclement weather. We experienced during our stay at Meeaday, a severe storm of wind and rain, but no water penetrated nor thatch escaped; and, if the tempest should blow down the house, the inhabitants would run no risk of having their brains knocked out or their bones broken; the fall of the whole fabric would not crush a lady's lap dog."

128 Administration of justice.

In the administration of justice the Birmans are extremely regular and formal; the place where the judges of any district sit is called the *rhoom*, where they hear the pleadings of parties or their counsel, and examine witnesses, whose depositions are taken down in writing. These depositions are sent to the maywoon or viceroy, who represents the king, and the judges transmit their opinions along with the evidence, which the maywoon either confirms or rejects as he thinks proper; and, in cases of capital conviction, orders execution or pardons the culprit. From his judgment there lies no appeal, unless the offender hold a royal commission; in which case the evidence must be transmitted to the council of state, and the king himself applies the law and pronounces judgment.

129 The rhoom.

The building denominated the *rhoom* is also the official hall where the members of provincial governments and all municipal officers are accustomed to assemble to transact public business. Every man of high rank in the Birman empire is a magistrate, and has a place of this description and name contiguous to his dwelling; but

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but always on the outside of the enclosure of his court-yard, and not surrounded by any fence or railing, in order to manifest publicity, and show that it is the seat of majesty and justice, to which all mankind may have free access. An imperial mandate to a governor, or an order from a governor to a petty miongee or chief of a small town or district, is invariably opened and read aloud in this sanctified hall. The Birman government, in the administration of public affairs, professes no such thing as privacy or concealment. The rhoom is likewise an appendage of dignity, as it denotes him to whose habitation it is annexed to be a person of rank and consequence; a building of this sort was erected within a few yards of the front gate of the British ambassador's enclosure. It is to be remarked, that when the ambassador had obtained from the government the establishment of certain regulations respecting commerce, and had returned to the sea port of Rangoon, the viceroy of that district informed him that the orders for carrying into effect the late regulations would be publicly read and registered at the rhoom on the following day. The viceroy also invited him to send a confidential person to be present at the ceremony; adding, that the records were also open to the public inspection; and that whoever chose might, at any time, procure a copy, by paying a trifling fee to the officers of the court. The result of this publicity is, that foreigners, acquainted with the character of the people, do not hesitate to trust themselves in the very centre of the country. At the distance of 150 miles from the coast, including the windings of the river, our embassy found a Mussulman merchant from Surat, out of economy, building a vessel of four hundred tons burden, instead of building it at the sea port of Rangoon. He meant, as soon as the hull should be finished, to float it down the stream. The inland navigation is considered as dangerous; but this merchant chose to encounter the risk for the sake of obtaining the teek timber at a cheap rate near the spot where it grows, and probably also for the sake of obtaining labour at a more moderate price. This adventurer furnishes a proof of the confidence that may be placed in the Birman government, and the security that a stranger has for his property.

130 Military force.

The Birman government is of a feudal nature in the strictest sense of the word. The people are a nation of soldiers; every man in the kingdom being liable to be called upon military service, and war is deemed the most honourable occupation. The regular military establishment of the nation, however, as among our ancestors in feudal times, is very inconsiderable, consisting only of the royal guards, and as many troops as are necessary to preserve the police of the capital. These are supposed to amount, in all, to about 2000 infantry, and 300 cavalry, though it is said that the cavalry scattered in small detachments through the districts adjoining to the capital, amount to about 2000. The infantry are armed with muskets and sabres, and are not uniformly clothed; the cavalry in the king's service, are natives of the northern province of Cassay, who are accounted much better horsemen than the Birmans; they seldom use any other weapon than a spear about seven or eight feet long. They ride like all orientals with short stirrups, and a loose rein; their dress is not unbecoming; it consists of a tight coat, with skirts reaching down to the middle of the thigh, and on their head they wear a turban of cloth rolled hard and plaited, which forms a high cone, that bends backwards in a graceful manner; their horses are small, but hardy and active, and are frequently exported to the western peninsula. When an army is to be raised, a mandate issues to all the viceroys of provinces and governors of districts, requiring a certain number of men to be at a general rendezvous on an appointed day; the levy is proportioned to the population of the province or district, estimated from the number of registered houses that it contains; the provincial court determines the burden which each house is to bear; a certain number of houses furnish a recruit among them, or pay 300 tackal in money, about 40l. or 45l.: The recruit is supplied with arms, ammunition, and, it is believed, with a daily allowance of grain, from the government; but he receives no pay. The families of these conscripts are carefully retained in their districts as hostages for the good conduct of their relation. In case of desertion or treachery, the innocent wife, children, and parents of the guilty person, are dragged to execution without pity; even cowardice subjects the family of the delinquent to capital punishment, and this barbarous law is rigorously inforced.

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131 War-boats.

By far the most respectable part of the Birman military force is the establishment of war-boats; every town of note in the vicinity of the principal rivers is obliged to furnish a certain number of men, and one or more boats, in proportion to the magnitude of the place: thus the king can command at a very short notice 500 of these vessels: They are constructed out of the solid trunk of the teek-tree, which is excavated partly by fire and partly by cutting; the largest are from 80 to 100 feet long, but the breadth seldom exceeds eight feet, and even this space is produced by artificially extending the sides after the trunk has been hollowed: they carry from 50 to 60 rowers, who use short oars, that work on a spindle. The prow is solid, and is a flat surface, on which, when they go to war, a piece of ordnance is mounted; a six, a nine, or even a twelve pounder. The gun-carriage is secured by lashings to strong bolts on each side, and swivels are frequently fixed on the curvature of the stern. Each rower is provided with a sword and a lance, which are placed by his side while he plies the oars. Besides the boatmen, there are usually 30 soldiers on board, who are armed with muskets: thus prepared, they go in fleets to meet the foe, and when in sight, draw up in a line, presenting their prows to the enemy. Their attack is extremely impetuous; they advance with great rapidity, and sing a war song, at once to encourage their people, daunt their adversaries, and regulate the strokes of their oars; they generally endeavour to grapple, and when that is effected, the action becomes very severe, as these people are endowed with great courage, strength, and activity. In times of peace they are fond of exercising in their boats, and they display much dexterity in the management of them. The vessels being low in the water, their greatest danger is that of being run down by a larger boat striking on their broadside, a misfortune which the steersman is taught to dread and to avoid above all other. It is surprising, says the author, to see the facility

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cility with which they steer and elude each other in their mock combats. The rowers are also practised to row backwards, and impel the vessel with the stern foremost; this is the mode of retreating, by means of which the artillery still bears upon their opponent. The largest of the war boats do not draw more than three feet water.

132 Revenue.

The revenue of the Birman king is, according to the laws of their religion, as stated in their sacred books, a tenth of all produce, and it is certain that one-tenth is the amount of the king's duty on all foreign goods imported into his dominions. The revenues arising from the customs on imports, and from internal produce, is mostly taken in kind; a small part of which is converted into cash: the rest is distributed as received in lieu of salaries to the various dependants of the court. Princes of the blood, high officers of state, and provincial governors, receive grants of provinces, cities, villages, and farms, to support their dignity, and as a remuneration of their services; the rents of these assignments they collect for their own benefit. Money, except on pressing emergency, is never disbursed from the royal coffers: to one man the fees of an office are allotted; to another a station where certain imposts are collected; a third has land; each in proportion to the importance of his respective employment. By these donations they are not only bound in their own personal servitude, but likewise in that of all their dependants; they are called slaves of the king, and, in turn, their slaves are denominated slaves to them; the conditions of these grants include also services of war as well as the duties of office. Thus the Birman government exhibits almost a faithful picture of Europe in the darker ages, when, on the decline of the Roman empire, the principles of feudal dependance were established by barbarians from the north.

133 The government feudal.

This system of feudal dependance may be considered as existing in the Birman government in its purest state. There are no hereditary dignities or employments; all honours and offices on the demise of the possessor revert to the crown, a circumstance which when taken along with the obligation to military service, which is incumbent upon all down to the lowest of the people, gives to this government that appearance of a military encampment and subordination which the feudal tenures have been understood to exhibit, but from which they degenerated in Europe, when dignities and authority became hereditary. In consequence of the feudal principles which here prevail, the subordination of rank is maintained and marked by the Birmans with the most tenacious strictness. In the manner of constructing houses, whether temporary or lasting, strict attention is paid to the form which indicates the rank of the inhabitants; nor dare any subject assume a mode of structure to which he is not legally entitled: the distinction consists chiefly of the number of stages of which the roof is composed; even domestic implements, such as the betel-box, water-flagon, drinking-cup, and horse-furniture, all express by their shape and quality the precise station of the owner; nor can one person intrude upon the rights of another under penalty of incurring a most severe punishment, which is never remitted. The tsaloe, or chain, is the badge of the order of nobility, of which there are different degrees, distinguished by the number of strings or small chains

134 Ranks in society.

that compose the ornament. These strings are fastened by bosses where they unite: three of open chain-work is the lowest rank; three of neatly twisted wire is the next; then of six, of nine, and of twelve; no subject is ever honoured with a higher degree than twelve; the king alone wears 24.

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As gold is understood to be the noblest of metals, the king of the Birmans, who is the foundation of rank, is designated or described by the appellation of *shoe* or *golden*; thus, a particular village inhabited by watermen in the service of the king, is called *Shoe-lee-rua*, or *golden boat village*, nor is the person of the sovereign ever spoken of but in conjunction with this precious metal. When a subject means to affirm that the king has heard any thing, he says, "It has reached the golden ears;" he who has obtained admission to the royal presence, has been at the golden feet; the perfume of ottar of roses, a nobleman observed one day, "was an odour grateful to the golden nose." Gold among the Birmans being a type of excellence, is not merely ascribed to their king, but on solemn occasions it is placed on his dress in such quantities as to prove not a little cumbersome. The form in which the ambassadors were introduced to his majesty, and the appearance which he made, are thus described: "On entering the gate, we perceived the royal saloon of ceremony in front of us, and the court assembled in all the parade of pomp and decoration. It was an open hall, supported by colonnades of pillars, 20 in length and only four in depth; we were conducted into it by a flight of steps, and advancing, took our places next the space opposite to the throne, which is always left vacant, as being in full view of his majesty. On our entrance, the basement of the throne was alone visible, which we judged to be about five feet high; folding doors screened the seat from our view: the throne, called *yazapalay*, was richly gilded and carved; on each side a small gallery, enclosed by a gilt balustrade, extended a few feet to the right and left, containing four umbrellas of state; and on two tables at the foot of the throne were placed several large vessels of gold, of various forms, and for different purposes; immediately over the throne a splendid piasath or pyramid rose in seven stages above the roof of the building, crowned by a tee or umbrella, from which a spiral rod was elevated above the whole.

135 Introduction of ambassadors to the Birman king.

"We had been seated little more than a quarter of an hour, when the folding-doors that concealed the seat opened with a loud noise, and discovered his majesty ascending a flight of steps that led up to the throne from the inner apartment; he advanced but slowly, and seemed not to possess a free use of his limbs, being obliged to support himself with his hands on the balustrade. I was informed, however, that this appearance of weakness did not proceed from any bodily infirmity, but from the weight of the regal habiliments in which he was clad; and if what we were told was true, that he carried on his dress 15 vis, upwards of 50 pounds avoirdupois of gold, his difficulty of ascent was not surprising. On reaching the top, he stood for a minute, as though to take breath, and then sat down on an embroidered cushion, with his legs inverted. His crown was a high conical cap, richly studded with precious stones: his fingers were covered with rings, and in his dress he bore the appearance of

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a man cased in golden armour, whilst a gilded or probably a golden wing on each shoulder did not add much lightness to his figure. His looks denoted him to be between 50 and 60 years old, of a strong make, in stature rather beneath the middle height, with hard features, and of a dark complexion; yet the expression of his countenance was not unpleasing, and seemed, I thought, to indicate an intelligent and inquiring mind.

"On the first appearance of his majesty, all the courtiers bent their bodies, and held their hands joined in an attitude of supplication. Nothing farther was required of us than to lean a little forward, and to turn in our legs as much as we could; not any act being so unpolite or contrary to etiquette as to present the soles of the feet towards the face of a dignified person. Four Bramins, dressed in white caps and gowns, chanted the usual prayer at the foot of the throne: a nakhaan then advanced into the vacant space before the king, and recited in a musical cadence the name of each person who was to be introduced on that day, and of whose present, in the character of a suppliant, he entreated his majesty's acceptance. My offering consisted of two pieces of Benares gold brocade; Doctor Buchanan and Mr Wood, each presented one. When our names were mentioned, we were separately desired to take a few grains of rice in our hands, and, joining them, to bow to the king as low as we conveniently could; with which we immediately complied. When this ceremony was finished, the king uttered a few indistinct words, to convey, as I was informed, an order for investing some persons present with the insignia of a certain degree of nobility; the imperial mandate was instantly proclaimed aloud by heralds in the court. His majesty remained only a few minutes longer, and during that time looked at us attentively, but did not honour us with any verbal notice, or speak at all, except to give the order before mentioned. When he rose to depart, he manifested the same signs of infirmity as on his entrance; after he had withdrawn, the folding doors were closed, and the court broke up."

It may here be added that among the Birmans the royal family is held of so much importance, that to succeed to the throne, every prince must be descended from royal parentage by both father and mother; for this reason incestuous marriages are permitted to their princes, but to nobody else; the king may indeed marry a second wife of inferior rank while his first is alive, but she is accounted merely a concubine, and her children are illegitimate, and cannot inherit the throne.

136 Literature.

The books of the Birmans are generally formed of the palmetto leaf, on which the letters are engraved with a stylus. Books are sometimes composed, however, of thin strips of bamboo delicately plaited, and varnished over in such a manner as to form a smooth hard surface upon a leaf of any dimension. This surface is afterwards gilded, and the letters traced upon it in black and shining japan. The margin is illumined by wreaths and figures of gold. The Birmans write from left to right, and though they leave no distinguishing space between their words, they mark the pauses of a sentence and the full stops. Their letters are distinct, and their manuscripts are in general very beautiful. Their language contains 33 simple sounds, and their alphabet consists of an equal number of distinct characters, exclusive of various marks and contractions, which are explained in their spelling-book. Their common characters consist of circles, and segments of circles, variously disposed and combined. The Birmans are extremely fond both of poetry and music: their poetry, when repeated by a well-educated person, is extremely melodious; it is sometimes in successive and sometimes in alternate rhymes: they have epic as well as religious poems of high celebrity, and they are fond of reciting in heroic numbers, the exploits of their kings and generals. It is said, that the prowess of the great Alompra, the deliverer of his country, is recorded in verses not unworthy of his courage and his fortune. The members of the British embassy were invited by the maywoon or viceroy of Pegu to one of their dramatic representations, which they applaud not a little. "The theatre was the open court, splendidly illuminated by lamps and torches; the maywoon and his lady sat in a projecting balcony of his house; we occupied seats below him, raised about two feet from the ground, and covered with carpets; a crowd of spectators were seated in a circle round the stage. The performance began immediately on our arrival, and far excelled any Indian drama that I had ever seen. The dialogue was spirited without rant, and the action animated without being extravagant; the dresses of the principal performers were showy and becoming. I was told that the best actors were natives of Siam, a nation, which though unable to contend with the Birmans and Peguers in war, have cultivated with more success the refined arts of peace. By way of interlude between the acts, a clownish buffoon entertained the audience with a recital of different passages; and by grimace and frequent alterations of tone and countenance, extorted loud peals of laughter from the spectators. The Birmans seem to delight in mimickry, and are very expert in the practice, possessing uncommon versatility of countenance. An eminent practitioner of this art, amused us with a specimen of his skill, at our own house, and, to our no small astonishment, exhibited a masterly display of the passions in pantomimic looks and gesture; the transitions he made from pain to pleasure, from joy to despair, from rage to mildness, from laughter to tears; his expression of terror, and, above all, his look of idiotism, were performances of first-rate merit in their line; and we agreed in opinion, that had his fates decreed him to have been a native of Great Britain, his genius would have rivalled that of any modern comedian of the English stage.

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137 Poetry.

"The plot of the drama performed this evening, I understood, was taken from the sacred text of the Ramayen of Balmiec (called by Sir William Jones, *Valmiec*) a work of high authority among the Hindoos. It represented the battles of the holy Ram, and the impious Rahwaan, chief of the Rakuss or demons, to revenge the rape of Secta, the wife of Ram, who was forcibly carried away by Rahwaan, and bound under the spells of enchantment. Vicissitudes of fortune took place during the performance that seemed highly interesting to the audience. Ram was at length wounded by a poisoned arrow; the sages skilled in medicine consulted on his cure; they discovered, that on the mountain Indragurry grew a certain tree that produced a

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gum, which was a sovereign antidote against the deleterious effects of poison; but the distance was so great that none could be found to undertake the journey. At length Honymaan, leader of the army of apes, offered to go in quest of it. When he arrived at the place, being uncertain which was the tree, he took up half the mountain and transported it with ease: thus was the cure of Ram happily effected, the enchantment was broken, and the piece ended with a dance and songs of triumph."

When at the capital, Ummerapoora, our author describes his visit to the royal library in the following terms: "Having finished our introductory visits to the different members of the royal family, we had now leisure to gratify our curiosity by viewing whatever the capital contained that was most deserving the notice of strangers. The day not being far advanced, we walked from the palace of Pagahm to see the pedigaut tiek, or royal library: it is situated at the north-west angle of the fort, in the centre of a court paved with broad flags, and close to a very handsome kioum or monastery. Before we entered the library we ascended the kioum, and found the inside correspond with the external appearance; the building was spacious and richly gilded; the pillars, the ceiling, and the pannels, were entirely covered with gold leaf; and the image of Gaudma shone with a brilliant lustre; a balustrade of wood, minutely and beautifully carved, protected the image from intruders. On the pannels of the walls were represented figures of inferior agents of the divinity, and of prostrate rhahaans in the act of devotion; these were all shaped in fret-work in the wood, and were of no contemptible workmanship: a well wrought foliage of the same bordered the pannels. The image of Gaudma in this kioum, was large, and made of marble; it was seated on a broad pedestal entirely gilded; in front of which, within the balustrade, stood a handsome girandole of cut glass of European manufacture: near the image was a gilded couch, which we were informed was the customary bed of the principal rhahaan, or head of all the Birman priesthood, when he chose to pass the night in the fort, which rarely happened. It was splendidly gilt; the bottom, however, was only a bare board; pillars were not wanting, for there were two, but they were made of wood. A mat spread on the floor is the highest luxury of repose in which the rhahaans indulge.

"From the kioum we proceeded to visit the adjacent library; it is a large brick building raised on a terrace, and covered by a roof of a very compound structure. It consists of one square room, with an enclosed veranda, or gallery, surrounding it: this room was locked, and as we had not brought a special order for seeing it, the person who had the care of the library said, that he was not at liberty to open the doors; but assured us, that there was nothing in the inside different from what we might see in the veranda, where a number of large chests, curiously ornamented with gilding and japan, were ranged in regular order against the wall; I counted 50, but there were many more, probably not less than 100. The books were regularly classed, and the contents of each chest were written in gold letters on the lid. The librarian opened two, and shewed me some very beautiful writing on thin leaves of ivory, the margins of which were ornamented with flowers of gold neatly executed. I saw also some books written in the ancient Pali, the religious text. Every thing seemed to be arranged with perfect regularity, and I was informed, that there were books upon divers subjects; more on divinity than any other; but history, music, medicine, painting, and romance, had their separate treatises. The volumes were disposed under distinct heads, regularly numbered; and if all the other chests were as well filled as those that were submitted to our inspection, it is not improbable that his Birman majesty may possess a more numerous library than any potentate from the banks of the Danube to the borders of China."

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Books were afterwards brought for sale to the gentlemen of the embassy, but always clandestinely; and an exorbitant price was demanded, under pretence that if any person were discovered to have sold books to a foreigner without permission, he would be liable to a severe penalty. A man was actually imprisoned for an offence of this nature, upon which Captain Symes sent a message to the chief woongee or prime minister, apprising him of the circumstance, and desiring to know whether it was illegal to sell books to himself or his suit; adding, that if their law prohibited it, he would reject such as in future might be brought, and direct every person under his authority to do the same. The woongee returned a civil message, and the man was set at liberty. His majesty being made acquainted with the affair, summoned on the following day, the principal rhahaans to attend his council, and submitted to them, whether or not it was consistent with Birman tenets, to grant books that treated of their history and laws to foreigners? The conclave, after solemn deliberation, determined in the affirmative, and added, that it was not only admissible, but laudable, for the dissemination of knowledge. His majesty was thereupon pleased to order a handsome copy of the Razawayn, or history of their kings, and of the Dhermasath, or code of laws, to be delivered to Captain Symes from the royal library; each was contained in one large volume, written in a beautiful manner, and handsomely adorned with painting and gilding.

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Music.

Music is a science that is held in no small degree of estimation throughout the Birman empire, and is very generally cultivated; there is scarcely even a boatman who does not possess an instrument of some sort; they who can procure no better have at least what is called a *Jew's harp*, with which they delight to beguile half an hour of a cool evening, after a day spent in severe labour under a burning sun. Some of the professional musicians display considerable skill and execution; and the softer airs are pleasing even to an ear unaccustomed to the melodies of the country. The principal instruments are a soum or harp, made of light wood hollowed and varnished, in shape somewhat resembling a canoe with a deck; at the extremity, a piece of hard wood is neatly fastened, which tapers to the end, and rising curves over the body of the harp; from this curvature the strings, usually made of wire, are extended to a bridge on the belly of the instrument; there are two sounding holes, one on each side of the bridge. The size of the soum varies from two to five feet in length. The turr resembles our violin. It has only three strings, and is played on with a bow. The pullaway is a common flagelet. The kyezoup is a collection of about

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about 18 cymbals, suspended in a bamboo frame: these cymbals, varying in size, produce modulated gradations of sounds. The patola, or guitar of the Birmans, is said to be a curious instrument: it is the exact form, in miniature, of a crocodile; the body of which is hollow, with sounding holes in the back; three strings of wire extend from the shoulder to the tail, to which they are fastened. It is played on by the fingers, and is generally used to accompany the voice. The bondaw is a collection of drums, oblong in form, and varying in size, which are suspended perpendicularly in a wooden frame by leather thongs. The whole machine is about five feet in diameter, and four feet high. The performer stands in the centre, and beats on the drums with a small stick. This instrument is always introduced when there is a full band, and is much used in processions, of which the Birmans are very fond, being carried by two men, while the performer shuffles along in the inside, playing as he goes. The heem is the pipe of Pan, formed of reeds neatly joined together, and sounded by a common mouth-piece. It produces a very plaintive melody.

139 Time.

The Birmans divide their year into 12 months, which, strictly speaking, cannot be called *synodical*, although they comprehend the same number of days. A revolution of the moon, in passing from one conjunction with the sun to another, is performed in 29 days 12 hours and 44 minutes: but the Birman lunations consist of 29 and 30 days alternately, which causes a difference between the Newtonian and Birman lunar account of 8 hours and 48 minutes. The Birman months are as follows:

	Days.
Tagoo contains	29
Kayoung	30
Nay Young	29
Wazoo	30
Wagoung	29
Toozelien	30
Tandaing Guite.	29
Tazoung Moang	30
Gnadoh	29
Peeazoo	30
Taboodiray	29
Taboung	30
	354

In order to complete a solar revolution, they intercalate in every third year a month of 30 days, which is called *Toodea Wazoo;* in this third year the months of Tagoo and Nay Young have each 30 days instead of 29; they likewise suppress or pass over a day, which, if reckoned, would either be the 31st Taboung, or the 1st of Tagoo; by these means the number of days in three solar years is thus computed:

	Days.
Three lunar years of 354 days each,	1062
Intercalary month in the third year,	30
Two intercalary days in Tagoo and Nay Young,	2
Suppressed or passed over at the end of the year,	1
	1095

This computation corresponds in the number of days with three years; every fourth year, however, will occasion the difference of a day, on account of our bissextile or leap year: of this the Birmans are fully sensible, as well as of many other defects in their manner of reckoning; to remedy the confusion likely to ensue from such erroneous calculations, their style or mode has frequently been altered by arbitrary authority.

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The manner in which the Birman month is subdivided is somewhat peculiar; instead of reckoning the days progressively from the commencement to the close of the month, they divide it into two parts, and number the days of the increasing and of the waning moon separately. Each moon or month is also divided into weeks of seven days each, and Sunday, as with us, is the first day of the Birman week. The eighth day of the increasing moon, the fifteenth or full moon, and the eighth of the decreasing moon, are observed as sacred festivals. On these holidays no business is transacted in the rhoom; mercantile dealings are suspended; handicraft occupations are forbidden, and the strictly pious take no sustenance between the rising and the setting sun. This last instance of self denial, however, is uncommon, except in the metropolis, where it is submitted to by ambitious persons with a view to obtain favour with the king, who is understood to be a great favourer of the austerities of the Birman religion. Minute portions of time are divided as follows: "The space in which the finger can be raised and depressed is called *charazi;* ten charazi make one piaan; six piaan one bezana, about a minute. The day, of 24 hours commencing at noon, is divided into eight portions or yettee, of three hours each. These divisions of time are ascertained by a machine resembling the hour-glass, and sometimes by a perforated pan placed in a tub of water; they are announced by a stroke on an oblong drum, which is always kept near the dwelling of the chief magistrate of the city, town, or village; it is commonly raised on a high bamboo stage, with a roof of mats to protect it from the weather.

The edifice at the royal palace for the reception of this instrument is of masonry, and very lofty, whence the sound is said to be distinctly conveyed to the remotest quarters of the city.

140 Money.

The Birmans, like the Chinese, have no coin. Silver in bullion, and lead, are the current moneys of the country; weight and purity are of course the standard of value, and in the ascertainment of both the natives are exceedingly scrupulous and expert. What foreigners call a *tackal*, properly *kiat*, is the most general piece of silver in circulation; it weighs 10dwts 10¼gr.; its subdivisions are, the tubbee, two of which make one moo; two moo, one math; four math, one tackal; and one hundred tackal compose one viss. Money scales and weights are all fabricated at the capital, where they are stamped, and afterwards circulated throughout the empire; the use of any other is prohibited. The bankers, called by foreigners *pynions*, are likewise workers in silver and assayers of metal. This is a class of people very numerous, and indispensably necessary, as no stranger can undertake either to pay or receive money without having it first examined. Every merchant has a banker of this description, with whom he lodges all his cash, and who, for receiving and paying, gets an established commission of one per cent.; in consideration of which he is responsible for the quality of

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of what goes through his hands; and in no instance has it been known that breach of trust was committed by one of these bankers. The quantity of alloy varies in the silver current in different parts of the empire; at Rangoon it is adulterated twenty-five per *cent;* at Ummerapoora, fine, or what is called *flowered silver*, is most common; in this latter all royal dues are paid. Any person may have his silver either purified or depreciated to whatever standard he chooses; the nearest silversmith will be glad to perform the work, free from charge for his labour, as the bringer, by the operation, must lose a trifle, which the artist gains; the small quantity of metal that adheres to the crucible is his profit.

141 Measures.

The Birman measures of length are a paul-gaut or inch, 18 of which compose the jaim or cubit; the saundgaling or royal cubit, equal to 22 inches; the dad or bamboo, which consists of 7 royal cubits; 1000 dha make one Birman league or dain, nearly equal to two British miles and two furlongs; the league is also subdivided into tenths. The Birmans keep their accounts in decimals, after the manner of the Chinese.

142 Arts. Agriculture.

The Birmans have hitherto carried few of the arts to very great perfection. The art of agriculture, which is the foundation of all others, seems in a very imperfect state; this, however, does not appear to arise so much from want of skill in the people as from their present situation, which renders great exertions to procure subsistence by no means necessary. The soil is extremely fertile, while the population is very scanty; the Birmans, therefore, are somewhat in the state of colonists upon a new territory; land is abundant and cheap, while labour is obtained with difficulty; hence they cultivate only the most fertile spots, and these in an indifferent manner, leaving the greater part of the work to nature, which has been very bountiful to them. They are not, however, altogether unacquainted with some useful practices; they everywhere burn the rank grass, once a year, to improve the pasture. In some quarters of the country neat farms are to be seen, with lands well fenced and divided into enclosures to receive the cattle, of which there are great abundance; the fields are divided by thorn hedges; the low grounds are prepared for rice, and the higher lands are planted with leguminous shrubs, or left for pasture.

143 Ship-building.

The Birmans are at present endeavouring with great spirit to improve their maritime architecture. Formerly they used only small vessels, no better than a kind of boats; but having obtained farther information from their communication with Europeans, they are now launching vessels of considerable magnitude. When the British embassy were at Rangoon, they saw several ships, upon the stocks from 600 to 1000 tons burden; one belonging to the maywoon of Pegu, about 900 tons, was considered, by professional men, as a specimen of excellent workmanship; it was entirely formed by Birman carpenters upon a French model, as are most of their large vessels, the Birmans having received their first rudiments of the art from that nation: three or four vessels of burden were likewise in a state of forwardness belonging to English adventurers. Birman shipwrights appear to finish their work well; they are athletic men, and possess, in an eminent degree, that vigour which distinguishes Europeans, and gives them pre-eminence over the enervated natives of Hindoostan. Asia.

144 Salt.

Upon the sea coast they manufacture great quantities of salt, from which the government derives a considerable revenue. 145 Cloths. Cloths of different kinds are manufactured by the women in all parts of the empire; and even in the royal palace they carry on domestic manufactures. On a visit to the mother of the queen, the ambassador saw, in one of the galleries of her palace, three or four looms at work. At Pegu the women weave for their own and their husbands use silk and cotton cloth; the thread is well spun; the texture of the web is close and strong, and is mostly chequered like Scotch tartan. At a town in the interior, called *Pakang-yag*, situated on the river Irrawaddy, large quantities of silken cloth, and of silk and cotton mixed, are manufactured. The silk of which these goods are made comes from Yunan, the south-west province of China, in a raw state; the colours are bright and beautiful; the texture is close, and the cloth is said to wear much longer than any Chinese or Indian manufacture. 146 Saltpetre and gunpowder. At a town called *Summei-kioum* is the greatest manufactory of saltpetre and gunpowder in the kingdom. From a prejudice not unusual in the infancy of commerce, neither saltpetre nor gunpowder is suffered to be exported upon any plea. At the suburbs of a town called *Pagahm*, the members of the embassy found the inhabitants employed in pressing oil from the sesamum seed; 147 Oil mills. the grain is put into a deep wooden trough, in which it is pressed by an upright timber fixed in a frame; the force is increased by a long lever, on the extremity of which a man sits and guides a bullock that moves in a circle, thus turning and pressing the seed at the same time; the machine was simple, and answered the purpose effectually. There were not less than 200 of these mills within a narrow compass. From the circumstances of the cattle being in good order, we concluded, that they were fed on the seed after the oil was extracted. The land about Pagahm scarcely yields sufficient vegetation to nourish goats.

148 Glass.

Our readers will readily believe, that *we* perused with much pleasure the following passage in Captain Symes's Account of his Embassy: "Among the articles of foreign trade which had found their way into the Birman country, nothing was held in higher estimation than the European glass-ware, imported into Rangoon from the British settlements in India. The art of vitrification has long been known and practised in most countries of the east; but nowhere can they make a pure transparent substance, like that which is brought from Europe. The Birman monarch, who is a great admirer of the manufacture, was particularly desirous to introduce it into his own dominions; and supposing that every Englishman must be versed in the knowledge of making whatever comes from his own country, he sent a message to request that I would furnish his artificers with such instructions as might enable them to fabricate glass of a quality equal to what was made in England. Unluckily none of us happened to be skilled in the mystery of a glass-house; all, therefore, that we could do, was to explain the principles of the art, which Dr Buchanan obligingly undertook; and, in order to facilitate them in the acquire-

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ment, and guide them in the practice, I lent them the *Encyclopædia Britannica*, and pointed out the article where the process is fully explained. Baba Sheen, the second in authority at the port of Rangoon, and the Armenian interpreter, translated it into the Birman tongue."

As the Birmans possess within their country the whole materials from which the best kinds of glass are prepared, there is little reason to doubt, that this active people would speedily be enabled to reduce to practice the lesson they obtained in the manner above mentioned; and thus the proprietors and conductors of the Encyclopædia Britannica have the satisfaction to know, that the former edition of their work has contributed to diffuse, in the most distant regions of the globe, a knowledge of those arts which add convenience and elegance to civilized life. The utility of their undertaking has exceeded the limits of their own foresight, as they have, in this instance at least, laboured for the instruction and improvement of a prince and of a people, whose very name and existence were unknown to them when their labours commenced. Happy had it been for the nations of the east, had they derived from their intercourse with Europeans no other fruits than the extension of science, and the enlargement of their powers, by an acquaintance with that command over the different objects of nature, which human ingenuity has attained in this quarter of the world.

One manufacture on which the Birmans bestow much attention, must not pass unnoticed. It is carried on at a village called *Kyeock Zeit*, and consists of the formation of idols of marble. Our author saw 30 or 40 large yards crowded with statuaries at work, on images of various sizes, but all of the same personage, Gaudma, sitting cross-legged on a pedestal. The quarries whence the materials are obtained, are only a few miles distant. The marble is brought to the village in blocks; and after being fashioned, the blocks are publicly sold to pious people. The largest little exceeded the human size, and the price was said to be 100 tackals, that is, 12l. or 13l.: but some diminutive Gaudmas were to be disposed of as low as two or three tackals. The workmen were civil and communicative. Their tools were a chisel and a mallet, and they smooth the image with freestone and water. Many of the idols were beautifully polished, which is said to be accomplished by rubbing the marble with three different sorts of stone; the first rough, the second finer, and the third, such as hones are made of. The workmen afterwards use the palms of their hands. This last operation gives it a transparent clearness, far surpassing the brightest polish that European marble ever exhibits. Such images as are designed for gilding, are not finished so highly; but none of the idols are allowed to be sold to any, except native Birmans.

149 Marble.

150 Idols.

151 Commerce.

An extensive trade is carried on between Ummerapoora the capital of the Birman dominions, and Yunan in China. The principal export from the Birman territory is cotton, of which it is said there are two kinds, one of a brown colour, of which nankeens are made, the other white, like the cotton of India. This commodity is transported up the Irrawaddy in large boats, as far as a place called *Bamoo*; where it is bartered at the common market with Chinese merchants, who convey it partly by land and partly by water, into the Chinese dominions. Amber, ivory, precious stones, betel nut, and the edible nests brought from the eastern Archipelago, are also articles of commerce. In return, the Birmans procure raw and wrought silks, gold leaf, preserves, paper, and some utensils of hardware. A great inland commerce is also carried on between the capital and the southern parts of the empire, which is greatly assisted by the noble river Irrawaddy, that waters the country. The chief objects of this commerce are the necessaries of life. Several thousand boats are employed in transporting rice and salt from the southern or lower provinces, to supply Ummerapoora and the northern districts. Up the same stream are conveyed China ware and glass; also European broad cloth, with some hardware and coarse muslins from Bengal. Silver, lace, and precious stones, are brought down by the merchants.

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We have treated somewhat minutely of the manners and situation of this people, because they form a striking exception to the general features of the Asiatic character, as it has always existed among the other nations that inhabit the more fertile districts of that great continent. It is to be observed, that the Birmans are also of importance, in consequence of their geographical position in relation to the great British empire in India. A durable vessel of burthen cannot be built in the Ganges without the aid of teek plank, which can only be procured from Pegu. Should the timber trade of the Birman empire therefore be interrupted, the marine of Calcutta, amounting to 40,000 tons of shipping, would be reduced nearly to annihilation. This marine has already been of importance to Britain. In 1794, 14,000 tons of shipping, almost entirely India built, were freighted to carry rice to England, and reduced the price of that article of food to three halfpence per pound. The maritime ports of the Birman empire are extremely commodious for Indian commerce. Britain possesses the western side of the bay of Bengal; the Birmans the eastern, which is far superior to the former for the purposes of navigation. From Cape Comorin to the Ganges, is an unbroken line of exposed shore, without a single harbour capable of affording shelter to a vessel of 500 tons burden: But the Birmans possess three excellent ports, Negrais, the securest harbour in the bay; Rangoon, and Mergui, each of which is as convenient, and not less accessible than the Ganges, which is the only British port in the whole bay. In such circumstances, the importance to the government of the western peninsula of retaining a good understanding with these people, cannot be disputed. They are a very different race from the timid and passive Hindoos, whom we have conquered. Though unequal to Europeans in manufactures or in arts, yet in a climate adapted to their natural constitution and unfriendly to ours, they might prove dangerous enemies, in a contest with whom much might be lost, and nothing can be gained.

152 Importance of the Birmans to the British.

After this account of the Birmans and their empire, it will be unnecessary to take much notice of the rest of the eastern peninsula, as the inhabitants of that territory appear upon the whole to possess the same general character, laws, and manners. To the south-east of the Birman territory, the great eastern peninsula becomes forked, or divides itself into two separate peninsulas, with the gulf of Siam between them. The most westerly of these two peninsulas, is a narrow tract of

153 The remainder of the eastern peninsula.

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of country called *Malacca*, which stretches southward to a great distance, till it approaches the equator. The peninsula to the eastward of the gulf of Siam is much broader than the other, but proceeds to a much less distance southward. The city of Siam stands at the bottom of the bay of that name, where the division of Farther India into two peninsulas commences. The peninsula, beyond the Siamese territory, contains the countries called *Ciampa*, *Cambodia*, and *Cochin-China*, on the east, and *Tonquin* on the north-east.

154 Malacca.

The isthmus, or neck of land, by which the peninsula of Malacca joins the continent, is only about 50 miles in breadth. To the westward of it, at the distance of 260 miles, is the island of Junkseilon, which yields considerable quantities of tin. In 1784, 590 tons of that metal were exported. Malacca itself yields few commodities for exportation, excepting ivory and tin. The city of Malacca, however, is a true emporium or magazine of the various rich articles of commerce brought from the surrounding countries. This coast was known to the ancients. It was celebrated for its gold, on account of which it received the appellation of *Aurea Chersonesus*. Some imagine this to have been the Ophir of Solomon, though others contend that Ophir was a port in Africa. One reason for suspecting this or some other port of India to have been Ophir, is this, that Solomon's fleet is said to have brought home peacocks. These birds are natives of India, and at that early period were unknown in the interior or southern coasts of Africa. It is farther to be remarked, that on the eastern side of this peninsula, much gold is found near Pahang. This town is situated in N. Lat. 3° 50′, in a most fruitful country, at the mouth of a river which has an estuary of about a mile broad. The river contains much gold. Lumps of five or six ounces weight are said to have been found. It is brought up by divers. Sometimes eight hundred weight has been exported. This place, therefore, might well be the Ophir of Solomon; and the Jewish historian, Josephus, actually fixes it here.

1 *Kings*, x. 23.

Trangano or Tringoran, a small town a little to the north of Pahang, is seated on a river near the sea. It consists of about 1000 houses, half of which are inhabited by Chinese, who traffic in their junks to Siam, Cambodia, and Tonquin. Trangano is most deliciously situated amidst low hills, covered with the eternal verdure of undeciduous trees. Lemons, oranges, mangosteens, and all the fruits of the Indies, grow here in perfection; and the valleys produce grain, pulse, sugar, and especially pepper, in great abundance; but only in consequence of the industry of the Chinese, for the Malays themselves are too indolent to make the earth yield its full increase. We know too little of the ancient history of this singular people in particular, and indeed of the whole peninsula beyond the Ganges in general, to be able to account in a satisfactory manner for their present state, or their connexion with a multitude of adjoining tribes and states. The ancients formed of the whole of this great eastern peninsula, along both sides of the bay of Siam, a mighty empire, to which they gave the appellation of *Thinæ*, or *Sinæ*, distinguishing them from the Chinese on the one hand, and from the Hindoos on the other. The similarity of character and customs that is to be found among the whole of these states of Birmah, Malacca, Siam, Cambodia, Cochin-China, and Tonquin, render the existence of such an ancient empire extremely probable. It may have been destroyed by Tartar conquest or internal revolutions, and the inhabitants may have lost a great part of the civilization, and a multitude of the arts, which they once possessed. That this last supposition is not only probable, but in some degree true, is sufficiently demonstrated by a fact mentioned by Captain Symes, in the account already noticed, of his embassy to Ummerapoora. He saw in many places beautiful vaults and arches formed of stone or brick, supporting lofty buildings; but he learned, that the art of constructing vaults or arches is at present entirely lost in the country, and that no Birman workman will at the present period engage to erect a building of that kind.

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155 Character of the Malays.

The character of the inhabitants of the peninsula beyond the Ganges, appears to be more strikingly marked in the Malays than any other people; and at some remote period, they have undoubtedly made a considerable figure in these regions, and must have possessed a great spirit of national enterprise. They differ from the other states of the peninsula only in this, that the Arabs have converted them to Mahometanism. The feudal system at present exists among them in full perfection or barbarity. They have the same pride of honour and delight in war that distinguish the Birmans, and that marked the character of the ancient inhabitants of the north of Europe. They are governed by petty chiefs, who are engaged in endless and sanguinary hostilities against each other. Like the Birmans, the people in their persons are robust, but not tall. They are active and restless, and their ferocity in war is unbounded: No enterprise is so dangerous as to deter them from engaging in it. Not only will a handful of them in a boat attempt to board an European vessel of any size, and to murder the crew with their poniards; but when employed by the Dutch as soldiers in their wars against the English or Portuguese, 14 or 20 of them have been known to sally from a fort, under cover of the smoke of the cannon; and having found their way in an instant into one of the batteries of the besiegers, they have stabbed almost the whole gunners while working the artillery, and retreated with little loss, and before effectual measures could be taken against them. The Dutch are so cautious with regard to them, that unless in case of extreme necessity, they never employ above two or three of them at once as mariners on board the same ship: Yet this people, barbarous as they now are, have at one period made such national exertions, that their race and language is found to extend over a very large portion of the globe. To the south and east of Malacca the great Asiatic Archipelago is situated, containing a multitude of isles of immense extent. Over a great part of these isles the Malays have spread themselves, and their language is spoken. The first island to the south and south-west of Malacca is Sumatra, the passage between which and the main land, is called the *straits of Malacca*. The island of Sumatra is crossed in the middle by the equator: its length is about 800 miles, and its breadth about 130. A range of mountains runs along the whole island, sometimes in a double or triple chain, with beautiful valleys between them; but unless where cleared, both valleys and mountains are clothed with shady forests. The

156 Asiatic Archipelago.

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island has long been celebrated for its gold, and a mountain under the line is called *Ophir*, which affords an additional reason for supposing that the ships of King Solomon came to this quarter of the world. It is 13,842 feet high, or two miles and 1094 yards. The Malays upon the island are said to be skilful artists in works of fillagree, in both gold and silver. Sugar, ivory, teek wood, and all the other tropical productions, are found upon it; but its climate is extremely destructive to Europeans. Though no snow is ever seen on the island, yet the inhabitants of the mountains, like those of other Alpine regions, are subject to monstrous wens in the neck, or goitres.

To the east of Sumatra, and divided from it by the straits of Sunda, is the island of Java, in which also the Malays abound, and in which the Dutch have their settlement of Batavia. Like Sumatra, a chain of mountains runs along the middle of it, and it is extremely unhealthy to Europeans. Eastward of Java is the great island of Borneo, immediately under the line. A great part of the coasts is in the hands of the Malays, though Moors and Javanese are also found here. It produces all the vegetable and mineral productions that are found in the other parts of the Indies. The interior is mountainous, but unhealthy; and this, like all the rest of these islands, is subject to frequent and very dangerous earthquakes. The original inhabitants of this and the other islands in its neighbourhood are extremely barbarous, and have been driven from the sea coast by the Malays and other strangers. To the north-east of Borneo are the Philippine islands; and to the south-east are Celebes and the Molucca isles, beyond which is New Guinea, with a multitude of adjoining islands, all inhabited by barbarous tribes of little importance in a general view of Asia. To the south of all these islands is the vast island, or rather continent, of New Holland, which is scarcely inhabited, though equal in size to Europe.

157 Siam.

Returning to the continent of Farther India, the kingdom of Siam is situated, as already mentioned, at the bottom of the bay of that name, to the south-east of the Birman territory. The city stands at the mouth of a large river called *Meinam*, which fertilizes the country, and affords an internal navigation to a considerable distance. The river is deep, rapid, and broader than the Elbe. The upper part is rocky and interrupted by cataracts. At its lower part, the stream divides into several channels, passing through a level country, which it fertilizes by periodical inundations. The country is woody. The houses, like those of the Birmans, are raised aloft on stilts or posts; but upon the river a kind of floating habitations are used, in which many people constantly reside, and occasionally move from place to place when the waters are high. The capital is in latitude 14° 13′, and is surrounded by a lofty brick wall, which has not always been able, as already noticed, to defend it against the arms of the Birmans. Rice is produced in amazing crops, and all the fruits of the Indies rise up with little or no cultivation. Logwood, like that cut in Campeachy, is said to be one of the productions of the country. The Siamese territory is very narrow from east to west, but extends northward along its own river to a considerable distance.

158 Cambodia.

To the eastward of Siam is the kingdom of Cambodia, extending along the banks of its river, which flows in a course nearly parallel to the river of Siam. The most southerly point of the country, being the eastern extremity of the gulf of Siam, is called *Cape Cambodia*, beyond which the coast turns to the eastward, and the river Cambodia discharges itself into the sea through several mouths, forming by its alluvions a very fertile tract of territory, like the rivers of Siam and of Birmah. The capital stands 90 miles up the river, and consists only of one street, built on an eminence, to preserve it during the inundations: The present city of Cambodia, is supposed to be near the site of *Thina Metropolis Sinarum*, of Ptolemy and Marcianus. Mr Caverhill quotes Argensol for the proof, and says, on his authority, that marble ruins of an extensive city have been discovered to the north-west of Cambodia: yet Ptolemy relates, that it was not surrounded with such walls, nor had any thing worth mentioning. Arrian, in his *Periplus Maris Erythræi*, calls it the greatest of the inland cities, and that it sent to Barygaza, the modern Barochia, on the western side of Hindoostan, wool, thread, and *othonium sericum*. These were carried the whole of the journey by men on foot: prodigious indeed must the journey have been, if it is true that they went through Bactra, a detour of amazing extent. The kingdom of Cambodia was known to the Arabs by the name of Rachmi. It was visited in the ninth century by two Arabian travellers, who report, that the finest muslins in the world were made there, and that the natives wore garments so fine, that they might be drawn through a middle-sized ring. The same writers tell wonderful things of the *karkandan* or unicorn; but from the whole description, it is evident, that they mean no other animal than the one-horned rhinoceros.

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159 Ancient city.

160 Island of Pulo Condore.

The noted island of Pulo Condore lies about 15 leagues to the south of the western channel of the Cambodia. It is situated in latitude 8° 40′. Its form is that of a crescent; the length not above eight miles, the greatest breadth about two: the whole is lofty and mountainous, and it is surrounded by lesser isles. The name is derived from *pulo*, an isle, and *condore*, a calabash, from its production of that fruit. It was visited by Dampier in 1686. Here Dampier's crew found the custom to prevail which we have noticed, among the inferior class of Birmans, which exists over the whole peninsula beyond the Ganges, of the people of ordinary rank allowing their women to live with strangers. Our poet, Prior, humorously exaggerates the practice, and by mistake ascribes it to the Chinese.

> "In China, Dampier's travels tell ye,
> (Look in his index for Pagelli),
> Soon as the British ships unmoor,
> And jolly long-boats row to shore;
> Down come the nobles of the land,
> Each brings his daughter in his hand;
> Beseeching th' imperious tar,
> To make her but one hour his care.
> The tender mother stands affrighted,
> Lest her dear daughter should be slighted;
> And poor Miss Yaya dreads the shame
> Of going back the maid she came."

161 Ciampa.

Eastward of the estuaries of the river of Cambodia, is the

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the small territory of Ciampa, extending about 150 miles along the shore: the breadth not exceeding 90. The people appear to be of the same race with those that inhabit the rest of the peninsula, but their chief is tributary to the Cochin-Chinese, whom, however, they excel in naval, though not in military affairs. Their ships, or junks, are extremely well built; they are chiefly employed in the fisheries, which are very considerable, and form their most important source of commerce. The Chinese send ships very frequently to the northern parts of the country laden with tea, an inferior sort of silk, porcelain, and some other commodities of that empire. They take in return gold and columbo wood, to be burnt on the tombs of their ancestors and relations, or before the altars of their divinities. It is to be observed, that a strange mixture of religions here exists, in consequence of the influence of the neighbouring nations upon this small maritime state. Many of the people are Mahometans. Others are followers of the Chinese philosopher, Confucius; a third sort are worshippers of Gaudma; and the greatest part of the people jumble all these systems together. They all agree, however, to tolerate each other.

162 Cochin-China.

To the eastward of its tributary, Ciampa, the kingdom of Cochin-China begins, forming a long stripe of territory along the eastern shore of the farther peninsula of India. To the westward it is limited by a chain of lofty mountains, which run parallel to the coast of the Chinese sea, or eastern Pacific ocean. The whole of Cochin China, beginning from the borders of Cambodia, is in form of a bow, bending into the ocean as far as Cape Varelle, in Lat. 13°, when it inclines to to its northern extremity, in Lat. 17° 30′. The whole length of this great curvature is about five hundred and sixty miles, the breadth not exceeding that which we have ascribed to Ciampa. The northern borders are defended by a wall, which runs from the sea to the great chain of mountains, and forbids all approach from that quarter, as the inaccessible chain itself does every attempt of invasion from their western neighbours. The lower parts of this kingdom are overflowed during the rainy season; and here, as elsewhere in India, rice is the greatest harvest: a kind as white as snow is cultivated on the mountains and dry soils: when dressed, it is of a slimy viscous nature, and is made into pastes. Sugar, cotton, pepper, and other Indian commodities, are also cultivated here in great abundance by the labour of free men, and are articles of commerce with China. Among other commodities which are exported, mention is made of silk, and of certain kinds of wood much esteemed in the east, such as, aloes wood, or agallocha, erroneously called *eaglewood*, columbo, and others, of value either in mechanics or for their sweet scent. The price of columbo wood on the very spot is five ducats a pound, at the ports sixteen, and in Japan, to which much is exported, two hundred. A pillow of this wood is the highest luxury of the orientalists, particularly of the Japanese, who will give three or four hundred ducats per pound for a piece big enough for that purpose. The agallocha bears a good price, great quantities being shipped for Hindoostan for the use of the Hindoos, to burn their dead, who seem to emulate the ancient Romans in the aromatic profusion of their funeral piles.

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The war-boats of the Cochin-Chinese are very numerous, and resemble those of the Birmans. Those allotted to the defence of the coast are finely painted and highly varnished, rowed with fifty oars, and carry a cannon at the head, and two small ones on each side. The navy of the country is quickly manned, every district being bound to furnish a certain number of sailors, who serve with alacrity, as they are well treated, and their wives and children supported during their absence. They are dressed in uniform, with a gilt helmet, and a cloak which leaves their right arm quite bare.

163 Military power of Cochin-China.

The Cochin-Chinese have considerable fisheries, and both consume and export fish in large quantities. They make use of elephants as beasts of burden. On the backs of these huge animals they place a machine like the body of a coach, which conveys of outside and inside passengers about thirteen or fourteen persons. When the elephants arrive at a river, they take the water very readily, and even convey their fare in perfect safety over an arm of the sea a mile wide. The people of this country resemble the Chinese in their persons, but they are less in body, and more brave and active. The complexion of those on the coast is olive: that of the inland inhabitants near the mountains is fairer, and approaches to that of Europeans.

164 Tonquin.

The bay of Tonquin begins near the wall of Cochin-China at the northern extremity of that kingdom. The entrance of the bay is bounded on the eastern side by the island of Hainan. The tides of this bay have long been remarked on account of the following peculiarity, that a single flux and reflux occupies a full period of 24 hours. The kingdom of Tonquin is very narrow towards the south, at the Cochin-Chinese wall. To the west it is there bounded by the Cochin-Chinese chain of mountains, which soon retires, and gradually leaves a larger and larger expanse to the great plain of which this kingdom consists. The country is very populous, being thick set with villages. It is watered by a river, which, coming from the north or north-west, is called by the name of the country, Tonquin. It enters the bay by two mouths, one of which having only 12 feet water, is frequented by the flat-bottomed vessels of the Siamese and Chinese; but the other being deeper, is frequented by European vessels. The river is subject, like all others in that territory, to periodical floods, which fertilize the soil, and enable it to give forth abundant crops of rice and other productions of warm climates. The natives are acquainted, like the Birmans, with the practice of rearing occasional dwellings for any temporary purpose. About six leagues from the mouth of the river is the village of Domea, usually consisting of a hundred houses; yet, on the arrival of the European ships, it soon increases to a large town. The natives resort, for the sake of trade, from all parts. Houses suddenly spring up; for being only constructed of frames of bamboo, and the roof of palm or other leaves, a temporary town is quickly formed, in which a fair is kept as long as the ships remain in the harbour. Here, as well as in Cochin-China, Chinese opinions and notions prevail in a considerable degree. The religion of the country appears to be that of Budho, or Gaudma. Here also, as among the Birmans and all the other nations of the peninsula beyond the Ganges, the strange practice pre-

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vails of rendering the teeth black by means of art. All persons, high or low, rich or poor, are under the necessity of undergoing a dyeing process, for the purpose of avoiding that disgrace to human nature, of having teeth white, like those of dogs or elephants. Prior mentions this custom, but transfers it to the Chinese:

"In China, none hold women sweet,
"Unless their snags are black as jet:
"King Chiku put nine queens to death,
"Convict on statute iv'ry teeth."

165 Review of the eastern peninsula.

From the brief description here given of these countries, it will not be difficult to understand the physical aspect of the great peninsula of Farther India, and the political divisions which have resulted from it. Aracan on the west, and Cochin-China on the east of the peninsula, bear a considerable resemblance to each other. They both consist of a narrow tract of fertile territory, extending along the shore, and having behind them towards the continent a large chain of lofty and rugged mountains, which form the natural as well as political boundary. The rest of the peninsula is chiefly formed in the following manner:—Several chains of mountains run from north to south. Between every two chains is a tract of fertile country, watered by a large river proceeding also from north toward the south. Each of these valleys forms a kingdom, which is long and narrow, and bounded to the east and the west by a chain of mountains: Thus are formed the countries of Birmah, Siam, Cambodia, and Tonquin. The narrow peninsula of Malacca, however, must be regarded as a sort of territory by itself, probably formed by a continuation to a great distance southward of the chain of mountains that divides the Birman from the Siamese territory. Were it possible to unite into one empire the various nations which we have mentioned as inhabiting this vast peninsula of India to the eastward of the Ganges, the vigorous character of the people would probably render them extremely formidable to their neighbours the Chinese on the north-east as well as the Hindoos of the western peninsula. Any union of these countries, however, into one state, though a possible event, could only be accomplished during a great length of time, and after many struggles, in consequence of the bravery of the people, and the readiness with which they engage in war. The Birmans have indeed conquered Pegu, but only in consequence of a long continuance of the most sanguinary conflicts, which exhausted the population of both states, and almost destroyed the inhabitants of the conquered country. Aracan was, no doubt, more easily united to the Birman empire; but this in all probability arose from its being accidentally ill governed, and perhaps also from its vicinity to Hindostan, which had led its inhabitants to acquire much of the feeble character of the Hindoos. In the contests between the Birmans and the Siamese, is appeared that neither of the nations could be subdued, and that before the one of them could enlarge its territory, it must nearly exterminate the population of the other.

166 China.

From the peninsula of Farther India, we proceed north-eastward to China, of which we shall not here find it necessary to say much. As already mentioned, it is the tract of country which forms the gradual descent from the high regions of Tartary towards the Pacific ocean on the east. The dominion of the Chinese emperor extends over a civilized people, from the straits of Hainan, in N. Lat. 20° 13′, to the extremity of the province of Pe-tche-li, in Lat. 41° 15′, comprehending a space of nearly fifteen hundred miles in length, and in breadth above a thousand. Or, more accurately, according to the information obtained by Lord Macartney's embassy, China Proper includes a space of 1,297,999 square miles, inhabited by a population of 333,000,000. The island of Hainan, already mentioned, is at the southern extremity of the empire; but it is only half subdued, the natives in the interior of it maintaining their independence amidst lofty mountains. It produces gold, and the *lapis lazuli*, which is in great request among the Chinese, for giving a blue glazing to their porcelain. It has considerable fisheries on its coasts. From the continent opposite to this island the coast proceeds towards the north-east to the bay of Canton, which is the port frequented by Europeans. At Canton begins the celebrated imperial canal, or passage by water, which reaches from hence within land to Pekin, and the extremities of the empire; an extent of about 1800 English miles. Part of this inland navigation is formed by rivers and lakes, and the rest of it consists of a canal 900 miles in length, and a fathom and a half in depth. On the course of this internal navigation, multitudes of populous cities are situated, amidst a country in which the cultivation of every part of the soil is carried on with the most minute attention and economy.

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167 Isle of Hainan.

168 Canton.

169 Coasts of China.

Of the coasts of China, and indeed of the country at large, not much is known, in consequence of the jealousy which they entertain of all foreigners, and of the great rigour with which they put in force their prohibition to trade in any of their ports except Canton.

The next province to the north-east, proceeding along the coast is called *Foo-tchien*. The country is hilly and irregular: but, by the industry of the inhabitants, the sides of the hills are formed into terraces, ascending in a series of twenty or thirty, one above another; and these terraces are often continued for several miles in length. Water is forced up to these terraces in pipes of bamboo, and grain and other vegetables are cultivated upon them. On an island called *A-muy*, on the coast of this province, is a vast rocking stone, of 40 tons weight, moveable by the slightest touch. Opposite to the coast, also, is the island of Formosa, 90 leagues in length and 30 in breadth.—The next province northward on the eastern coast is called *Tche-Tchiang*. Like the rest of China, it is amazingly commercial. It is remarkable for its rich embroidered silks, its timber, its forests of bamboo, its salt-works upon the coasts, its mushrooms, hams, and vegetable tallow. A great part of the province has been won from the sea, as Holland was by the Dutch. It is guarded by immense mounds from the fury of the waves; and these mounds remain as stupendous marks of the industry of this most populous nation. They far exceed the similar dykes of Holland, as they have a much more powerful ocean to resist than that which assails the coast of the European low countries.

170 Wild silk worms.

The next province northward is called *Kyang-Nan*, near the northern boundary of which is the great and rapid river Whang-ho-hoo. Among the curiosities of this province is said to be the worm that fabricates not

the

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the common silk, but that mentioned by Pliny, which he and the ancient writers believed to be the only species of that beautiful production. Pliny represents silk as a vegetable, combed from the leaves and branches of trees. His error is not surprising; for the wild worms of this province, which resemble caterpillars, spin their webs on shrubs and bushes, and furnish as great quantities as the domestic worms. This silk costs in a manner nothing, and is so strong that the goods made from it are uncommonly lasting.

171 Northern boundary of China.

From hence northward, the Chinese coast is exposed not to the open ocean, but to a gulf, the eastern side of which consists of the peninsula of Korea. In Lat. 38° 12′ begins the province of Pe-tche-li already mentioned, which in N. Lat. 30° takes a north-eastern direction, and on the side of the gulf finishes China Proper, in N. Lat. 40°. The capital, Pekin, is in this northern part of the empire, about 100 miles from the mouth of the river Pei-ho. The empire ends about 150 miles farther, in Lat. 40° 45′, where the celebrated wall begins, whose length in a straight line is 700 or 800 miles, and including its windings and ascents over craggy mountains, or descents into deep valleys, may be estimated at double that length. It was intended as a bulwark against the invasions of the Tartars on this most accessible side of the empire; but this purpose it has never successfully fulfilled.

172 Climate.

The climate of China is liable to severe vicissitudes of heat and cold. The heat is powerful during the summer, because a great part of the country is in a southern latitude, and because its great extent does not admit of its being cooled by breezes from the sea. At the same time its vicinity to Siberia on the north, and to the elevated country of Tartary on the west, the mountains of which are covered with perpetual snow, expose it to a degree of cold in winter greater than what is known in the southern parts of Europe. It is also to be remarked, that the Chinese rivers, especially towards the northern parts of the empire, have a far more rapid current than those of either peninsula of India: the reason is, the country of China is itself much more elevated than India. It rises far more suddenly from the Pacific ocean than India does from its own seas. Hence it is enabled to oppose a more powerful front to the waters which wash its coasts, and which, impelled by the trade winds, would otherwise very rapidly encroach upon the land in this quarter of the globe.

173 Polygamy of the Chinese.

In China, domestic life is undoubtedly upon a worse footing than in the Indian peninsulas. The Hindoos who have not become Mahometans are monogamists; and we have seen that the same law prevails among the Birmans and the other nations of the eastern peninsula. But in China polygamy has always been allowed. This necessarily produces an unsocial mode of living, and the jealous seclusion of one half of the human species which uniformly attends the existence of such a law. It is not improbable, however, that the permission of polygamy, accompanied as it is in China, by a law of succession, which admits of no right of primogeniture, but divides the whole property of the parents equally among the children, may contribute in no small degree to the production of the crowded population that is found to exist in this empire. The luxury and sensuality of rich men is thus directed into a particular channel. Instead of becoming ostentatious and magnificent in their dress, equipage, and houses, they are led to expend their wealth in supporting and rearing up very numerous families.

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174 Chinese government.

The structure of the Chinese government perhaps deserves even more attention from philosophers than it has hitherto obtained. They acknowledge in their emperor absolute power in the most unlimited degree. From the nature of human affairs, however, it is evident that this power can be directly exerted over only a few individuals of the immense society of which he is the head. The people at large must necessarily be governed by delegated authority; and the value of the constitution of the state, or of the mode of government, must depend upon the manner in which a selection is made of those magistrates to whom the imperial power is intrusted. The Chinese emperor, like other Asiatic princes, will naturally be led to pass much of his time in the luxury of his palace among eunuchs and women. Were the nomination of the magistrates of the empire altogether intrusted to such a man, it is evident that the administration of affairs would speedily go into confusion, and usurpation and anarchy prevail. This, however, rarely occurs; and it is the peculiar nature of the Chinese government to reconcile despotism with a regular and prudent administration of affairs, and the luxury and weakness of the prince, with fidelity and ability on the part of his ministers. Foreign conquest does not alter this order of things. The strangers speedily coalesce with the vanquished people, and the conqueror submits his arbitrary will to the customs that he finds established among a wealthy and a numerous people. Hence the civilization of China has existed from the remotest antiquity. It has had periods of interruption and of anarchy, during which the nation has submitted to strangers; but these strangers soon ceased to be known as such. The ancient laws of the empire, by the admiration which they excited, subdued the minds of the barbarians, whose arms had proved irresistible.

The ostensible maxim of the Chinese government or constitution is this: that paternal authority is in all situations to be respected and implicitly obeyed; that the emperor is the father of the people, and to be regarded with boundless reverence as such; that all inferior magistrates are to be regarded in the same point of view; and the severities they inflict are to be considered not as the punishment of criminals, but as the chastisement of children intended for their benefit. From the nature of the human character, however, it is evident that this fiction, applied to a Tartarian conqueror recently seated upon the throne, would only go a short way to preserve the tranquillity of the state, and that, even under a long established line of hereditary princes, it would have little effect in restraining the ambition of enterprising individuals, or in preserving the submission of a discontented people. It may operate at times perhaps as a salutary prejudice on the minds of the weak and ignorant, or it may afford a plausible justification of that implicit obedience in the people, and absolute power in the prince, which are established and maintained by more powerful means; but farther its influence can scarcely extend.

The radical principle of the political constitution of China must consist of a more powerful and efficient

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principle, which appears to be this:—The law, or ancient custom of China, so arranges affairs, that the best informed men in the country, and those whose characters are most unexceptionable, shall at all times possess the power of the state and the administration of public business. Literature there affords the means of advancement; and China affords the singular example of a country governed by its men of letters. In this empire no order of nobility or of magistracy is hereditary. The whole country, however, is ruled by a privileged class of individuals called *Mandarins*, and it is upon the mode in which this ruling class is nominated, or selected from the mass of the people, that the peculiarity of the Chinese constitution and its whole value depend. There are two sets of mandarins, the civil and the military, who are employed in these different departments of the public service. Of each department there are six or seven classes or orders of mandarins, ascending above each other in a regular gradation of rank. The son of the lowest person in the state is allowed at certain appointed periods to present himself for trial before the mandarins of his district, either civil or military. If his character is without reproach, and if after various examinations, his learning or skill in the appointed exercises appear complete, he is admitted to the rank of a mandarin of the lowest order, which makes him a candidate for certain public offices, as the emperor, unless in very singular cases, only confers public employments upon mandarins thus found duly qualified. After a certain time he may present himself for trial in his district before the next superior order of mandarins, and, if received into their number, his rank in society is proportionably augmented, and he becomes a candidate for still higher employments. He may thus ascend by force of talents, and of an unblemished reputation, through all the orders of mandarins, till he is enrolled in the highest class, out of which the ministers of state, governors of provinces, and commanders of armies are appointed. In the different examinations and trials, favour or hereditary interest can give little assistance to the candidate; for no mandarin ever holds an office in the province where he was born; so that the judges cannot be the kindred of the persons who appear before them for examination or trial.

175 Apparent perfection of the Chinese constitution.

One would almost suppose that such a constitution must be absolutely perfect. The establishment of a hereditary reigning family at its head represses inordinate ambition, and prevents military usurpations by soldiers of fortune. As the emperor possesses the power of appointing any one of the imperial family as his successor, the hazard is avoided of having at any time an idiot or an infant placed at the head of the state. The expence of his court can be of little importance in this mighty empire. The absolute power ascribed to him can do little harm, as he is at all times surrounded by the ablest and most virtuous men of the nation. The manners of the people cannot become corrupted, because vice is not kept in countenance by the bad example of powerful men; as distinction and power can only be attained by persons whose integrity of conduct is proved to the satisfaction of men of advanced age, who have themselves risen to eminence by the accomplishments of their minds and the purity of their lives. It must be difficult, or almost impossible, to disturb the internal tranquillity of such a nation, because the ablest men that it contains are at the head of all affairs; and the power which results from uniting intellectual superiority to the authority of office must evidently prove irresistible. The administration, also, of public business will in general be well conducted, because the inferior mandarins, unprotected by family connections, will have no means of securing indemnity for ill conduct, and because their ambition will naturally lead them constantly to endeavour to recommend themselves to those of a superior class, whose public approbation affords the only means of obtaining farther preferment. Accordingly, in no country in the world has any government found it practicable to execute and keep in repair such immense public works as are found in China. Their prodigious canals and regular roads, together with the immense public magazines of grain accumulated to guard against any partial or general scarcity, demonstrate this to the satisfaction of every traveller.

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176 Bad effects of the Chinese constitution.

Yet this apparently unexceptionable government, which produces a numerous, an industrious, a peaceful, and wealthy people, does undoubtedly contain in a moral or intellectual point of view, some great and radical defect. It is true, that under it men become no worse; but it is also true that they become no better. No improvements are ever made; arts and sciences have remained for ages in the same state; invention is unknown: Imitation, regularity, and routine, pervade every order of society, and lull the human faculties into everlasting slumber. Though the Chinese annals extend to many thousands of years of civilization, yet in a few centuries, the Europeans, emerging from barbarism, have been able to surpass them in every science, and almost in all the arts of life. The present Chinese are precisely what their forefathers were 4000 years ago, and should their political arrangement continue for ages to come, there is no reason to believe that they will rise above their present state. With all their literature and all the encouragement they give to it, they do not yet practise alphabetical writing; but having a mark for every separate word, it is necessary for them to spend many years in learning to write and read. Though they have been acquainted with gunpowder from a very remote antiquity, the military art among them is so contemptible, or such is understood to be the feebleness of their character, that it is believed an European army of 100,000 men would find little difficulty in dethroning their emperor, and seizing the government of the country.

177 The defect of the constitution of China.

The imbecility of character, or the stagnation of intellect which takes place in China, cannot be ascribed to religion as among the superstitious Hindoos, for they tolerate all religions: they even admit of no religious establishment, and the greater number of them are supposed, as already mentioned, to be of the same religion with the more vigorous and active Birmans. The weakness of the Chinese, therefore, and want of progress in improvement, is in all probability to be ascribed to the manner in which power and preferment are obtained under their political constitution. In all countries the higher classes of society are apt to be afraid of novelties, because their situation cannot be made better. The lower classes, on the contrary, perceiving

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ceiving themselves at the bottom of the wheel of fortune, readily set changes at defiance, and are fond of whatever promises to improve their condition. Hence they applaud and patronize, though frequently to their cost, the fearless, the ambitious, and the contrivers of whatever is bold or uncommon. The higher classes naturally oppose all this, and patronize among their inferiors the qualities of caution, docility, submission, and whatever is farthest from innovation or an impatience of controul. In every society, ambitious men regulate their conduct in the way best calculated to recommend them to those from whom promotion comes. Hence in England, in consequence of the existence in the political constitution of a portion of popular patronage, aspiring individuals have often attempted to recommend themselves to notice by turbulence, and by loud declaration that all was wrong and ought to be altered. But in a society arranged like China, every candidate for preferment must necessarily study to regulate his conduct and manners in the way most acceptable to his superiors, who in that country are a set of wealthy and prudent old men. He will, therefore, like a student on trial for a degree at one of our universities, avoid whatever looks like novelty, rashness, or disrespect for those above him: He will labour to speak as they speak, and to think as they think: thus ambition itself will make him tame and submissive, and the passion for distinction will render him careful to keep in the beaten track, and to subdue his mind to an unqualified acquiescence in whatever has been long established. A society, whose most vigorous members are thus constantly occupied in subduing their own minds, and reducing them to this passive temper and to a corresponding demeanour, will necessarily possess the character of prudence, languor, timidity, and perpetual old age: It will hate novelty and invention, which will render improvement impossible, because all improvements are new, and the result of a restless spirit. Could the Chinese constitution be reversed; were the first or lowest class of mandarins elected by the multitude, or by persons of moderate wealth; were the second class elected by the first, the third class by the second and so upwards; it is evident, that the intellectual character of the people would speedily alter, and they would become as restless and enterprising, as they are now passive and stationary. That the happiness of this multitude of people would not by such a change be increased, is undoubtedly very true; that they might even in consequence of it be exposed to many sanguinary convulsions, is also very probable: but their rank in the scale of intelligent beings would be altered, and their importance among nations would be immeasurably increased. Foreigners would cease to be objects of terror to a people ruled by men of an enterprising character: To preserve tranquillity at home, it would be found necessary to have recourse to objects of distant enterprise: the immense population of this empire would enable and compel it to cover all Asia with its colonies; to fill the Indian ocean with its fleets, and the isles with its commercial and political establishments.

178 Korea.

Adjacent to the north-eastern quarter of China, and opposite to a part of the Chinese coast, is the peninsula of Korea, extending from latitude 42° 50′ to latitude 34°; bounded on one side by the gulf of Pe-tche-li, and on the eastern side by the Japanese gulf. Japan extends the whole length of the coast of Korea, and even stretches beyond its southern part. Korea is of an oblong form; about 100 leagues in breath, and 180 in length. Its inhabitants are a mixed people, and have been conquered at different periods by the Japanese, the Tartars, and the Chinese. The yoke of China, however, is very light, as the Chinese fear, that severe treatment might at some period induce them to unite with the Russians, who have advanced through Siberia towards the Chinese frontiers. Korea is mountainous, and produces most of the European fruits and forest trees; it was protected by a wall to the north-west, which, however, did not prevent a Tartar conquest, and is now neglected. The government is regular, and the customs and laws resemble those of the Chinese. The natives carry on a great commerce openly with China, and clandestinely with Japan, the Philippine isles, and perhaps Java: They also trade with the Russians to a considerable extent, and procure from them large quantities of furs, which they convey to China, and represent there as the produce of their own country. To facilitate their illicit trade with the Japanese, the latter have ceded to them a small island called *Susima* near their coast. As they possess abundance of European goods, no part of which they purchase in China, they are understood to obtain them by their trade with the Dutch at Batavia.

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179 Liquejo Isles.

To the eastward of the Chinese coast, and south of the peninsula of Korea, are several islands called the *isles of Liquejo*. The most considerable is Kintschin, extending north and south between latitude 26° 28′ and 25° 45′. It is about 50 leagues long, and 15 broad; the east and south parts of it are skirted by numberless little isles and rocks. The inhabitants are chiefly Chinese, who fled from the Tartars at the time of the last revolution; they export considerable quantities of cowries of the same species that is found in the Maldive isles: From these shells is prepared a white varnish. They also export a sort of large flat shells, which, when polished, are almost transparent, and are used by the Japanese in their windows instead of glass.

180 Japan.

To the eastward of Korea are the isles of Japan; they extend from latitude 30° to 40° north: their longitude is from 143° to 161° east. The surrounding seas are stormy and filled with dangerous rocks; the climate is changeable and subject to frequent rains; thunder is frequent, and earthquakes so common, as not to be regarded, unless, which is often the case, they produce dangerous consequences; the summer heat rises in July and August to 100 degrees of Fahrenheit's thermometer, and the cold of winter is proportionably severe; the country is everywhere mountainous, and the people of a mixed race from the neighbouring countries, but possessing a very active character. See JAPAN.

181 Chinese Tartary.

To the north of the wall of Korea and of China, Chinese Tartary begins. It is in general inhabited by Tartars in a pastoral state, subject to the present imperial family of China, who are themselves Tartars. This country extends northward to the river Amoor or Saghalien. This river takes its rise from the Keutaikam mountains, about the latitude of 49°, and longitude 110° east from Greenwich; and is here called *Onon*. Its direction is nearly north-east; and at the discharge

182 The river Amoor. *Sauer's Expedition to Russia.*

Asia. of the Nirza, where the city of Nertshinsk is situated, about latitude 52°, it bears the name of the Shilha. This course it continues to latitude 52½°, its most northern extremity, where the Tungoose call it *Amoor*, and the Chinese *Seghaalien Ula* (black mountain river, from the oak forests on the mountains hereabouts, which the Chinese call *blackwood*). From hence it is navigable in vessels of moderate size, having received considerable supplies from the torrents rushing down the eastern and northern mountains, as also from a very considerable river flowing from the south-west, and called the *Argoon*, which discharges itself into the Amoor, about 180 miles east of Nertshinsk. In the vicinity of these parts the Russians have several forts. From latitude 52¼° to 47½° it flows nearly south-east, receiving in its course a number of rivers both east and west. The Tshukir has its source from this side of the same mountains as gave rise to the Olekma and Aldan, (both emptying themselves into the Lena), and flowing nearly south, joins with the Silempid, which flows from the vicinity of the Ud; keeping nearly a western course into the Amoor. All these rivers are navigable for boats nearly to their source. The country is very mountainous, but the plains and valleys are spacious and fertile: the low country, however, labours under the disadvantage of being subject to inundations and earthquakes, which are very frequent.

No rivers of any importance join the Amoor from the east, except the two above mentioned. The Nonni Ula, however, a very large river, which takes its rise about the latitude of 51°, and longitude 123°, makes a considerable inland circuit, and empties itself into the Amoor at its southern extremity, about the latitude of 47½°. Another considerable river, the Usuri, loses itself in the Amoor nearer its estuary, about latitude 48½°. It rises from the lake Hinka, and has a communication after a short day's journey by land with the sea of Japan. It now flows in its own channel north-west into the sea of Ochotsk, about the latitude of 52½°, opposite the island Saghalien. This river is well stocked with fish, and its borders are covered with forests of oak, walnut, birch, and different sorts of pines. The soil is very rich, the climate mild and healthy. The whole course of this great river and its tributary streams is subject to the Chinese, or inhabited by people under their protection. It was discovered by the Russians in 1639 by means of some Cosacks: the Russians were delighted with the discovery of a river which report made to cast up gold and silver, and its neighbourhood to abound with the most precious furs, cattle, and fruit: the Russian colonists of Siberia emigrated thither in crowds, and depopulated their former country. They founded a fort in latitude 53°, which they called *Albasin*. The Chinese burnt it in 1680, and carried the garrison prisoners to Pekin; but it was rebuilt and strongly garrisoned, till it gave such serious cause of jealousy, that the affair was at last terminated in 1689, by a treaty at Nertshinsk, upon the river Indoga, in the reign of John and Peter afterwards surnamed the *Great*, and of Kang-hi, emperor of China. Had the Russians obtained the possession of Amoor, and of the forests and fertile territory in its vicinity, they might soon have got the command of the sea of Japan and of the coasts of China, by descending the river with their fleets. Even by marching from this river as from a magazine of arms and provisions, they could without difficulty have assaulted the Chinese empire, with an army trained in the discipline and the military tactics of Europe. By the treaty of Nertshinsk, however, the Chinese empire was declared to extend as high as Lat. 56° 32′. Its western limit is near the lake Baikal, at the northern front of the high region of Tartary, the greatest part of which also it includes. Beyond this, to the north and west, the territory is claimed by the Russians, who have settlements in various situations, and are in a great measure masters of the Tartar inhabitants of different tribes. These tribes are apt to become discontented with the Russian government; hence great numbers of them have recently emigrated to the Chinese territory upon the river Amoor. In the year 1787, there emigrated from the Russians no less than 6000 of the tribe called *Yakuti*, with all their cattle and goods, who put themselves under the protection of the Chinese. Thus at present upon the river Amoor, a mixed race of Chinese, and of people from all the Tartar and Siberian tribes, is uniting in a fertile country under the government of China, and will probably form out of their several dialects a new language of their own. The Chinese justly consider them as a valuable advanced guard to their frontiers, and give them every encouragement, by assisting them in the cultivation of grain, and in carrying on trade with Korea and other places in their neighbourhood. Asia.

Passing to the north of the Amoor and of the streams that flow into it, we come to Siberia, the proper country of the rein-deer, and of men who pass the winter in holes dug in the earth, to protect them against the severity of the climate. The whole territory inclines, as already mentioned, down toward the polar circle: but the surface of the country is various, and the coasts exhibit some peculiarities. Opposite to the mouth of the Amoor is the island of Saghalien, inhabited by a peaceable people, little known either to the Russians or Chinese. The island is 160 miles long, and 80 broad. It is situated at the mouth of the sea or gulf of Ochotsk, which has the main land of Siberia on the west, and the peninsula of Kamtschatka on the east. The Russians are settled on both sides of the bay. This peninsula having been visited of late years by different European navigators, has been described at least as minutely as its importance on the map of Asia requires. It is in general very mountainous; but a part of it which is level contains a deep rich soil composed of black earth. Firs, common pine, and larch trees of a tolerable size, with birch, poplar, ash, and mountain ash, cover the hills in the middle of the peninsula. The underwoods are currants, dog-roses, hawthorn, alder, and bushes producing berries. The climate in the southern parts is chilled by the sea-breezes, and in the northern by the cold winds from Siberia; but in the centre of the peninsula a sheltered valley produces very fine cabbages, potatoes, turnips, carrots, &c. together with buck-wheat and rye. Hemp also grows remarkably well, but there is little necessity for cultivating it, as the nettle answers every purpose equally well. The Kamtschadels and Russians make sewing thread of this last plant, the nettle, and fabricate from it their fishing nets, which, if used with caution and properly dried, serve them four or five years; the process 183 Kamtschatka.

Asia. cess of preparing it is nearly the same as that for hemp. On a good soil the nettle grows to the height of six or seven feet; the fibres are much finer, and a thread of equal thickness is said to be stronger than that made of the best hemp. The country is very subject to earthquakes, and has several volcanoes and hot springs.

In this quarter of the globe the coasts of the two great continents of America and of Asia begin to approach each other. From the American coast, opposite to Kamtschatka, extends to a considerable distance into the ocean the peninsula of Alyaska. From the
184 point of this peninsula a succession of islands called the
Aleutan isles. *Aleutan isles*, in the form of a crescent, crosses over to Kamtschatka. These islands are most closely joined where they approach the American continent, and the intervals between them become more considerable near the Asiatic shore. The concavity of the crescent is towards the north. The islands are, in general, inhabited; but the natives have been subdued by the Russians, or rather by the bodies of men who have been sent thither by different trading companies for the purposes of hunting and fishing. One of the Aleutan islands called *Oonalashka* is worthy of attention; it is in north latitude 53° 45′, and east longitude 193° 47′. It is very mountainous, and the natives live chiefly by fishing; they are of a middle size, of a very dark brown and healthy complexion, with round features, small nose, black eyes and hair, the latter very strong and wiry; they wear seal skins, with the hair outward, fastened like a carter's frock; they go bare-footed, unless when walking on the rocky beach, when they wear a kind of awkward boots made of the throat of the sea lion, soled with thick seal skin, which they line with dry grass. The men sometimes wear a kind of clothing made of the skins of birds, with the feathers occasionally outward or inwards; the skin side is dyed red, and ornamented with slips of leather hanging down to a considerable length: the seams are covered with thin slips of skin, ornamented or embroidered with white deers hair, goats hair, and the sinews of sea animals dyed of different colours; they also wear light pantaloons of white leather; the men have their hair cut short; the women wear theirs short before, combed over the forehead, and tied in a club on the top of the back part of the head. In wet weather, or when at sea, they wear a dress formed of the intestines of sea animals, the bladder of the halibut, or the skin of the tongue of a whale; it has a hood to cover the head, and is tied close round the neck and wrists, so that no water can penetrate; it is nearly transparent, and looks well. The men wear a wooden bonnet ornamented
185 with the whiskers of the sea lion and with beads. Their
Their baidars or boats. baidars or boats, which are the admiration of travellers from the ease with which they are navigated, are built in the following manner: A keel eighteen feet long, four inches thick on the top, not three inches deep, and two inches, or somewhat less, at the bottom. Two upper frames, one on each side, about an inch and a half square, and sixteen feet long, join to a sharp flat board at the head, and are about sixteen inches shorter than the stern, joined by a thwart, which keeps them about twelve inches asunder. Two similar frames near the bottom of the boat, six inches below the upper ones, about one inch square. Round sticks, thin, and about six inches distant from each other, are tied to these frames, and form the sides. For the top thwarts, very strong sticks, and nearly as thick as the upper frames, curved so as to raise the middle of the boat about two inches higher than the sides. There are thirteen of these thwarts or beams: seven feet from the stern is one of them; twenty inches nearer the head is another; a hoop about two inches high is fastened between them for the rower to sit in; this is made strong, and grooved to fasten an open skin to, which they tie round their body, and it prevents any water getting into the boat, although it were sunk. This frame is covered with the skin of the sea lion, drawn and sewed over it like a case. The whole is so extremely light, even when sodden with water, that it may be carried with ease in one hand. The head of the boat is double, the lower part sharp, and the upper part flat, resembling the open mouth of a fish, but contrived thus to keep the head from sinking too deep into the water; and they tie a stick from one end to the other, to prevent its entangling with the sea weeds. They row with ease, in a sea moderately smooth, about ten miles in the hour, and they keep the sea in a fresh gale of wind. The paddles that they use are double, seven or eight feet long, and made equally neat with the other articles. Asia.

The women of these islands plait neat straw mats, which serve for curtains and beds; they also make baskets, and kindle fires readily by strewing the powder of native sulphur upon dry grass or moss, after which they strike two pieces of quartz one against the other over it; the fine particles of sulphur immediately blaze like a flash of lightning, and set the whole of the dry grass or moss in a flame. The whole natives
186 of the Aleutan islands are held in a state of most mi-
Oppression of the Russians. serable slavery by the Russian hunters, who reside in this remote quarter of the globe, and compel them to hunt and fish in their service. Foxes and marmots are almost the only animals that the Russian hunters themselves can kill; for they are not capable of chasing the sea animals, which require particular agility in governing the small leather canoes in which the natives pursue the sea lion, the ursine seal, sea otter, porpoises, and common seals. The sea lion, called by the Rus-
187 sians *sirootsha*, is the strongest and largest of the seal
Sea lion. kind; it is covered with dark-coloured coarse hair, which is very thick and long about the neck and shoulders; the hinder part is tapering, with smooth short hair. The largest of these animals is about eight feet long; they have a small white spot on the temples, which is the only place about them vulnerable by arrows, which hardly pierce the skin in other parts; but if poisoned, they penetrate deep enough to destroy the animal. The flesh of the sea lion is cut into thin shreds and dried, and is eaten by the Russian hunters.
188 The ursine seal has a soft downy under fur, resembling
Ursine seal. brown silk; the largest of the species are about six feet long; when very young the fur is of a beautiful short glossy black, which changes to silvery when they grow up, and, when they become old; it is almost white. The most valuable fur is that of the sea otter,
189 called in Russia *morskoi-bobre;* the largest are about
Sea otter. five feet long, with a rich fur nearly black, interspersed with longer hairs of glossy white. From their value the pursuit after them has been so eager, that their numbers are declining fast. Indeed the destruction of

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all kinds of animals that produce valuable kinds of fur has there, of late, been so great, that the trade will probably soon be at an end; and this is the only period at which the natives of these islands, and of the adjoining Asiatic and American coast, can expect a deliverance from the state of slavery under which they have been reduced by the Russians. From the Aleutan chain of islands the two continents irregularly but rapidly approach toward each other till they come within a distance of 40 miles at Bering straits. At this quarter, the part of Asia that approaches nearest to America is a peninsula, having the Icy sea on the north and the Pacific ocean on the south; it is inhabited by a tribe called the *Tshutski*, who appear to be the same class of people that inhabit the opposite coast of America. The Tshutski nation or tribe is divided into two distinct branches: the one consists of stationary or fixed inhabitants of the coast; the other are called *Reindeer* or *Wanderers*. Of the stationary part of the tribe the population amounts to about 3000 males; they are industrious and neat workmen, as appears from their boats, lances, arrows, bows, apparel, and utensils, with which they supply the wandering part of their tribe; they dig cellars, in which they keep their supplies of food and oil. Their provisions consist of the dried flesh of sea animals and deer, of roots and herries. They keep the oil of the sea animals in seal skins; they obtain immense quantities of it, which they use for food, fuel, and light: and also, as an article of commerce with the wandering tribes.

190 Approach of Asia and America to each other.

191 Tshutski.

This wandering tribe consider themselves as a very superior and independent race of beings. They call all the nations that surround them old women, only fit to be their servants. Rein-deer are their only riches. These, and the skins of animals that they kill in hunting, they barter with the Russians for kettles, knives, and trinkets; which articles they again exchange with the stationary tribe, for arms, dresses, &c.

192 Capital of Siberia, Irkutsk.

Of Siberia in general it may be observed, that the Russians have fixed their capital in the neighbourhood of the Baikal lake, near the northern front of the high region of Tartary. It is called *Irkutsk*, and is situated in 103° 46′ 45″ east of Greenwich, and in N. Lat. 52° 16′ 30″. It contains 1500 houses, chiefly of wood, twelve stone churches, a cathedral, and two monasteries: besides which, there are several public buildings; an hospital, a public school, a library, and a theatre. The number of inhabitants is about 20,000. The merchants are numerous and affluent, and a considerable trade is carried on with the Chinese. Here the assortments of furs are made which are brought from America and the northern parts of Siberia. There is a glass-house near the Baikal lake, and a distillery, in which 60,000 ankers of spirits are made in a year; there are also salt-works at three springs, which supply the neighbouring country. The people are extremely hospitable to strangers. All kinds of food are cheap, as are spirituous liquors, and home-brewed beer; silks, cottons, linen, furs, and even English cloths, are sold at a moderate price. Many articles of luxury are brought from China, and the country itself supports immense herds of cattle and horses, and produces all the kinds of European grain; the chief disadvantage under which it labours is the intense severity of a winter which lasts during six months of the year. The severity of the winter, and its duration, increase in proportion to the distance from this most southern part of Siberia.

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193 River Kovima.

The first of the great rivers of Siberia towards the east that runs into the Icy sea is the Kovima, which takes its rise in what are called the *Virchoyanski mountains*, to the westward of the most northerly part of Kamtschatka. It flows in a direction nearly north-east about 1800 Russian versts, each verst being about three quarters of an English mile. Different Russian villages are situated upon it, or upon the different streams that fall into it. Of these it may be observed, that the village called *Virchni* is in N. Lat. 65° 28′ 25″, and E. Long. 153° 24′ 30″. Seredni, another village upon the same river farther down to the north, is in N. Lat. 67° 10′ 14″. A third village, containing 70 houses and a church, called *Neizshni*, is in N. Lat. 68° 17′ 14″, and E. Long. 163° 17′ 30″.

194 Climate.

To give a correct idea of the climate of these latitudes, we shall state the temperature at Virchni, as observed during nine days of the month of November 1786, old stile, by Martin Sauer, secretary to a Russian expedition, sent to attempt to navigate the Icy sea; the observations appear to have been made with a spirit thermometer of Reaumur.

	Deg.	Wind.
Nov. 22.		
4 A. M.	38½	S. W. light airs.
6 ——	39¼	
8 ——	39¼	
12 M.	38½	
4 P. M.	39	S. S. E.
6 ——	39½	
8 ——	39½	
12 ——	40	
Nov. 23.		
4 A. M.	37½	
6 ——	36	
8 ——	32	
12 M.	32	S. E.
4 P. M.	32¾	
6 ——	32¾	
8 ——	30½	
12 ——	33	
Nov. 24.		
4 A. M.	34	N.
6 ——	35	
8 ——	36	
12 M.	35½	
6 P. M.	35	
12 ——	36	
Nov. 25.		
4 A. M.	34½	S. W. little wind.
2 M.	34¾	N. W. ditto.
4 P. M.	35	
6 ——	36	
8 ——	37	
12 ——	38	
4 A. M.	39½	S. E.
8 ——	40½	
12 M.	40½	
8 P. M.	40½	
12 ——	41¼	
Nov. 27.		
4 A. M.	40½	N. E.
6 ——	40¼	Calm.
8 ——	40	
12 M.	38	
4 P. M.	39	
8 ——	40	
12 ——	40½	
Nov. 28.		
4 A. M.	37¾	E. N. E.
8 ——	33	S. E.
12 M.	32¼	
4 P. M.	31	
6 ——	30½	
8 ——	31½	
9 ——	32½	
12 ——	36¼	
Nov. 29.		
6 A. M.	38¼ to 39	
Nov. 30.		
6 A. M.	35¾	S. S. W. little wind.
8 ——	33	
12 M.	31½	
4 P. M.	31½	
8 ——	32	
12 ——	32	

195 Effects of cold.

On the 22d, at six A. M. nine ounces of mercury froze in two hours; the earth, the ice of the river, the timber of the houses, &c. cracking with reports equal

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to those of a musket. On the same evening ten ounces of mercury in a stopped phial, froze in two hours and a half. On the 23d, about ten o'clock A. M. the mercury in a stopped phial thawed, but in the evening of the same day was again quite frozen. On the 26th, in the morning, there was a thick fog, and the earth and the river cracked violently. On the 27th, at nine A. M. a sealed bottle of Astracan brandy (there called *French brandy*) exposed to the frost, thickened very much, but was not frozen. On the 28th, at noon, the mercury thawed, but at half past ten at night it was observed frozen. At 37° it was almost impossible to fell timber (which was as hard as the hatchet) unless it was perfectly dry; and in the greatest severity of the cold, the hatchets, on striking the wood, broke like glass. On coming out of a warm room it was absolutely necessary to breathe through a handkerchief; the body was imediately surrounded by a mist arising from the breath, and this mist consisted of very small nodules of hoar ice. Breathing caused a noise like the tearing of coarse paper or the breaking of thin twigs, and the expired breath was immediately condensed into the fine substance already mentioned. The northern lights were constant and very brilliant; they assumed an amazing diversity of shapes, and might be heard to shoot along.

196 Vegetables growing near the Icy sea.

The vegetable productions of this climate were chiefly the following.

Larch.—This is the chief tree in use for building, firing, &c. and the most plentiful. It is pretty sizeable as far as Virchni, and the country is moderately wooded about 200 versts lower, but the trees very stunted; beyond that they are in clusters on elevated spots of ground to about 30 versts from the Icy sea, where they cease growing, in about the latitude 68° 30′.

Birch extends to a little below Seredni, but very stunted and small trees.

Poplar and asp grow to a moderate size on the islands sheltered by mountains about the source of the Kovima, but do not extend so low down as Virchni.

Mountain ash is plenty as far as Virchni, but very scarce lower down.

Alder and willow have a trunk about 18 inches in circumference, and grow to the height of two fathoms, about Virchni. They gradually diminish in size, and cease growing with the larch.

Creeping-cedar, brushwood, black and red currant, rose, and juniper, are met with as low as Neizshni. Brushwood and creeping-willows extend to the Icy sea, but never exceed from six to eight inches. The creeping cedar, or *pinus cembra*, produces a considerable quantity of seeds or nuts in cones, like the common pine: but they ripen only the second year. Immense numbers are collected by the inhabitants; sometimes considerable quantities are found in the squirrels nests in hollow trees: in fact they are the chief food of squirrels and mice. A very pellucid and sweet oil is extracted from these seeds.

Mountain ash berries are gathered, and used to give a pleasant flavour to their drink.

Black and red currants are collected in abundance, and preserved in casks among ice; some are boiled and preserved. The black only extend to about Seredni, but the red continue growing as far as Neizshni.

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Cranberry.—These are scarce, and extend no further north than Seredni; they are always preserved raw.

Brusniki, *vaccinium vitis idæa*, whortleberry.—These are very plenty as far as Neizshni, and are preserved raw.

Colubniki are very numerous: they seem to delight in such stony places as are overflowed in the spring. They are very pleasant tasted, of a dark blue colour, and grow on a low bush exactly resembling a myrtle. They are preserved by boiling.

Maroshka, *rubus chamæmorus*.—These are the favourite berry of the inhabitants, and grow in damp mossy places, particularly near lakes. They are reckoned a certain cure for the scurvy, and are always preserved raw.

Siccha, growing on dry stony places about the mountains, on a creeping species of heath, with short needle leaves; they are very small, black, and stony, are collected in great abundance, and preserved by boiling.

Knezshnitsi, *rubus arcticus*, are scarce, growing about the roots of the alder and currant bushes.

197 Animals.

The following animals are found in the neighbourhood of the river Kovima, and are hunted for food or on account of the value of their skins.

Names.	*Price of the Skins.*
Elk,	2 rubles.
Deer,	1 do.
Bear,	1 do.
White bear,	1 do.
Glutton,	2 to 10 do.
Wolf,	2 to 8 do.
Fox,	1 to 5 do.
Stone Fox,	50 copeeks.
Ermine,	5 do.
Lynx,	3 to 10 rubles, according to the length of the hair.
Otter,	8 to 10 rubles.
Sable,	10 do.
Sheep, argali,	1 do.
Hare,	3 to 5 copeeks.
Marmot,	5 to 10 do.
Squirrel,	3 to 5 do.

198 Birds.

Most of the kinds of birds known in the northern parts of Great Britain are also found in Siberia at some period of the year. At Neizshni the swallows were observed swarming together under the caves of the church, chirping very much, particularly on the 2d of August old style, which is still used in Russia; and on the third there was not one to be found, nor had any body seen them depart. They appear about the 21st of May, and depart between the 2d and 6th of August, never staying beyond the latter date. The red-breasted remains a day or two longer than the white. The snow bunting, the first bird that appears, is seen about the middle of March, feeding on the seeds of grass on the sandy shores of the river, and about the roots of bushes where the snow is earliest melted by the sun. Different flights follow after each other for about a month; eagles follow close upon them. Swans, geese, and ducks arrive towards the end of April, and continue about the neighbouring lakes and rivers till the beginning of September. The river Kovima is frozen over about the 20th of September, and opens about the 24th of May, when it deluges the low country. At Neizshni, on the 25th of November, the sun

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goes down, and does not rise again till the 1st of January, when it appears above the horizon, and this is the time of the greatest cold.

199 Coast of the Icy sea described.

The coast of the Icy sea is moderately high, formed by projecting promontories and shallow bays, exposed to every wind except the south. The mountains are covered in different places with snow, which melting, produces small torrents that rush into the sea. The mountains are composed of granite, quartz, and a hard black stone; they produce moss, a kind of vetch, the root of which is edible, creeping willow and birch, not exceeding ten inches in height. Near the mouths of the large rivers the shores are covered with drift-wood, and in every place remains of huts left by different hunters are seen. Upon the shore rein-deer are found pretty numerous; bears, but not white; wolves, foxes, stone fox, wild sheep, and the whistling marmot; the gulls, ravens, hawks, black-headed buntings, snow-larks, a few partridges, geese, ducks, and divers. The productions of the sea itself are very few; some seals, herrings, whales, and a small species of salmon; but no traces of shell-fish of any kind are to be met with. The atmosphere is always cold and chilly, though the thermometer in the middle of July rises 14° and 16° above the freezing point of Reaumur. The fogs upon this sea are very remarkable, continually hovering above the ice at no great height; sometimes having the same appearance with islands when seen in a haze, and resembling vast columns of smoke. Neither ebb nor flow of the tide is perceived, and the ice is always brackish to the taste.

200 Attempt to explore the Icy sea.

This ocean never has been, and, in all probability, never can be fully explored; various attempts, however, have been made by individuals, as hunters, in search of places in which abundance of game may be found, or in search of what are called the *mammoths tusks*: these are the tusks of a species of animal that is now unknown and extinct; but which must once have existed in immense multitudes in Siberia. These tusks are found in great numbers buried under the high sandy shores of rivers at a considerable depth; the spring floods bring them to view by washing away the sand that covers them, and they appear to have been originally buried by similar floods; they are equal to elephants teeth in whiteness, beauty, and value, but very different in their shape, being all bent spirally: the largest are found on the shores of the Icy sea; one is mentioned, which in direct length extended to four feet one inch French measure; when measured along the bending, it was eight feet seven inches and four lines in length; its circumference near the root was 14 inches and 3 lines; the thickest part, which was at 22 inches from the root, was 17 inches and 8 lines; the weight of the whole was 115lb. avoirdupois. The outside was very brown from its having been exposed to the weather, and it was crackled through the coat or upper stratum about an inch; the inside was firm and very white.

201 Mammoth tusks.

Sauer's Expedition.

In search of this valuable kind of ivory, which forms an important branch of Siberian commerce, individuals have attempted to penetrate into the Icy sea, in the hope of discovering untouched stores upon new islands, or some unexplored continent. With this view one Lachoff made an expedition from the river Yana, with some attendants, in the year 1770, and the following years.

Of this expedition Mr Sauer obtained the following account from Zatai Protodiokanoff, a burgher of a Siberian town called *Yakutsk*, in N. Lat. 62° 1′ 50″, E. Long. 129° 34′. The account is chiefly of importance on account of the savage nature of the unknown region to which it refers, and the extraordinary circumstance of the bones of animals, particularly the rhinoceros, being found in it, which in our times can only inhabit the warmest latitudes. Protodiokanoff accompanied Lachoff in 1770, from his winter buildings at the estuary of the Yana, in the month of March, to Swatoi Noss, the northern promontory of a bay which receives this river.

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202 Expedition by Russian hunters.

"They saw an immense herd of deer going to the south, and observed that their traces were from the north across the Icy sea. Lachoff resolved, if possible, to find out whence they came; and in the beginning of April, set out very early in the morning, with his sledge drawn by dogs. Towards evening he arrived at an island 70 versts from the promontory, in a due north direction, where he passed the night, and the next day proceeded farther, the traces of the deer serving as a guide. About noon he arrived at a second island 20 versts distant, and in the same direction. The traces coming still farther from the north, he continued his route. At a small distance from the second island he found the ice so rugged and mountainous as to prevent his proceeding with dogs. He observed no land; and therefore, after passing the night on the ice, he returned, and with great difficulty, for want of provisions for his dogs, regained Swatoi Noss. He represented his discovery to the chancery of Yakutsk, and the intelligence was forwarded to St Petersburg. The empress Catherine II. called the islands by the name of the discoverer, and gave him the exclusive right of collecting ivory, and hunting animals in this place, and in any other that he might thereafter discover.

In 1783, he went with five workmen in a boat to the islands, and continued across straits, where he found the sea very salt, and a current setting to the west. He soon saw land to the north, the weather being pretty clear, and arrived on what he called the *third island*. The shore was covered with drift wood. The land was very mountainous, and seemingly of great extent; but no wood was seen growing, nor did he observe the traces of any human being. He found some tusks of the mammoth, saw the tracks of animals, and returned (without making any other discovery) to the first island, where Lachoff built a hut of the drift wood, and passed the winter. One of his companions left a kettle and a palma on the third island.

"This was reckoned a discovery of some importance, and the land-surveyor Chvoinoff received orders from the chancery of Yakutsk, to accompany Lachoff to this farthest island, and take an exact survey of the same. In 1775, on the 9th February, he left Yakutsk, and arrived on the 26th March at Ust Yansk Lemovia, or winter huts at the estuary of the Yana. He immediately proceeded across the bay to Swatoi Noss, which is 400 versts from the discharge of the river in a direction north-north-east. On the 6th May he arrived at the first island, which is 150 versts long, and 80 versts broad in the widest parts, and 20 versts in the narrowest. In the middle is a lake of considerable extent, but very shallow, but the borders of which are steep.

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The whole island, except three or four inconsiderable rocky mountains, is composed of ice and sand; and, as the shores fall, from the heat of the sun's thawing them, the tusks and bones of the mammoth are found in great abundance. To use Chvoinoff's own expression, the island is formed of the bones of this extraordinary animal, mixed with the horns and heads of the buffalo, or something like it, and some horns of the rhinoceros; now and then, but very rarely, they find a thin bone, very straight, of considerable length, and formed like a screw.

"The second island is 20 versts distant from this, low, and without drift-wood; 50 versts in length, and from 20 to 30 versts broad. Here also the tusks and other bones are found; and great numbers of the arctic foxes are to be met with on both. The surface is a bed of moss of considerable thickness, producing a few low plants and flowers, such as grow about the borders of the Icy sea. This moss may be stripped off as you would take a carpet from a floor, and the earth underneath appears like clear ice and never thaws; these spots are called *kaltusae*.

"The straits to the third island are 100 versts across. He travelled along the shore, and on the 21st May discovered a considerable river, near which he found the kettle, palma, and some cut wood, in the same place and situation, as they had been left by Lachoff's companions three years before Chvoinoff's arrival. This river he called *Izarevaia Reka*, in consequence of having discovered it on the 21st of May. The shore was covered with drift-wood, all of it extremely shattered. Ascending to the top of a very lofty mountain, he saw a mountainous land as far as his eye could trace in clear weather, extending east, west, and north. Continuing his route along the coast 100 versts, he observed three rivers, each of which brought down a great quantity of wood, and abounded in fish; and here the nerk, a species of salmon frequenting Ochotsk and Kamtschatka, was in abundance, though not found in the Kovima or Indigirka. On this land he passed the summer, and returned in the autumn to Swatoi Noss.

"I asked, whether he observed any regular ebb or flow of the tide? He said, 'that he did not observe any remarkable alteration:' Whether he recollected how the current set? 'He believed to the west:' Whether the water was salt? 'Yes, and very bitter.' He further observed, that there were whales and belluga, white bears, wolves, and rein-deer. No growing wood was to be seen, and the mountains were bare stone. None of these travellers took any notice of the depth of the water, nor were they acquainted with the nature of tides."

203 Opinions of philosophers about the Icy sea.

We account it worth while to take notice of these facts; partly, because no circumstance that can tend to elucidate the general structure of this globe, or point out its different productions, ought to be regarded as unimportant; and partly, because some philosophers have attempted, from the remains of animals which appear to have once inhabited the dreary regions within the polar circle, to infer that these countries must once have possessed a better climate, more favourable to animal life, which must have been altered by some extraordinary change in the astronomical position, or in the general temperature of the earth.

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Besides the rivers we have already noticed, Siberia contains many others; the chief of which rise near the northern front of the high region of Tartary, and receive the rest as tributary streams in their passage to the Icy sea; the principal are the Lena, the Jenisea, and the Oby. The description of them all is similar. They flow through a country containing a very trifling population, but which is as varied in its surface and in its mineral productions as any other part of the world: We shall here take notice of the Lena only, as a description of it will afford a sufficient general idea of the rest.

204 Rivers of Siberia.

205 River Lena described.

About a hundred miles west-south-west of a small Russian village called *Katshuga Pristan*, the Lena takes its rise from an inconsiderable lake among the mountains of Altai, near the Baikal lake. It flows in a gentle and uninterrupted stream, though here and there impeded by shallows at a late season, to about the distance of 300 miles from its source; when it deepens considerably. The direction is very winding, but pretty uniformly east-north-east to Yakutsk, and nearly north from thence to its discharge into the Icy sea, about the latitude 71° 30′, and longitude 127° east of Greenwich, after a course of 3450 geographical miles. The appearance that it assumes is continually varying. In some places, mountains bound the channel on both sides, clothed to the summits with stately pines; in others they are barren, projecting into the river, and turning its course, taking fantastic shapes, resembling ruins of large buildings, towers, and churches; the chasms overgrown with hawthorn, currant bushes, dog roses, &c. In some places the mountains retreat inland for miles, forming a back ground to extensive plains, and exposing a miserably built town, surrounded with corn fields, gardens, and pasture grounds, with a few herds of cattle grazing: These openings are frequent, at unequal distances of five to forty versts from each other, and are always occupied by villages as far as Olekma, 1800 versts from Katshuga. All beyond is desolate, except a few huts inhabited by convicts who have the charge of horses for the posts, and the towns of Petrofstsky, Yakutsk, and Gigansk. The best of them is only a collection of huts inhabited by priests and their attendants, officers, and Cossacks, who teach obedience, and enforce the payment of tribute from the wandering tribes of Tartars that infest the neighbourhood.

206 Rivers flowing into the Lena.

The following are the rivers that flow into the Lena.—The Ilga, 170 versts from Katshuga. The Koot, 469 versts from the same place. Very near the estuary of this river is a salt lake, which is very shallow, and works, the property of the present ispravink of the district, at which one boiling produces 1080 pounds weight of salt. Marakofka, 601 versts from Katshuga. Makarova, 690. Kiringa, 778. Vitima, 1178. This last river flows from a lake east of the Baikal. It is nearly equal to the Lena in width, depth, and extent; and is famous for sables, lynx, fox, ermine, squirrel, and deer. The sables of this river, and of the Momo, which falls into it 300 versts from the discharge, are very valuable, and of a superior quality. Numbers of Tungoose travel about here on the chase. Three versts up this river are the mountains that produce talc. Specimens have been formerly found, 28 inches square, and transparent as glass: What is now found is very small, but perfectly pellucid.

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cid. All the windows of these parts are glazed with it. The river Pellidui, 1202 versts from Katshuga; also famous for the above mentioned animals, and the last place that produces corn. Sparrows and magpies are not seen farther north: they only came here about the year 1780, after the ground had begun to be cultivated. The Nuye, 1475 versts from Katshuga. The Yerba, 1505. The Patama, 1575. The Oonaghtali, 1595. The Olekma, 1822. The Aldan, 2600. Besides several rivers farther north of no material consequence.

207 Siberian tribes.

The most remarkable of the native tribes of Siberia are the Tungoose, the Yakuti, and the Burati; all of whom appear to have originally descended thither from the southern and more elevated regions of Tartary. To these may be added the Cossacks, whom the Russians have everywhere introduced.

208 Tribe of Tungoose.

The Tungoose wander over an amazing extent of ground, from the mouth of the Amour to the Baikal lake, the rivers Angara or Tungooska, Lena, Aldan, Yudoma, Mayo, Ud, the sea coast of Ochotsk, the Amicon, Kovima, Indigirka, Alasey, the coast of the Icy sea, and all the mountains of these parts, constantly on the look-out for animals of the chase. They seldom reside more than six days in one place, but remove their tents, though it be to the small distance of 20 fathoms; and this only in the fishing season, and during the time of collecting berries. They leave their supplies of fish and dried berries in large boxes, built on trees or poles, for the benefit of themselves and their tribes in travelling during the winter. Berries they dry by mixing them with the undigested food (*lichen*) out of the stomach of the rein-deer, making thin cakes, which they spread on the bark of trees, and dry upon their huts in the sun or wind. They seem callous to the effects of heat or cold: their tents are covered with shamoy, or the inner bark of the birch, which they render as pliable as leather, by rolling it up, and keeping it for some time in the steam of boiling water and smoke. Their winter dress is the skin of the deer, or of the wild sheep, dressed with the hair on; a breast-piece of the same, which ties round the neck, and reaches down to the waist, widening towards the bottom, and neatly ornamented with embroidery and beads; pantaloons of the same materials, which also furnish them with short stockings, and boots of the legs of rein-deer, with the hair outward; a fur cap and gloves. Their summer dress only differs in being simple leather without the hair.

209 Customs of the Tungoose.

They commonly hunt with the bow and arrow; but some have rifle-barreled guns. They do not like to bury their dead, but place the body, dressed in its best apparel, in a strong box, and suspend it between two trees. The implements of the chase belonging to the deceased are buried under the box. Except a sorcerer is very near, no ceremony is observed; but in his presence they kill a deer, offer a part to the demons, and eat the rest. They allow polygamy; but the first wife is the chief, and is attended by the rest. The ceremony of marriage is a simple purchase of a girl from her father; from 20 to 100 deer are given, or the bridegroom works a stated time for the benefit of the bride's father. The unmarried are not remarkable for chastity. A man will give his daughter for a time to any friend or traveller that he takes a liking to; if he has no daughter he will give his servant, but not his wives. They are rather below the middle size, and extremely active; have lively smiling countenances, with small eyes; and both sexes are great lovers of brandy. They declare that they know no greater curse than to live in one place, like a Russian or Yakut, where filth accumulates, and fills the habitation with stench and disease.

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210 Yakuti.

The Yakuti, or Socha, are a Tartar tribe that originally descended into the country of Siberia from the high regions on the south. A nation of Mongals inhabiting a part of the country near China also call themselves *Socha*, and speak the same language as the Yakuti. The Russians discovered them in 1620: they were divided into many tribes, and the dissensions that existed among them contributed to their being subdued. Their number is computed at 50,000 males; but the population is declining. They complain of the oppression of the Russian government; and of late, as already mentioned, many of them have emigrated to the river Amoor, to enjoy the advantage arising from the protection of the milder and more popular government of the Chinese.

211 Their persons.

There is perhaps no nation in the world that can exhibit a greater variety with regard to size than the Yakuti. The affluent, whose dwellings are situated about the meadows on the south side of the Virchoyanski chain, are from five feet ten inches to six feet four inches high, well proportioned, extremely strong, and very active; while the indigent inhabitants of the more northerly parts are in general below the middle size, indolent, and of an unhealthy complexion; evidently stunted by the badness of their food, the severity of the climate, and the want of proper clothing. Their wealth consists of horses and horned cattle. The private property of no individual at present exceeds 2000, all species included; formerly, numbers of them possessed 20,000.

212 Means of subsistence.

With regard to their capacity of supporting themselves, they are independent. Their only necessaries are, a knife, hatchet (or palma), flint and steel, and a kettle; and with these articles the all-providing hand of God sufficiently supplies them, and capacitates them to furnish the other tribes. From the iron ore of the Vilui, they make their own knives, hatchets, &c. and of such temperature as baffles the more enlightened art of the Russians. This ore may be called native iron, from the little trouble they have in preparing it. Every utensil and article of dress they make themselves.

213 Religion of the Yakuti.

Tanghra is with them the general name of god, or perhaps of the supreme God; but they have other deities, whose names are in their language descriptive of their attributes. One of these is styled *Aar-toyon*, (or the merciful chief). To him they ascribe the creation, and suppose that he has a wife, whom they call *Kubey Chatoon*, (shining in glory). They are both almighty. Another god, called *Wechsyt*, (the advocate), carries up their prayers, and executes the will of the godhead. He sometimes appears among them, assuming the form of a white stallion, or of any bird, from the eagle to the cuckoo. It is he that intercedes for them, and procures all desirable things. The wife of Wechsyt, is called *Aksyt*, (the giver). These are their benevolent gods, together with a being whom they adore in the sun. They regard the fire, as containing a peculiar being possessed both of good and evil qualities,

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ties, and to whom they constantly offer sacrifices. Their malevolent aerial spirits are very numerous; they have no less than 27 tribes or companies of them. Their chief they call *Ooloo Toyon:* he has a wife and many children. Sugai Toyon, the god of thunder, is his minister of immediate vengeance. (Sugai signifies a hatchet). The rest they distinguish by the names of different colours. Cattle and horses are sacred to the different spirits whose colours they bear. They reckon eight tribes of spirits inhabiting Mung Taar (everlasting misery). Their chief is called *Ashary Bioho* (the mighty). They have wives, and the cattle sacred to them are quite black: Their departed shamans, or magicians, are supposed to unite to these. They dread greatly an evil goddess, whom they call *Enachsys*, (cowherdess). She damages the cows, inflicts disorders on them, destroys calves, &c. She is frequently honoured with propitiatory sacrifices.

Their magicians, or shamans, are chiefly men, though a few of them are women. Young magicians are instructed by an old professor of the art, who conducts them to the most solitary places of the woods; shews them the favourite spots of the spirits of the air and of the pit, and teaches them to invoke their power and prevail with them to appear. The magicians have a peculiar dress, consisting of a leather jacket, and an apron reaching from the chin to the knees. The whole is ornamented all over with iron plates, and pieces of iron and brass, hanging, which make a dismal noise when they agitate their bodies, during the fantastic but childish ceremonies which they perform while driving, as they say, the demons out of sick people. They use a tambour in their ceremony, and are the priests and physicians in the tribe.

214 Food.

In their roving parties, on the chase or travelling, they only take with them a scanty supply of kousmiss, depending on chance for the rest; and should their pursuits prove unfortunate, they find their food in the inner bark of the pines and birch-trees, or the different edible roots. Squirrels are in their estimation very good eating, but their favourite food is the whistling marmot. Of all their provisions, however, koumiss is the most valued; it is formed of mare's milk, collected in large leather buckets, wide at bottom, and narrow at the top: each containing about an anker. Into this a small piece of the stomach of a calf or colt is thrown, and some water mixed with it: it is agitated till it ferments, and acquires an agreeable acidity; and when taken in great quantities it has an intoxicating quality (See KOUMISS). Of this drink every one collects as much as he can; and some of the chiefs obtain more than 500 ankers of it. A day is then fixed upon by each chief to consecrate his stock, which is performed as follows:—A summer hut is built of thin poles, of a conical form, covered with the inner bark of birch, on some extensive meadow. It is ornamented, inside and out, with branches of the birch-tree, and a hearth is made in the centre. Relations and acquaintances are invited to the banquet; but all guests are welcome, of every nation, indiscriminately. The magicians, or shamans, take the head seats; others are seated according to the estimation of their seniority. When the hut is full, the elder shaman rises, and commands one of the Socha that he knows to be qualified (namely, that has not seen a corpse within the month, and that never has been accused of theft, or bearing false witness against any body, which defiles them for ever, and renders them unqualified for this sacred and solemn task), to take a large goblet, called a *tshoron*, which is used to drink out of on solemn occasions, and fill it with koumiss out of the first symir; then to place himself before the hearth, with his face to the east, holding the tshoron to his breast about two minutes. He then pours koumiss three times on the hot embers, as an offering to Aar Toyon. Turning a very little to the right, he pours three times to Kubey Chatoon; then, to the south, he offers in the same manner to each of the benevolent gods. With his face to the west, he pours three times to the 27 tribes of aerial spirits, and three times to the north to the eight tribes of the pit, and to the manes of their departed sorcerers. After a short pause, he concludes his libation by an offering to Enachsys, the cowherdess. The sorcerer then turns the man with his face to the east, and commences a prayer aloud, thanking the godhead for all favours received, and soliciting a continuance of their bounty. On concluding his prayer, he takes off his cap, with which he fans himself three times, and cries out aloud, "Oorui" (grant), which is repeated by all present. The elder shaman, then, taking the tshoron, drinks a little, and hands it to his brethren of the same order, from whom it passes to the company as they sit, except such as are defiled. Women are not admitted into the hut; nor are they or the disqualified allowed any of the koumiss out of the first symir, which they call sanctified, as possessing the power of purifying and strengthening in a divine sense. They all now go out of the hut, and seat themselves on the strewed branches of birches, in half circles, fronting the east. All the symirs are carried, and placed between the branches of trees stuck in the earth, and they commence drinking; every crescent having their symirs, tshoron, and presiding shaman who fills the goblet, and pushes it about with the course of the sun. The quantity that they drink is incredible. Tournaments now begin; wrestling, running, leaping, &c.; and if any one carry off the prize in all the achievements, he is esteemed as particularly favoured by the deities, and receives more respect and credit in his testimony than falls to the lot of a common man. When the ceremony is finished, they mount their horses, forming half circles, drinking a parting draught, and wheeling round with the sun's course, ride home. Women attend, and form parties among themselves at some distance from the men, where they drink, dance, &c.

215 Consecration of koumiss.

216 Character.

The Yakuti or Socha, in their intercourse with each other, have few atrocious vices. Robberies are seldom committed; they sometimes, indeed, lose their cattle from their straying in these wide countries. If stolen, detection is almost certain, as they relate all their losses at every public meeting; in consequence of which, if the lost beast has been seen, information is given, and it is traced. A thief is not only compelled to make restoration, but to make good all the losses of other Yakuti during the year, whether he has stolen the property or not. If one is accused of having stolen cattle, and eaten or killed them, he must either pay for them, receive a flogging, which is very disgraceful, or take an oath of his innocence, which is administered with so many superstitious solemnities, that innocent persons will

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will often rather pay the damages than take the oath. They are very revengeful of insults, and entail upon their progeny the duty of revenge: their gratitude, however, is equal to their resentment; they never forget a benefit; and not only make a return, but recommend to their children to persevere in friendship and gratitude to the benefactors of their parents. They are very obedient to their chiefs and old men. They deliberate in council on all matters of public concern, as the course which each is to take in the chase, &c. The old men are surrounded by the rest, and their advice is implicitly obeyed. A young man gives his opinion respectfully and cautiously; and, even when asked, he submits his ideas to the judgment of the old. They are extremely hospitable and attentive to travellers, and are very inquisitive; they ask questions frequently, but, at the same time, they answer them without embarrassment, and with a considerable appearance of intelligence. They are a vigorous race, accustomed to travel in the severest frosts, and to endure hunger with patience. They are, however, subject to some diseases, particularly rheumatisms, weakness of the eyes, boils, and the itch. The smallpox and measles have also at times proved very destructive amongst them.

217 Superstitions.

They have a multitude of petty superstitions, independent of their religion. Ravens, crows, and cuckoos, are ominous birds: and, if these perch near their huts, they dread some misfortune, which can only be averted by shooting the birds. On the contrary, eagles and large birds of prey are the foreboders of good; and almost every tribe has its object of veneration, but not of worship, as the eagle, the swan, the stallion, &c. They always take care to make the doors of their huts towards the east; the fire-place is in the middle, with the back of the chimney towards the door; the sides of the hut are furnished with benches and small cabins, which serve for sleeping places, and for sitting on. The men keep upon the south side and the women upon the north. Except the hostess, no woman may present food to a male stranger in front of the fire-place, but must walk round the chimney to present it. They never wash the vessels that contain their food; but when a dish is emptied, they clean it as well as they can with their fingers, accounting it ominous, or that it forebodes a scarcity, to wash away any part of their food. Their earthen vessels are preserved extremely clean by repeated burnings, as the fire consumes what adhered to the sides. Before eating any thing, they cast a morsel into the fire. Every Yakut has two names, and is only called by the right name, in cases of necessity, to avoid the search of evil spirits. They never mention the dead, unless allegorically, and forsake the hut in which any one has expired.

218 Women and marriage.

Polygamy is allowed among them, and some have six wives, but the first is respected by all the rest, and they dwell in separate huts: their marriage ceremonies are extremely formal. The young man, who wishes to marry, sends his friend to ask the consent of the bride's father, and what kalym (purchase) he demands; that is, how many horses and cattle, as also the quantity of raw meat, horse flesh, and beef, that he requires for treats and feasts; this they call *kurim;* half of the quantity is always given in presents to the bridegroom by the bride's father, and is called *yrdy*. The daughter's inclinations are always consulted; and, if she does not object, the kalym and kurim are stipulated. The bridegroom kills two fat mares, dresses the heads whole, and the flesh in pieces, and goes with three or four friends to the father of the bride. On his arrival at the hut, one of his friends enters, and places one of the dressed horse's heads before the fire, and returns to his companions without speaking a word. They then all enter the hut; and a sorcerer being placed opposite the fire, the bridegroom kneels on one knee with his face towards it, into which butter is thrown; he then lifts up his cap a little, and nods his head three times without bowing his body. The sorcerer pronounces him the happy man, and prophesies a succession of happy years, &c. Then the bridegroom rises, bows to the father and mother, and takes his seat opposite the bride's place, but keeps silent. The meat is then brought in, and the father of the bride distributes it among his own friends, but kills a fat mare to treat his new guests. Supper being over, the bridegroom goes to bed; the bride, who has not been present, is conducted into the hut, and to his bed, by some old women, and they sleep together; sometimes, however, the bride does not appear at the first visit. In the morning the friends return home, but the bridegroom remains three or four days. A time is now fixed for payment of the kalym, either at the new or full moon. The kalym and kurim are then carried without any ceremony, and delivered in the presence of many friends, who are feasted, and the bridegroom remains again three or four days, and fixes a time to receive the bride at his own dwelling, which must be new built on purpose; and this also at the new or full moon. All her relations, male and female, with friends and neighbours, sometimes more than a hundred, accompany the bride with her father and mother, taking with them eight or ten symirs full of melted butter, and the dressed meat of three mares. They go to the new hut prepared for them; three men are sent to the bridegroom in his old hut, and the greatest drinkers are chosen for this purpose. On entering, the first says, "we are come to see your dwelling, and to fix posts before your door." They then kneel on one knee before the fire: an ayack is filled with koumiss, and handed by two men to the three kneeling; each of whom empties an ayack at three draughts. They then rise and go out, all the company saluting them with one cheer. Three others enter; the first with nine sables, the second with nine foxes, and the third with twenty-seven ermine skins; these they hang on a peg in the chief corner of the hut, and retire. Then a number of women conduct the bride, her face being covered with ermine skins, to the hut; the entrance has a wooden bar placed across it, but of no strength, which the bride breaks with her breast, and enters the hut. She is placed before the fire, holding her hands open before her, into which seven pieces of sticks are put; as also several pieces of butter, which she throws into the fire. The shaman pronounces a blessing; she then rises and is again conducted, with her face concealed all the while, to the new hut, where the cover is taken from her face. The bridegroom enters, and feasts his guests two days; then presents all his relations with cattle, over and above the kalym; which is, however, returned on paying their formal visits, perhaps a year or more afterwards.

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afterwards. When a child is about to be born, the husband is called; and two skilful women, in his presence, assist the delivery. If a son be born, a fat mare is killed on the third day; all the neighbours are invited to supper; the child is rubbed all over with fat, and a name given to it, the more insignificant the better; for an elegant name would only entice the demons to be continually about it. No ceremony is observed if the child be a daughter.

219 Funerals. The Yakuti bury a dead person in his best apparel, with his knife, flint, steel, tinder, and some meat, that he may not hunger on the road to the dwelling of souls. Two holes are dug under a tree; a favourite horse of the deceased is killed and buried in one, while the corpse is laid in the other; a fat mare is killed, dressed, and eaten, by the guests; her skin is suspended on the tree, under which the body lies with the head to the west. A magician, playing upon his tambour, invokes the demons to let the spirit of the departed rest in peace; and the ceremony is finished by filling up the grave. If an elder brother die, his wives become the property of the younger; but the wives of a younger brother become free at his death.

220 Arts. Their dress is similar to that of the Tungoose, but more complete. Their principal arts consist of working iron ore, as already mentioned, by means of charcoal, rendering it malleable without any previous process of fusion, and of dressing leather, which they are said to perform with wonderful success, so as to render it completely water-proof, in the following manner: For symirs or buckets, they take a fresh skinned cow's or horse's hide, and steep it in water a few days, when the hair easily rubs off. It is then hung up till nearly dry, when they lay it in blood until soaked through, and then hang it in a smoky place for a considerable time; of this they make their buckets and soles of boots, &c. The latter are completely water-proof, and the buckets or symirs even retain oil. The legs of boots they make of colts or calves skins, scraped and rubbed till they be soft, then sewed, steeped in blood, and dried in smoke; afterwards blackened with wood coals and fat several times, and smoked again: they are then water-proof. The thread with which they sew their clothes is made of the sinews from the legs of the horse-deer or elk. They are expert archers, and have a plentiful supply of arrows in their quivers. They make considerable quantities of hay, and collect berries which they preserve by boiling. To save their hay, they kill at the beginning of winter the cattle they intend to use for food, and let it freeze, which preserves it fresh and good during the whole of that season.

221 Tribe of Burati. Another tribe of Siberians inhabiting the southern parts of the territory, is the Burati. They are divided into a great number of separate small tribes, and are also a race of Tartars. They possess immense herds of cattle and horses. They are not unacquainted with letters, and have lamas or priests, like the inhabitants of the southern parts of High Tartary. There are also various other tribes, such as the Yukagiri, the Tshuvantsi, Chatinsy, &c. who do not seem to differ in their manners and character from those already described.

222 Population of Siberia. On the whole, however, it appears that the population of Siberia is very trifling. It is greatest towards the southern boundary, in the latitudes of the Baikal lake and the river Amoor, where the climate is mildest. To give an idea of the population of the lower or northern part, we shall here state, from the work already quoted, an account of the number of inhabitants from the latitude of 64°, to the extremity of the north coast, and from the river Kovima westward to the Anabara. "The district of Lashiversk comprehends the rivers Kovima, Alascy, Indigirka, and Yana, and those that flow into them: The tributary nations are

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Yakuti - - -	2810
Lamut and Tungoose - -	742
Yukagiri - - -	322
Tshuvantsi and Chatinsy - -	37
	3911

Tribute received in 1788, amounts to 4560 rubles.—The circuit is about 6000 versts in circumference.

"The district of Gigansk, a town north of Yakutsk on the Lena, contains one church, two government houses, seven private ones, and 15 huts. It has a mayor (*gorodnitshik*) and his chancery, and court of the district (*leinihoi sud*) and a magistracy, although the merchants are mere trading pedlars, and only two I think in number. Its circuit also is about 6000 versts from the Yana to the Anabara, which divides the governments of Tobolsk and Irkutsk. The tributary nations are

Yakuti - - -	1449
Tungoose - - -	489
	1938

Tribute received in 1798, 56 sables, 262 foxes, and 1196 rubles in money.

"The Russians inhabiting both districts, including exiles, &c. do not exceed 750 males."

223 Russians in Siberia. The Russian inhabitants of the better parts of Siberia, especially towards the west, employ themselves in the cultivation of grain, or as graziers or carriers. They have an excellent breed of horned cattle, with which, as well as with butter, they supply both the northern and eastern districts of the empire. They are wealthy, hospitable, healthy, and clean, and live under no controul of individuals, only paying a trifling sum to the captain of the district for government. The Siberians throughout are more industrious and independent than any Russian peasants, and live far more comfortably. They are making considerable progress in civilization, and this is perhaps, so far as the bulk of the people are concerned, the happiest part of that great empire.

224 Grand Tartary. We now return to the territory from which we set out, Grand Tartary, or the elevated level tract which constitutes the central region of Asia. This high country possesses considerable variety of soil and appearance. Towards China is an immense desert forming the boundary of that empire. It consists of sands, that move with the winds like the current of a river. Nature has formed three passages across them by means of three chains of mountains, which, as in Arabia or in Africa, are mixed with pleasant valleys amidst these oceans of sand. Travellers who take any other course are apt to be overwhelmed with the torrents of sand, which are equally dangerous as in the Arabian desert.

225 Desert of Lop, and roads through it.

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The first of these communications is in latitude 42° north, to the east-north east of Pekin; the second to the east of the province of Shen-si; and the third in latitude 32°, to the east of Hami, on the frontiers of Thibet. By these roads a safe access was given through the vast Tartarian regions, from the countries bordering on the Caspian sea, and more remotely from Europe itself, to caravans of merchants, who had no other way of carrying on commerce with China in the middle ages, before the invention of the mariner's compass, and the discovery of the passage round the Cape of Good Hope, had laid open an easier mode of communication. It is not wonderful, that when travelling in these dreary solitudes, the imaginations of men should have been haunted and terrified by illusions. Accordingly, Marco Polo, a traveller in the middle ages who passed through the great desert, which he names the *desert of Lop*, says, that during the night, the caravans are terrified with the demons which haunt these horrid sands and dreadful deserts; the travellers must be careful how they stray, for they will imagine themselves called by their names by voices familiar to them, till they are brought to the edge of a precipice, and sometimes they will be entertained with aerial music. These romances reached Europe; and our poet, Milton, makes the lady in Comus, when benighted and bewildered on her way, to speak in the style of them.

——"A thousand fantasies
Begin to throng into my memory
Of calling shapes, and beck'ning shadows dire,
And aery tongues, that syllable men's names
On sands and shores and desert wildernesses."

Even these deserts, however, are not entirely destitute of inhabitants, as a few Tartars are found upon them, with their horses, asses, and mules.

226 Soil of Tartary, and inhabitants.

The rest of this high region possesses a considerable variety of soil. In general, however, though it bears abundance of trees and grass, the climate is extremely severe. The summits of all the chains of mountains are covered with perpetual snow, which augments the cold of the adjoining plains. Even in the southern parts of it, in latitude 31° 39′, within eight degrees of the burning Calcutta, the cold is frequently found to reach 29° below the freezing point, and this even within a dwelling house. The high country, as already mentioned, looks down from its different sides upon Persia, India, China, and Siberia, towards all which it is surrounded by steep precipices of difficult descent, which exclude its inhabitants from holding an easy intercourse with these regions. Southward, however, on the side of India, the mountains appear to be most precipitous, and the approach most difficult. Towards Siberia, on the north, it seems less so, and accordingly it is chiefly in that direction, or by the north-east or south-west, that the Tartars have in different ages approached China or Persia, and through them the southern regions of the Indies. The inhabitants of this lofty territory have in every age possessed the same character, and engaged in the same occupations. They have subsisted in a pastoral state, by means of their flocks and herds, and upon the flesh of such wild animals as they could obtain by the chase. They have, at the same time, been rude, and in general illiterate barbarians, possessing similar manners to their Siberian kindred, whom we have already described, the Tungouse, the Yakuti, and Burati. It is a singular circumstance, however, that in the southern part of this territory, called *Thibet*, a superstition should have established itself, which gives to an established priesthood the whole dominion of the state. What proves in a singular manner the influence of education upon mankind, is this, that the subjects of the lama, or high pontiff of the Tartars of Thibet, are no less unwarlike and unfit to defend themselves against invaders, than the subjects of the high-priest, who, in the regions of the west has so long occupied the capital of the Cæsars. This corner, however, of Grand Tartary, must be regarded merely as an exception to the general character of the people, who have at all times displayed the greatest aptitude for military enterprises. From this high region the great conquerors of Asia have descended, and under the names of Moguls, Turks, or Tartars, have repeatedly overrun, and assumed complete dominion over the surrounding civilized nations.

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227 Idea of the history of Asia and its revolutions.

The general history of the great continent of Asia may be stated in a few words. When the civilized nations which occupy the coasts of it on the west, the south, and the east, are well governed; when society is in a proper state, and its powers can be directed with skill and energy for the public protection, Grand Tartary becomes a place of little importance, or is merely regarded as a grazing territory fit for the breeding of cattle, which periodically are brought down to the great markets of the richer countries in which they are intended to be fattened and consumed. The Tartars themselves, divided into an immense multitude of tribes, are easily kept by the intrigues of their more artful neighbours in a state of constant domestic hostility, or they readily submit to the dominion, and engage in the service of the rulers of a better soil and climate, to which they are at all times willing to emigrate.

On the contrary, when the arrangements of society become defective in the surrounding nations; when public institutions are allowed to fall into decay, and when anarchy and weakness of government prevail, the Tartars gradually resume their independence. Being no longer either divided by the arts or overawed by the power of their neighbours, they acquire a contempt for their weakness, and an avidity to possess their riches. On such occasion, if an aspiring chief of a Tartar tribe is able by persuasion or by force to unite under his standard a few neighbouring tribes, he speedily becomes dangerous to the nations in his vicinity, and almost to the human race. By the booty obtained in some successful inroads, he acquires new associates; the hope of plunder brings his whole countrymen to his standard, and the few who are not led by hope, are compelled to follow and obey him through fear. All Tartary is soon in motion, and China, Persia, and India, are desolated and subdued.

That this is a correct account or true theory of the history of Asia, is evident from its present and past state. At present, China, which has repeatedly been conquered by the Tartars, commands them with the greatest ease. The power of the Chinese emperor is uncontrouled in the country of Thibet, which he protects by his arms, and rules by mandarins, his deputies.

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ties. Almost the whole of the high region of Tartary westward to Imaus, which looks down upon the Caspian sea, and northward along the coast of the Amoor and the Baikal lake, acknowledges his authority. The same appears to have been the case during the third century of the Christian era, when a Chinese general, in the reign of Vou-ti-thi, first emperor of the seventh dynasty, marched as far as the Caspian. A single anecdote will sufficiently point out the authority which the Chinese possessed over Tartary at that period. Mamgo, a Tartar chief, whose horde frequented the skirts of China, having incurred the displeasure of the government of that country, retired with his followers to the banks of the Oxus, and implored the protection of Sapor, the reigning emperor of Persia. The emperor of China claimed the fugitive, and alleged the rights of sovereignty. The Persian monarch pleaded the laws of hospitality, and with some difficulty avoided a war, by the promise, that he would banish Mamgo to the uttermost parts of the west; a punishment, as he described it, not less dreadful than death itself. Armenia was chosen for the place of exile, and a large district was assigned to the Scythian horde, on which they might feed their flocks and herds, and remove their encampment from one place to another, according to the different seasons of the year.—Between that period and the present, however, China has been repeatedly desolated by Tartar invasions, though it has always risen from its ruins, and resumed its ancient power and prosperity.

228 Story of Mamgo. See *Gibbon's History.*

Thus Asia has been the scene of continual revolutions. At one period the Tartars have been divided and weak barbarians, destitute of arts and of power, and subject to the controul of their civilized neighbours. These neighbours have at the same time been prosperous, commercial, and great. After the lapse of some time, however, the reverse of all this has taken place; the civilized nations have sunk into anarchy; Tartary has become strong; its ferocious tribes have united, and the enterprises resulting from their union have covered the earth with desolation and carnage. Thus the history of Asia has always proceeded in a circle; and it becomes the duty of the philosophical geographer to investigate the causes of this peculiarity, which has attended the human race in so great a portion of the globe. We shall here, therefore, endeavour first to point out those qualities in the character and manners of the Tartars, which have enabled them to vanquish the civilized nations of the earth from China to Germany, for so far their conquests have reached, as the Hungarians and the Turks originally descended from Grand Tartary, as well as the race of princes who now rule the great empire of China. We shall afterwards endeavour to explain the circumstances in the state of society among the eastern nations, which periodically reduce them to degeneracy and political weakness, and prevent their persevering in that career of civilization and of improvement, in which the nations of Europe are now so rapidly advancing, and to which the friends of humanity and of science, as yet, rather wish than hope a perpetual duration. If we are successful in our investigation of the causes of the revolutions now alluded to, the philosophy of general history will become extremely simple, and mankind will be enabled, from the experience of past ages, to distinguish the institutions which contain within themselves the seeds of decay and dissolution, from those which have a tendency to increase the energies of the human character, and to preserve upon the earth the dominion of civilization and of science over barbarism and ignorance.

229 Arrangement of the following remarks.

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We formerly remarked, that the human character is formed by its situation, or by the education which it receives. The education, however, of barbarians, or the situation in which they are placed, is almost entirely the result of their physical wants, and of the climate and soil which they inhabit: Hence their character is formed by these circumstances, and is the same in every age. On the contrary, the most remarkable circumstances in the situation and education of civilized men, and those which have the most powerful effect upon their character, arise not so much from the cold or heat of the region in which they are born, or from its comparative fertility or barrenness, as from the civil, religious, and political institutions which have been established in it, and the degree in which the human mind is habituated to the pursuits of an enlightened science, or accustomed to make exertions for the improvement of the various arts of life. Hence we shall find, that although the Tartars always resemble each other, yet in countries of equal fertility and of similar temperature, the Turks or Persians, and the Chinese and Indians, differ widely in consequence of the diversity of their institutions.

230 Causes of diversity of character among nations.

Though Grand Tartary, situated in the centre of Asia, and in contact with its great monarchies, is the place from which the revolutions of that continent have usually commenced, this high region must not be considered as the sole country of that barbarous race of people, usually called *Tartars* by the Europeans. We have seen, that kindred tribes inhabit the countries to the northward of China upon the river Amoor; they also occupy the whole length of the habitable part of Siberia, and proceed westward to the Caspian sea, and along the northern shores of the Black sea, to the mouth of the Danube. Thus they range over 110 degrees of longitude. When a movement, however, is once begun in Grand Tartary, it is apt to extend itself in a lesser or greater degree over the whole of these savage regions. Vanquished tribes are driven westward before their conquerors, and precipitated upon others, who in their turn are pressed upon the northern nations of Europe. At other times, the whole barbarous world submitting to the same master, and gathering around his victorious standard, has been known to pour down upon the more wealthy and peaceful nations of the south. In this way were accomplished the great conquests of the Moguls and Tartars, the Turks, and the Huns. A Tartar chief has been known to number 1,500,000 followers in arms, and to make an expedition at the head of 500,000 horse. Zenghis Khan's army usually amounted to 800,000 barbarian cavalry, who trode down the nations in their progress. Considered as a nation of shepherds and of warriors, the following circumstances have in all ages contributed to prepare the Tartar, or as they were anciently called the *Scythian tribes*, for a career of victory.

231 Extent of Tartary.

232 Causes of the Tartar victories. See *Gibbon's Hist.* vol. ii.

The corn or the rice which constitutes the ordinary and wholesome food of a civilized people can be obtained only by the patient toil of the husbandman. Some

233 Their food.

Asia. of the savages who dwell between the tropics are plentifully supplied with vegetable food by the liberality of nature; but in the climates of the north, and in the sterile plains of Grand Tartary, a nation of shepherds is reduced to depend for subsistence upon their flocks and herds. When animal food is dressed in a certain way, the common association of carnivorous and cruel probably deserves to be considered in no other light than that of a humane prejudice; but if it be true that the sentiment of compassion is imperceptibly weakened by the sight and practice of domestic cruelty, we may observe, that the horrid objects which are disguised by the arts of European refinement, are exhibited in their naked and most disgusting simplicity in the tent of a Tartarian shepherd. The ox or the sheep are slaughtered by the same hand from which they were accustomed to receive their daily food; and the bleeding limbs are served, with very little preparation, on the table of their unfeeling murderer. In the military profession, and especially in the conduct of a numerous army, the exclusive use of animal food appears to be productive of the most solid advantages. Corn is a bulky and perishable commodity; and the large magazines which are indispensably necessary for the subsistence of our troops, must be slowly transported by the labour of men and horses. But the flocks and herds which accompany the march of the Tartars afford a sure and increasing supply of flesh, milk, &c. In the far greater part of the uncultivated waste the vegetation of the grass is quick and luxuriant; and there are few places so extremely barren that the hardy cattle of the north cannot find some tolerable pasture. The supply is multiplied and prolonged by the undistinguishing appetite and patient abstinence of the Tartars. They indifferently feed on the flesh of those animals that have been killed for the table or have died of disease. Horse flesh, which has in every age and country been proscribed by the civilized nations of Europe and Asia, they devour with peculiar greediness; and this singular taste facilitates the success of their military operations. The active cavalry of Scythia is always followed in their most distant and rapid incursions by an adequate number of spare horses, who may be occasionally used, either to redouble the speed or to satisfy the hunger of the barbarians. Many are the resources of courage and poverty. When the forage round a camp of Tartars is almost consumed, they slaughter the greatest part of their cattle, and preserve the flesh, either smoked, or dried in the sun. On the sudden emergency of a hasty march, they provide themselves with a sufficient quantity of little balls of cheese, or rather of hard curd, which they occasionally dissolve in water, and this unsubstantial diet will support, for many days, the life and even the spirits of the patient warrior. But this extraordinary abstinence, which the stoic would approve, and the hermit might envy, is commonly succeeded by the most voracious indulgence of appetite. The wines of a happier climate are the most grateful present, or the most valuable commodity, that can be offered to the Tartars; and one of the most remarkable examples of their industry consists of the art, already mentioned, of extracting from mares milk a fermented liquor which possesses some power of intoxication. Like the animals of prey, the savages, both of the old and new world, experience the alternate vicissitudes of famine and plenty, and their stomach is inured to sustain, without much inconvenience, the opposite extremes of hunger and of intemperance. Asia.

234 Habitations.

The nature of their habitations also prepares the Tartars for war. In a country in which agriculture is carried on, the husbandmen are scattered over the face of the soil, and some time must elapse before they can assemble in a body to defend their own confines, or to invade the territories of others. The progress of manufactures and commerce insensibly collects a large multitude within the walls of a city: but these citizens are no longer soldiers; the arts which adorn and improve the state of civil society, corrupt the habits of the military life. The pastoral manners of the Scythians seem to unite the different advantages of simplicity and refinement. The individuals of the same tribe are constantly assembled, but they are assembled in a camp; and the native spirit of these dauntless shepherds is animated by mutual support and emulation. The houses of the Tartars are no more than small tents, of an oval form, which afford a cold and dirty habitation for the promiscuous youth of both sexes. The palaces of the rich consist of wooden huts, of such a size that they may be conveniently fixed on large waggons, and drawn by a team perhaps of 20 or 30 oxen. The flocks and herds, after grazing all day in the adjacent pastures, retire on the approach of night within the protection of the camp. The necessity of preventing the most mischievous confusion in such a perpetual concourse of men and animals, must gradually introduce, in their distribution of the order and the guard of the encampment, the rudiments of the military art. As soon as the forage of a certain district is consumed, the tribe, or rather army of shepherds, makes a regular march to some fresh pastures; and thus acquires, in the ordinary occupations of the pastoral life, the practical knowledge of one of the most important and difficult operations of war. The choice of stations is regulated by the difference of seasons. In the summer the Tartars advance towards the north, and pitch their tents on the banks of a river, or at least in the neighbourhood of a running stream; but in the winter they return to the south, and shelter their camp, behind some convenient eminence, against the winds, which are chilled in their passage over the bleak and icy regions of Siberia. These manners are admirably adapted to diffuse, among the wandering tribes, the spirit of emigration and conquest. The connexion between the people and their territory is of so frail a texture, that it may be broken by the slightest accident. The camp, and not the soil, is the native country of the genuine Tartar. Within the precincts of that camp, his family, his companions, his property, are always included; and in the most distant marches, he is still surrounded by the objects which are dear or valuable, or familiar in his eyes. The thirst of rapine, the fear or the resentment of injury, the impatience of servitude, have, in every age, been sufficient causes to urge the tribes of Scythia boldly to advance into some unknown countries, where they might hope to find a more plentiful subsistence or a less formidable enemy. Even the severity of the climates which they inhabit facilitates their enterprises. In the winter season, the broad and rapid rivers that discharge their waters into the Euxine, the Caspian, or the Icy sea, are strongly frozen; the fields

are

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are covered with a bed of snow; and the fugitive or victorious tribes may securely traverse with their families, their waggons, and their cattle, the smooth and hard surface of an immense plain.

235 Exercises.

The ordinary exercises of these people prepare them for war. The pastoral life, compared with the labours of agriculture and manufactures, is undoubtedly a life of idleness; and as the most honourable shepherds of the Tartar race devolve on their captives the domestic management of their cattle, their own leisure is seldom disturbed by any servile and assiduous cares. But this leisure, instead of being devoted to the soft enjoyments of love and harmony, is usually spent in the violent and sanguinary exercise of the chase. The plains of Tartary are filled with a strong and serviceable breed of horses, which are usually trained for the purposes of war and hunting. The Scythians of every age have been celebrated as bold and skilful riders: and constant practice has seated them so firmly on horseback, that they were supposed by strangers to perform the ordinary duties of civil life, to eat, drink, and even to sleep without dismounting from their steeds. They excel in the dexterous management of the lance; the long Tartar bow is drawn with a nervous arm; and the weighty arrow is directed to its object with unerring aim, and irresistible force: these arrows are often pointed against the harmless animals of the desert, which increase and multiply in the absence of their most formidable enemy; the hare, the goat, the roebuck, the fallow-deer, the stag, the elk, and the antelope. The vigour and patience both of the men and horses are continually exercised by the fatigues of the chase; and the plentiful supply of game contributes to the subsistence and even luxury of a Tartar camp. But the exploits of the hunters of Scythia are not confined to the destruction of innoxious beasts; they boldly encounter the angry wild-boar when he turns against his pursuers, excite the sluggish courage of the bear, and provoke the fury of the tiger as he slumbers in the thicket. Where there is danger there may be glory; and the mode of hunting which opens the fairest field to the exertions of valour, may justly be considered as the image and as the school of war. The general hunting matches, the pride and delight of the Tartar princes, compose an instructive exercise for their numerous cavalry. A circle is drawn of many miles in circumference, to encompass the game of an extensive district; and the troops that form the circle regularly advance towards a common centre, where the captive animals, surrounded on every side, are abandoned to the darts of the hunters. In this march, which frequently continues many days, the cavalry are obliged to climb the hills, to swim the rivers, and to wind through the valleys, without interrupting the prescribed order of their gradual progress. They acquire the habit of directing their eye, and their steps, to a remote object; of preserving their intervals; of suspending or accelerating their pace, according to the motions of the troops on their right and left; and of watching and repeating the signals of their leaders. Their leaders study in this practical school the most important lesson of the military art; the prompt and accurate judgment of ground, of distance, and of time. To employ against a human enemy the same patience and valour, the same skill and discipline, is the only alteration which is required in real war; and the amusements of the chase serve as a prelude to the conquest of an empire.

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236 Government.

The nature of their domestic government has at all times greatly favoured every attempt of the Tartars towards conquest. The political society of the ancient Germans has the appearance of a voluntary alliance of independent warriors. The tribes of Scythia, distinguished by the modern appellation of *hordes*, assume, on the contrary, the form of a numerous and increasing family; which in the course of successive generations, has been propagated from the same original stock. The meanest and most ignorant of the Tartars preserve, with conscious pride, the inestimable treasure of their genealogy; and whatever distinctions of rank may have been introduced by the unequal distribution of pastoral wealth, they mutually respect themselves and each other, as the descendants of the first founder of the tribe. The custom, which still prevails, of adopting the bravest and most faithful of the captives, may countenance the very probable suspicion, that this extensive consanguinity is in a great measure legal and fictitious. But the useful prejudice, which has obtained the sanction of time and opinion, produces the effects of truth; the haughty barbarians yield a cheerful and voluntary obedience to the head of their blood; and their chief, or mursa, as the representative of their great father, exercises the authority of a judge in peace, and of a leader in war. In the original state of the pastoral world, each of the mursas (if we may continue to use a modern appellation) acted as the independent chief of a large and separate family; and the limits of their peculiar territories were gradually fixed by superior force, or mutual consent. When, by a coincidence of fortune and of talents, a successful chieftain contrived to unite under his command a great number of separate hordes, with a view to a common enterprise, he found, from their ordinary habits of obedience and subordination, an army ready formed and arranged for action: each tribe or horde followed its own chief, to whose authority it was accustomed to submit. If the chief was taught to obey, the obedience of his horde might, from the habits of the people, be safely relied on. Thus these barbarians have at all times been able to send forth detachments upon distant expeditions, which have acted with all the promptitude of a well disciplined military force, and enabled them at once to push their conquests towards the tropic and polar circle, the Chinese empire, and the banks of the Danube.

237 The Tartars acquainted with the Chinese military arts.

To these advantages the Tartar chiefs have sometimes added a portion of military skill, according to the state in which it existed in the civilized nations in their neighbourhood. It has been an usual practice among the Chinese to receive into their pay some of the Tartar chiefs, and to use as soldiers considerable bodies of this brave and hardy race of men. These are employed as the cavalry of the Chinese armies, and become a convenient engine in the hands of an artful government, at once to keep Tartary itself in subjection, and to repress every attempt at rebellion among the Chinese themselves, when they at any time happen to become discontented, either in consequence of a corrupted and tyrannical administration, or of accidental famine, to which that over-peopled country is exposed. But these Tartar auxiliaries, or tools of power, have sometimes ultimately become very dangerous. When the Chinese princes,

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princes, trusting to the passiveness of their people, and to the irresistible force of their mercenary troops, have suffered themselves to sink into indolence, and to neglect the administration of affairs, the Tartar chiefs in their pay have sometimes learned to despise their feeble masters, and have turned against them the portion of military knowledge which they had acquired in the Chinese service, adding to it the whole vigour and ferocity which they derived from the habits of their early life. The most celebrated of the Tartar chiefs was the renowned Temujin, or Zinghis, who, in the 13th century of the Christian era, erected a monarchy among his pastoral countrymen, and, in his own person, or by his descendants, subdued the whole civilized nations of Asia. In his youth he was a vassal of the Chinese empire: he was led to invade it by a knowledge of its weakness and of the means of success, at a time when it was distracted by domestic faction, and left exposed in consequence of the revolt of 100,000 Khitans, who guarded the frontier. The conquest of the five northern provinces of that empire rendered him more dangerous to other nations. He marched westward, and attacked the flourishing and civilized empire of Carizme, which then existed to the eastward of the Caspian sea. After a battle, in which the sultan of Carizme lost 160,000 of his troops, that prince withdrew into his towns, in the hope of wearying out the barbarians by the length and difficulty of a number of regular sieges. But the foresight of Zinghis had formed a body of Chinese engineers, skilled in the mechanic arts, informed perhaps of the secret of gunpowder, and capable, under his discipline, of attacking a foreign country with more vigour and success than they had defended their own. The Persian historians relate the sieges and reduction of Otrar, Cogende, Bochara, Samarcand, Carizme, Herat, Merou, Nisabour, Balch, and Candahar; and the conquest of the rich and populous countries of Transoxiana, Carizme, and Chorasan. From the Caspian to the Indus, the Tartars ruined a tract of many hundred miles, which was adorned with the habitations and labours of mankind; and five centuries have not been sufficient to repair the ravages of four years.

The right of hereditary succession to the sovereignty of a number of united hordes, together with the revenue, which, by their customs, the sovereign was entitled to levy, had a tendency to render them long formidable. Zinghis had originally been raised to power by the admiration of his equals, and the success of his enterprises, under the title of khan. The right of hereditary succession was long confined to the blood of the founder of the monarchy; and at this moment all the khans who reign from the Crimea to the wall of China, represent themselves as the lineal descendants of the renowned Zinghis. But as it is the indispensable duty of a Tartar sovereign to lead his warlike subjects into the field, the claims of an infant are often disregarded; and some royal kinsman, distinguished by his age and valour, is entrusted with the sword and sceptre of his predecessor. Two distinct and regular taxes are levied on the tribes, to support the dignity of their national monarch, and of their peculiar chief; and each of those contributions amounts to the tythe, both of their property and of their spoil. A Tartar sovereign enjoys a tenth part of the wealth of his people; and as his own domestic riches of flocks and herds increase in a much larger proportion, he is able plentifully to maintain the rustic splendour of his court, to reward the most deserving or the most favoured of his followers, and to obtain, from the gentle influence of corruption, the obedience which might be sometimes refused to the stern mandates of authority. The manners of his subjects, accustomed, like himself, to blood and rapine, might excuse, in their eyes, such partial arts of tyranny as would excite the horror of a civilized people; but the power of a despot has never been acknowledged in the deserts of Scythia. The immediate jurisdiction of the khan is confined within the limits of his own tribe, and the exercise of his royal prerogative has been moderated by the ancient institution of a national council. The coroultai, or diet, of the Tartars was long regularly held in the spring and autumn, in the midst of a plain, where the princes of the reigning family and the mursas of the respective tribes may conveniently assemble on horseback, with their martial and numerous trains; and the ambitious monarch, who reviewed the strength, must consult the inclination of an armed people. Thus the rudiments of a feudal government may be discovered in the constitution of the Scythian or Tartar nations; and in all their conquests they have uniformly been disposed in some degree to retain some resemblance of this form of government, by distributing their new territory among their chiefs, to be ruled and divided among their followers in subordination to the head of the state.

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238 Weakness of other nations necessary to the success of the Tartars.

One circumstance, however, has always been necessary to the success of Scythian or Tartar conquest, that the neighbouring nations should be in a state of weakness. The Chinese and the Russians are at present the tyrants or masters of the Tartars, who heretofore tyrannized over the world. The Chinese rule them partly by art and partly by force; and the Russians find that they are unable to resist the arts and the military skill of Europe. The population of China amounts to between 300,000,000 and 400,000,000. That of Hindoostan is equal to 100,000,000; and the ancient Persian empire was capable of pouring forth to the invasion of Europe, an army amounting, as it is said, to three millions of men. Such nations, possessed of superior arts and means of defence, could not upon their own territory have been vanquished by any number of barbarians that could unite against them, did not some defect exist in their character, or had they not been brought into a state of political weakness by some fault in their government. Such reasoning is natural to modern Europeans, who see the present state of the Tartars with just indifference, as by no means formidable to the peace of the world. It is confirmed by history and experience. We shall therefore proceed to consider the circumstances which have hitherto had a tendency to expose all the Asiatic states to conquest and to ruin.

239 Circumstances that have weakened the Asiatic states.

One circumstance, which in most of the Asiatic states has a powerful tendency to produce a permanent inferiority of character in the people, and a constant tendency to anarchy and revolution in the government, arises from the imperfect state of domestic society. In all the countries of Asia that have adopted the Mahometan religion, polygamy is authorised by law, that is to say, besides Arabia, in Turkey, Persia, and Hindoostan, which last contains 10,000,000 of Mahometans. The same practice is also allowed in China,

240 Polygamy.

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China, and it has always prevailed among the rude tribes of Tartars. It is probable, that this law upon the whole facilitates population. It divides between the rich and the poor more equally, that is, in a better proportion to their means, the expence of rearing the future generation, as rich men, who can afford to do so, will naturally be led to have a greater number of children. But at the same time, there can be no doubt that this law must have a powerful tendency to repress the intellectual improvement of the people. The rich in every country dictate the fashions of life; and by this institution a fashion is necessarily introduced of treating women with jealousy, and thus of secluding one half the species from the ordinary society of the other. Women thus shut up in retirement, must possess illiterate and unimproved characters; they must also be prevented in a great degree from carrying on any part of the common business of life. From these circumstances more evils will arise than are at first obvious. One half of society, instead of being useful, becomes a burden upon the industry of the other. A secluded and unsocial mode of life is introduced, and as the human powers are best improved by intercourse with society, a considerable difficulty is thrown in the way of the enlargement of our faculties. Besides this, it must happen, that the ignorance and imbecility of one half of the species will affect the other. An Asiatic retires from the management of his business, to the society of an unintelligent and weak being, who neither sees nor knows any thing of the world or its affairs. In such society he must relinquish his reason and his rational faculties, before he can enjoy much satisfaction. In such society, however, he was educated during his first years, and a great part of his time must necessarily be spent. He cannot fly from it to the house of a friend, for no friend can receive him; and he can receive nobody freely into his dwelling, lest his female prisoners should be seen. This at least is the case with all those who live not in spacious mansions with a variety of apartments. In such a state of society, it is impossible that many men can acquire, or long preserve, much zeal for scientific pursuits, or that the improvement of literature and of ingenious arts can be very earnestly cultivated.

241 Its effects on population,

242 on the character of the people,

243 on the form of houses and cities,

These effects of the law which regulates domestic society, appear even to the most careless observer of an Asiatic city. It occupies a large extent of territory, because every family secludes itself from the other. Every house is surrounded by a wall, and stands in an enclosed area: Each family thus fortifies itself as within a rampart against the intrusion of all neighbours. Hence it has happened, that no attempt has ever been made in the cities of Asia to establish a republican form of government, even when the people were driven to despair by the severest oppression. There exists not that rapid communication of sentiment, and that confidence in each other, which takes place where society is more intimately blended, and which leads men to repose such confidence in each other, as to believe that they can act under the mere authority of public pactions or laws, without the interposition of a master. The mode of erecting their dwellings also explains the wonderful stories, told us by the ancient writers, of the immense extent of Babylon and of Nineveh. It also accounts for the great tracts of territory, which in modern times are occupied by the Asiatic cities. This circumstance also has contributed more than any thing else to expose them to the enterprises of invaders. The extent of their walls in proportion to the population they contain, rendered the defence of them difficult or impossible.

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244 on government.

The law of polygamy has also had a very fatal effect upon the Asiatic governments, and has been one of the most ordinary means of introducing anarchy into them. The princes have very numerous families by different women. Each of the female favourites of the reigning monarch attempts to establish her own children in the most advantageous situations. Hence, the Asiatic courts are at all times occupied by an endless tissue of dangerous intrigues. Attempts are often successfully made to inspire an old man with jealousy of his eldest son, the apparent heir. The knowledge of the existence of such attempts, or even of the possibility of their existence, and of the fatal effects which they may produce in a despotic government, disposes all the sons of the prince to watch the conduct both of him and of each other with the utmost jealousy: this jealousy is apt to burst out into open rebellion, and frequently does so. At all events, upon the death of an Asiatic monarch, his numerous sons, whose rivalship, hatred and jealousy of each other, have hitherto been confined within decent bounds, openly break out into violence. A younger brother knows that he is hated by the elder, who is now become his master. In defence of his own existence, therefore, he is compelled to have recourse to arms, and to obtain a crown or submit to destruction. In this way, the successor of an Asiatic prince has often to begin his reign by struggling against a considerable number of desperate rebellions, and must wade to the throne through the blood of his nearest kindred. As success does not always attend the arms of the elder brother, the law of primogeniture, being frequently violated, loses its importance and estimation in the eyes of the multitude. The royal family itself, covered as its members must be with parricides and crimes, cannot be greatly respected by the people, in whose eyes success and victory become, therefore, the only undoubted titles to obedience. Powerful subjects also, therefore, or enterprising military leaders, are frequently tempted to disregard the claims of the reigning family, and to appeal to the fortune of arms as a title to dominion. When successful, they find a people distracted by civil wars, and by the pretensions of different candidates, ready to acquiesce in any government that can bestow upon them a temporary repose.

245 Produces dissensions in the reigning family.

246 Produces usurpations.

Even should a reigning family escape these obvious calamities which lay waste the territories of a nation, and overthrow its prosperity by sanguinary civil contests, there are evils by which the law of polygamy more gradually, though not more certainly, undermines the safety of the state. The founder of a new dynasty is usually an ambitious and artful military chief. His first successors, educated in an active reign, and anxious to secure their dubious authority, usually partake his talents and energy. Time, however, soon sanctifies their right to the throne, though originally founded in usurpation. The monarch now placed in security, indulges in that luxury to which he is tempted by his situation; and luxury, where the

247 Polygamy produces bad government.

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law of polygamy exists, has more powerful and dangerous attractions, and is attended with more pernicious effects, than elsewhere. This kind of luxury, above all others, leads to an indolent life, and to the production of an ignorant and unintelligent character. The prince is led to shut himself up among a crowd of eunuchs and women, from whose society he can derive no improvement, and to whose counsels and passions he is ultimately led to intrust the direction of the most important affairs of his government. The armies of the state are soon neglected, by a monarch, whose favourites employ every art to inspire him with a disgust of the toils of war, that he may the more easily be retained within the precincts of his palace, and under their management and influence. The provinces are subjected to the most ruinous exactions to gratify their avarice, and every place of public trust comes to be filled by men who undertake not to administer public affairs, but to extort large sums of money from the people, to be conveyed to the favourites that rule within the palace. Thus the state experiences a rapid decay of its population and resources; and if it is attacked from abroad, it has no head to call forth its remaining powers, and direct them with vigour and skill against an invader. The population that remains may still be sufficiently ample for the defence of its own territory, and abundance of personal courage may exist among the citizens; but they cannot be arranged,

248 Instance of Turkey.

or their force rendered effectual, from the want of an active government. This appears to be precisely the situation of the Turks at the present moment. Their first princes, inhabiting the frontier of Europe and of Asia, exhibited, during a much longer period than is usual in the families of Asiatic monarchs, a very considerable degree of spirit and of exertion. But the law which authorises them to live with a multitude of women, all of whose children are legitimate, gradually produced its natural effect. The latter princes have shut themselves up in their palace, and neglected the administration of affairs. The provinces have been wasted; and instead of the numerous people which they once contained, immense forests are rising over the whole territory, and becoming the habitation of wild beasts. The governors of the remoter provinces are aspiring to independence; anarchy prevails in different quarters; and a foreign conquest is only prevented by the jealousy of the neighbouring nations, who cannot agree to whose lot these fine countries shall fall. Yet at this day the Turks are a race of as stout and brave men as their Scythian forefathers. They are equally willing to fly to arms, and sufficient numbers still remain to set every enemy at defiance; but they are not led by those vigorous chiefs who conducted their ancestors from the foot of Imaus, resisted the power of Persia, seized the city of Constantine, and diffused terror over Europe. A man of talents only is wanting to render them still respectable, if not formidable; but their unusual respect for the descendants of so many illustrious princes, has hitherto prevented their government from being seized, and their nation preserved by a bold usurper; while, in the mean time, their sultan, lost in the indolence and voluptuousness of his seraglio, and blinded by his favourites, refuses to come forth and to undertake the direction of the remaining armies of the state, or to place himself at the head of a warlike people.

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249 Polygamy ruinous to China.

This law of polygamy appears to be the single circumstance that has brought about the revolutions which have occurred in China. From the nature of the singular form of government established there, the human mind is indeed preserved in a state of perpetual imbecility, and is prevented from rising in improvement beyond a certain degree; this degree, however, it never fails to attain. It is sufficient to render the nation decidedly superior to their rude neighbours of Tartary; and as Chinese improvement can never advance far, there appears no good reason why it should ever decline or pass away. But the law of polygamy from time to time deranges all their institutions, and the regular march of their government. As they ascribe absolute power to their monarch, and their laws secure tranquillity to the state and complete obedience to his will, he can have no occasion to quarrel with his people, or to disturb institutions which give him the command of as much wealth as his wishes can crave, and as much power as he personally can have any inclination to exert. Accordingly, for some time after a recent conquest, all goes well in China: the monarch is delighted with the submission and tranquillity of his people, the industry and prosperity of the country, and the immense revenue which is placed at his disposal, and which he can have no occasion to use otherwise than in works of public magnificence, generosity, or utility. Speedily, however, this peaceable state of things produces its natural effects. The monarch having nothing to fear, and little to do, resigns himself to pleasure; and that pleasure most probably consists in the kind of indulgence which the law allows and encourages, of collecting around him, and passing his time in the society of, a multitude of beautiful women. Such, however, is the skilful structure of the Chinese government, that it proceeds and prospers without the interference of the prince, who is rather a useful name to prevent military usurpation than an active organ of the constitution. Affairs being in the hands of the most prudent men in the state, who have risen by approved fidelity and talents to the highest rank and trust, are conducted with abundance of care; and the responsibility of all inferior magistrates is enforced. Thus the emperor may be allowed to slumber with secure dignity in his palace: If he interefere not to do harm, the constitution of the state will provide for the management of public business and the prosperity of the people. But matters cannot long rest thus. A weak and ignorant prince, who passes his days secluded from the world, amidst eunuchs and women, will not comprehend the value of that constitution at the head of which he is placed; his favourites prevail with him to encroach upon its fundamental maxims; he is induced to distrust those officers who have risen by a gradual progress under the direction of the law to distinction and power, and to confer authority upon individuals to whom the constitution gives no title to receive it. As implicit obedience to magistrates, and above all to the emperor, is a fundamental maxim of Chinese jurisprudence, and inculcated as superior to all other duties, the will of the emperor meets with no resistance: The constitution trusts that he will not attempt to violate it;

but

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but if he do so, it provides no other remedy than the prayers and entreaties of the highest order of mandarins, which they have been known to employ at the hazard of their lives, and even with the certainty of destruction. As the imperial will, therefore, can in no way be resisted or controuled, when an emperor relinquishes himself to the dominion of the inmates of his palace, the consequences speedily occur which we have already mentioned as resulting from the law of polygamy in other countries. The defence of the state is disregarded; worthless men are raised to the command of armies and provinces; corruption becomes the means of obtaining preferment: The Tartar subjects find out the important secret, that the reins of government are loosely held, that the barriers which protect the treasures of a wealthy nation have fallen into decay, and that these treasures have come to be at the mercy of poverty and courage. Some chief endeavours to unite the shepherds of the west and the north in a common enterprise: His first efforts procure him plunder, if not dominion, and the prospect of his riches procures him new adherents, till at last the hardy cavalry of Scythia are enabled to disperse the feeble and ill-conducted armies of the Chinese; and their leader and his family, seated on the throne of a mighty empire, is gradually led, by similar circumstances, to proceed in the same career, from strength and activity, to weakness, degeneracy, and ruin. The constitution of China, indeed, triumphs over these calamities. The Tartars admire the arts and manners of the vanquished people; and the conqueror is willing to revive and preserve a constitution which preserves the prosperity of the people, while it submits every thing to the will of their master. Had the laws of that empire provided, as in Europe, that the inheritance both of public and private individuals should only pass to their legitimate children by one woman, China might undoubtedly have avoided many of its revolutions. Its princes might have been men of talents or otherwise, according to the ordinary vicissitudes that in the course of nature occur in families; but the possession of talents by the prince is not necessary to the good government of China: it is enough that he interfere not to do positive mischief, and under such a law, every temptation to do mischief would be removed from him.

250 General form of government in Asia, 251 feudal.

Another cause of periodical weakness in Asiatic nations arises from the general form of government that has been there adopted. Excepting in China, the Tartars have in all their conquests been led to establish themselves under a sort of feudal arrangement. In their native country, they were divided and subdivided into tribes and families, under a chief who had led them forth to war and conquest. In their new territories, it was natural for the chief to reward his successful officers with grants of provinces, which they were again to subdivide among their followers, under condition of remaining in subjection to himself, and of being ready on all occasions to attend him in war. These grants, however, were only bestowed upon individuals personally who received them: They were given as the price or pay of military service: They might be recalled at will, like the commission of an officer; and they were never meant to go to the heirs of the favoured chief, though undoubtedly in equal circumstances his heirs would be preferred to others. A government like this is exposed to two kinds of disorders; the one, arising from exorbitant power acquired by the great vassals: and the other, arising from the too great despotism of the prince.

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Under a monarch of great activity and vigilance, the chief vassals of the state, who have received large grants of territory, may be retained in sufficient subjection. He may summon them and their followers frequently to attend his person; and by engaging them in wars under him, may preserve his personal ascendency over them, by having frequent occasion to change their situations, and to prefer others to the places they occupy. Should his immediate successors, however, not be men of equal talents with himself, or should a disputed succession occur, the greater chiefs will immediately aspire to independence: the empire will fall to pieces, and degenerate into a hereditary aristocracy, in which every chief is engaged in hostility with his neighbours, and in which the people at large, oppressed by a multitude of petty tyrants, can enjoy no repose or prosperity. Such has been the destiny of several of the nations of Asia; and it was also the destiny of Europe after its conquest by the northern barbarians. It is true that the European princes gradually recovered the power that had been wrested from them, and converted into local inheritances by their great nobles. To subdue these nobles, they associated themselves with the populace, with the few merchants, and the industrious part of the nation. They encouraged these people to unite themselves into communities, and to fortify themselves with walls. They established courts of justice, whose regular and equitable procedure gained the affection of the weak, whom they protected, and brought odium upon the violence and despotism of the petty local tyrants of the country. The commercial and industrious part of the community were induced to contribute to the support of the prince, who seemed thus to labour only for their welfare, and to protect them against oppression. By this wealth he was enabled to confirm his power, and to subdue his refractory vassals. By following out these prudent maxims for a few generations, the dominion of law and order, along with the power of the sovereign, were established in the nations of Europe. But nothing of all this can occur in Asia. Power may there be acquired by the violence of sudden conquest, but it cannot be gained by a train of artful policy steadily pursued from father to son during a course of several generations. In consequence, as already mentioned, of the law of polygamy, no sooner does a prince die than one of two things occurs; either a war for the succession ensues among his children by different wives, which consumes the wealth of the people, and augments the power of the nobles, upon whom the candidates for dominion must rely for aid; or, to prevent this calamity, the eldest son of the deceased monarch seizes his younger brothers, and puts out their eyes, or destroys their lives. Thus an example of cruelty and injustice is exhibited, which destroys in the minds of the people every growing sentiment favourable to the establishment of order, and of humane and equitable laws.

252 Feudal government apt to become aristocratic.

253 Government by viceroys.

On the other hand, it has frequently happened in Asia, that the power of the monarch has not been lost by its vassals converting different districts into hereditary possessions. A succession during a few generations

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of active and warlike princes has given leisure for the chiefs of the Tartar tribes to acquire the manners of the nations whom they vanquished, and to sink, like them into a state of permanent subjection to a sovereign, become too powerful to be resisted. In this case, however, an error exists in the general structure of Asiatic governments, which gradually brings them to decay. The monarch divides his territory into provinces, and over each province he places a governor, or viceroy, whom he appoints and recals at pleasure. The governor of a province possesses within it the whole power of the master whom he represents; he collects the taxes, and remits them to the capital; he administers justice by himself, or by deputies whom he appoints and removes at pleasure; and lastly, he commands within his district the armies of the state. On a little reflection it will readily be conceived, that a nation governed in this way cannot permanently prosper. An absolute monarch can scarcely fail to be patriotic, because the whole country is his own, and he must regard his people as his property, or as a kind of appendage to his family. He will therefore intend to govern them well, or as advantageously as possible. But the governors whom he places over the provinces must entertain very different sentiments: The state is not their inheritance; they are appointed only for a season; and like tenants at will, they will endeavour to make the most of their temporary possession, though they diminish the permanent value of the estate. Hence these men are always apt to govern ill; and, with a view to make the most of their time and opportunity, they oppress the people by their rapacity. The monarch has no intention to sanction their conduct, but there exists no other means of restraining it than to maintain a perpetual and vigilant inspection over them. If he is not constantly at short intervals travelling into every part of his dominions, and viewing objects with his own eyes, the governors of provinces will take advantage of their situation, to oppress the people, and will endeavour to secure their own safety by corrupting the ministers who are near the person of the prince.

In a government thus constituted, too much is made to depend upon the activity and vigilance of one man. If the monarch relax in his attention, the state at once begins to decay; and even his personal infirmities, his youth, or his old age, produce important effects upon the provinces. When a weak prince happens to succeed to the throne, the decline of the empire becomes visible in a few years; and the most active reign scarcely suffices to repair the injuries which a short period of weak government has occasioned. All these evils are aggravated in Asia by the tendency which the law of polygamy has to introduce into the palace of the monarch a system of seclusion from business, of indolence, and of favouritism.

254 Viceregal government adopted in the Roman empire.

In the ancient Roman empire this practice was adopted of ruling the provinces by temporary governors possessed of unlimited power, and was attended with all the bad consequences which we have here described. From its first establishment, that empire, like an Asiatic monarchy, underwent a gradual progress of decay; and instead of the people becoming gradually more powerful, wealthy, and enlightened, every science and every art, together with the population of the state, declined, till the whole was oppressed and sunk under the inroads of the northern barbarians. It is a curious circumstance, and well worthy of all our attention, that the progress of modern Europe is altogether the reverse of this. In Asia a monarchy is no sooner established than its decline commences, and it gradually becomes weaker and weaker, till, in the course of a few successions, its overthrow is easily accomplished: whereas in Europe, for some centuries past, every state or monarchy of any tolerable extent, has gradually been waxing stronger and stronger, and is capable of greater exertions in proportion to the time that it has stood. Such, at least, is the case, with regard to the middle and northern states of Europe. The mode in which the government is administered will explain this, when contrasted with that which is adopted in most of the Asiatic states, and which existed in the Roman empire. In Europe the sovereign does not intrust the whole government and administration of affairs in a province to an individual, who is at once to be tax-gatherer, judge, and commander of the military force. On the contrary, instead of portioning out the whole territory of the state in provinces, to be allotted to particular viceroys, a more artificial arrangement is adopted. The business to be done is divided into different branches, and these branches, though sometimes extending over the whole territory, are intrusted by the sovereign to distinct individuals or classes of individuals. Thus an office or officer is established near the person of the prince, into which the whole taxes of the nation are ultimately paid. Under this office, or its managing minister, a variety of tax-gatherers are sent throughout the whole country, to collect in the different towns and districts the taxes established by law, and to remit them to the government. These tax-gatherers have no interference in military affairs or in the administration of justice. In like manner, a particular class of persons, properly qualified for the duty to be performed, are appointed to administer justice in the provinces, and to interfere no farther in public affairs. No part of the revenue comes into their hands, and they have no command of the military force of the state. Lastly, the whole military or soldiers likewise form a separate and distinct body. Their officers are all appointed by the prince and his ministers, upon whom they immediately depend, and they have no concern in the collection of the taxes, or in the administration of justice. Under a government thus constituted, if a tax-gatherer make an unjust exaction from any of the people, they complain to the judges, who, having no share in the management of the public revenue, and deriving no profit from the oppressions that may be committed in it, are disposed to listen to all complaints, and to do justice against the collectors of the taxes. The judges themselves are kept under controul in a similar way. Not being commanders of the military force, or entrusted with the direction of its operations, they can only pronounce decrees, but have no power to execute them. This must be performed by the military, who are a distinct body. They, however, will have no inclination to see the power of judges and lawyers exorbitantly increased, and will revolt from the idea of putting in force decrees which are notoriously unjust, and of which the public disapprove. Thus the people will, in every respect, be assured of protection. The judges will protect them against the tax-

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255 Why European nations improve instead of decaying like Asiatic states.

gatherers

Asia.

gatherers and the military, who, in their turn, will regard with jealousy the power of the judges. In this way a just and equitable government is maintained. Access is easily had to the prince, who can have no wish to see affairs ill administered. A great nation is governed like a single family, by allowing different duties to its different members, who are prevented from abusing their power. Industry is encouraged by the security of property; and the human mind, unsubdued by oppression, and animated by hope, is led to exert its whole energies in improving its own character and condition. Whereas in Asia, and in all those countries in which governors of provinces are appointed with absolute power to conduct the whole business of administration, every province is converted into a separate empire, in which no redress can be obtained for any grievance. If a tax-gatherer make an undue demand, the citizen can only state his complaint to the employer of that tax-gatherer, the provincial-governor, who is to receive the money that is to be paid. If a soldier do wrong, he can only be complained of to the same governor who is the master and patron of the soldier. If a judge is unjust, it is still to the same individual that the complaint must be carried. Thus no check or controul exists; and if the governor of the province is rapacious and unjust, and has need of unprincipled dependents to support his power, the people must submit to an oppression for which there is no remedy; and the whole state, thus divided into departments and oppressed, must speedily sink into ruin. Commerce cannot flourish where the fruits of industry are not secure; and without commerce those arts cannot prosper, the practice and improvement of which afford some of the best means of enlarging the human faculties."

256 Religions of Asia hurtful.

In many parts of Asia, religion is also a great source of national weakness. This arises from two causes; either from its dividing a state into different parties, or from its doctrines being of such a nature as to restrain in too great a degree the activity and improvement of the human mind.

257 Religion in some places divides the state.

Before the Turks subdued the Greek empire, they had been long enough settled in the countries near the Caspian sea, to acquire the religion of a more civilized people. By the time they subdued the country round Constantinople, and at last the capital itself, they were become zealous Mahometans; whilst the nation over whom they established their dominion, consisted of no less zealous Christians. Hence a line of separation was drawn between the conquerors and the conquered, which time has not been able to obliterate. One half of the state consists of masters, and the other of an oppressed people. In other nations the evils of conquest have been temporary, because in a short time the victors and the vanquished, mingling in the ties of affinity and thence of consanguinity, have ceased to be distinguished from each other, and have coalesced into one common people. But in Turkey, to this day, the proud invader is known from the vanquished native. Their respective religions have fixed upon each of them a mark, which has proved as indelible as that by which, in our West India islands, nature distinguishes the negro slave from his European master. Hence the Turks continue to act the part of insolent oppressors to their subjects, the Greeks; while the latter, accustomed to insults and to a sense of inferiority, have acquired the characteristics of slaves, insincerity and cowardice. It is not wonderful, therefore, that the Turkish empire should decay. It not only labours under all the evils attending upon the law of polygamy, and of a government by viceroys called *pachas;* but to these have been added an internal division among the people, which degrades the character of one half of the nation, without conferring any improvement upon the other. The same evil has existed during many centuries in Hindoostan. Before the conquest of it by the Mogul or Tartar princes, they had also embraced the Mahometan faith. Their new subjects, however, the Hindoos, adhered to the religion of their ancestors, with still more obstinacy than the Greek Christians have done against the Turks, and the result has been similar. The Mahometan conquerors, with all the advantages on their side, of victory, of public employment, and royal favour, never amounted to above one-tenth of the population of the country. The great body of the people, therefore, necessarily sunk into a contemptible and degraded condition, which impaired the national strength, and retained society in a violent and unnatural state in which it could not flourish.

Asia.

258 Hurtful religious doctrines.

We can scarcely consider as religious systems the superstitions of the Siberians and Tartars, or other rude Asiatic tribes. Leaving them out of view, therefore, the religions of Asia are chiefly three: that of Budho, Gaudma, or Fo, which prevails in Ceylon, the farther peninsula of India, China, Japan, and Thibet; the Mahometan religion, which, besides Arabia, is in possession of Turkey, Persia, and partly of Hindoostan; and, lastly, the Gentoo faith, which is adhered to by ninety millions of people in India. Of these, the religion of Budho, Gaudma, or Fo, seems the least pernicious. It is loaded with few ceremonies, so that it cannot greatly occupy the human mind. It is perfectly tolerant, and thus does not positively prohibit intellectual improvement; and its priests are men who voluntarily choose their profession, and, excepting in the sterile country of Thibet, have no interference in the ordinary business of life, and no share in the administration of public affairs. All error is, however, injurious to the human intellect, by diminishing its power of discerning truth. Even independent of this general circumstance, the religion of Gaudma has been dangerous in another point of view. It has a book which is of sacred authority, and believed to be the work of inspiration. That book is said to regulate minutely the ordinary affairs of life; the taxes to be paid to the state, and what ought to be accounted just and unjust in the common transactions of men: But an infallible law for the regulation of ordinary affairs is always a great evil, as it renders error and ill government perpetual. Such a book, at the time when it was written, might perhaps be a useful work, and contain many valuable maxims and rules for adjusting all kinds of business, and for the decision of all disputes; but human affairs, to proceed well, must be in a state of improvement, that is, in a state of change to what is better: But such a book has a tendency to oblige the nation that adopts it to stand still, and consequently to fall behind other nations. Hence they have all the

259 Religion of Budho.

Asia.

chances of falling back into barbarism that affect other nations, while there exists no possibility of their advancing farther in improvement.

260 Mahometan religion.

The Mahometan law has this speculative advantage over that of Gaudma or Budho, that it suffers not the supreme Intelligence to be likened to a stock or a stone; but its practical character is much more injurious to the world. It not only has an infallible book, which in the countries where it is adopted is regarded as the law of the land for regulating the decision of controverted causes in all courts of justice, but enjoins to its followers the observance of a number of daily ceremonies, consisting of prayers and washings at stated intervals, which tend to fix down superstition upon the human mind. In addition to these, its extreme intolerance has a tendency to render the intellectual improvement of the people that have once adopted it extremely difficult, while the sanction that it gives to the law of polygamy, at once places private society on a defective footing, and ensures the bad government of the state.

261 Gentoo religion.

The most pernicious of all the religions of Asia, however, appears to be the Gentoo superstition, or the religion of the natives of Hindoostan. It does not indeed authorize polygamy, nor does it sanction the persecution of those who believe in other religions; but in every other respect, it is most evidently ruinous to the vigour of the human character. It fills the mind with all the idle tales and superstitions of an absurd polytheism. It enjoins an endless variety of rites and purifications; and under its influence a morsel of bread cannot be eaten, or a cup of water tasted, without the utmost caution, that it have not come into contact with impure hands or impure vessels. The division of the people into hereditary casts, of different degrees of dignity according to their respective employments, none of which casts can intermarry, or even eat or drink together, completely insulates every class of inhabitants; and by fixing them down to hereditary occupations, prevents every exertion of talents beyond the sphere in which individuals happen to be born. Religion, or superstitious fear of offending against the rules of his cast, constantly occupies and absorbs the whole mind and faculties of a Hindoo, so as utterly to deprive him of intellectual vigour or courage to investigate the foundations of the notions which place under controul every step of his life. A people thus divided can possess little united strength or energy as a nation, and the feebleness even of their bodily exertions may well suggest the question, Whether superstitious fear and intellectual imbecility fixed down upon a people during a course of ages, has not a tendency to diminish the corporeal powers, and to render the body as feeble as the mind? In justice to the religion of the Hindoos, however, it may be observed, that if it prevent the nation from acquiring great power, it also guards its civilization, or the arts that it possesses from being entirely lost in consequence of conquests by barbarians. Every Hindoo being bound by his religion to follow the occupation of his father, if a whole cast is not utterly exterminated, the arts which were understood by its members cannot be lost. They are immediately practised anew; they come to be in request, and the cast is employed by society, and multiplied as before.

Asia.

262 Influence of physical causes on civilized nations.

That we may not appear, however, from a love of system, altogether to deny the effect of physical causes upon the history of the civilized nations of Asia, we shall acknowledge, that the fertility of the soil in these countries in all probability assists the tendency to negligence of management which appears in their governments. In the more barren regions of Europe, it is absolutely necessary that a government act with a considerable degree of caution, and administer justice well, to enable a nation to attain to any tolerable share of power or prosperity. With us, man has many imperious wants, which must be supplied before an individual can contribute any thing to the public. He must at least have food, which can only be extorted from an ungrateful soil by patient and skilful industry. He must also have clothes and fuel. The fertility of the Asiatic soil enables man to obtain food with less labour than in Europe, while the mildness of the climate subjects him to little expence on account of fuel and clothing. Hence in these countries a much less degree of industry is necessary for the support of individuals, and to enable them to contribute something towards the public revenue. Governments, therefore, are not so soon brought under the necessity of repairing their own errors. Abuses are more readily allowed to multiply, and at last can be got quit of with greater difficulty. Add to this, that in a country whose inhabitants could not originally subsist without the exertion of much industry, a more vigorous character is apt to diffuse itself among the people, than in those nations upon whom, in their rude state, the slightest effort of labour conferred abundance, and who have only come to find good management and industry requisite, in consequence of the great multiplication of their numbers.

263 Arabian conquest.

Besides the revolutions occasioned by Tartar invasions, several of the nations of Asia experienced a great revolution from the arms of another barbarous race of men, the inhabitants of the peninsula of Arabia. Similar causes to those which have repeatedly given victory to the Tartars, enabled the Arabians to vanquish the neighbouring nations. They also exist in a pastoral state, and are divided into tribes or families. The Arabians, however, have not been accustomed to conquest like the Tartars. Arabia is of trifling extent, when compared to Tartary and its dependencies; its strength being less, it is less likely to be engaged in distant enterprises. Unlike to Tartary, it has always possessed some cities, and a part of the people have connected themselves with the arts and the commerce of the civilized nations around them. Hence something more was necessary to rouse the Arabian nation, and to unite its members in one common enterprise, than the mere love of dominion. The Arabs became conquerors, only because Mahomet was successful in rendering them fanatics; and they subdued the earth, not so much from a desire to possess its riches and its luxuries, as from a zeal to extend the glory of God, and to give the means of salvation to mankind. When their religion had prevailed in all directions, and other nations adopted the same spirit and cause, the Arabians relapsed into their original unimportance, and ceased to be dangerous to the peace of the world.

Of late some of the nations of Asia have undergone subjugation

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Asia.

subjugation, and others have been threatened with it, not from the ordinary quarter of Tartary, or from any other race of barbarians, but from the enterprises of the civilized nations of Europe. This new peril has originated from several causes. The discovery of the mariners compass, and the improvements which have occurred in navigation, have brought the nations of Asia, as it were, nearer to those of this north-west corner of the globe, and exposed them in a greater degree to their attacks. The nations of Europe, also, from their better government, and from a religion which prohibits polygamy, and which, at least in the protestant states, interferes little in the affairs of this world, and confers no dominion upon its priests, have of late been enabled to make a more rapid progress in the improvement of every art, than was ever formerly done, and among the rest they have improved the terrible art of war. In the mean time, the civilized nations of Asia have been either standing still as usual, satisfied with their allotted measure of intelligence, or they have been going backward. Thus the relative strength of these two quarters of the world has been greatly altered, and should any remarkable additional improvement in the art of navigation be soon made, it is probable that all Asia will be enslaved by European nations. Should such an event take place, its first consequences will probably prove unfortunate. Europe will be corrupted, while Asia will not be reformed. Its imperfect governments, however, and its false religions, will be broken up. The superiority of the human character in European countries is so great, and the population of North America is increasing so rapidly, carrying the pursuits of science and the practice of the arts in its train, that there is little doubt the race of Europe must in a few centuries obtain the dominion of the earth. A new era, therefore, is commencing for Asia, the events of which cannot be foreseen. From the short review, however, which we have taken of that great continent, we perceive, and we perceive with satisfaction, that the most beautiful regions of this globe are by no means unfit, as was supposed, for the production of a vigorous and active race of men. The Hindoo is timid and feeble; but it is not his climate which renders him so. In the same climate with Hindoostan, and scarcely divided from it, a vigorous race of men has been found to exist, forming a rising people, eager to emulate the career of civilized and powerful nations. It is the religion of the Hindoo, therefore, that is the cause of his weakness, as the government of China is the cause of the stationary character of its people. Were these causes of feebleness removed, and above all were the art of printing diffused, the nations of the earth would probably by degrees approach nearer to a similarity of mind and talents, than they have hitherto been accounted capable of doing. Even Siberia itself, by the great tracts of fertile land which attention to its inland navigation is capable of laying open, may one day contribute to the general stock of human power and riches. It ought never to be forgotten that this globe is given as a valuable domain or possession to the human race, only in proportion to the degree in which they subdue its native wildness or sterility; and it becomes a fit and salubrious habitation for them, according to the degree in which it is improved by cultivation. The rein-deer once wandered in the forests of Germany. It cannot now live upon the shores of the Baltic, and is forced to seek a region sufficiently cold for its constitution, within the polar circle and in the neighbourhood of the Icy sea. The progress of civilization and of agriculture have accomplished this change in the climate of the north of Europe, and the descendants of Europeans may probably accomplish still greater alterations upon the north of Asia.

264 European conquests.

265 Prospect of the destiny of Asia.

Asia ‖ Asisia.

Asia Minor, or *Lesser Asia*; the same with Natolia. See Natolia.

ASIARCHÆ, (termed by St Paul, *Chief of Asia*, Acts xix. 31.) were the Pagan pontiffs of Asia, chosen to superintend and have the care of the public games, which they did at their own expence: for which reason they were always the richest and most considerable men of the community.

ASIDE, in the drama, something said by an actor, which some, or even all the other actors present are supposed not to hear; a circumstance justly condemned as being unnatural and improbable.

ASIITO, a town of Italy, in Perugia, and in the pope's territories. E. Long. 23. 40. N. Lat. 43. 0.

ASILUS, or Hornet-fly. See Entomology *Index*.

ASINARA, an island of Italy, on the western coast of Sardinia. E. Long. 8. 30. N. Lat. 41. 0.

ASINIUS Pollio, a Roman consul and orator, distinguished himself under Augustus by his exploits and his literary works. He is frequently mentioned with praises by Horace and Virgil, and is said to have collected the first library at Rome. He died at Frescati, at 80 years of age.

ASIONGABER, Esiongeber, or Eziongeber, a town of Arabia Petræa, on the bay of Elath, a part of the Arabian gulf: the dock or station for the ships of Solomon and Jehoshaphat; an ancient town, mentioned also by Moses. It was afterwards called *Berenice* (Josephus).

ASISIA, or Assisia, a town of Liburnia (Ptolemy, Antonine), now in ruins, but exhibiting many monuments of antiquity. It is the Assesia or Asseria of Pliny. This author, after having specified the Liburnian cities that were obliged to attend the congress or diet of Scardona, adds to the catalogue the free Asserians, *immunesque Asseriates;* and this people, who created their own magistrates, and were governed by their own municipal laws, were no doubt more rich and powerful than their neighbours.

The vestiges of the walls of Asseria that still remain, are a sufficient proof of this; for their circumference is clearly distinguishable above ground, and measures 3600 Roman feet. The space enclosed by them forms an oblong polygon, and they are built with common Dalmatian marble; but not taken from the hill on which they stand, for that furnishes only soft stone. The walls are invested, both inside and out, with this marble: some of the stones are ten feet long, and they are all of considerable dimensions. The thickness of these fortifications is commonly about eight feet: but at the narrowest extremity, which falls towards the foot of the hill, they are eleven feet thick; and, in some parts, their height still above ground reaches to near 30 feet. An antiquary, or even a simple lover of the fine arts, or of erudition, the abbé Fortis observes, cannot help wishing at Podgraje (the modern name of Asseria),

Asisia ‖ Asna.

Asserіa), that some powerful hand *quicquid sub terra est in apertum proferit:* and such a wish becomes stronger when he reflects, that since the destruction of that city no search has ever been made under ground, with a view to discover any thing curious; and yet these walls without doubt enclose a valuable deposite of antiquities, thrown down in heaps, who knows by what cause; perhaps naturally, by an earthquake, or perhaps by a sudden inundation of barbarians, which is still worse. The gate now demolished, the considerable height of the walls to be seen in several places from without, some pieces of thick walls that still appear levelled to the ground among the bushes, are circumstances which give ground to hope that many costly monuments might be recovered out of these ruins. The magnificence of the remaining wall, and the many pieces of well-cut stone and fine marbles scattered over the contiguous fields, afford sufficient proof that both good taste and grandeur once flourished in that country. In the midst of the rubbish which covers the remains of Asseria, the parish church of the little village stands insulated; it is built of broken pieces of ancient ruins, taken as they happened to be nearest, mixed with mutilated inscriptions and fragments of noble cornices.

ASISIO, or ASITO, a city of the pope's territories in Italy, situated about 16 miles east of Perugia. E. Long. 13. 35. N. Lat. 43.

ASKELON. See ASCALON.

ASKERON, a place five miles from Doncaster, noted for a medicinal spring. It is a strong sulphureous water, and is slightly impregnated with a purging salt. It is recommended internally and externally in strumous and other ulcers, scabs, leprosy, and similar complaints. It is good in chronic obstructions, and in cases of worms and foulness of the bowels.

ASKRIG, a town in the north riding of Yorkshire. W. Long. 0. 5. N. Lat. 53. 50.

ASLANI, in *Commerce*, a silver coin, worth from 115 to 120 aspers. See ASPER.

ASMONEUS, or ASSAMONEUS, the father of Simon, and chief of the Asmoneans, a family that reigned over the Jews 126 years.

ASNA, or ESNA, a town in Upper Egypt, seated upon the Nile, and occupying the site of the ancient Latopolis. It is near the cataracts of the Nile, and is the last place of any magnitude on the side of Nubia. It contains several monuments of antiquity; and among the rest an ancient Egyptian temple, pretty entire, all painted throughout, except in some places that are effaced by time. The columns are full of hieroglyphic figures. This structure is considered by Denon as one of the most perfect monuments of ancient architecture he had seen. A little way from thence are the ruins of an ancient nunnery, said to be built by St Helena, surrounded with tombs.—Asna is the principal town in these parts, and the inhabitants are rich in corn and cattle. They drive a considerable trade into Lower Egypt and Nubia, by means of the Nile, and also by the caravans that pass over the desert. The inhabitants are all Arabs, except about 200 Copts, the ancient inhabitants, and a sort of Christians. They are under the government of the Turks, who have a cadi, and the Arabs have two scheriffs of their own nation. E. Long. 32. 35. N. Lat. 23. 15.

Asola ‖ Asow.

ASOLA, a town of the Bressan in Italy, belonging to the republic of Venice. E. Long. 14. 18. N. Lat. 45. 15.

ASOSO, a town of Italy, in the Trevisan, seated on a mountain 17 miles north-west of Treviso, and 10 north-east of Bassano. E. Long. 12. 2. N. Lat. 45. 49.

ASOPH, a town of Cuban Tartary, in Asia, seated on the river Don, near its mouth, a little to the east of the Palus Mæotis, or sea of Asoph. It has been several times taken and retaken of late years; but in 1739, the contending powers agreed that the fortifications should be demolished; and the town remains under the dominion of Russia. E. Long. 39. 5. N. Lat. 47. 18.

ASOPUS, a river of Phrygia Major, which, together with the Lycus, washes Laodicea, (Pliny).—Another of Bœotia, which running from Mount Cithæron, and watering the territory of Thebes, separates it from the territory of Platæa, and falls with an east course into the Euripus, at Tanagra. On this river Adrastus king of Sicyon built a temple to Nemesis, thence called *Adrasteia.* From this river Thebes came to be surnamed *Asopides*, (Strabo). It is now called *Asopo.* A third Asopus, a river of Peloponnesus, which runs by Sicyon, (Strabo); and with a north-west course falls into the Sinus Corinthiacus, to the west of Corith.—A fourth, a small river of the Locri Epicnemidii, on the borders of Thessaly, (Pliny); rising in Mount Oeta, and falling into the Sinus Maliacus.

ASOPUS, a town of Laconia, (Pausanias); on the Sinus Laconicus, with a port in a peninsula, between Boæ to the east, and the mouth of the Eurotas to the west. The citadel only remains standing, now called by the sailors *Castel Rampano.*

ASOR, or HASOR, in *Ancient Geography*, a town of the tribe of Judah, to the south-west, on the borders of Ascalon, (Joshua); as also Hasor-Hadata, translated by the Seventy Ασωρ Καινη (id).—Another Asor, Asorus, or Hazor, a town of Galilee; called the capital of all the kingdoms to the north of Palestine. It was taken by Joshua; the inhabitants were put to the sword, and their houses burnt. It was afterwards rebuilt (Judges, 1 Sam.); but remained still in the hands of the Canaanites, though in the lot of the tribe of Naphtali, (Joshua). It lay to the north of the Lacus Samachonites, called in Scripture the *Waters of Merom* (Josephus).

ASOW, a celebrated and important fortress of Russia, once a place of considerable trade, but now demolished. It was situated in the district of Bachmut, near the place where the Greeks many centuries ago built the city of Tanais, which was very famous for its trade, and underwent many vicissitudes. The Genoese, who settled a trade with Russia soon after the discovery of Archangel by Captain Chancellor, became masters of this place, and gave it the name of *Tana* or *Catana:* but the Tartars, who were very powerful in these parts, seem to have been in possession of it long before: for, as Busching informs us, there are Asow coins yet extant, on which is the name of *Tacktamyss Kan.* From the Genoese it fell into the hands of the Turks, lost its

Asow || Aspasia.

its trade, and became an inconsiderable town. In 1637, it was taken by the Cossacks, who defended it against the Turks in 1641, and next year set fire to it, and blew it up. The Turks rebuilt it with strong fortifications. The Russians laid claim to it in 1672, and took it in 1696; but, by the treaty of Pruth in 1711, it was restored to the Turks. In 1736, the Russians became masters of Asow; but by the treaty of Belgrade they were obliged to relinquish it, and entirely destroy the place.

ASP, in *Natural History*, a small poisonous kind of serpent, whose bite gives a speedy but easy death. It is said to be thus denominated from the Greek ασπις, *shield*, in regard to the manner of its lying convolved in a circle, in the centre of which is the head, which it exerts, or raises, like the umbo or umbilicus of a buckler. This species of serpent is very frequently mentioned by authors; but so carelessly described, that it is not easy to determine which, if any of the species known at present, may properly be called by this name. It is said to be common in Africa, and about the banks of the Nile; and Bellonius mentions a small species of serpent which he had met with in Italy, and which had a sort of callous excrescence on the forehead, which he takes to have been the aspis of the ancients. It was with the asp that Cleopatra is said to have despatched herself, and prevented the designs of Augustus, who intended to have carried her captive to adorn his triumphal entry into Rome. But the fact is contested: Brown places it among his vulgar errors. The indications of that queen's having used the ministry of the asp, were only two almost insensible pricks found in her arm; and Plutarch says it is unknown what she died of. At the same time, it must be observed, that the slightness of the pricks found in her arm furnishes no presumption against the fact; for no more than the prick of a needle point dipt in the poison was necessary for the purpose.

Lord Bacon makes the asp the least painful of all the instruments of death. He supposes it to have an affinity to opium, but to be less disagreeable in its operation; and his opinion seems to correspond with the accounts of most writers, as well as with the effects described to have been produced upon Cleopatra.

The ancients had a plaster called δι Ασπιδων, made of this terrible animal, of great efficacy as a discutient of strumæ and other indurations, and used likewise against pains of the gout. The flesh, and skin or exuviæ, of the creature, had also their share in the ancient materia medica.

ASPA, a town of Parthia, (Ptolemy), now *Ispahan*, (Holstenius). In Ptolemy the latitude seems to agree, being 33°; but whether the longitude does, is a question. E. Long. 51. 0. N. Lat. 32. 30.

ASPALATHUS, African Broom. See Botany *Index*.

ASPARAGUS, Sparagus, or Sparrow-grass. See Botany *Index*.

ASPASIA of Miletus, a courtesan who settled at Athens under the administration of Pericles, and one of the most noted ladies of antiquity. She was of admirable beauty: yet her wit and eloquence, still more than her beauty, gained her extraordinary reputation among all ranks in the republic. In eloquence she surpassed all her contemporaries; and her conversation was so entertaining and instructive, that notwithstanding the dishonourable commerce she carried on in female virtue, persons of the first distinction, male and female, resorted to her house as to an academy: she even numbered Socrates among her hearers and admirers. She captivated Pericles, in such a manner, that he dismissed his own wife, in order to espouse her; and, by her universal knowledge, irresistible elocution, and intriguing genius, she in a great measure influenced the administration of Athens. She was accused of having excited, from motives of personal resentment, the war of Peloponnesus; yet, calamitous as that long and obstinate conflict proved to Greece, and particularly to Athens, it may be suspected that Aspasia occasioned still more incurable evils to both. Her example, and still more her instructions, formed a school at Athens by which her dangerous profession was reduced into system. The companions of Aspasia served as models for painting and statuary, and themes for poetry and panegyric. Nor were they merely the objects, but the authors of many literary works, in which they established rules for the behaviour of their lovers, particularly at table; and explained the art of gaining the heart and captivating the affections. The dress, behaviour, and artifices of this class of women, became continually more seductive and dangerous; and Athens thenceforth remained the chief school of vice and pleasure, as well as of literature and philosophy.

Aspasia || Asperifoliate.

ASPASTICUM, (from ασπαζομαι, "I salute,") in ecclesiastical writers, a place, or apartment, adjoining to the ancient churches, wherein the bishop and presbyters sat, to receive the salutations of the persons who came to visit them, desire their blessing, or consult them on business.—This is also called *aspasticum diaconicum*, *receptorium*, *metatorium*, or *mesatorium*, and *salutatorium:* in English, "greeting-house."

ASPECT, in *Astronomy*, denotes the situation of the planets and stars with respect to each other.

There are five different aspects. 1. Sextile aspect is when the planets or stars are 60°-distant, and marked thus *. 2. The quartile, or quadrate, when they are 90° distant, marked □. 3. Trine, when 120° distant, marked △. 4. Opposition, when 180° distant, marked ☍. And, 5. Conjunction, when both in the same degree, marked ☌.

Kepler, who added eight new ones, defines aspect to be the angle formed by the rays of two stars meeting on the earth, whereby their good or bad influence is measured: for it is to be observed, that these aspects being first introduced by astrologers, were distinguished into benign, malignant, and indifferent; the quartile and opposition being accounted malign; the trine and sextile, benign or friendly; and the conjunction, indifferent.

ASPEN tree. See Populus, Botany *Index*.

ASPER, in *Grammar*, an accent peculiar to the Greek language, marked thus (ʽ); and importing that the letters over which it is placed ought to be strongly aspirated, or pronounced as if an *h* were joined with them.

Asper, or *Aspre*, in *Commerce*, a Turkish coin, three of which make a Medine.

ASPERIA arteria, in *Anatomy*, the same with the windpipe or trachea. See Anatomy *Index*.

ASPERIFOLIATE, or Asperifolious, among botanists, such plants as are rough-leaved, having their leaves

Asperifoliate || Asphaltites.

leaves placed alternately on their stalks, and a monopetalous flower divided into five parts.—They constitute an order of plants in the *Fragmenta methodi naturalis* of Linnæus, in which are these genera, viz. tournefortia, cerinthe, symphytum, pulmonaria, anchusa, lithospermum, myosotis, heliotropium, cynoglossum, asperugo, lycopsis, echium, borrago: *magis minusve oleraceæ, mucilaginosæ, et glutinosæ sunt.* Lin. In the present system, these are among the pentandria monogynia.

ASPERIFOLIÆ PLANTÆ, rough-leaved plants; the name of a class in Hermannus, Boerhaave, and Ray's methods, consisting of plants which have four naked seeds, and whose leaves are rough to the touch.

In Tournefort's System, these plants constitute the third section or order of the second class; and in Linnæus's Sexual Method, they make part of the pentandria monogynia.

ASPERITY, the inequality of the surface of any body, which hinders the hand from passing over it freely.—From the testimony of some blind persons, it has been supposed that every colour hath its particular degree of asperity: though this has been denied by others. See the article BLIND.

ASPEROSA, a town of Turkey in Europe; it is a bishop's see, situated on the coast of the Archipelago. E. Long. 25. 20. N. Lat. 40. 58.

ASPERUGO, SMALL WILD BUGLOSS. See BOTANY *Index*.

ASPERULA, WOODROOF. See BOTANY *Index*.

ASPHALTITES, so called from the great quantity of bitumen it produces; called also the *Dead sea;* and from its situation, the *East sea*, the *Salt sea*, the *sea of Sodom*, the *sea of the Desert*, and the *sea of the Plain*, in the sacred writings: A lake of Judea.

Many things have been said and written of this famed, or, if they were indeed true, rather infamous lake: such as that it arose from the submersion of the vale of Siddim, where once stood, as is commonly reported, the three cities which perished in the miraculous conflagration, with those of Sodom and Gomorrah, for their unnatural and detestable wickedness: on which account this lake has been looked upon as a lasting monument of the just judgment of God, to deter mankind from such abominations. Hence it is added, that the waters of the lake are so impregnated with salt, sulphur, and other bituminous stuff, that nothing will sink or live in it; and that it casts such stench and smoke, that the very birds die in attempting to fly over it. The description likewise of the apples that grew about it, fair, without, and only ashes and bitterness within, were looked upon as a farther monument of God's anger. So likewise the description which many travellers give not only of the lake, but of all the country round about, of the whole appearing dreadful to behold, all sulphureous, bituminous, stinking, and suffocating: and lastly, what hath been farther affirmed of the ruins of the five cities being still to be seen in clear weather, and having been actually seen in these latter times; all these surprising things, and ill-grounded notions, though commonly, and so long, received among Christians, have been of late so much exploded, not only by the testimony of very credible witnesses, but even by arguments drawn from Scripture, that we must give them up as inventions, unless we will suppose the face and nature of all these things to have been entirely changed. Those, in particular, of bodies not sinking in the water, and of birds being stifled by the exhalations of it, appear now false in fact, though it is true, that the quantity of saline matters, with which it is impregnated, renders it so much specifically heavier than fresh water, that bodies will not so easily sink. Its waters were found, by Dr Marcet in 1807, to have a specific gravity of 1,211; but Klaproth, a German chemist, found it to be 1,245, which is much higher than that of sea water. But objects of all kinds above this specific gravity are found to sink in it; birds fly over it without injury, and according to Chateaubriand fishes live in it. The substances it holds in solution are nearly the same as are found in sea water; muriates of lime, of soda, and of magnesia. To reconcile these things with the experiments which Pliny* tells us had been made by Vespasian, is impossible, without supposing that those ingredients have been since much exhausted, which is not very probable. With respect to its salt, we are told, the Arabs make quantities of it from that lake, in large pits about the shore, which they fill with that water, and leave to be crystallized by the sun. This salt is in some cases much commended by Galen, as very wholesome, and a strengthener of the stomach, &c. on account of its unpleasant bitterness.

Asphaltites.

*Nat. Hist. lib. v. cap. 15.

What likewise relates to the constant smoke ascending from the lake, its changing the colour of its water three times a-day, so confidently affirmed by Josephus† and other ancients, and confirmed by Prince Radziville and other moderns, who pretend to have been eye-witnessess of it, is all now in the same manner exploded by authors of more modern date, and of at least equal candour. The unhealthiness of the air about the lake was affirmed by Josephus and Pliny, especially on the west; the monks that live in the neighbourhood confirm the same, and would have dissuaded Dr Pococke from going to it on that account; and, as he ventured to go and bathe in it, and was two days after seized with a dizziness, and violent pain in the stomach, which lasted near three weeks, they made no doubt but it was occasioned by it; and he doth not seem to contradict them. As to the water, it is, though clear, so impregnated with salt, that those who dive into it come out covered with a kind of saline matter. There is one remarkable thing relating to this lake, generally agreed on by all travellers and geographers, viz. that it receives the waters of Jordan, a considerable river, the brooks of Jabbok, Kishon, Arnon, and other springs, which flow into it from the adjacent mountains, and yet never overflows, though there is no visible way to be found by which it discharges that great influx. Some naturalists have been greatly embarrassed to find a discharge for these waters; and have therefore been inclined to suspect the lake had a communication with the Mediterranean. But, besides that we know of no gulf to corroborate this supposition, it has been demonstrated, by accurate calculation, that evaporation is more than sufficient to carry off the waters brought by the river. It is, in fact, very considerable; and frequently becomes sensible to the eye, by the fogs with which the lake is covered at the rising of the sun, and which are afterwards dispersed by the heat. It is enclosed on the east and west with exceeding high mountains, many of them craggy and dreadful to behold.

† *Bell. Jud. lib. v. cap. 5.*

Asphaltites. hold. On the north it has the plain of Jericho; or, if we take in both sides of the Jordan, it has the Great Plain, properly so called, on the south; which is open, and extends beyond the reach of the eye. Josephus gives this lake 580 furlongs in length, from the mouth of the Jordan to the town of Segor, on the opposite end, that is about 22 leagues; and about 150 furlongs or 5 leagues, in its greatest breadth; but our modern accounts commonly give it 24 leagues in length, and 6 or 7 in breadth. On the west side of it is a kind of promontory, where they pretend to show the remains of Lot's metamorphosed wife. Josephus says, it was still standing in his time; but when Prince Radziville inquired after it, they told him there was no such salt pillar or statue to be found in all that part. However, they have found means, about a century after him, to recover, as they pretended to assure Mr Maundrell, a block or stump of it, which may in time grow up, with a little art, into its ancient bulk.

It is to be observed here, that the name of *Dead sea* is not to be found in the sacred writings; but hath been given to this lake because no creature will live in it, on account of its excessive saltness, or rather bituminous quality; for the Hebrews rank sulphur, nitre, and bitumen, under the general name of *salt*. However, some late travellers have found cause to suspect the common report of its breeding no living creature; one of them having observed, on the shore, two or three shells of fish like those of an oyster, and which he supposes to have been thrown up by the waves, at two miles distance from the mouth of the Jordan, which he there takes notice of, lest they should be suspected to have been brought into the lake by that way. And Dr Pococke, though he neither saw fish nor shells, tells us, on the authority of a monk, that some sort of fish had been caught in it; and this is confirmed by Chateaubriand, who visited the shores of the lake in 1807. Mr Volney, however, affirms that it contains neither animal nor vegetable life. We see no verdure on its banks, nor are fish to be found within its waters. But he adds, that it is not true that its exhalations are pestiferous, so as to destroy birds flying over it. "It is very common (says he) to see swallows skimming its surface, and dipping for the water necessary to build their nests. The real cause which deprives it of vegetables and animals is the extreme saltness of the water, which is infinitely stronger than that of the sea. The soil around it, equally impregnated with this salt, produces no plants; and the air itself, which becomes loaded with it from evaporation, and which receives also the sulphureous and bituminous vapours, cannot be favourable to vegetation: hence the deadly aspect which reigns around this lake. In other respects, the ground about it, however, is not marshy; and its waters are limpid and incorruptible, as must be the case with a dissolution of salt. The origin of this mineral is easy to be discovered; for on the south-west shore are mines of fossil salt, of which I have brought away several specimens. They are situated in the side of the mountains which extend along that border; and, from time immemorial, have supplied the neighbouring Arabs, and even the city of Jerusalem. We find also on this shore fragments of sulphur and bitumen, which the Arabs convert into a trifling article of commerce; as also hot fountains, and deep crevices, which are discovered at a distance by little pyramids built on the brink of them. We likewise find a sort of stone, which, on rubbing, emits a noxious smell, burns like bitumen, receives a polish like white alabaster, and is used for the paving of court-yards. At intervals, we also meet with unshapen blocks, which prejudiced eyes mistake for mutilated statues, and which pass with ignorant and superstitious pilgrims for monuments of the adventure of Lot's wife; though it is nowhere said she was metamorphosed into stone like Niobe, but into salt, which must have melted the ensuing winter."

Asphaltites, Asphaltum.

It is on account of this bitumen that it hath had the name of *Asphaltite lake*, it being reported to have thrown up great quantities of that drug, which was much in use among the Egyptians, and other nations, for embalming of dead bodies. Josephus assures us, that in his days it rose in lumps as big as an ox without its head, and some even larger. But whatever it may have formerly done, we are assured by Mr Maundrell and others, that it is now to be found but in small quantities along the shore, though in much greater near the mountains on both sides the lake. But the contrary is since affirmed by two or more late * travellers; one of whom tells us, that it is observed to float on the surface of the water, and to come on the shore after windy weather, where the Arabians gather it, and put it to all the uses that common pitch is used for, even in the composition of some medicines; and another † tells us, he was there informed, that it was raised at certain times from the bottom, in large hemispheres, which, as soon as they touch the surface, and are acted upon by the external air, burst at once, with great noise and smoke like the *pulvis fulminans* of the chemists, dispersing themselves about in a thousand pieces. From both these judicious authors we may conclude the reason of Mr Maundrell's mistake, both as to the lake's throwing it up only on certain seasons (that reverend gentleman might chance to be there at the wrong time); and likewise as to his not observing it about the shores, seeing the Arabs are there ready to gather it as soon as thrown up: all of them describe it as resembling our black pitch, so as not to be distinguished from it but by its sulphureous smoke and stench when set on fire; and it has been thought to be the same with that which our druggists sell under the name of *bitumen Judaicum*, or *Jewish pitch*, though we have reason to think that this last is factitious, and that there is now none of the right asphaltum brought from Judea.

* *Pococke's Travels*, p. 56.

† *Shaw's Travels*, p. 374.

It hath, moreover, been confounded with a sort of blackish combustible stone thrown on the shore, and called by some *Moses's stone*, which being held in the flame of a candle, will soon burn, and cast a smoke and intolerable stench; but with this extraordinary property, that though it loses much of its weight and colour, it becoming in a manner white, yet it diminishes nothing in its bulk. But these, Dr Pococke tells us, are found about two or three leagues from the shore. He concludes, however, from it, that a *stratum* of that stone under the lake is probably one part of the matter that feeds the subterraneous fire, and causes the bitumen to boil up out of it. See Asphaltites, Supplement.

ASPHALTUM, Bitumen Judaicum, or Jews Pitch, is a light solid bitumen, of a dusky colour on the outside, and a deep shining black within; of very

Asphaltum ‖ Aspicueta.

little taste; and having scarcely any smell, unless heated, when it emits a strong pitchy one. It is found in a soft or liquid state on the surface of the Dead sea, and by age grows dry and hard. The same kind of bitumen is met with likewise in the earth, in other places of the world, in China, America, and in some places of Europe, as the Carpathian hills, France, Neufchatel, &c. There are several kinds of Jews pitch in the shops: but none of them are the genuine sort, and have little other title to their name than their being artificially compounded by Jews; and as they are a medley of we know not what ingredients, their medicinal use begins to be deservedly laid aside, notwithstanding the discutient, resolvent, pectoral, and other virtues attributed to this bitumen by the ancients. The true asphaltum was formerly used in embalming the bodies of the dead. The thick and solid asphalta are at present employed in Egypt, Arabia, and Persia, as pitch for ships; as the fluid ones, for burning in lamps, and for varnishes. Some writers relate, that the wall of Babylon, and the temple of Jerusalem, were cemented with bitumen instead of mortar. This much is certain, that a true natural bitumen, that for instance which is found in the district of Neufchatel, proves an excellent cement for walls, pavements, and other purposes, uncommonly firm, very durable in the air, and not penetrable by water. The watch and clock makers use a composition of asphaltum, fine lamp black, and oil of spike or turpentine, for drawing the black figures on dial plates: this composition is prepared chiefly by certain persons at Augsburg and Nuremberg. See the preceding article.

ASPHODELUS, Asphodel, or King's Spear. See Botany *Index*.

ASPHURELATA, in *Natural History*, are semimetallic fossils, fusible by fire, and not malleable in their purest state, being in their native state intimately mixed with sulphur and other adventitious matter, and reduced to what are called *ores*.

Of this series of fossils there are only five bodies, each of which makes a distinct genus; viz. antimony, bismuth, cobalt, zinc, and quicksilver.

ASPICUETA, Martin de, commonly called the Doctor of Navarre, or *Doctor Navarrus*, was descended of a noble family, and born the 13th of December 1491, at Varasayn, a small city of Navarre, not far from Pampeluna. He entered very young into the monastery of regular canons at Roncevaux, where he took the habit, which he continued to wear after he left the convent. He studied classical learning, natural and moral philosophy, and divinity, at Alcala, in New Castile, adopting chiefly the system of Petrus Lombardus, commonly called the *Master of the Sentences*. He applied to the study of the law at Ferrara, and taught it with applause at Toulouse and Cahors. After being first professor of canon law at Salamanca for 14 years, he quitted that place to be professor of law at Coimbra, with a larger salary. The duties of this office he discharged for the space of 20 years, and then resigned it to retire into his own country, where he took care of his nieces, the daughters of his deceased brothers. Having made a journey to Rome to plead the cause of Bartholomeo de Caranza archbishop of Toledo, who had been accused of heresy before the tribunal of the inquisition in Spain, and whose cause was, by the Pope's order, to be tried in that city, Aspicueta's writings, which were well known, procured him a most honourable reception. Pope Pius V. made him assistant to Cardinal Francis Aciat, his vice penitentiary; and Gregory XIII. never passed by his door without calling for him, and stopped sometimes a whole hour to talk with him in the street. His name became so famous, that even in his lifetime the highest encomium on a learned man was to call him a *Navarrus*. He was consulted as an oracle. By temperance he prolonged his life to a great length. His economy enabled him to give substantial proofs of his charity. Being very old, he used to ride on a mule through the city, and relieved all the poor he met; to which his mule was so well accustomed, that it stopped of its own accord at the sight of every poor man, till his master had relieved him. He refused several honourable posts in church and state, that he might have leisure to correct and improve the works he had already written, and compose others. He died at the age of 94, on the 21st of June 1586. He wrote a vast number of treatises, all which are either on morality or common law.

Aspicueta ‖ Assassin.

ASPIRATE, in *Grammar*, denotes words marked with the spiritus asper. See Asper.

ASPIRATION, among grammarians, is used to denote the pronouncing a syllable with some vehemence.

ASPLENIUM, Ceterach. See Botany *Index*.

ASS, in *Zoology*, is ranged as a species of equus, or horse. See Mammalia *Index*.

Coronation of the Ass, in antiquity, was a part of the ceremony of the feast of Vesta, wherein the bakers put bread crowns on the heads of these quadrupeds; *Ecce coronatis panis dependet asellis**. Hence, in an ancient calendar, the ides of June are thus denoted; *Festum est Vestæ. Asinus coronatur!*—This honour, it seems, was done the beast, because, by its braying, it had saved Vesta from being ravished by the Lampsacan god. Hence the formula, *Vestæ delicium est asinus*.

* *Ovid. Fast.* vi. 311.

ASSAI, in *Music*, signifies quick; and, according to others, that the motion of the piece be kept in a middle degree of quickness or slowness. As, *assai allegro, assai presto*. See Allegro and Presto.

ASSAM, a kingdom of eastern Asia. See Supplement.

ASSANCALA, a strong town in Armenia, near the river Arras, in the road between Erzerum and Erivan, and noted for its hot baths. It stands on a high hill, and has walls round it, strengthened with towers. E. Long. 41. 30. N. Lat. 39. 46.

ASSANCHIF, a town of Asia, in Diarbekir, seated on the river Tigris. E. Long. 42. 30. N. Lat. 37. 20.

ASSANS. See Assens.

ASSARIUM, in antiquity, denotes a small copper coin, being a part or diminutive of the *as*. The word ασσαριον is used by Suidas indifferently with οβολος and νομισμα, to denote a small piece of money; in which he is followed by Cujacius, who defines ασσαριον by *Minimus æris nummus*. We find mention of the assarion in the gospel of St Matthew, chap. x. ver. 29.

ASSARON, or Omer, a measure of capacity, in use among the Hebrews, containing five pints. It was the measure of manna which God appointed for every Israelite.

ASSASIN, or Assassin, a person who kills another

Assassin. ther with the advantage either of an inequality in the weapons, or by means of the situation of the place, or by attacking him at unawares.

The word *assassin* is said by some to have been brought from the Levant, where it took its rise from a certain prince of the family of the *Arsacidæ*, popularly called *Assassins*, living in a castle between Antioch and Damascus, and bringing up a number of young men, ready to pay a blind obedience to his commands; whom he employed in murdering the princes with whom he was at enmity. But according to Mr Volney, the word *Hassassin* (from the root *hass*, "to kill, to assassinate, to listen, to surprise,") in the vulgar Arabic signifies "Robbers of the night," persons who *lie in ambush to kill;* and is very universally understood in this sense at Cairo and in Syria. Hence it was applied to the *Batenians*, who slew by surprise. See the next article.

There was a certain law of nations, an opinion, received in all the republics of Greece and Italy, whereby he that assassinated an usurper of the supreme power was declared a virtuous man. At Rome especially, after the expulsion of the kings, the law was formal and solemn, and instances of it admitted. The commonwealth armed the hand of any citizen, and created him a magistrate for that moment.

Assassins, a tribe or clan in Syria, called also *Ismaelians* and *Batanists* or *Batenians*. These people probably owed their origin to the Karmatians, a famous heretical sect among the Mahometans, who settled in Persia about the year 1090; whence, in process of time, they sent a colony into Syria, where they became possessed of a considerable tract of land among the mountains of Lebanon, extending itself from the neighbourhood of Antioch to Damascus.

The first chief and legislator of this remarkable tribe appears to have been Hassan Sabah, a subtile impostor, who by his artifices made fanatical and implicit slaves of his subjects. Their religion was compounded of that of the Magi, the Jews, the Christians, and the Mahometans; but the capital article of their creed was to believe that the Holy Ghost resided in their chief; that his orders proceeded from God himself, and were real declarations of his divine pleasure. To this monarch the orientals gave the name of *Scheik;* but he is better known in Europe by the name of the *Old Man of the Mountain*. His dignity, instead of being hereditary, was conferred by election, where merit, that is, a superior multiplicity and enormity of crimes, was the most effectual recommendation to a majority of suffrages.

This chief, from his exalted residence on the summit of Mount Lebanon, like a vindictive deity, with the thunderbolt in his hand, sent inevitable death to all quarters of the world; so that from one end of the earth to the other, caliphs, emperors, sultans, kings, princes, Christians, Mahometans, and Jews, every nation and people, execrated and dreaded his sanguinary power, from the strokes of which there was no security. At the least suggestion or whisper that he had threatened the death of any potentate, all immediately doubled their guards, and took every other precaution in their power. It is known that Philip Augustus king of France, on a premature advice that the scheik intended to have him assassinated, instituted a new body-guard of men distinguished for their activity and courage, called *sergens d'armes*, with brass clubs, bows and arrows: and he himself never appeared without a club, fortified either with iron or gold. Most sovereigns paid secretly a pension to the scheik, however scandalous and derogatory it might be to the lustre of majesty, for the safety of their persons. The Knights Templars alone dared to defy his secret machinations and open force. Indeed they were a permanent dispersed body, not to be cut off by massacres or assassinations. Assassin.

This barbarous prince was furnished with resources unknown to all other monarchs, even to the most absolute despotic tyrant. His subjects would prostrate themselves at the foot of his throne, requesting to die by his hand or order, as a favour by which they were sure of passing into paradise. On them if danger made any impression, it was an emulation to press forward; and if taken in any enterprise, they went to the place of execution with a magnanimity unknown to others. Henry count of Champagne, who married Isabella daughter of Amaury king of Jerusalem, passing over part of the territory of the Assassins in his way to Syria, and talking highly of his power, their chief came to meet him. "Are your subjects (said the old man of the mountain) as ready in their submission as mine?" and without staying for an answer, made a sign with his hand, when ten young men in white, who were standing on an adjacent tower, instantly threw themselves down. On another occasion, Sultan Malek-Shah summoning the scheik to submit himself to his government, and threatening him with the power of his arms, should he hesitate to comply; the latter very composedly turning himself towards his guards, said to one of them, "Draw your dagger, and plunge it into your breast;" and to another, "Throw yourself headlong from yonder rock." His orders were no sooner uttered than they were joyfully obeyed: and all the answer he deigned to give the sultan's envoy was, "Away to thy master, and let him know I have many thousand subjects of the same disposition." Men so ready to destroy themselves were equally alert and resolute in being the ministers of death to others. At the command of their sovereign, they made no difficulty of stabbing any prince, even on his throne; and being well versed in the different dialects, they conformed to the dress and even the external religion of the country, that they might with less difficulty strike the fatal blow required by their chief. With the Saracens they were Mahometans; with the Franks, Christians: in one place they joined with the Mamelukes; in another, with the ecclesiastics or religious; and under this disguise seized the first opportunity of executing their sanguinary commission. Of this we meet with an instance, in the history of Saladin, while he was besieging Manbedge, the celebrated Hieropolis of antiquity. Being one day, with a few attendants, and they at some distance, reconnoitring the place for the better disposition of the attack, a man rushed on him with a dagger in his hand, and wounded him on the head; but the sultan, as he was endeavouring to repeat his stroke, wrested the dagger from him, and, after receiving several wounds, laid him dead at his feet. Before the sultan had well recovered himself, a second encountered him to finish the treachery of the former;

Assassins ‖ Assay.

but he met with the same fate: he was succeeded with equal fury by a third, who also fell by the hand of that magnanimous prince whom he was sent to assassinate. And it was observed that these wretches dealt about their fruitless blows as they lay in the agonies of death. With such rapidity was this transacted, that it was over before Saladin's guards could come to his assistance. He retired to his tent, and in great perturbation throwing himself on his sofa, ordered his servants to take a strict view of his household, and to cashier all suspected persons; at the same time asking with great earnestness, "Of whom have I deserved such treacherous usage?" But it afterwards appeared, that these villains had been sent by the old man of the mountain; of whom the vizir Kamscheglin had purchased the murder of Saladin, to free himself from so great a warrior, whom he could not meet in the field. To animate them in their frantic obedience, the scheik, before their departure on such attempts, used to give them a small foretaste of some of the delights which he assured them would be their recompense in paradise. Delicious soporific drinks were given them; and while they lay asleep, they were carried into beautiful gardens, where every allurement invited their senses to the most exquisite gratifications. From these seats of voluptuousness, inflamed with liquor and enthusiastic views of perpetual enjoyments, they sallied forth to perform assassinations of the blackest dye.

This people once had, or at least they feigned to have, an intention of embracing the Christian religion. They reigned a long time in Persia and on Mount Lebanon. Hulaku, a khan of the Mogul Tartars, in the year 655 of the Hegira, or 1254 of the Christian era, entered their country and dispossessed them of several places; but it was not till the year 1272 that they were totally conquered. This achievement was owing to the conduct and intrepidity of the Egyptian forces sent against them by the sultan Bibaris. It has, however, been thought, that the Druses, who still reside among the eminences of Mount Lebanon, and whose religion and customs are so little known, are a remnant of those barbarians.

ASSAULT, in *Law*, is an attempt to offer to beat another, without touching him: as if one lifts up his cane or his fist in a threatening manner at another; or strikes at him, but misses him: this is an assault, *insultus*, which Finch describes to be "an unlawful setting upon one's person." This also is an inchoate violence, amounting considerably higher than bare threats; and therefore, though no actual suffering is proved, yet the party injured may have redress by action of *trespass vi et armis*, wherein he shall recover damages as a compensation for the injury.

ASSAULT, in the military art, a furious effort made to carry a fortified post, camp, or fortress, wherein the assailants do not screen themselves by any works: while the assault continues, the batteries cease, for fear of killing their own men. The *enfans perdus* march first to the assault. See *Enfans Perdus*.

ASSAY, Essay, or Say, in *Metallurgy*, the proof or trial of the goodness, purity, value, &c. of metals and metalline substances. See Essay.

In ancient statutes this is called *touch;* and those who had the care of it *keepers of the touch*.—Under Henry VI. divers cities were appointed to have touch for wrought silver-plate, 2 Hen. VI. c. 14.—By this, one might imagine they had no better method of assaying than the simple one by the touchstone; but the case is far otherwise. In the time of King Henry II. the bishop of Salisbury, then treasurer, considering that though the money paid into the king's exchequer for his crown rents did not answer *numero et pondere*, it might nevertheless be mixed with copper or brass: wherefore a constitution was made, called the *trial by combustion;* which differs little or nothing from the present method of assaying silver. See a description of it in the Black Book in the Exchequer, written by Gervase of Tilbury, c. xxi. This trial is also there called *essaium*, and the officer who made it is named *fusor*. The method still in use of assaying gold and silver was first established by an act of the English parliament 1354.

Assay ‖ Assay-master.

Assaying, *Ars Docimastica*, in its extent, comprehends particular manners of examining every ore, or mixed metal, according to its nature, with the best-adapted fluxes; so as to discover, not only what metals, and what proportions of metal, are contained in ores; but likewise how much sulphur, alum, &c. may be obtained from each respectively. See Mineralogy *Index*. See also Assaying, Supplement.

Assaying is more particularly used by moneyers and goldsmiths, for the making a proof or trial by the cuppel, or test, of the fineness or purity of the gold and silver to be used in the coining of money, and manufacture of plate, &c. or that have been already used therein.

There are two kinds of assaying; the one before metals are melted, in order to bring them to their proper fineness; the other after they are struck, to see that the species be standard. For the first assay, the assayers used to take 14 or 15 grains of gold, and half a drachm of silver, if it be for money; and 18 grains of the one, and a drachm of the other, if for other occasions. As to the second assay, it is made of one of the pieces of money already coined, which they cut in four parts. The quantity of gold for an assay among us is six grains; in France nearly the same; and in Germany, about three times as much.

The proper spelling of that word, however, is Essay; under which article, therefore, the reader will find the subject more particularly treated.

Assay-Balance, or *Essay-Balance*. The flat pieces of glass often placed under the scales of an assay-balance, seem, by their power of electricity, capable of attracting, and thereby making the lighter scale preponderate, where the whole matter weighed is so very small. See *Essay-Balance*.

The electricity of a flat surface of about three inches square has been known to hold down one scale, when there were about 200 grains weight in the other. See Balance.

Assay-Master, or *Essay-Master*, an officer under certain corporations, intrusted with the care of making true touch, or assay, of the gold and silver brought to him; and giving a just report of the goodness or badness thereof. Such is the assay-master of the mint in the Tower, called also *assayer of the king*.

The assay-master of the goldsmith's company is a sort of assistant-warden, called also a *touch-warden*, appointed to survey, assay, and mark all the silver-work, &c. committed

Assay-master || Assemblies.

committed to him. There are also assay-masters appointed by statute at York, Exeter, Bristol, Chester, Norwich, Newcastle, and Birmingham, for assaying wrought plate. The assay-master is to retain eight grains of every pound troy of silver brought to him; four whereof are to be put in the pix, or box of deal, to be re-assayed the next year, and the other four to be allowed him for his waste and spillings.

Note, The number of pennyweights set down in the assay-master's report, is to be accounted as per pound, or so much in every pound of 12 ounces troy. For every 20 pennyweight, or ounce troy, the silver is found by the assay to be worse than standard or sterling, sixpence is to be deducted; because every ounce will cost so much to reduce it to standard goodness, or to change it for sterling.

In gold, for every carat it is set down to be worse than standard, you must account that in the ounce troy it is worse by so many times 3s. 8d.; and for every grain it is set down worse, you must account it worse by so many times 11d. in the ounce troy; and for every half grain $5\frac{1}{2}$d.: for so much it will cost to make it of standard goodness, &c.

ASSELYN, JOHN, a famous Dutch painter, was born in Holland, and became the disciple of Isaiah Vandervelde the battle-painter. He distinguished himself in history-painting, battles, landscapes, animals, and particularly horses. He travelled into France and Italy; and was so pleased with the manner of Bamboehio, that he always followed it. He painted many pictures at Lyons, where he married the daughter of a merchant of Antwerp, and returned with her to Holland. Here he first discovered to his countrymen a fresh and clear manner of painting landscapes, like Claude Lorraine; upon which all the painters imitated his style, and reformed the dark brown they had hitherto followed. Asselyn's pictures were so much admired at Amsterdam, that they sold there at a high price. He died in that city in 1660. Twenty-four pieces of landscapes and ruins, which he painted in Italy, have been engraved by Perelle.

ASSEMBLAGE, the uniting or joining of things together; or the things themselves so united or joined. It is also used, in a more general sense, for a collection of various things so disposed and diversified, that the whole produces some agreeable effect.

ASSEMBLY, the meeting of several persons, in the same place, upon the same design.

ASSEMBLY, in the beau-monde, an appointed meeting of fashionable persons of both sexes, for the sake of play, dancing, gallantry, conversation, &c.

ASSEMBLY, in the military art, the second beating of a drum before a march; at which the soldiers strike their tents, roll them up, and stand to arms.

ASSEMBLIES of the clergy are called *convocations*, *synods*, *councils*. The annual meeting of the church of Scotland is called a *General Assembly*: In this assembly his Majesty is represented by his Commissioner, who dissolves one meeting, and calls another, in the name of the *King*, while the Moderator does the same in the name of the *Lord Jesus Christ*.

ASSEMBLIES of the Roman people were called *comitia*.

Under the Gothic governments, the supreme legislative power was lodged in an assembly of the states of the kingdom held annually for the like purposes as our parliament. Some remains of this usage subsisted in the annual assemblies of the states of some provinces of France previous to the late revolution; but these were no more than shadows of the ancient assemblies. It is only in Great Britain, and perhaps in Sweden, that such assemblies retain their ancient powers and privileges.

Assemblies || Assets.

ASSENS, a sea-port town of Denmark, situated upon the Little Belt, a strait of the Baltic, which separates the isle of Funen from the continent. It is the common passage from the duchy of Sleswick to Copenhagen. E. Long. 10. 30. N. Lat. 55. 15.

ASSENT, in a general sense, implies an agreement to something proposed or affirmed by another.

Royal Assent, the approbation given by the king to a bill in parliament, after which it becomes a law.

ASSER, JOHN, or ASSERIUS MENEVENSIS, that is, *Asser of St David's*, bishop of Shirburn in the reign of Alfred the Great. He was born in Pembrokeshire in South Wales; and educated in the monastery of St David's by the archbishop Asserius, who, according to Leland, was his kinsman. In this monastery he became a monk, and by his assiduous application soon acquired universal fame as a person of profound learning and great abilities. Alfred, the munificent patron of genius, about the year 880, sent for him to court. The king was then at Dean in Wiltshire. He was so charmed with Asser, that he made him his preceptor and companion. As a reward for his services, he appointed him abbot of two or three different monasteries: and at last promoted him to the episcopal see of Shirburn, where he died and was buried in the year 910. He was, says Pits, a man of happy genius, wonderful modesty, extensive learning, and great integrity of life. He is said to have been principally instrumental in persuading the king to restore the university of Oxford to its pristine dignity and lustre. He wrote, *De vita et rebus gestis Alfredi*, &c. Lond. 1574, published by Archbishop Parker, in the old Saxon character, at the end of *Walsinghami hist.*——Francf. 1602, fol. Oxf. 1722, 8vo. Many other works are ascribed to this author by Gale, Bale, and Pits; but all doubtful.

ASSERIA. See ASISIA.

ASSERTION, in the language of the schools, a proposition advanced by the assertor, who avows the truth of it, and is ready to defend it.

ASSESSOR, an inferior officer of justice appointed chiefly to assist the ordinary judge with his opinion and advice.

ASSESSOR is also one who assesses, or settles taxes and other public dues.

ASSETS, in *Law*, signifies goods enough to discharge that burden which is cast upon the executor or heir, in satisfying the debts and legacies of the testator or ancestor. Assets are real or personal. Where a man hath lands in fee simple, and dies seised thereof, the lands which come to his heirs are assets real; and where he dies possessed of any personal estate, the goods which come to the executors are assets personal. Assets are also divided into *assets by descent*, and *assets in hand*. Assets by descent is where a person is bound in an obligation, and dies seised of lands which descend to the heir, the land shall be assets, and the

heir

Assets || Assiento.

heir shall be charged as far as the lands to him descended will extend. *Assets in hand* is when a man indebted makes executors, and leaves them sufficient to pay his debts and legacies; or where some commodity or profit ariseth to them in right of the testator: this is called *assets in their hands.*

ASSEVERATION, a positive and vehement affirmation of something.

ASSHETON, William, doctor of divinity, and rector of Beckenham, in Kent, was born in the year 1641, and was educated at Brazen-nose college, Oxford. After entering into orders, he became chaplain to the duke of Ormond, and was admitted doctor of divinity in 1673. Soon after, he was nominated to a prebend in the church of York, presented to the living of St Antholin, London, and to the rectory of Beckenham in Kent. He was the first projector of the scheme for providing for clergymen's widows, and others, by a jointure payable out of the mercers company. He wrote several pieces against the Papists and Dissenters, and some devotional tracts. He died at Beckenham in September 1711, in the 70th year of his age.

ASSIDEANS, or Chasidæans, (from the Hebrew *chasidim*, "merciful, pious"); those Jews who resorted to Mattathias to fight for the law of God and the liberties of their country. They were men of great valour and zeal, having voluntarily devoted themselves to a more strict observation of the law than other men. For after the return of the Jews from the Babylonish captivity, there were two sorts of men in their church; those who contented themselves with that obedience only which was prescribed by the law of Moses, and who were called *Zadikim*, i. e. the *righteous;* and those who, over and above the law, superadded the constitutions and traditions of the elders, and other rigorous observances: these latter were called *Chasidim*, i. e. the *pious.* From the former sprung the Samaritans, Sadducees, and Caraites; from the latter, the Pharisees and the Essenes.

ASSIDENT signs, in *Medicine*, are symptoms which usually attend a disease, but not always; hence differing from *pathognomic* signs, which are inseparable from the disease: e. gr. in the pleurisy, a pungent pain in the side, in an acute fever, difficulty of breathing, &c. collectively taken, are pathognomic signs; but that the pain extends to the hypochondrium or clavicle, or that the patient lies with more ease on one side than on the other, are *assident* signs.

ASSIDUUS, or Adsiduus, among the Romans, denoted a rich or wealthy person. The word in this sense is derived from *as assis*, q. d. a moneyed man. Hence we meet with *assiduous* sureties, *assidui fidejussores*, answering to what the French now call city sureties or securities, *cautions bourgeois.*

When Servius Tullius divided the Roman people into five classes, according as they were assessed or taxed to the public, the richer sort who contributed asses were denominated *assidui;* and as these were the chief people of business who attended all the public concerns, those who were diligent in attendances came to be denominated *assidui.*

ASSIENTO, a Spanish word signifying a *farm*, in commerce, is used for a bargain between the king of Spain and other powers, for importing negroes into the Spanish dominions in America, and particularly to Buenos Ayres. The first assiento was made with the French Guinea company; and, by the treaty of Utrecht, transferred to the English, who were to furnish 4800 negroes annually.

Assign || Assise.

ASSIGN, in *Common Law*, a person to whom a thing is assigned or made over.

ASSIGNATION, an appointment to meet. The word is generally understood of love-meetings.

ASSIGNEE, in *Law*, a person appointed by another to do an act, transact some business, or enjoy a particular commodity.

ASSIGNING, in a general sense, implies the making over the right of one person to another. In a particular sense, it signifies the pointing out of something; as, an error, false judgment, &c.

ASSIGNMENT, the transferring the interest one has in a lease, or other thing, to another person.

ASSIMILATION, in *Physics*, is that motion by which bodies convert other bodies related to them, or at least such as are prepared to be converted, into their own substance and nature. Thus, flame multiplies itself upon oily bodies, and generates new flame; air upon water, and produces new air; and all the parts, as well similar as organical, in vegetables and animals, first attract with some election or choice, nearly the same common or not very different juices for aliment, and afterwards assimilate or convert them to their own nature.

ASSISE, in old English law-books, is defined to be an assembly of knights, and other substantial men, together with a justice, in a certain place, and at a certain time: but the word, in its present acceptation, implies a court, place, or time, when and where the writs and processes, whether civil or criminal, are decided by judge and jury.

All the counties of England are divided into six circuits; and two judges are assigned by the king's commission, who hold their assises twice a-year in every county (except London and Middlesex), where courts of *nisi prius* are holden in and after every term, before the chief or other judge of the several superior courts; and except the four northern counties, where the assises are taken only once a-year) to try by a jury of the respective counties the truth of such matters of fact as are then under dispute in the courts of Westminster hall. These judges of assise came into use in the room of the ancient justices in eyre, *justiciarii in itinere;* who were regularly established, if not first appointed, by the parliament of Northampton, A. D. 1176, 22 Hen. II. with a delegated power from the king's great court or *aula regia*, being looked upon as members thereof: and they afterwards made their circuit round the kingdom once in seven years for the purpose of trying causes. They were afterwards directed by *magna charta*, c. 12. to be sent into every county once a-year to take or try certain actions then called *recognitions* or *assises;* the most difficult of which they are directed to adjourn into the court of common pleas to be there determined. The itinerant justices were sometimes mere justices of assise, or of dower, or of gaol-delivery, and the like; and they had sometimes a more general commission, to determine all manner of causes, *justiciarii ad omnia placita:* but the present justices of assise and *nisi prius* are more immediately derived

Assise. derived from the statute Westm. 2. 13 Edw. I. c. 30. explained by several other acts, particularly the statute 14 Edw. III. c. 16. and must be two of the king's justices of the one bench or the other, or the chief baron of the exchequer, or the king's serjeants sworn. They usually make their circuits in the respective vacations after Hilary and Trinity terms; assises being allowed to be taken in the holy time of Lent by consent of the bishops at the king's request, as expressed in statute Westm. 1. 3 Edw. I. c. 51. And it was also usual, during the times of Popery, for the prelates to grant annual licenses to the justices of assise to administer oaths in holy times: for oaths being of a sacred nature, the logic of those deluded ages concluded that they must be of ecclesiastical cognizance. The prudent jealousy of our ancestors ordained, that no man of law should be judge of assise in his own county: and a similar prohibition is found in the civil law, which has carried this principle so far, that it is equivalent to the crime of sacrilege for a man to be governor of the province in which he was born, or has any civil connexion.

The judges upon their circuits now sit by virtue of five several authorities. 1. The commission of the *peace* in every county of the circuit: and all justices of the peace of the county are bound to be present at the assises; and sheriffs are also to give their attendance on the judges, or they shall be fined. 2. A commission of *oyer* and *terminer*, directed to them and many other gentlemen of the county, by which they are empowered to try treasons, felonies, &c. and this is the largest commission they have. 2. A commission of general *gaol-delivery*, directed to the judges and the clerk of assise associate, which gives them power to try every prisoner in the gaol committed for any offence whatsoever, but none but prisoners in the gaol; so that one way or other they rid the gaol of all the prisoners in it. 4. A commission of *assise*, directed to the judges and clerk of assise, to take assises; that is, to take the verdict of a peculiar species of jury called an *assise*, and summoned for the trial of *landed* disputes. The other authority is, 5. That of *nisi prius*, which is a consequence of the commission of *assise* being annexed to the office of those justices by the statute of Westm. 2. 13 Edw. I. c. 30. And it empowers them to try all questions of fact issuing out of the courts of Westminster, that are then ripe for trial by jury. The original of the name is this; all causes commenced in the courts of Westminster-hall are by the course of the courts appointed to be there tried, on a day fixed in some Easter or Michaelmas term, by a jury returned from the county wherein the cause of action arises; but with this proviso, *nisi prius justiciarii ad assisas capiendas venerint*, *unless before* the day prefixed the judges of assise come into the county in question. This they are sure to do in the vacations preceding each Easter and Michaelmas term, and there dispose of the cause; which saves much expence and trouble, both to the parties, the jury, and the witnesses. Assise || Assithment.

The word *assise* (from the French *assis*, seated, settled, or established, and formed of the Latin verb *assideo*, "I sit by") is used in several different senses. It is sometimes taken for the sitting of a court; sometimes for its regulations or ordinances, especially those that fix the standard of weights and measures; and sometimes it signifies a jury, either because juries consisted of a fixed determinate number, or because they continued sitting till they pronounced their verdict. In Scots law, an assise or jury consists of 15 sworn men (*juratores*), picked out by the court from a great number, not exceeding 45, who have been summoned for that purpose by the sheriff, and given in a list to the defender, at serving him with a copy of his libel.

ASSISIO, an episcopal town of Italy, in the duchy of Spoleto, built on the side of a very high mountain. The cathedral of St Francis is very magnificent, and composed of three churches, one above another. E. Long. 13. 35. N. Lat. 43. 4.

ASSITHMENT, a wiregeld, or composition, by a pecuniary mulct; from the preposition *ad*, and the Sax. *sithe*, *vice*; *quod vice supplicii ad expiandum delictum solvitur*.

END OF THE SECOND VOLUME.

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