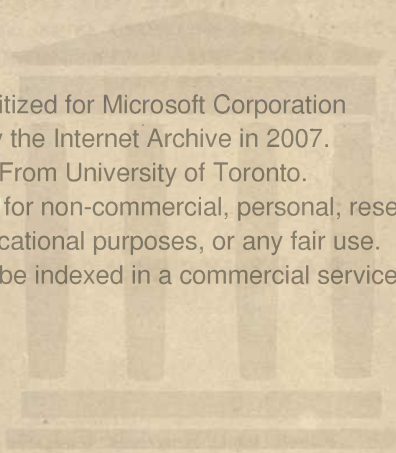


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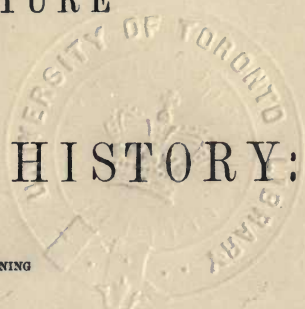
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SCRIPTURE
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NATURAL HISTORY:

CONTAINING

A DESCRIPTION OF QUADRUPEDS, BIRDS, REPTILES, AMPHIBIA,
FISHES, INSECTS, MOLLUSCOUS ANIMALS, CORALS,
PLANTS, TREES, PRECIOUS STONES,
AND METALS,

MENTIONED IN THE

HOLY SCRIPTURES.

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Illustrated by Numerous Engravings.  
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PHILADELPHIA:
PRESBYTERIAN BOARD OF PUBLICATION.

1890



NATURAL

DEPARTMENT OF GEOGRAPHY AND MINERALOGY
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CONTENTS.

	PAGE
INTRODUCTORY OBSERVATIONS,.....	9
THE ANIMAL KINGDOM,.....	11
CLASS I.—QUADRUPEDS,.....	11
CLASS II.—BIRDS,	74
CLASS III.—REPTILES AND AMPHIBIA,.....	108
CLASS IV.—FISHES,.....	126
CLASS V.—INSECTS,.....	130
CLASS VI.—MOLLUSCOUS ANIMALS,.....	156
CLASS VII.—CORALS,.....	161
THE VEGETABLE KINGDOM,.....	163
FOREST TREES,.....	204
FRUIT TREES,.....	220
THE INORGANIC KINGDOM,.....	234
PRECIOUS STONES,.....	234
METALS,.....	249
CONCLUDING REMARKS,.....	251

CONTENTS

1. INTRODUCTION 1

2. THE GENERAL PRINCIPLES 15

3. THE SPECIAL PRINCIPLES 35

4. THE THEORY OF THE 55

5. THE THEORY OF THE 75

6. THE THEORY OF THE 95

7. THE THEORY OF THE 115

8. THE THEORY OF THE 135

9. THE THEORY OF THE 155

10. THE THEORY OF THE 175

11. THE THEORY OF THE 195

12. THE THEORY OF THE 215

13. THE THEORY OF THE 235

14. THE THEORY OF THE 255

15. THE THEORY OF THE 275

16. THE THEORY OF THE 295

17. THE THEORY OF THE 315

18. THE THEORY OF THE 335

19. THE THEORY OF THE 355

20. THE THEORY OF THE 375

INDEX.

A.		PAGE		PAGE
	ADAMANT	238	Box.....	210
	Adder.....	118	Bramble	191
	Agate.....	238	Brass	249
	Alabaster	241	Brimstone	247
	Algum.....	201	Broom.....	177
	Almond	230	Buccinum	157
	Almug.....	201		
	Aloes.....	200	C.	
	Amber.....	248	Cachalot	71
	Amethyst.....	238	Calamus.....	189
	Anise	171	Camel.....	44
	Ant.....	143	Camphire	193
	Antelope	59	Cankerworm	135
	Apes	12	Carbuncle	237
	Apple	228	Carob	207
	Apples of Sodom.....	180	Cassia	199
	Ash.....	215	Caterpillar	135
	Asp.....	119	Cedar	215
	Ass	43	Cerastes	117
	Ass, Wild.....	41	Chalcedony.....	240
B.			Chameleon	114
	Baboon.....	13	Chamois.....	60
	Badger	37	Chetah	28
	Balm	194	Chimpanzee.....	13
	Balsam.....	194	Chrysolite	240
	Barbary Ape	14	Chrysoprasus.....	240
	Barley.....	164	Cinnamon.....	199
	Basilisk	118	Citron	228
	Bats.....	15	Clay.....	242
	Bay	212	Cock	93
	Beans	166	Cockatrice.....	118
	Bear	36	Cobra di Capello.....	120
	Bee.....	137	Coney.....	17
	Beetle.....	136	Copper	249
	Behemoth	62	Coral.....	161
	Beryl	238	Coriander.....	171
	Bitter Herbs.....	168	Cormorant.....	106
	Bittern.....	100	Corn	163
			Cotton	166
			Cow	48

	PAGE		PAGE
Crane	98	Gier Eagle.....	80
Crocodile	107	Gnat.....	147
Cucumbers.....	169	Goat.....	55
Cummin.....	171	Gold.....	250
Cypress	213	Gopher-wood	213
		Gourd, Wild.....	178
		Grub.....	130
D.		H.	
Daman	17	Hare.....	18
Deer.....	58	Hart	58
Derrias.....	13	Hawk.....	81
Diamond	237	——, Night.....	84
Dog.....	31	Heifer	45
Dog-fly	145	Hemlock.....	185
Dove	96	Heron	100
Dragon.....	110	Hippopotamus.....	62
Dziggtai.....	41	Hog	60
		Honey	138
E.		Hoopoe.....	90
Eagle	76	Hornet	141
Ebony	201	Horse.....	38
Elephant.....	66	Horseleech	154
Emerald	237	Hyena.....	33
Entellus.....	12	Hyssop.....	174
		I.	
F.		Ibex	57
Falcon, Peregrine.....	82	Ibis.....	103
Fallow Deer.....	58	Iron	249
Fig	225	J.	
Fir.....	214	Jacinth.....	240
Fish Hawk.....	79	Jackal	32
Fitches.....	170	Jocko	13
Flax	167	Jerboa.....	20
Flea.....	148	Jasper.....	240
Fly.....	145	Juniper.....	177
Fowl, Domestic.....	92	K.	
Fox.....	32	Kalong	16
Frankincense.....	196	Kermes.....	131
Frog	123	Kite, or Glede.....	80
Fuller's earth.....	243	L.	
		Lapwing	89
G.			
Galbanum	196		
Gall	183		
Garlick.....	167		
Gazelle	59		
Gecko.....	112		

	PAGE		PAGE
Larch.....	250	Ossifrage	78
Lead	250	Ostrich	97
Leeks	167	Ourang Outang.....	13
Lentiles	165	Owl.....	82
Leopard.....	27	Ox.....	48
———, Hunting.....	28	Oyster, Pearl.....	158
Leviathan	108		
Lice	146	P.	
Lign Aloes	200	Palm	231
Ligure.....	238	Palmer-worm.....	135
Lily	192	Partridge.....	93
Limestone.....	241	Peacock.....	91
Lion	22	Pearl.....	158
Lizards.....	111	Pelican.....	104
Locusts.....	131	Pigeon	96
		Pine.....	214
M.		Pitch.....	245
Magot.....	14	Plane tree.....	209
Man.....	11	Pomegranate	230
Mandrakes.....	179	Pygarg	59
Marble	241		
Melons	169	Q.	
Millet.....	164	Quail.....	94
Mint	171		
Mole	20	R.	
Monkeys.....	12	Raven	88
Moth.....	130	Reed.....	188
Mouse	20	Rhinoceros	69
Mulberry.....	229	River Horse.....	62
Mule.....	43	Roebuck	59
Murex	157	Rose	192
Mustard	173	Rue	171
Myrrh.....	195		
Myrtle	212	S.	
		Saffron	198
N.		Salmon.....	128
Nettle.....	177	Salt	242
Nitre.....	243	Sand Martin.....	87
Nuts	209	Sapphire... ..	237
		Sardius	236
O.		Sardonyx.....	240
Oak	205	Scorpion.....	152
Olive.....	223	Serpent... ..	115
Onions.....	167	Sesamum	171
Onycha.....	196	Shaphan	17
Onyx.....	239	Sheep.....	51
Ospray	79		

	PAGE		PAGE
Shittim.....	202	Topaz.....	237
Silver.....	250	Turpentine.....	204
Sittab	202		
Sittim	202	U.	
Skink	118	Unicorn	69
Snail.....	156		
Soap	243	V.	
Spalax	21	Vine	219
Sparrow, Common House... 85	85	Vinegar	222
Spice.....	197	Viper	119
Spider.....	149	Vulture	79
Spikenard	198		
Stacte	195	W.	
Storax.....	197	Walnut.....	208
Stork	101	Whale	70
Sulphur	247	Wheat	164
Swallow.....	86	Whelk	156
Swan.....	106	Willow	209
Sycamore.....	227	Wolf	29
		Worm	130
T.		Wormwood.....	176
Tamarisk	208		
Tares	186	Z.	
Terebinth.....	204	Zinc.....	251
Thistles	190		
Thorns	190		

SCRIPTURE NATURAL HISTORY.

INTRODUCTORY OBSERVATIONS.

THIS work is designed to direct the attention of the reader to the productions of that land where the Saviour lived, and his apostles taught, and where Abraham, David, Isaiah, and Amos testified of Jehovah. Since the days of the apostles, this land has been laid waste by war, and by famine, war's frequent attendant. Jerusalem, in fulfilment of our Saviour's prediction, was destroyed by Titus; Judea was ravaged by the Romans, and long held by that people as a conquered province. After the fall of the Roman empire, it was held by the Saracens, and became the theatre of the Crusades. It now forms part of the Turkish empire; and the debasing superstition of Mohammed prevails where Christ came to suffer and die for the sins of the world, and thus open the kingdom of heaven to those who unfeignedly believe in his merits and sacrifice.

Great as the changes in the moral, social, and religious condition of a country may be, its general aspect and its productions (unless influenced by certain causes) continue the same. Thus, in Judea, the same animals, plants, and minerals, the same natural productions exist as in the days of king Solomon, of whom we read, that "he spake of trees, from the cedar tree that is in Lebanon, even unto the hyssop that springeth out of the wall: he spake also of beasts, and of fowl, and of creeping things, and of fishes." 1 Kings iv. 33.

The natural history of every country is interesting; but our readers will surely think that of a country where holy men of old both wrote and spoke, as inspired by the Holy Spirit, where God displayed so many miracles, and where our Saviour dwelt when he took upon himself the form of a servant, to be peculiarly attractive. Indeed the force of many allusions, the propriety and beauty of many passages, cannot be fully appreciated unless we are acquainted with the habits, instincts, or real character of the natural objects referred to. Examples in point abound in the book of Job, and many in other portions of sacred writ will no doubt occur to the mind of the reader.

The whole assemblage of visible objects belonging to the earth may be arranged under three grand divisions, often called kingdoms; namely, the animal, the vegetable, and the inorganic kingdoms. Each of these kingdoms is again subdivided into secondary sections, classes, orders, and genera. Genera comprehend those species that closely agree with each other, as the tiger and the leopard, the raven and the crow, etc. By means of classification, the labour of becoming acquainted with a vast number of natural objects is rendered easier than it otherwise would be, and their characters are more readily remembered. The design, however, of this work is not to follow out minute subdivisions, nor to display, according to strict systematic arrangements, the objects of either the animal, vegetable, or inorganic kingdom. We take a far different ground; our purpose is to interest while we instruct the reader, and to afford him, in a plain and simple manner, some insight into Scripture Natural History.

THE ANIMAL KINGDOM.

CLASS I.—QUADRUPEDS:

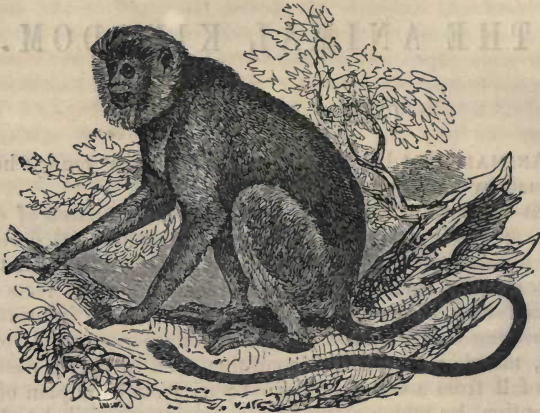
ANIMALS that breathe air, and suckle their young: hence termed by naturalists Mammalia.

At the head of class I. stands MAN, the monarch of creation, an intelligent and rational being, with a soul destined for immortality. The Holy Scriptures give us his natural history. In them we learn the most important facts connected with his creation; there we gain full information respecting God's purposes towards him, respecting his physical, moral, and spiritual condition, and ultimate destiny. His fall from a state of original purity, and the plan of redemption, by which alone he can become reconciled to God, are there fully revealed, with all that relates to his present and eternal happiness.

We must, however, proceed to the lower orders, to creatures far below man, because they are ungifted with an immortal soul, and, consequently, are neither rational nor accountable.

The Mammalia, it must be observed, though mostly terrestrial, that is tenanted the ground, are not exclusively restricted to hills, valleys, rocks, and woods; some are aquatic in their habits, and roam through the waters of the great deep, their birthplace and their home. Such are the whales and grampuses, often considered as fishes, but which in reality belong to the present class. Again, some of the Mammalia fly like birds, and give chase through the realms of air to their insect prey. Such are the bats, which by many have been looked upon as birds, or as creatures between the bird and beast, but which resemble the bird in no respect save that of being formed for flight. Thus, then, of Mammalia there are terrestrial, aquatic, and aerial.

APES.

ORDER.—*Quadrupana* or Four-handed Animals.

THE ENTELLUS.

APES. or monkeys, are mentioned among the animals brought in king Solomon's vessels to Palestine from Ophir, a country not definitely known. The words translated apes and peacocks (1 Kings x. 22 ; 2 Chron. ix. 21) seem to be originally Indian, for they are both found in the Sanscrit language. The kinds of apes and monkeys are very numerous ; as to size, some are no larger than squirrels, while others, such as the ourang-outan, are almost the size of a man. Though the notice of these animals occurs only once in the Scriptures, it is, nevertheless, most probable that the Israelites were acquainted with the kinds found in North Africa, Nubia, and Ethiopia, and certain districts of Arabia. Yet it is impossible to say what precise species was brought to Jerusalem. As Solomon was so fond of studying natural history, probably many kinds of apes and other animals, were brought to him from foreign parts. Among the more remarkable of the ape tribe are the ourang-outan, the chim-

panzee, several baboons, and the magot, of which we shall give some account.

The **OURANG-OUTAN**, OR **WILD MAN**, as the name means, possesses great muscular strength. It is found in the islands of Borneo, and Sumatra. Its body is covered with long coarse hair of a brownish-red, but the face and palms of the hands and feet are bare; the throat is swollen, the skin being loose and folded, and covering a membranous pouch, which communicates with the wind-pipe, and extends below the collar bones. Its arms are very long, so that, when standing on its legs, its fingers almost touch the ground. Its movement when walking is not that of most four-footed animals, nor of man, but something between both, as it makes use of its long arms as crutches, on which it rests while it swings its hinder extremities forward. The structure of its limbs is adapted for swinging from tree to tree, which it does with surprising address.

The **JOCKO**, OR **CHIMPANZEE**, is a native of Africa, and sometimes called the African ourang. The hair is black, the ears large, the nose flat, the mouth wide, the arms shorter, and legs more adapted for sustaining the body than those of the Indian ourang. The hair on the fore-arms is long, and directed back towards the elbows, where it meets the hair that grows from the shoulder in an opposite direction, and thus forms a kind of ruff.

The **BABOONS** are, among other particulars, distinguished from other apes by the greater length of the face and jaws, and the shape of the muzzle, which gives the whole head a close resemblance to that of a dog; hence by the Greeks and Romans they were called dog-faced monkeys.

Among these is the **DERRIAS**: this species inhabit the mountains of Arabia and Abyssinia. The face is long, bare, and of a dirty flesh-colour, with a lighter ring round the eyes; the nostrils, as in the dog, are separated by a slight furrow; the head, neck, and shoulders, and all the fore-part of the body are covered with long, shaggy hair: the tail is about half the length of the body, and is terminated by a long tuft of brown hair. Large troops of them have been found in the mountains above the Red Sea. The figure of this animal, in a sitting posture, is common on the ancient monuments of Egypt and Nubia. Small metal images of it

have been dug up in the ruins of Memphis; and embalmed mummies of the animal have also been met with.

Another quadrumanous (or four-handed) animal evidently a monkey, probably the red monkey, or nisnas, a native of Ethiopia, is also found upon the sacred monuments of ancient Egypt. The ENTELLUS is found in Hindostan and the islands of the Indian Archipelago.

The MAGOT, OR BARBARY APE, has a large projecting muzzle, like a dog; its eyes are very near each other, and deeply fixed in the head. The brows extremely thick, forehead narrow, neck short, and the body thick and muscular. It walks awkwardly on all-fours, but displays wonderful agility in climbing. It puts every thing which it does not know, or of which it has any suspicion, to its nose for the purpose of smelling it. Its natural inclination to live in flocks leads it to cherish, as if they were its own young, the little animals that are sometimes confined with it. It hugs them very carefully, and is excessively provoked if any one attempts to take them away. Its favourite amusement is cleaning its face from the slightest impurities. The average length of this animal is about two feet or two feet and a half.

From the mummies of apes being found among the relics of ancient Egypt, as well as from various testimonies, we learn that these creatures were there held in veneration; and, such is the ignorance and blind superstition of the Hindoos, that certain kinds of monkeys are worshipped by them as gods. Strange, and almost incredible as it may appear, this is the case. Temples are built for them, and hospitals provided for such as are sick and aged. To kill one of them is reckoned a capital offence. In Guzerat they come in troops into the towns, where rice, millet, and fruit are placed before them by the inhabitants. Hence, in some districts of India, they not only swarm in the woods, but even invade the gardens, despoiling them of their most delicate productions. Rendered bold by toleration, they resent the slightest molestation, and in numbers assail those who incautiously disturb them.

The mimicry and grimaces of monkeys render them amusing; and they perform astonishing feats of activity in their gambols: they leap from branch to branch, and from tree to tree, with remarkable ease, their long tails acting as a

sort of balancer in their movements. In the hotter portions of America, monkeys are abundant; and of these many kinds have tails capable of grasping the branches, from which they may be often seen hanging with the head downwards. The natives in many parts of South America, as we are assured by travellers, kill and eat these animals, having broiled them over a fire; and, revolting as the appearance of a broiled monkey is stated to be, Europeans travelling in that country have been occasionally constrained to partake of this disgusting fare.

Some of the American monkeys live in vast troops, which utter loud yellings as the night comes on, and make the gloomy forests resound with their cries. It need not be said, that the ancients were utterly unacquainted with the American kinds of these animals. Amusing as are the ape and monkey tribes generally, from their grimaces and activity, they possess no qualities, like the faithful dog, to recommend them. They are petulant, cunning, and teacherous; and many kinds, as the great baboon, are extremely ferocious, and much dreaded by the natives of those parts of Africa where they abound. That any of these animals should have been worshipped while alive, and embalmed when dead, may excite surprise and horror in the minds of our readers, but their surprise will be moderated when they reflect on the degradation and blindness of human nature, till elevated and enlightened by the revelation of God. Let us pity and pray for the heathen in darkness.

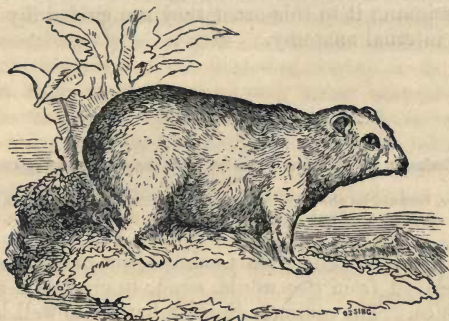
BATS.

ORDER.—*Cheiroptera*, or Wing-handed Animals.

THE bats are called by naturalists *Cheiroptera*, or hand-winged. The first notice we have of them in the Bible is in Lev. xi. 19, and again in Deut. xiv. 18, where we find them forbidden as articles of food. There is also a striking allusion to them in Isaiah ii. 18—20: "And the idols he shall utterly abolish. And they shall go into the holes of the rocks, and into the caves of the earth for fear of the Lord," etc. "In that day a man shall cast his idols of silver and his idols of gold, which they made each one for himself to worship, to the moles and to the bats." The original word

(*atelephim*) appears to denote "fliers in darkness," a very fit name for bats, which during the day hide themselves in holes and crevices, and fly abroad in the dusk or at night. They are enabled to fly by means of a membranous skin, which rises from the sides of the neck and body, and is spread between the fore-feet and their fingers. The part answering to the thumb in other animals is not lengthened like the fingers, or inclosed in the membrane, but free, short, and armed with a strong hooked claw. The hind feet are feeble, divided into five toes, with sharp-edged and pointed claws; the external ears, which are often large, form with the wings an extensive surface, nearly bare, and endued with a high degree of sensibility, which enables them to avoid striking against objects in the dark.

One of the largest animals of this class is the KALONG, which is very common in the island of Java. During the day they hang in clusters, amounting sometimes to several hundreds, under a large tree, but soon after sunset leave their roosting-place in quest of food, which consists chiefly of fruits of various kinds. The bats in our own country feed upon moths, flies, and other small insects. They drink on the wing, like swallows, and love to frequent pools and streams, not only for the sake of drinking, but for the swarms of insects that hover about such spots. In Egypt, the tombs of the ancients excavated in the rocks, their ruined temples, and the chambers in the pyramids, are tenanted by thousands of bats, which find a congenial lurking-place amidst the remains of idols, and the sculptured representations of idolatrous practices.

THE CONEY.—(*Shaphan*, or *Daman*.)ORDER.—*Pachydermata*, or Thick-skinned Animals.

THE DAMAN.

The *coney*s are but a feeble folk,
 Yet make they their houses in the rocks. Prov. xxx. 26.

And the *coney*, because he cheweth the cud, but divideth not the hoof, he is unclean to you.—Lev. xi. 5; Deut. xiv. 7.

The high hills are a refuge for the wild goats;
 And the rocks for the *coney*s.—Psalm civ. 18.

THE animal referred to in the above passages is supposed to be the daman, or Syrian hyrax, also called the rock rabbit; its colour is a brownish grey above, and white below, with a yellowish tint between. Its length is about two feet, and its height eleven inches. Mr. Bruce states, that it is not formed for burrowing, like the rabbit, but chooses for its retreat the mouths of caves or clefts in the rock. In walking they steal along as if frightened, with the belly almost on the ground, advancing a few steps at a time, and then pausing. Their whole manner is mild, feeble, and timid; they are easily tamed, though if roughly handled at first they will bite. The feet are divided into four toes before and three behind, tipped with little rounded hoofs of slender horn, except the inner toe on each foot, behind which it is furnished with a sort of hoof hooked like a claw. In Abyssinia its flesh is considered unclean, both by Christians and Mohammedans. The Arabs eat it, and call it, perhaps in jest, "the sheep of the children of Israel."

The coney, or daman, closely as it resembles the hare or rabbit in external form and appearance, is placed by naturalists among the animals of the order termed *Pachydermata*, (of which the rhinoceros and hippopotamus are examples.)

In assigning it to this order they are guided by its teeth, and its internal anatomy.

THE HARE.

ORDER.—*Rodentia*, or Gnawers, so called from the form and use of the incisor teeth.

The *hare*, because he cheweth the cud, but divideth not the hoof; he is unclean unto you.—Lev. xi. 6.; Deut. xv. 7.

THE Hebrew name of this animal (*avneveh*) is supposed to be derived from two words, *avah*, to crop, and *nib*, fruit or produce. The common English hare is so well known as hardly to need description. The palms of the feet are covered with hair. The upper lip is cleft; the tongue is thick and soft. Its very long ears are capable of being closed. Hares do not, like rabbits, dig or seek a retreat under ground, but merely choose some convenient hollow, usually called a form. In severe weather they retreat to the woods. The great length of their hind legs, compared with the others, only allows of a leaping motion, or an interrupted gallop. The hare, or rather several kinds of this animal, are met with in most parts of the world. Europe, Africa, Asia, and America, have their respective species. The Egyptian hare is of a paler colour than the English hare, and its ears are of far greater size in proportion.

The reason given for rejecting both the hare and the coney, or daman, as articles of food, is, that though they chew the cud they do not divide the hoof. With respect to the latter point, the meaning may be, that the foot, though divided into toes, does not resemble the divided hoof of the ox; but with respect to the former point there is greater difficulty.

Naturalists do not admit that any of the *Pachydermata* or *Rodentia* (to which latter order the hare belongs) chew the cud, as does the ox, and assure us the structure of the stomach differs from that of the same organ in ruminating animals. Cowper, indeed, informs us that his tame hares chewed the cud all day, till evening; and Bruce states that

the daman chews the cud. But with regard to the latter animal, this circumstance has not been observed in the various specimens which have been brought alive into Europe, nor is the statement of Cowper borne out by the observations of others. Mr. Bell, in his "British Quadrupeds," says, the hare is exclusively a vegetable feeder, and adds, that the structure of the whole of its digestive organs is expressly adapted for such diet; but he, with other naturalists, is silent respecting its chewing the cud. As, however, the expression "divideth not the hoof," must here be taken in a qualified sense, so some latitude must be allowed to the expression "cheweth the cud." It may allude not only to the act of rumination, as exhibited by the ox, or sheep, but also to the habit of reposing motionless on a "form," or hollow place, during the process of digestion, till the time of activity, which coincides with that of a desire for fresh food, returns. The hare leaves its form in the evening, and during the night fills its stomach with vegetable aliment; when the morning breaks it retires to its form, and there sits close all the day, while the process of digestion is in operation. Now, as animals that ruminate first fill the stomach, and then repose to chew the cud, till the operation is finished, and then take more, so those that repose without absolutely remasticating the swallowed herbage, till the whole is digested, may be, with allowance for latitude of expression, included among the animals thus designated, namely, "those that chew the cud." Hence, Cowper probably meant no more, when he wrote of his hares, "they chewed the cud all day, till evening."

The above solution of the difficulty in question, suggested to us by a naturalist whom we consulted on the point, if not perfectly satisfactory, is at least plausible.

THE MOUSE.

ORDER.—*Rodentia*, or Gnawers.

These also shall be unclean unto you among the creeping things that creep upon the earth; the weasel, and the mouse, etc. Lev. xi. 29.

Five golden mice. 1 Sam. vi. 4.

Eating swine's flesh, and the abomination, and the mouse. Isa. lxvi. 17.



THE JERBOA.

PROBABLY the animal called the *jerboa* is here intended. In size it is equal to a large rat, of a pale tawny yellow, lighter beneath, the tuft of the tail being black. Its speed is very great. In leaping it raises its body on the hind toes, balancing itself by means of its tail. The fur is soft and sleek, the ears large and open, the eye full and round, the muzzle short, and the head somewhat resembling a rabbit's head. It abounds in Egypt, Syria, and North Africa, burrowing in the sand-hills, or among ruins. The Arabs, Kalmucks, and Tartars, eat it freely.

THE MOLE.

ORDER.—*Rodentia*, or Gnawers

BY the term Mole, as used in Isaiah, (ch. ii. v. 20,) the original of which is *chepor-peroth*, perhaps any burrowing, darkness-loving animal may be intended, the word having

rather a general, than a particular application. If, however, we are to suppose any species to be definitely indicated, as most commentators would contend, we are inclined to fix upon the mole rat, or spalax; (*Spalax typhlus*, or *Aspalax typhlus*,) the ἀσπαλαξ (*aspalax*) of Aristotle and the Greek writers, who regarded it, and correctly, as totally destitute of the powers of vision. The mole (*talpa*) does not appear to exist in Syria; but the spalax is common, extending thence through Persia, and Asia Minor, into the south-east of Russia, especially along the river Don. It is probable, however, that two or more species are included under the same title, and that the Russian and Syrian spalax may be distinct.

The spalax is a burrowing, mole-like animal, of the rodent order; the head is singularly broad and flat, with a lateral ridge on each side, extending from the naked nose to the ears, which are scarcely to be distinguished. The eyes are mere rudimentary black grains, about the size of poppy-seeds, buried beneath the skin; the nostrils are wide apart; there is no tail; the limbs are short and strong, and, together with the feet and claws, are well adapted for burrowing; the fur is soft and close.

The spalax excavates extensive galleries in the earth, which have openings at the distance some yards from each other, where, like mole-hills, only much larger, the earth is raised in hillocks, sometimes of two yards in circumference, of proportionate height. From the main gallery, the spalax drives lateral passages, in search of roots, upon which it feeds, and especially bulbous roots, such as those of the *Chærophyllum*. It works with great rapidity and unwearied perseverance; and on the appearance of an enemy digs a perpendicular shaft with extraordinary rapidity. Though unable to see, its hearing and sense of smell supply the deficiency, and give it warning of the approach of danger; and when surprised, it will lift up its head, snort, and gnash its teeth, and endeavour to seize its assailant. Its bite is very severe. In the morning it often quits its burrow, and basks with its mate in the sunshine. There is a superstition among the people along the banks of the Ukraine, that the hand of a person, in the grasp of which one of these animals has been suffocated, is capable of curing scrofulous diseases.

The general colour of the spalax is ashy grey, the fur

being dusky at the roots. A white line extends along the lateral ridge of the head, from the nose to the ears. The spalax measures eight or nine inches in length.

THE LION.

ORDER.—*Carnivora*, or Flesh eating Quadrupeds.



What is sweeter than honey? and what is stronger than a *lion*?—Judges xiv. 18

A *lion* which is strongest among beasts,
And turneth not away from any.—Prov. xxx. 30.

Judah is a *lion's whelp*:
From the prey, my son, thou art gone up:
He stooped down, he couched as a *lion*,
And as an *old lion*; who shall rouse him up?—Gen. xlix. 9

Behold, the people shall rise up as a *great lion*,
And lift up himself as a *young lion*:
He shall not lie down until he eat of the prey,
And drink the blood of the slain.—Numbers xxiii. 24.

SUCH are some of the expressions in which the Holy Scriptures describe the power and majesty of the lion. The figurative language of the Bible, in its allusions to this animal, is easily understood. We read that "the king's wrath is as the roaring of a lion," Prov. xix. 12; xx. 2: of the teeth of the lion in Psa. lviii. 6; Joel i. 6. David says of Saul and Jonathan, "They were swifter than eagles, they were stronger than lions." 2 Sam. i. 23 In 1 Chron. xii. 8, it is said of David's soldiers that their "faces were

like the faces of lions." Of the heroic Benaiah we are told, in 2 Sam. xxiii. 20, that he slew two "lion-like men" (literally "lions of God") "of Moab," that is, two distinguished Moabitish warriors. Thus a king of Abyssinia describes himself: "I stand among my neighbours as a lion of the forest, and I fear not all the Moors and heathens." Isaiah, speaking of the advance of an army, says, "Their roaring shall be like a lion, they shall roar like young lions: yea, they shall roar, and lay hold of the prey, and shall carry it away safe, and none shall deliver it." Isa. v. 29. We may observe, that in the Hebrew language there are various terms for the lion at different periods of its life; thus, in Ezekiel xix. 1, 2, we read,

What is thy mother? A lioness: (*Vbiya* :)

She lay down among lions, (*araioth*.)

She nourished her whelps (*gureiha*.) among young lions, (*c'phirim*.)

And in Job iv. 10, "The roaring of the lion, (*aryeh*.) and the voice of the fierce (or black) lion, (*shachal*.) and the teeth of the young lions, (*c'phirim*.) are broken. The old lion (*laish*) perisheth for lack of prey, and the stout lion's (*labi*) whelps are scattered abroad."

When an enraged lion bends his head close to the ground, and utters his dreadfully deep roar, it might be mistaken for the rumbling of thunder or an earthquake. The roaring of a lion is best fitted to denote not acts of secret enmity, but open and violent persecution; and for this reason the apostle Peter, speaking of the persecutions of the Christians, says that "the devil, as a roaring lion, walketh about, seeking whom he may devour." 1 Pet. v. 8. When the lion, in his great eagerness, springs after his prey to a great distance, it not unfrequently happens, that he misses his aim, and leaps beyond it; he then slinks away ashamed, like a detected thief. This is particularly the case if he happen to meet with a man who has self-possession enough to look him steadily in the face. He then turns away with his tail between his legs, and without uttering the least noise. Indeed every ravenous beast has a natural fear of man. "The fear of you and the dread of you," said God to Noah, "shall be upon every beast of the earth, and upon every fowl of the air, upon all that moveth on the earth, and upon all the fishes of the sea." Gen. ix. 2.

The lion, as the noblest of the beasts of prey, seems to have this fear. But if the natural courage of man can produce so great an effect, the freedom from the fear of death which faith in Jesus Christ gives, must have a still stronger influence. This was shown on many occasions, when the first Christians were exposed to wild beasts in the public shows at Rome. And in the case of Daniel, God sent his angel, and shut the mouths of the lions, and probably enabled the holy prophet to view them with extraordinary calmness and self-possession.

If you have never seen a lion, you have only to imagine an enormous cat, upwards of three feet in height at the shoulders, with a large head, broad face, majestic commanding look, wrinkled forehead, deeply set eyes, cleft upper lip, hanging down on both sides like a mastiff's, adorned about the breast, neck, and throat with a thick shaggy mane, and a large tuft of hair at the end of the tail. The mane is peculiar to the male lion, and makes its appearance when the animal is in its third year.

The lion, like the tiger and leopard, belongs to the cat tribe of the carnivorous order of quadrupeds. The whole of the bodily formation, and the character of the teeth, indicate the ferocious and blood-thirsty habits of these animals. The head is large, the muzzle short, and the limbs vigorous; the canine teeth are large and strong; the sharp, hooked claws are habitually sheathed, unless about to be used in lacerating a victim. There are four grinding teeth on each side in the upper, and three in the lower jaw: of these, the last but one above, and the last below, are sharp-edged flesh-cutters; the last grinder above is very small.

The animals of the cat tribe differ in many particulars from the animals of the canine tribe or dog kind. You need only look into the mouth of a dog and a cat to see the difference of the teeth. In the dog, the cutting teeth are six above and below; the canines,* sharp and strong, are one on each side in each jaw: there are six molars on each side above, and seven below; of these, the last but two on each side are sharp-edged flesh-cutters; the last two are bruising and crushing molars. You may also easily find out the difference in the claws of the two races. Dogs, and other animals

* So called from their size and strength in the dog (*Canis*.)

of the same kind, such as the jackal, the wolf, and the fox, have the claws unsheathed; hence they wear down in walking; they are also very frequently used for scratching the ground, and are thick and blunted. Compare the paw of the common cat with that of the dog, and if you examine you will see how the sharp claws in the former are concealed in a sheath, and preserved from injury by a soft cushion or pad at the sole of the foot, besides a smaller one under each claw. Thus they are always kept in readiness either for catching their prey, or for inflicting severe scratches: the latter use the reader has perhaps known to his cost.

In former times, lions were far more numerous in the world than at present. Two thousand years ago they were not at all uncommon in Greece and Lesser Asia. Armenia swarmed with them; but they are no longer to be met with in these countries. As many as six hundred were collected and brought to Italy by Pompey, to fight in the Amphitheatre on one occasion, for the amusement of the Roman people. Under the emperors these cruel exhibitions were made on a still larger scale. Titus collected together nine thousand, and Trajan eleven thousand wild beasts, to slaughter one another; and of these a large proportion were lions. Fights, in which at least one hundred lions engaged, took place almost every year. It is surprising that in Palestine, where they were numerous while the country was thickly populated under the kings, they do not now exist. In Egypt, also, they are no longer to be met with. To whatever causes this circumstance may be owing, it is not to the care of the public safety taken by the government, nor to the increase of the population: nor is it the climate, for this has been the same for two thousand years—we may say four thousand years; for it may be seen at once from the books of Moses, in what months there was the early and latter rain, seed-time and harvest in Palestine; namely, the same as at present. The use of fire-arms, in modern times, may have assisted in chasing away these animals from the abodes of men. Yet this does not seem fully to clear up the matter. We know that wild beasts have sometimes been expressly sent by the Lord. We read in 2 Kings xvii. 24, “The king of Assyria brought men from Babylon,” and other places, to dwell in “the cities of Samaria, instead of the children of Israel.” And. “they feared not the Lord; therefore the

Lord sent lions among them." And he can send them away whenever he will.

How common lions were in the Holy Land and the adjacent countries in ancient times, is shown by many passages of Scripture: for instance, Nahum ii. 11, 12, "Where is the dwelling of the lions?" etc. See Psal. civ. 21. They were found in Lebanon, Song of Sol. iv. 8; near the banks of the Jordan, Jer. xlix. 19; 2 Sam. xxiii. 20; in the plains near Tabor, 1 Kings xx. 36; in the fields of Bethlehem, 1 Sam. xvii. 34; in the land of the Philistines, Judges xiv. 5; in Egypt, "the land of trouble and anguish, from whence come the young and old lion." Isa. xxx. 6. Yet the danger was not so great as to prevent husbandmen from going on their own fields; the expressions in Prov. xxii. 13, and and xxvi. 13, are only meant as cutting reproofs of the slothful.

In Ezekiel xix. 1—8, the carrying away of the kings of Judah, in the Babylonish captivity, is compared to a lion hunt. Beasts of prey were taken either in pitfalls or nets (v. 8). The first method is still common among the Moors in Morocco; they dig a deep pit, which is slightly covered with rushes and straw, and a live sheep or lamb is fastened to a pole, fixed in the middle of the pit. When a lion finds itself taken in a pit of this sort, it is so frightened that the Moors can destroy or secure it without much risk. The other way of hunting is with nets, into which the lion is driven by torch-light. This is common, even now-a-days, near the Euphrates. The natives of Abyssinia sometimes, it is said, venture to attack a lion single-handed, as Benaiah and David once did, with a shield on the left arm, which they hold against the lion as he rushes upon them; they stab him in the neck with a sword in the other hand.

In the Holy Scriptures the Almighty is often represented under the symbol of a lion. Provoked to anger by the wickedness of men, he utters his awful voice, threatens the most dreadful judgments against sinners, and destroys his enemies with a power from which none can escape or resist. "For I will be unto Ephraim as a lion, and as a young lion to the house of Judah: I, even I, will tear and go away; I will take away, and none shall rescue him." Hos. v. 14: xiii. 7. "The Lord shall roar like a lion." Hos. xi. 10; Amos i. 2; iii. 4, 8. But, under the same image, he is described as coming

to protect his saints, and rescue them from their enemies. "Like as the lion, and the young lion roaring on his prey, so shall the Lord of hosts come down to fight for Mount Zion, and for the hill thereof." Isa. xxxi. 4. And in the same chapter of the Revelation, where the Lord Jesus Christ is described, in reference to his atoning sacrifice, "a Lamb that had been slain," he is also styled "the Lion of the tribe of Judah." Rev. v. 5, 6. How desirable is it that we should combine these and similar views of the Saviour; that we should not dwell on one class of representations to the exclusion of another class equally important; that our hearts and minds should receive the full impression of his blessed character, of the whole circle of his Divine perfections; that, in short, our love may be reverential, and our reverence filial!

THE LEOPARD.

ORDER.—*Carnivora*, or flesh-eating Quadrupeds.



Can the Ethiopian change his skin, or the leopard his spots?
Then may ye also do good, that are accustomed to do evil.—Jer. xiii. 23.

THIS animal (in the Hebrew, and several other eastern languages, called *namer*) is about the size of a large dog. It would seem that it was formerly common in Palestine, as several places bear names which intimate that they were infested with leopards, as Nimrah, Numb. xxxii. 3; Bethnimrah, Numb. xxxii. 36; Josh xiii. 27; and "waters

of Nimrim," Isa. xv. 6; Jer. xlvi. 34; and in Song of Sol. iv. 8, we read of the "mountains of the leopards."

The leopard is still known in Syria and Arabia, though no longer common. It is one of the most beautiful animals of the cat tribe. The black rosettes, with which its yellow hide is marked, give it an appearance which has always been admired, and supplies the comparison in Jeremiah quoted above. It much resembles the tiger, except its having black spots instead of stripes, but is a much smaller animal. It is distinguished from the panther by having spots in clusters instead of single ones. These animals lie in wait for their prey, and in pursuit are remarkably swift; which last quality shows the propriety of the allusion to them by the prophet Habakkuk, (i. 8) who, speaking of the Chaldeans, says, "Their horses are swifter than leopards." For the same reason a *winged* leopard is the emblem made use of in Daniel's vision to denote the extreme rapidity of Alexander's conquests. Dan. vii. 6. To express the peaceful and happy state of the reign of Christ, it is said in Isaiah xi. 6, "The leopard shall lie down with the kid." There is another animal, known in Palestine, and other parts of the East, very similar to the one we have just described, and termed the hunting-leopard. In India it is called the chetah: it is of a pale yellow colour on the upper part, white underneath, and covered all over irregularly with very small spots. In the slim make of its body and limbs, and in its aptness for being trained to field sports, it is more like the dog than the cat. It is tamed by the Mohammedans in Syria, and employed in hunting the gazelle. The huntsman draws a hood over its face, and places it behind him on horseback. As soon as he sees a gazelle, he takes off the hood; the leopard immediately creeps towards its prey, till within the proper distance, when it suddenly springs upon its unwary victim. If it misses its aim, it slinks back ashamed to the sportsman. As the Mohammedans consider all meat from which the blood has not been taken, as unclean, and, therefore, eat no game which has died of a gunshot wound, hunting with the leopard must always, as long as they regard the Koran, be preferred to hunting with fire-arms. Though this animal is not equal in strength to the larger leopard, it is sufficiently dangerous to the traveller through unfrequented regions.

The missionary Schultz mentions a remarkable instance: "The son of a Maronite priest was going home one evening through a coppice, when he saw a hunting-leopard. The animal sprung immediately on the youth, who was beforehand with it, and shot it with his gun through the head. But he had scarcely killed this before a second made its appearance; he then drew out a long knife, which he wore by his side and held it so that on the animal's springing at him it received a fatal wound in the belly; but alarmed by this second attack, he hastened onwards, leaving the knife sticking in the animal. Scarcely had he gone a hundred steps further, before a third leopard met him. He had now no weapon, except the unloaded gun; making a desperate effort, he knocked the beast down by a stroke on the head, but in doing so broke his gun in pieces, so that he was now wholly defenceless. In this plight he reached his home. His parents soon saw that some strange accident had happened; and after he had told them the whole adventure, they went out the next morning and skinned the leopards he had killed. But their poor son took to his bed, and died in three days, owing to the fright."

THE WOLF.

ORDER—*Carnivora*, or Flesh-eating Quadrupeds.

Wherefore a lion out of the forest shall slay them,
And a wolf of the evenings (or deserts), shall spoil them.—Jer. v. 6.

THE wolf is a native of both northern and southern climates. It is inferior in strength to the bear, and in swiftness to the leopard, and frequently becomes a prey to the stronger wild beasts; but in its ravenous, destructive disposition it is surpassed by none. The wolf, like the thief, "cometh not but for to steal, and to kill, and to destroy." Its appetite for slaughter is never satisfied. What it cannot devour, it mangles; and when it breaks into a sheepfold it never leaves off killing as long as there is any thing alive. It hides itself by day; and comes forth at dusk to destroy. "They are more fierce than the evening wolves," says the prophet Habakkuk of the Chaldean horsemen. (i. 8.) T's

describe the severity of the divine judgments on the wicked Jews, it is said, "A wolf of the evenings shall spoil them," Jer. v. 6. In general appearance the wolf resembles the dog. It is about two feet and a half in height, and three and a half from the nose to the beginning of the tail. The head is long and pointed; the eyes open slantingly, and have a fierce and sinister expression; the ears are erect and sharp; the tail is rather bushy, and bends down towards the legs. The hair is of a greyish fawn-colour, with a dark stripe on the fore-legs, but in some kinds the colour is nearly black and dusky. From the strength of the jaws and neck, the wolf bites very severely, and can carry an animal of some weight in its mouth while running. It does not bark like a dog, but howls. But though so fierce in its natural state, it is capable of being tamed, and of showing great affection for its master or keeper. It still abounds in the colder and more mountainous parts of Europe, where it destroys not only smaller animals, but even horses and horned cattle. At one period it was the terror of England; retreats were built in the northern districts to protect passengers, and taxes were paid in wolves' heads. The month of January was called "*Wolf-monat*" by the Anglo-Saxons, because people were wont in that month to be in more danger of being devoured by wolves than in any other season of the year, because through the extreme cold and snow, those ravenous creatures could not find other beasts sufficient to feed upon.

The scriptural allusions to the wolf have reference to his fierceness and cruelty, his delight in slaughter, his preying on inoffensive animals, and his habit of prowling by night. The tribe of Benjamin was prophetically described by Jacob as "a ravening wolf," Gen. xlix. 27, and the history of this tribe justifies the comparison; see Judges xix. xx. The princes and judges of the Jews who were cruel and oppressive, are compared to wolves who "gnaw not the bones till the morning," that is, keep even the bones to satisfy their rapacity. Our Lord compares false prophets to "wolves in sheep's clothing," mild and harmless in appearance, but really dangerous and destructive. Matt. vii. 15. Paul calls false teachers "grievous wolves." Acts xx. 29. The Saviour speaks of his apostles as "sheep in the midst of wolves." Matt. x. 16; Luke x. 3; John x. 12. The influ-

ence of the gospel in changing the disposition is described by saying that "the wolf shall dwell with the lamb," and that they "shall feed together." Isa. xi. 6, lxxv. 25.

THE DOG.

ORDER.—*Carnivora*, Or *Flesh-eating Quadrupeds*.

THE dog belongs to the same family as the wolf. This tribe is distinguished from that of the cats by the form of the muzzle, the number and structure of the grinders, as already described, and by the blunt claws, which are not drawn in and out.

The dog, in eastern countries, is seldom treated as a domestic animal, and hence scarcely shows any marks of that attachment, faithfulness, and obedience to his master, which make him, among us, quite a favourite. In the East, the famished dogs run about the streets like beggars, and grumble if they do not get a full meal; they devour carrion, rummage the heaps of refuse, and even tear open graves to appease their ravenous hunger; and when criminals had been executed it was usual to throw their bodies to the dogs. Jer. xv. 3; 1 Kings xiv. 11, xvi. 4, xxi. 23, xxii. 38; 2 Kings ix. 33, 36. In what contempt the dog was held by the Hebrews from the earliest times, is shown by the proverbial expressions we meet with in the Old Testament: Job xxx. 1; 1 Sam. xxiv. 14; 2 Sam. iii. 8, and ix. 8; 2 Kings viii. 13. But after the time of the Maccabees, when the Jews had adopted, in some measure, Grecian customs, dogs were probably kept as domestic animals. Thus the Syrophenician woman said to our Lord, "The dogs eat of the crumbs which fall from their master's table," Matt. xv. 27; and dogs are described as licking the sores of Lazarus, as he lay at the rich man's gate. Luke xvi. 21. Still, in the New Testament, the allusions to this animal are all expressive of contempt or abhorrence. According to the Mosaic law, dogs were unclean; flesh that had been torn by beasts was directed to be thrown to them. Exod. xxii. 31. Unholy men are termed dogs by our Saviour, in Matt. vii. 6; "Give not that which is holy unto the dogs." The

same name is given to false teachers by Paul, in Phil. iii 2; and in Rev. xxii. 15, it is applied to men addicted to vile sensuality.

THE FOX.

ORDER.—*Carnivora*, or Flesh-eating Quadrupeds.

THIS animal, so noted for its cunning, belongs also, as does the wolf, to the dog tribe. Its thick head, which ends in a long pointed muzzle, its slanting eyes, and sharp ears, give us at first sight an impression of its character. It makes a noise like the yelping of a young cur, which is heard most frequently in very severe weather. It dwells in holes generally, consisting of three or four chambers with several openings. Our Saviour applies this name to Herod, "Go ye, and tell that fox," Luke xiii. 32; and strikingly expresses his own want of earthly comforts when he came into the world to save sinners, by saying, "Foxes have holes, and the birds of the air have nests; but the Son of man hath not where to lay his head." Luke ix. 58.

The Hebrew word *shual*, generally translated "fox" in the English version, is, however, supposed, on good grounds, to be the *jackal*, which still abounds throughout the eastern world, and in many parts of Africa. The tail is bushy, but reaches only to the heels; the pupils of the eyes are round and small. Altogether it very much resembles a dog, and is supposed by some naturalists to be the original stock of our domestic dogs. The general colour is a dirty-fawn above, and whitish underneath. Jackals hunt their prey together in large packs, sometimes two or three hundred, differing in this respect from the fox, which is not gregarious. The howlings of these packs are frightful, and give great alarm to travellers; hence they are also called in Hebrew *ayim*, that is, howlers. Like the foxes, they live in holes under ground; but they are also fond of ruined towns, which afford numerous secure retreats. Hence, in the Lamentations of Jeremiah it is said, "Because of the mountain of Zion, which is desolate, the foxes walk upon it." v. 18. In Psa. lxiii. 10, we read, "They shall fall by the

sword: they shall be a portion for foxes." That the jackal is the animal mentioned in Judges xv. may be inferred from the number of animals taken by Samson, which must have been much easier with those that assembled in packs, than with a solitary creature like the fox. In ancient Rome a fox was sacrificed to Ceres, with torches tied round it, because a fox wrapped round with stubble and hay set on fire, being let go by a boy, once burned the growing corn of the people of Carseoli, as the foxes of Samson did the growing corn of the Philistines.*

The jackal has been called the lion's provider, but the reverse is the truth; for the jackal picks the bones of the beast on which the lion has satiated his hunger. He is a terrible depredator on vineyards.

THE HYENA.

ORDER.—*Carnivora*, or Flesh-eating Quadrupeds.



It is singular, common as the hyena is in Egypt, Abyssinia, Nubia, Persia, and Syria, and common as it ever has been, that no mention of it is made in the authorized version of the Scriptures. If the reader will turn to Jeremiah xii. 9, he will read, "Mine heritage is unto me as a

* Adam's Roman Antiquities, p. 223.

speckled bird; the birds round about are against her." The word translated "speckled bird" should be rendered, according to the learned Bochart, by "the hyena." The author of the apocryphal book of Ecclesiasticus, ch. v. 18, asks, in allusion to the antipathy between this animal and the dog, "What agreement is there between the hyena and the dog?"

That the Greeks and Romans were well acquainted with this animal is very certain, but, at the same time, they attributed to it many properties, which, though for a long time currently received, involve absurdities unworthy the slightest notice.

The hyena is as tall as the wolf, but more heavily built, especially about the neck, shoulders, and head. Its strength is very great; and though it will not, unless driven to extremity, attack man, it fears no animal. Its coat consists of long harsh hairs, which form a mane running down the back from the shoulders. The colour is dirty grey, clouded with transverse stripes of a darker tint. The hyena stands higher before than at its hind quarters; his hind legs, indeed, seem bowed and disproportionately weak, hence his walk is shuffling and awkward; nevertheless, he can run with great celerity.

The hyena prowls at night, destroying donkeys, sheep, pigs, and cattle; to counterbalance this, it devours the offal and refuse of towns and villages of those districts where it abounds, a work which it shares with the vulture.

On the approach of morning the hyena retires to his den, a cave among rocks, or old ruins, or a lair in some tangled thicket; here he sleeps, till the shades of evening call him to his nightly carnage.

Of the ferocity and daring of the hyena, some idea may be formed from Major Denham's account of them in the Bernou country: "The hyenas, which are every where a legion, grew now so extremely ravenous, that a good large village, where I sometimes procured a draught of sour milk on my duck-shooting excursions, had been attacked the night before my last visit, the town absolutely carried by storm, notwithstanding defences nearly six feet high, of branches of the prickly tulloch; and two donkeys, whose flesh these animals are particularly fond of, carried off in spite of the efforts of the people. We constantly heard

them close to the walls of our town at nights ; and on a gate being left partially open, they would enter, and carry off any unfortunate animal they could find in the streets." Bruce had on one occasion, a narrow escape from a hyena, which entered his tent at night ; his large blue eyes glaring in the dark startled the traveller, who with his servant, managed to despatch this unwelcome guest. In Abyssinia, hyenas, Bruce writes, "were the plague of our lives, the terror of our night walks, and the destruction of our mules and asses, which are their favourite food."

Captain Beechey says, "Although we had very frequently been disturbed by hyenas, we never found that familiarity with their howl, or with their presence, could render their near approach an unimportant occurrence ; and the hand would instinctively find its way to the pistol, before we were aware of the action, whenever either of these interruptions obtruded themselves closely upon us, either by night or day."

Seldom, however, will the hyena prove the aggressor : if unmolested, he utters his peculiar howl, and displays his teeth, at the same time walks doggedly away, with a peculiar drag and limp, as if he were lame. If, however, he is attacked, he commences the combat, and fights with the utmost fierceness and obstinacy. Belzoni gives us an instance in point. "Having taken a proper view of the temple, named Cassar el Haron, and the town in ruins, I went to see the small Greek chapel, accompanied by the two boatmen ; and as there was no appearance of any danger, I left my gun and pistols in the temple, but had nearly suffered for my temerity, for just as I was mounting the few steps that lead to the platform of the small chapel, a large hyena rushed from the apartments beneath, and had I not been on the first step, it could not have avoided attacking me, as there was no other way by which it could come out. The animal stopped three or four yards from me, and then turned round as if determined to attack me, but it appeared, on second thoughts, to have relinquished its intent ; after having shown me its pretty teeth, it gave a hideous roar, and set off as fast as it could. I attributed its flight to the noise made by the two boatmen."—*Travels in Egypt and Nubia.*

It has been asserted and believed, that the savage hyena, is utterly untamable, that his ferocity can never be sub-

dued. This is a mistake; naturalists, and travellers, of the present day, testify to the fact, that he may be as completely tamed as a dog, and that he is intelligent and affectionate in his reclaimed condition. Many instances of this kind are recorded in works on natural history; and Barrow assures us, that "in the Snewberg, Southern Africa, it has been domesticated, and is there considered as one of the best hunters after game, and as faithful and diligent as any of the common sort of domestic dogs." The hyena, however, is impatient of confinement, which keeps it in a state of perpetual irritation, and renders it distrustful and savage. "A hyena at Exeter Change some years ago was so tame, as to be allowed to walk about the exhibition room. He was afterwards sold to a person, who permitted him to go about with him into the fields, led by a string. After these indulgences he became the property of a travelling showman, who kept him constantly in a cage. From that time his ferocity became quite alarming, he would allow no stranger to approach him, but gradually pined away, and died."—*Menageries*, vol. i.

THE BEAR.

ORDER.—*Carnivora*, or Flesh-eating Quadrupeds.

As if a man did flee from a lion,
And a bear met him.—Amos v. 19.

IN the days of the kings of Israel, the bear was much more common in Palestine than at present. There are several kinds of this animal, but the one mentioned in Scripture is that called the Syrian bear. It frequently preys on animals, but, for the most part, feeds on vegetables. The skin is sometimes of a yellowish brown, and sometimes a yellowish white, varied with yellowish spots. The bear has a long clumsy body covered with coarse hair, and short thick legs; but what distinguishes it particularly is its feet. It walks on the soles of the feet, while most of the Mammalia tread on the ground only with their toes. When its anger is roused, it is a dreadful opponent, from its great strength and undaunted resolution.

The anger of bears when robbed of their young, gave rise to a proverbial expression, which occurs in several places in Scripture. Jehovah, in threatening his rebellious people, declares, "I will meet them as a bear that is bereaved of her whelps, and will rend the caul of their heart." Hosea xiii. 8. Of David and his warriors it is said, "They be chafed in their minds, as a bear robbed of her whelps in the field." 2 Sam. xvii. 8. In the vision of Daniel (vii. 5,) the second beast which appeared was like a bear, and represented the empire of the Medes and Persians.

THE BADGER.

ORDER.—*Carnivora*, or Flesh-eating Quadrupeds.

THE common badger is about the size of a middling dog, but stands much lower on the legs, and has a broader and flatter body. Like the bear, it walks on the soles of the feet, which have five toes each, short, strong, deeply buried in the flesh, and armed with powerful claws, admirably suited for burrowing or turning up the earth in search of food. With the claws of their fore-feet they make a deep burrow, generally in a sandy or light gravelly soil. The burrow has but a single entrance from without, but afterwards divides into several chambers, and ends in a round cell at the bottom, well lined with dry grass and fur. They sleep all day in this retreat, and move about during the night in search of food. They are often charged with destroying rabbits, game, and even young lambs, but roots and fallen fruits appear to form the chief part of their food.

The badger attacks the nests of the wild bees, which it can do without any risk of being stung, owing to the length of its hair and the thickness of its hide. It lives in the most solitary woods, is quiet and inoffensive, but when attacked defends itself with great courage. It is hunted in some parts of the country during the bright moonlight nights, when searching for food; its hide, when properly dressed, makes the best pistol furniture; the hair is valuable for painting-brushes, and the hind-quarters, when salted and smoked, make excellent hams; they are a favourite article of food with the Chinese.

The only passages in the Bible in which this animal is mentioned, are, with one exception, those relating to the building of the tabernacle. Five times in the book of Exodus, and once in Numbers, we read of "badgers' skins." But it is very doubtful whether the animal so called was intended by the Hebrew word *tachas*. Almost all the ancient versions, and the Jewish traditions, regard it as a colour of leather or skin, and point out crimson, or different shades of blue. In Ezek. xvi. 10, costly shoes are described as made of this material, but badger's skin would be quite unsuitable for this purpose in a warm climate. Many learned men, however, consider the word *tachas* to signify an animal, though they differ as to the kind. As the word in Arabic signifies a dolphin, with which the ancients commonly classed the seal, some have understood it to mean seal-skins; which would certainly make a good sense, and be tolerably applicable to all the passages in which the word occurs. But, most probably, coloured leather of some kind is intended.*

THE HORSE.

ORDER.--*Pachydermata*, or Thick-skinned Quadrupeds.

THE horse, which, as a domestic animal, is now well known in all civilized countries, was but little used by the Israelites. No animal appears to have improved so much under the care of man as this noble creature. Its beautiful form, its strength, speed, courage, docility, and attachment to man, besides other most valuable qualities, give it an important place among domestic animals.

* "The Superior of the convent at Sinai procured for me a pair of the sandals usually worn by the Bedouin of the peninsula, made of the thick skin of a fish which is caught in the Red Sea. The Arabs around the convent called it Turs, but could give no further account of it than that it is a large fish, and is eaten. It is a species of *Helicore*, named by Ehrenberg, *Helicora hemprechei*. The skin is clumsy and coarse, and might answer very well for the external covering of a tabernacle which was constructed at Sinai, but would seem hardly a fitting material for the ornamental sandals belonging to the costly attire of high-born dames in Palestine, described by the prophet Ezekiel.

"Exod. xxv. 5, xxvi. 14. The Hebrew word is *תחש* usually translated badger, though, as it would seem, without sufficient reason in this case."—Dr. ROBINSON'S *Biblical Researches*.

In very early times the horse was used in war, as we learn from the magnificent description in the book of Job, xxxix. 19—25. Yet we do not find it among the possessions of the patriarchs. Even the Arabians, who for several hundred years have been noted for their breed of horses, and who profess to trace their pedigree in an unbroken line to king Solomon's stud, appear to have made little or no use of the horse in the time of Moses; for, in the booty taken from the five kings of Midian, no mention is made of this animal. Numb. xxxi. 32—34. It is indeed remarkable, that the first notice of it, in any country besides Egypt, is in Joshua xi. 6. Even when the tribes beyond Jordan waged war with four Arabian nations, though the victors captured 50,000 camels, 250,000 sheep, 2000 asses, and 100,000 men, not a word is said of horses. In short, throughout the whole Scripture history, the horse is never mentioned in connection with Arabia. With this all ancient history agrees: even Strabo, who lived near the time of Christ, says of Arabia Felix, that it had neither horses, mules, nor swine; and of Arabia Deserta, that camels supplied the place of horses. This explains why Moses never supposed that the Hebrews would go to Arabia for horses, but that they would go to Egypt. When the Arabians began to pay attention to the breeding of horses we do not know; but it is certain, that horses were numerous and highly valued in that country before the time of Mohammed. The Egyptians appear to have been the first who employed the horse, not only in war, but in agriculture and for draught. Gen. xlvii. 17; Exod. ix. 3. When Jacob's corpse was removed from Egypt to Canaan, Joseph accompanied the funeral procession with chariots and horsemen. Gen. l. 9. Pharaoh had a great host of "horses, and chariots and horsemen." Exod. xiv. 9, 18. The Canaanitish kings, who possessed the northern part of the land, led out a numerous cavalry to battle; and the Philistines made use of war-chariots against the Israelites. Josh. xi. 4; Judg. i. 19; 1 Sam. xiii. 5; 2 Sam. i. 6. The Israelitish kings were forbidden by God to multiply horses. David observed the law; and of the horses belonging to a thousand war-chariots, killed all excepting for a hundred chariots. 2 Sam. viii. 4. Several expressions of David in the Psalms allude to this Divine command. "A horse is a vain thing for safety: neither shall he deliver any

by his great strength." Psal. xxxiii. 17. "He delighteth not in the strength of the horse." Psal. cxlvii. 10. Solomon violated this law, for he had 1400 chariots, and 12000 horsemen. 1 Kings x. 26, 29; 2 Chron. i. 16, 17. His merchants also carried on a traffic in horses with the Syrians. The increase in the number of horses kept by the Israelites, and their dependence on the supply of horses from Egypt, called forth the rebukes of the prophets: "Woe unto them that go down to Egypt for help; and stay on horses, and trust in chariots, because they are many; and in horsemen, because they are very strong." Isa. xxxi. 1: see also Isa. ii. 7, xxxvi. 9; Jer. xlvi. 4, 9; Ezek. xvii. 15.

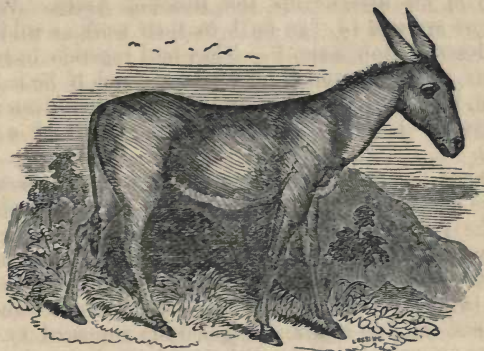
The Egyptian and Nubian horses are still among the handsomest, and are esteemed next to the Arabian; they are remarkable for their high spirited gait, on which account, in the Song of Solomon, the bride is compared to "a company of horses in Pharaoh's chariot." i. 9. The Assyrians and Chaldeans were dreaded by the Israelites chiefly on account of their cavalry. Jer. iv. 13; Habak. i. 8.

Saddles and horse-shoes were not known to the ancients; a strong solid hoof was therefore a prime point in a good horse: "Their horses' hoofs shall be counted like flint." Isa. v. 28; Amos vi. 12. The rein and the curb are of the highest antiquity. "Be ye not as the horse, or as the mule, whose mouth must be held in with bit and bridle." Psal. xxxii. 9. Their carriages for travelling and war were only two-wheeled, as is proved by existing paintings and sculpture.

The chariots and horses of the sun, mentioned in 2 Kings xxiii. 11, were probably dedicated to Baal, or the god of the sun, and employed in idolatrous processions.

THE WILD ASS.

ORDER.—*Pachydermata*, or Thick-skinned Quadrupeds.



DZIGGTAI, OR WILD ASS.

Who hath sent out the wild ass (*para*) free?
 Or who hath loosed the bands of the wild ass? (*arod*)
 Whose house I have made the wilderness,
 And the barren land his dwellings.
 He scorneth the multitude of the city,
 Neither regardeth he the crying of the driver.
 The range of the mountains is his pasture,
 And he searcheth after every green thing.—Job xxxix. 5-8.

THE wild ass is called *dziggtai* by the Mongolians. It is a beautiful, powerful animal, intermediate in size between the horse and the ass; light-footed, slender, with a neck resembling a stag's, which it holds very erect, and a large head, with very movable, hare-shaped ears. Its colour is a pale bay, or cream, with a black line along the back, a black mane, and a black tuft of hair at the end of a thin short tail. Its neighing resembles that of a horse, but the tone is deeper and rougher. Its residence is the plains and deserts. Isa. xxxii. 14. Large herds of these animals are found in the mountain districts of Central Asia, and in Eastern Tartary and Mongolia; they are frequently hunted, as their flesh is esteemed a delicacy, but, being bold, untable, and very swift, they are not easily taken. Hence

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Zophar describes the native corruption of man by saying, "Vain man would be wise, though man be born like a wild ass's colt." Job xi. 12. It was predicted of Ishmael, "He will be a wild man." Gen. xvi. 12, literally "a wild-ass man," which most correctly expresses the untamable freedom of his descendants, the Bedouin Arabs. Wicked oppressors are said to "go forth to their work as wild asses in the desert." Job xxiv. 5. They feed together in troops, with one of their number for a leader; and if he is killed or taken, the rest disperse themselves. By their keen scent, they discover pools or springs in the desert at a great distance.

Josephus mentions, that hunting the wild ass was a favourite amusement of king Herod, and that in one day he killed forty of these animals; they must, therefore, have been much more numerous at that time in Palestine than in the present day.

The two Hebrew words *pora* and *arod*, both translated "wild ass" in Job xxxix. are generally supposed to mean the same animal; but some understand the latter to be another kind of wild ass, called *koulan* by the Tartars, intermediate between the *dziggtai* and the common ass. It stands much higher than the latter in its limbs, and is altogether a more graceful animal. The mane is composed of short erect hair, of a dusky colour, and rather a woolly texture; the colour of the body is silvery grey with a broad coffee-coloured stripe down the back, from the mane to the tail, and crossed on the shoulders by another band, as in the domestic variety. The *koulan* inhabits Central Asia, from the forty-eighth degree of north latitude to the northern confines of India. They migrate from north to south according to the season. In summer they are commonly found about Lake Aral, but in autumn they collect in vast troops, under the conduct of a regular leader, and proceed towards the south, arriving at Cutch and Guzerat in October or November, and returning northward again in the middle of spring. The Persians and Tartars hold the flesh of the *koulan* in high esteem, and hunt it in preference to all other sorts of game

THE ASS.—THE MULE.

ORDER.—*Pachydermata*, or Thick-skinned Quadrupeds.

THE ass is highly prized in the East, and, where proper care is bestowed on developing its form, and cultivating its spirit, occupies no mean rank among domestic animals. With us it is small, clumsy, and sluggish; but in Syria it is larger, well made, light-footed, with a sprightly pace, and carries its head high. White asses are highly valued, as in ancient days. When Deborah sang of Israel's prosperity, she exclaimed, "Speak, ye that ride on white asses, ye that sit in judgment." Judges v. 10. In simple prose narration, the use of the ass is mentioned as a mark of dignity. Judges x. 3, 4; xii. 13, 14. When the Saviour wished to enter Jerusalem as King of Israel, he made use of the foal of an ass, on which never man sat. Although naturally a high-spirited animal, and never before broken, it immediately became tractable and submissive. Mark xi. 3; compare Zech. ix. 9; John xii. 14. It is not to be wondered at, that the ass should be employed as an image of strength and activity, Gen. xlix. 14, for its use as a beast of burden and in husbandry is not the least of the services it renders. Gen. xlii. 26; Neh. xiii. 15. When females rode, they took a guide, who accompanied them with a whip. 1 Sam. xxv. 20; 2 Kings iv. 22—24. In ancient times a saddle was not used, and when we read of "saddling an ass," we must understand it only of the bridle with a saddle-cloth and girths. Gen. xxii. 3; Num. xxii. 21; 2 Sam. xvi. 1; xvii. 23.

Asses made no inconsiderable part of the possessions of the patriarchs Abraham, Jacob, and others; Gen. xii. 16; xxiv. 35; xxx. 43; Josh. ix. 4; 1 Chron. v. 21. Among Job's herds five hundred she asses are counted, without any mention of the males, a much higher value being set on the female.

"An ass's head," 2 Kings vi. 25, is equivalent to an ass; just as we count so many head of cattle, meaning so many beasts. In the same way the expression, "Am I a dog's head?" 2 Sam. iii. 8, is the same as saying, "Am I a dog?" Thus, when an Oriental says, "I give thee a sheep's head," he means a sheep.

The MULE is the offspring of the horse and the ass. The

first time it is indisputably mentioned* in the Bible is in 2 Sam. xiii. 29. When Amnon was slain, by order of his brother Absalom, at a feast, where all their brothers (David's sons) were present, it is said, "Every man gat him upon his mule, and fled." Absalom was riding on a mule after his defeat, when he was caught by the branches of a tree, and he was slain by Joab. 2 Sam. xviii. 9. David himself had a choice mule, which he directed to be used when Solomon was proclaimed as his successor. 1 Kings i. 33. Mules are among the presents which Solomon received from those who came from foreign parts to hear his wisdom. 1 Kings x. 25

Mules are sometimes brought from Spain, where they are much used, as well as in the East. Their strength and steadiness of foot render them useful animals in mountainous countries.

The inhabitants of Armenia (called Togarmah in Ezek. xxvii. 14,) carried on a considerable traffic with Tyre in horses and mules.

THE CAMEL.

ORDER.—*Ruminantia*, or, Animals that chew the cud.

THE camel presents one of the most singular appearances in the animal creation. Whoever beholds, for the first time, its long slender legs, with the round, broad foot, the long swan-like neck, the small head with round ears, the submissive and yet fiery look, the projecting upper lip, and especially the high natural saddle which it carries on its back, can hardly suppress a smile of wonder at so strange a sight. But this feeling will be soon succeeded by admiration of the divine wisdom in the structure of this animal for the purposes of a beast of burden, on which account it is called by the Arabians "the ship of the desert." "Admirably adapted," Dr. Robinson observes, "to the desert regions, which are their home, they yet constitute one of the evils

* The word translated mules in Genesis xxxvi. 24, is supposed by many learned men to mean "warm springs." Anah might have been led to them by means of his father's asses; these animals like the camel, having a very quick scent for water.

which travelling in the desert brings with it. Their long, slow, rolling or rocking gait, although not at first very unpleasant, becomes exceedingly fatiguing, so that I have often been more exhausted in riding five-and-twenty miles upon a camel than in travelling fifty on horseback. Yet, without them, how could such journeys be performed at all? But their home is the desert, and they were made in the wisdom of the Creator to be the carriers of the desert. The coarse and prickly shrubs of the waste are to them the most delicious food; and even of these they eat but little. So few are the wants of their nature, that their power of going without food, as well as without water, is wonderful. They never appear to tire, but commonly march as freshly at evening as in the morning. The only instance I remember to the contrary was after our long march in returning to Hebron, when my young camel, on arriving at the place of encampment, seemed weary, and lay down of its own accord in order to be relieved of its load. If they once begin to fail, they soon lie down and die. Thus two camels of our train died between Suez and 'Akabah, which a few hours before had been travelling with full loads. In all our journey to Wady Mousa the camels fed only upon shrubs, and never tasted grain of any kind, although once we had them loaded for thirty-six hours, during all which time they browsed only for an hour. Their well-known habit of lying down upon the breast to receive their burdens, is not, as is often supposed, merely the result of training, it is an admirable adaptation of their nature to their destiny as carriers. This is their natural position of repose, as is shown too by the callosities upon the joints of the legs, and especially by that upon the breast, which serves as a pedestal beneath the huge body. Hardly less wonderful is the adaptation of their broad-cushioned foot to the arid sands and gravelly soil which it is their lot chiefly to traverse. The camel, in many respects, is not unlike the sheep. They are a silly, timid animal, gregarious, and when alarmed, like sheep, they run and huddle all together. They are commonly represented as patient; if so, it is the patience of stupidity; they are, rather, exceedingly impatient, and utter loud cries of indignation when receiving their load, and not seldom on being made to kneel down. They are also obstinate, and frequently vicious, and the attempt to urge them forward is

often very much like trying to drive sheep the way they do not choose to go. The cry of a camel resembles, in a degree, the bleating of a sheep; sometimes it is like the lowing of neat cattle, or the hoarse squeak of swine. But the Arabs heed not their cries, nor does the poor animal find much mercy at their hands; heavy and galling loads and meagre fare are its appointed portion; and God has hardened it to them. The singular power of the camel to go without water seems to be of the same nature as that of the sheep, at least in its manifestation, though in a far greater degree. The dew, and the juice of grass and herbs, are sufficient for them in ordinary cases; though, when the pasturage has become dry, the Arabs water their flocks every two days, and the camels every three. The longest trial to which we subjected our camels in respect to water, was from Cairo to Suez, four days; yet some of them did not drink even then, although they had only the driest fodder. But at all times the camel eats and drinks little, and secretes little; he is a heavy, sullen animal, having little feeling and little susceptibility for pain. Thistles, and briars, and thorns, he crops and chews with more avidity than the softest green fodder; nor does he seem to feel pain from blows and pricks, unless they are very violent.

“There is nothing graceful or sprightly in any camel, old or young; all is misshapen, ungainly, and awkward. The young have nothing frisky or playful, but in all their movements are as sober and staid as their dams. In this respect how unlike to the lamb! Another important quality of the camels, is their sure-footedness. It was surprising to find them travelling with so much ease and safety up and down the most rugged mountain passes. They do not choose their way with the like sagacity as the mule, or even as the horse, but they tread much more surely and safely, and never either slip or stumble.* In all our long journeys with them I do not recollect a single instance.

* This assertion must be taken with some limitation. The camel is essentially fitted for the level sandy desert, and not for rocky places, where it not unfrequently stumbles. “We ascended the rock we had to pass to come at the village of Zaboo, and on our descending my camel slipped his foot on one side and rolled down the rock, the height of about twenty feet, taking me of course along with him.”—BELZONI'S *Egypt and N. wa.*

“The sounds by which the Arabs govern their camels are very few and very guttural; the signal for kneeling is not unlike a gentle snore, and is made by throwing the breath strongly against the palate, but not through the nose; that for stopping, is a sort of guttural clucking.”*

Burekhardt has observed, that while the hump on the camel's back continues full, the animal will endure considerable fatigue on a very short allowance, feeding as the Arabs say, on the fat of its own hump. After a long journey the hump almost entirely subsides, and it is not till after three or four months' repose, and a considerable time after the rest of the carcass has acquired flesh, it resumes its natural size, of one-fourth of the whole body.

The Arabian Camel, or Dromedary, is distinguished by a single bunch on the back; the Bactrian Camel has two. The ordinary rate of a camel's walk is about two and one-third English miles per hour, when in full progress.

Camels are mentioned in Scripture as forming part of the riches of the patriarchs. Gen. xii. 16. Gen. xxx. 43; Job i. 3; xlii. 12. They were made use of by the Amalekites, and other tribes, in their predatory expeditions, as they are employed by the Bedouin Arabs in the present day.

Milch camels are mentioned as part of the present which Jacob sent to his brother Esau, Gen. xxxii. 15; and camels' milk is now a chief article in the diet of the Arabs. They drink it either fresh or sour; in the latter state it has an intoxicating quality. They also give it to their horses, and to the foals when weaned. It is richer and better than that of goats. Its flesh, though forbidden to the Jews, Lev. xi. 4, is eaten by the Arabs; it is coarse-grained, and inferior to beef.

Camels' hair was woven into a coarse kind of cloth. Matt. iii. 4. The two-humped camel is not noticed in Scripture.

An attempt was made to introduce the ordinary camel into Europe, about the middle of the sixteenth century, at Pisa, in Italy. The stud consisted of about two hundred camels, and was afterwards increased by importations from Tunis, but soon degenerated. This animal is alluded to in

* ROBINSON'S *Biblical Researches*, vol. ii. 632—635.

several proverbial expressions. Thus our Lord declares, "It is easier for a camel to go through the eye of a needle, than for a rich man to enter into the kingdom of heaven," Matt. xix. 24; and again, "Ye strain at (out) a gnat, and swallow a camel." Matt. xxiii. 24. There is an Arabian proverb of a similar kind, "He swallows an elephant, and is strangled by a flea."

THE COW, OX, AND HEIFER

ORDER — *Ruminantia*, or, Animals that chew the cud

THE OX and the cow are well known; we will begin by noticing a few passages in which they are used figuratively. Of Joseph it is said, "His glory is like the firstling of his bullock." Deut. xxxiii. 17.

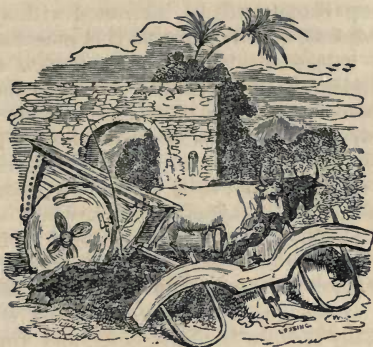
Egypt is like a very fair heifer—
Also her hired men are in the midst of her
Like fatted bullocks.—Jer. xlvi. 20.

O ye destroyers of mine heritage!
Because ye are grown fat as the helper at grass,
And bellow as bulls.—Jer. l. 11.

Ephraim is as an heifer that is taught,
And loveth to tread out the corn.—Hos. x. 11.

These expressions may strike us as very strange, unaccustomed as we are to a pastoral life. But to a Syrian shepherd his first-born bullock was like a bosom friend; his young cow was an image of all that was beautiful; his mare he would call a princess; and his horse, a sheikh, or chief. Phrases of this sort, "A man like a buffalo," or, "A woman like a cow,"* would sound to us like expressions of contempt; but among a people whose riches consisted chiefly in flocks and herds, it was quite different. When the sultan of Darfur, a country near Abyssinia, sits down on his throne, a herald proclaims before him "Behold the buffalo! the son of the buffalo; the bull of bulls! the elephant in strength!" and the people bow the knee before him.

* Homer calls Juno "ox-eyed," an epithet in compliment to her beauty.



OXEN AND YOKE.

THE ox, whose whole structure renders it fit for the plough, was employed from the earliest times as a beast of draught, and also to carry burdens. Num. vii. 3—8. The ox was not put under the yoke till three years old. Oxen were trained to the draught in the easiest manner by the threshing machine. In the middle of the field, a post was driven into the ground, and a long pole fastened to it, so that it turned round the post, like the spoke of a wheel round the axle. To this pole, from six to twelve, or more, cattle, were fastened, and driven round till the ground was trodden quite hard. Then the threshing-floor was swept; the sheaves were laid down, and trodden out by the cattle, unmuzzled. Threshing-time was, therefore, a golden time for the cattle, and an image to the Israelites of prosperous days; while ploughing, as the hardest labour, was a symbol of adversity. Hosea x. 11; Deut, xxv. 4; 1 Cor. ix. 9; 1 Tim. v. 18. Another kind of threshing was with the threshing-wain, which is still very common in Syria and Egypt. The threshing-wain is a kind of roller with teeth, over which is placed a seat for the driver. If the grain is hard, the seat is made heavier with stones, Isa. xxviii. 28; by such threshing all the straw is reduced as small as chaff. Mat. iii. 12; Psal. i. 4. But this did not render it worthless, as it was collected, and made use of as fodder in the winter. This effect of threshing was considered as an image of desolation. Amos i. 3.

Our young readers will be interested with a description, by an eye-witness, of threshing, as it is practised in the present day in Palestine. "The wheat, as soon as it is cut," says Dr. Robinson, "is brought in small sheaves to the threshing-floor, on the backs of asses, or sometimes of camels. The little donkeys are often so covered with their load of grain as to be themselves hardly visible; one sees only a mass of sheaves moving along, as if of its own accord. A level spot is selected for the threshing-floors, which are then constructed near each other, of a circular form, perhaps fifty feet in diameter, merely by beating down the earth hard. Upon these the sheaves are spread out quite thick, and the grain is trodden out by animals. Here were no less than five such floors, all trodden by oxen, cows, and younger cattle, arranged in each case five abreast, and driven round in a circle, or rather, in all directions over the floor. The sledge is not here in use, though we afterwards met with it in the north of Palestine. The ancient machine with rollers we saw nowhere.* By this process the straw is broken up, and becomes chaff. It is occasionally turned with a large-wooden fork having two prongs, and, when sufficiently trodden, is thrown up with the same fork against the wind, in order to separate the grain, which is then gathered up and winnowed. The whole process is exceedingly wasteful, from the transportation on the backs of the animals, to the treading out upon the ground. The precept of Moses, 'Thou shalt not muzzle the ox when he treadeth out the corn,' was not very well regarded by our Christian friends, while, among the Mohammedans, I do not remember ever to have seen an animal muzzled."†

When the heifer, by the light and pleasant labour of threshing, had been accustomed to be fastened to a pole, a yoke was placed on her neck, and she was worked with the plough. Ploughing with cattle is mentioned in the book of Job. In ploughing, the husbandman, in order to drive the cattle, instead of a whip made use of a goad, several feet in length, with an iron point. In threshing, the young cow might be sometimes restive, but if it kicked, the goad was

* Isa. xxviii. 27. Niebuhr found it still in use in Egypt, *Reiseb.* i. 151, called 'norei.' Lane also found it under the same name. See Winer, i. 324.

† *Biblical Researches*, vol. ii. p. 277.

driven into its leg, so that it soon gave over. Many a warrior, in case of necessity, made use of such a goad instead of a lance. Judg. iii. 31; 2 Sam. xxiii. 21.

The largest breed of cattle was that of Bashan, although they were not directly brought from Bashan. The ox was held so sacred by the Egyptians, who owed their whole prosperity, in the first place, to the overflowing of the Nile, and then to ploughing, that they abhorred the Israelites, who used cattle for food; from which they not only abstained, but even made gods of these animals. But the Israelites became so infected with this idolatry from their intercourse with the Egyptians, that they made a golden calf, and worshipped it while they were in the wilderness.

As cattle formed the principal possession of the Israelites, it was a cutting reproof of parsimony and ill-managed house-keeping to be without them :

Where no oxen are, the crib is clean :

But much increase is by the strength of the ox.—Prov. xiv. 4.

For in Judea, he who was not too idle to cultivate the ground could not fail of acquiring a maintenance.

THE SHEEP.

ORDER.—*Ruminantia*, or, Animals that chew the cud.

THERE are two varieties of this well-known and useful animal in Syria. The first, called the *Bedoween*, differs little from the largest breed known among us, excepting that its tail is somewhat longer and thicker. The other, called the *broad-tailed* sheep,* is distinguished by long hanging ears, and by a still larger tail, having two large masses of fat on each side of it, which often weigh from forty to fifty pounds. It is a part of the animal frequently referred to in Leviticus (iii. 9; vii. 3; viii. 25; ix. 19.) In the English version the Hebrew word *alyah*, is translated rump, which rather obscures the sense. The first passage is more correctly rendered by Dr. Boothroyd: "The large fat tail entire, taken off close to the rump." It was sometimes supported by a board, or small two-wheeled cart. At the present day

* The sheep of Palestine are all of the broad-tailed species; the broad part being a mere exerescence of fat, with the proper tail hanging out of it.—ROBINSON'S *Biblical Researches*, vol. ii. p. 169.

the fat, which is very rich, is often used instead of butter or oil, and eaten with lean meat or rice.

The colour of the sheep in the East is generally white, like our own, but sometimes black, speckled, or striped, as we learn from the history of Laban, Gen. xxx.

These animals made an important part of the possessions of the Israelites, and other eastern nations. In the wars between different tribes, they are generally enumerated among the booty taken by the conquerors. Joshua vi. 21; 1 Sam. xiv. 32; xv. 3; 1 Chron. v. 21. They are mentioned as an article of traffic in Ezek. xxvii. 21. The patriarchs had large flocks in Palestine: as Abraham, Gen. xxiv. 35; Isaac, xxvi. 14; Jacob, xxx. 43: and afterwards their descendants in the land of Goshen, Gen. xlvi. 32; xlvii. 3. In Palestine extensive plains and mountainous districts were devoted to pasturage, for this and other kinds of cattle, such as the plain of Sharon, Isa. lxx. 10; Mount Carmel, Bashan, and Gilead, Mic. vii. 14. Sheep were sometimes made use of as tribute; thus we are told, that "Mesha, king of Moab, was a sheep-master, and rendered unto the king of Israel an hundred thousand lambs, and an hundred thousand rams, with their wool." 2 Kings iii. 4. The flocks of the Kedarenes, (descendants of Kedar the son of Ishmael,) and "the rams of Nebaioth," (so named from Ishmael's first born, Gen. xxv. 13,) are also particularly mentioned in Scripture. "The flocks of Kedar shall be gathered together unto thee, the rams of Nebaioth shall minister unto thee." Isa. lx. 7. In the patriarchal times the flocks were tended not only by the daughters of their owners—for in the East all drudgery devolves on the females—but by the sons, which shows that it was originally considered an honorable employment: "Rachel came with her father's sheep: for she kept them." Gen. xxix. 9. "Thy servants are shepherds, both we, and also our fathers," said the sons of Jacob to Pharaoh, Gen. xlvii. 3; but at a later period, hired servants and menials were employed: "He that is an hireling, and not the shepherd, whose own the sheep are not, seeth the wolf coming, and leaveth the sheep." John x. 12. It was customary for the Jews, like the Arabians in the present day, to give names to individual sheep. The same practice was common in Greece, as we learn from a passage in the poet Theocritus. Nor is it unknown in

Germany, for "a shepherd lately told me," says Dr. Barth, "that in half a year he could easily train a flock of two hundred sheep to answer each one to its own name." An interesting illustration of this practice, and of the scriptural allusion, is contained in the Journal of the Rev. John Hartley. "Having had my attention directed last night," says Mr. H., "to the words in John x. 3, I asked my man if it was usual in Greece to give names to the sheep. He informed me that it was, and that the sheep obeyed the shepherd when he called them by their names. This morning I had an opportunity of verifying the truth of this remark. Passing by a flock of sheep, I asked the shepherd the same question which I had put to the servant, and he gave me the same answer. I then bade him call one of his sheep. He did so, and it instantly left its pasturage and its companions, and ran up to the hands of the shepherd with signs of pleasure, and with a prompt obedience which I had never before observed in any other animal. It is also true of the sheep in this country, that 'a stranger they will not follow, but will flee from him.' The shepherd told me, that many of his sheep were still wild, that they had not yet learned their names, but that by teaching them they would all learn them. The others which knew their names he would call tame. How natural an application," continues Mr Hartley, "does this description of the sheep admit of! The good Shepherd laid down his life for the sheep; but many of them are still wild; they know not his voice. Others have learned to obey his call, and to follow him; and we rejoice to think that even to those not yet in his fold the words are applicable, 'Them also I must bring.'"*

It is worthy of remark that in Scripture a shepherd is always said to *lead*, not to *drive* a flock, because the Hebrew shepherds always went before their sheep, and induced them to follow by a peculiar call. Thus, our Saviour says, "When the shepherd putteth forth his own sheep, he goeth *before* them, and the sheep *follow* him; for they know his voice." John x. 4. And Asaph, in Psa. lxxx. 1, thus addresses Jehovah, "Give ear, O Shepherd of Israel, thou that *leadest* Joseph like a flock." The same custom prevails

* *Researches in Greece and the Levant, by the REV. JOHN HARTLEY: London, 1831, p. 321.*

now in the East, and in Spain. In Russia, also, a peasant may often be seen marching through a village in the morning, playing on a pipe, on hearing which the animals come forth from their homesteads, and follow him to the pastures. The cattle are brought home in the evening, and called to be milked, in the same manner. In general, the flocks remained during the night, as well as by day, in the open air; thus we read in Luke ii. 8, that "there were in the same country shepherds abiding in the field, keeping watch over their flock by night;" but when exposed to predatory incursions, or the attacks of wild beasts, the shepherds drove them into caves, or into uncovered enclosures, erected for the purpose. Thus the Reubenites and Gadites said to Moses, "We will build sheepfolds here for our cattle, and cities for our little ones." Numb. xxxii. 16. When the flocks were very large, and required several shepherds, one of superior ability was chosen to superintend the rest; in allusion to this custom, the apostle Peter styles our Saviour "the chief Shepherd." 1 Peter v. 4.

The sheep is proverbially an emblem of meekness and gentleness. In reference to these qualities, as exemplified in our blessed Redeemer, it is said, in Isa. liii. "He is brought as a lamb to the slaughter, and as a sheep before her shearers is dumb, so he openeth not his mouth." With an evident allusion to the victims slain under the law, for the atonement of sin, of which he was the great antitype, he is styled, emphatically, "the Lamb of God, which taketh away the sin of the world." John i. 29. In the book of Daniel, a ram with two horns is employed as a symbol of the kings of Media and Persia. Dan. viii. 20. The Jews are frequently spoken of as the sheep of God, and their priests and rulers as shepherds. "We are his people, and the sheep of his pasture." Psa. c. 3; xc. 7. "My people hath been lost sheep; their shepherds have caused them to go astray." Jer. l. 6. Christ said to his disciples, "Behold, I send you forth as sheep in the midst of wolves." Matt. x. 16.

We have already noticed the beautiful representation given of the Saviour, as "the good Shepherd, who laid down his life for the sheep," who was at once "the offering and the priest." But let us not be satisfied with simply perceiving the exquisite beauty and propriety of the imagery of the Bible, while we neglect the practical application of the truth which

that imagery is employed to convey. Can we say with the psalmist, "I have gone astray like a lost sheep; seek thy servant; for I do not forget thy commandments?" Psa. cxix. 176 Are we still wanderers from the fold of God, still "wild," to use the expression of the Greek mentioned by Mr. Hartley; or have we listened to the voice of the heavenly Shepherd, and are we following in his footsteps?

Thou Keeper of a lovely flock,
Thyself far lovelier still,
Beneath the overshadowing rock,
Thy sheep are safe from ill.

O may I always hear thy voice,
Nor ever wander more:
But in thy constant care rejoice,
Thy dying love adore.

All gentleness and love thou art
Oh may I also be
Humble and lowly, pure in heart,
And more, my Lord, like thee!

THE GOAT.

ORDER.—*Ruminantia*, or, Animals that chew the cud.



SYRIAN GOAT.

IN Palestine there are two varieties of the goat. The first is longer and slenderer than the sort known in this coun

try, with short hair, generally fawn-coloured, small horns, very long hanging ears, and a thick shaggy tail. The other kind resembles our own, is for the most part black, and very shaggy, especially the male. The missionary Schulz, writing from Lebanon, gives the following account of these animals: "We pitched our tents near a brook, and witnessed the manner in which the goats are led down from the mountains, in order to drink at the brook. There were two herds, of a light reddish colour, with long hair and hanging ears. These goats are called in Arabic *kemmel*; they are shorn like sheep, and their hair is sold under the name of camel's hair. The yarn which is purchased in Europe for camel's hair is mixed and adulterated with wool. Goats, such as I have described are most numerous in Gilead, and Angora in Lesser Asia. The hair of these animals was probably that employed in making curtains for the tabernacle. Exod. xxv. 4. As they descended from the mountains, I was reminded of the expression in the Song of Solomon (iv. 1,) 'Thy hair is as a flock of goats, that appear from Mount Gilead.' Goats' milk was formerly, as it is now, a favourite article of food in the East: hence, in Prov. xxvii. 27, it is promised as one of the rewards of industry, "Thou shalt have goats' milk enough for thy food, for the food of thy household, and the maintenance for thy maidens." The flesh of the young animal was also highly esteemed. See Gen. xxvii, 9; Judges vi. 19; xiii. 15; 1 Sam. xvi. 20. It is difficult to explain the command, "Thou shalt not seethe a kid in his mother's milk," which is given twice in Exodus, (xxiii. 19; xxxiv. 26,) and once in Deuteronomy, (xiv. 21.) The most probable opinion is that it was intended to oppose an idolatrous practice of using the broth thus made, to sprinkle the trees, fields, and gardens, which was supposed to increase their fruitfulness by a certain magical influence. It confirms this view of the subject, that in Exodus the precept is given in connection with the laws concerning the season of ingathering and presenting the first fruits to the Lord.



THE IBEX

The WILD GOAT, (Hebrew, *akko*,) mentioned in Deut. xiv. 5, is supposed by some to be the ibex. Its horns sometimes measure more than four feet in length, knotted with a series of rings, and arching backwards. The colour of the animal is greyish yellow above, and dull white on the under parts, with a brown band along the flanks, and a black line down the spine. In winter it has an additional coat of long coarse hair, which is shed as summer comes on, leaving the under coat short and fine. Another species of goat the Abyssinian, or Jaal ibex, appears to be intended in Job xxxix. 1; 1 Sam. xxiv. 2; and in Psal. civ. 18, where the name in the original is *yaal*, (and *yaalim*, plural.) The female defends her young with great boldness and dexterity against the eagles, wolves, and other enemies, by concealing them in a cave, and standing on guard at the entrance.

The "bottles" mentioned in Scripture, (Gen. xxi. 15; Josh. ix. 4; Matt. ix. 17, etc.) were made of the skins of kids or goats, which are still employed for the same purpose in eastern countries. Dr Robinson saw at Hebron a large

manufactory of water-skins, which occupied an extensive yard, with several tanners' vats. They were merely the skins of goats stripped off whole, except at the neck, the holes at the legs and tail being sewed up. They are first stuffed out full, and strained by driving in small billets and chips of oak wood, and are then filled with a strong infusion of oak-bark for a certain time, until the hair becomes fixed, and the skin sufficiently tanned. This constitutes the whole process. Not less than fifteen hundred skins were lying, thus stuffed, in rows about the yard. They are sold at different prices, from fifteen to forty piastres.

In flocks of goats, the strongest and boldest act as leaders; this explains Jer. l. 8; "Go forth out of the land of the Chaldeans, and be as the he-goats before the flocks."

The prophet Daniel describes Macedonia under the symbol of a goat with one horn; and an ancient bronze figure of a goat with one horn has been dug up in Asia Minor. The same figure is seen on the reverse of a coin of Arche-laus, king of Macedon. The horn is represented as growing out of the middle of the forehead, but curved backward.

THE HART.

ORDER.—*Ruminantia*, or, Animals that chew the cud.

As the *hart* panteth after the water brooks, so panteth my soul after thee, O God.—Psal. xlii. 1.

THE original word, here rendered "hart," (*ayal*), and the feminine, hind, (*ayalah*), seems to be a general name for animals of the deer, or of the antelope kind. Such animals suffer much when they have been chased from their favorite haunts, and are afraid to return to the water lest they should be again molested. But when compelled by the unconquerable wants of nature to venture, the intense eagerness they exhibit beautifully verifies the comparison employed by the psalmist, Psal. xlii. 1. Can we apply this language to ourselves, or must we not confess that not God, the living God, but some earthly good, is the object of deepest interest to our souls?

The FALLOW DEER, which is the kind usually kept in English parks, is met with in large numbers on Mounts

Carmel and Tabor. Its colour is a darkish brown in winter, but in summer bay, spotted with white, and one variety is milk-white. It is smaller than the red deer, or stag, but very similar in its form and general habits; it differs, however, from it in the shape of the horns; those of the fallow deer being flat, while those of the stag are round. This ornament and instrument of defence or attack, does not appear till the second year, and is shed every successive spring; the first season it is single like a dagger, and every year increases, when renewed, in the number of antlers, snags, or tines, as they are sometimes called; this takes place with some regularity till the animal is seven years old, after which the number of antlers is indeterminate. One, belonging to the first king of Prussia, had thirty-three.

These animals were accounted clean by the Mosaic law, Deut. xiv. 5, and are mentioned among the articles of daily consumption in Solomon's household. 1 Kings iv. 23.

The ROEBUCK (Hebrew, *tsebi*) is considerably less than the fallow deer, being little more than two feet in height; its form is elegant, and its motions light and easy. When hunted, it begins, after a first dash forward, to mislead the hounds by doubling over its track, and then by some great bounds it springs off to a cover, while the pack pass by. They do not keep together in herds like other deer, but live in separate families.

It seems most probable, however, that by the word translated roebuck in the English version, is intended a species of ANTELOPE, called GAZELLE. It is remarkable for its fine eyes, and the general elegance of its figure: and from this circumstance probably derives its name, which signifies "loveliness." "You have the eyes of an antelope," is at the present day a common compliment in the East. In 2 Sam. ii. 18, Asahel is said to be swift of foot as a *tsebi*, of the Gadites it is said, "They were as swift as the roes (*tsebaim*) upon the mountains," 1 Chron. xii. 8; and antelopes are proverbial for their fleetness. The swiftest dogs and horses are left far behind in the pursuit of these animals, and they can only be caught by artifice.

The PYGARG, (Hebrew, *dishon*,) of which the name occurs only once in the Bible, Deut. xiv. 5, is supposed to be a larger kind of antelope. The "wild ox," mentioned in the same passage, may be the antelope, *leucoryx*, a species

frequently represented on the monuments of Egypt and Nubia, and particularly in the inner chamber of the great pyramid at Memphis, where a whole group of these animals is represented, some driven or pushed forward, and others led by the horns, or by a cord about the neck, apparently by way of tribute from some conquered nation. With one exception, these representations are in profile, so that only one horn is seen.

It is quite uncertain what animal is intended by the Hebrew word *zemer*, translated CHAMOIS, in Deut. xiv. 5: it cannot be the species so called, for the Alps, Pyrenees, mountains of Greece, and the islands of the Archipelago, are almost the only places where it is to be found. The Septuagint, St. Jerome, and some modern critics, render it the camelopard, but this animal is exclusively African, being a native both of Southern Africa, and also of Nubia and Abyssinia. If known in Palestine, it was only from report, or from individuals captured in Nubia, and brought there as objects of curiosity. Hence the camelopard, or giraffe, could not have been used as an ordinary article of food; so that a law, either to prohibit or permit its use, could hardly be supposed to be given. Might it not be the wild sheep?

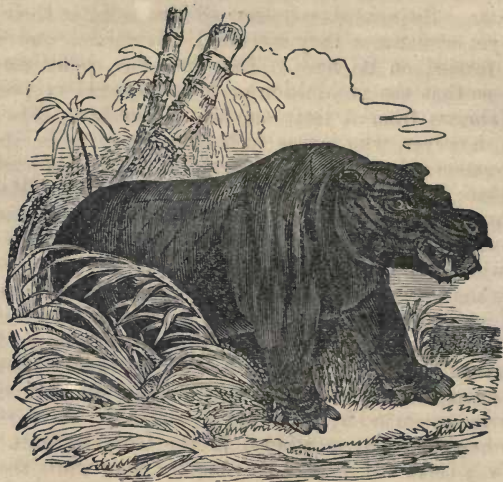
THE HOG.

ORDER.—*Pachydermata*, or Thick-skinned Quadrupeds.

THE hog is an example of herbivorous animals, with divided toes, which do not chew the cud. This animal is found wild in the East, and also in the forests of continental Europe, excepting the very coldest latitudes. It is an obstinate, untractable, stupid animal, and both in a wild and tame state is distinguished by its unsightly figure and awkward movements. Its uncleanness is proverbial among all nations, as well as in the Bible; and not less so is its ungovernable fury and eagerness for destroying every thing within its reach, when provoked. It lives and thrives on every kind of food, vegetable and animal, and for this reason has been domesticated from the earliest ages among various nations, both of Europe and Asia. No animal converts a given quantity of corn or other nourishing food so soon into fat, or can be fattened on so great a variety of food. In a

wild state, it lives upon grass, roots, acorns, beechmast, and wild fruits. The use of swine's flesh was forbidden by the Mosaic law. It was also disallowed by the Egyptians, Phenicians, and Arabians. The ancient Greek historian Herodotus informs us, that if an Egyptian by accident touched a hog, he immediately plunged himself, clothes and all, into the water. Swineherds were not allowed to enter their temples; yet sometimes they sacrificed this animal, and afterwards feasted on its flesh. They therefore, sometimes ate pork; so that the prohibition of Moses tended to preserve the Hebrews from at least one act of idolatry. The chief reason, however, why it was forbidden seems to be its unwholesomeness in warm climates, and especially its tendency to produce leprosy, or other disorders of the skin. Mohammed in the Koran, forbids the eating of pork; but the Mohammedans, though they do not eat it themselves, if they meet with a wild hog will take it, dead or alive, and sell its flesh to the Christians. The prophet Isaiah mentions the eating of swine's flesh as one mark of impiety in the rebellious Jews. Isa. lxxv. 4; lxxvi. 17. On the other hand, in the dreadful persecution of the Jews by Antiochus, there were many noble examples of persons who would rather die than violate the Divine command by partaking of such food. With respect to the herd of swine mentioned in the Gospels, Matt. viii.; Mark v.; Luke viii. it may be remarked, that while the Mosaic law forbade the using them for food, Hyrcanus had also passed a law prohibiting the Jews from keeping swine. The loss of these animals was therefore a just punishment of their disobedience; and the disposition they showed on this occasion in being more impressed with the loss of their property than with the Divine power manifested by the Saviour, proves how well they deserved correction.

When Hadrian rebuilt Jerusalem, he set up the image of a hog on the gates of the city, to deter the Jews from entering it, and to express his contempt for them.

HIPPOPOTAMUS.—*Behemoth.*ORDER.—*Pachydermata*, or Thick-skinned Quadrupeds.Behold now *behemoth*, which I made with thee; he eateth grass as an ox.—
Job xl. 15.

THE HIPPOPOTAMUS.

It is now generally supposed, that the animal described in the book of Job under the name of *behemoth*, is no other than the river-horse or hippopotamus. The male has been found seventeen feet in length, fifteen in circumference, and seven in height. The head is enormously large, and the jaws extend upwards of two feet, and are armed with four-cutting teeth, each of which is twelve inches in length. The animal is of one uniform colour, similar to a light tint of Indian ink; the hide, above an inch in thickness, is hardly flexible; the ribs are covered with a thick layer of fat, which when salted and dried, is esteemed as a delicacy. The food of this animal consists chiefly of grass and aquatic plants; though it is also fond of rice and the sugar-cane, and often lays waste the fields which are planted with these productions. Such is its strength, that it will sometimes overset

heavy-laden boats, or break them in pieces with its teeth. Its skin is not, as in the elephant, soft under the belly, but as thick as in other parts, and is rendered, in some degree, more callous from being dragged over the rough stones at the bottom of the river. The tail is not considerable in proportion to its body, but can be moved and twisted at pleasure. It swims with ease, and can remain for some time under water; but when it rises its spouts forth a quantity of water through its nostrils like the whale. Its voice is a harsh and heavy sound, like the creaking of a large door; it is uttered when it raises its huge head out of the water, and when it retires to it again.

We are assured by naturalists, that the hippopotamus is restricted exclusively to the African continent, where it is universally spread, being found from the provinces of Nubia, Abyssinia, and Dongola, to the boundary of the settlement at the Cape of Good Hope, wherever deep rivers afford it an asylum. Formerly it was common within the boundary of the colony at the Cape, but is now rarely if ever, to be met with in the Berg river, where it once abounded. This circumstance may be attributed to the fire-arms of the Europeans, before which weapons the wild beasts of the desert retire.

During the residence of the Israelites in Egypt they must have had their attention frequently called to this huge animal, since it is, and was, common in the Nile, if not immediately in the neighbourhood of the great cities, at least above the Cataract of Assouan, in Nubia and Abyssinia.

According to Burckhardt, the hippopotamus is abundant in Dongola, "where it is a dreadful plague, on account of its voracity, and the want of means in the inhabitants to destroy it. It often descends the Nile as far as Sukkot. In 1812, several of them passed the Bahr el Hadjar and made their appearance at Wady Halfa and Den, an occurrence unknown to the oldest inhabitants. Another continued its course northward, and was seen beyond the Cataract of Assouan at Doran, one day's march north of that place."

The writer of the article on the hippopotamus in the "Menageries," vol. iii. says, "We learn from Mr. Salt that it is in the district of Abyssinia, watered by the river Tazaze, a noble tributary to the Nile, that this animal abounds. Its Abyssinian name is *gomari*."

“Mr. Salt had scarcely reached the bank of that stream, when he heard a noise in the water, and his attendants crying out, Gomari! Gomari! Upon that occasion, however, he only obtained a momentary view of the immense creature, whose action in the stream he compares to the rolling of a grampus in the sea. Advancing along the line of the river, our traveller found it interrupted by frequent overfalls, and shallow fords. Between these shallows he observed holes or pits of almost immeasurable depth, and which very much resembled the small lochs or tarns found among the mountains of the north of England and Scotland. It is to these depths that the hippopotami delight to resort. Mr. Salt soon came to one where several of them were assembled, and having crossed the river at a ford, and gained a high overhanging rock that commanded the deep pool, he and his party prepared their muskets. They did not remain long on the spot before they discovered, at the distance of only twenty yards, a hippopotamus rising above the surface of the water. The animal came up very confidently, elevating its enormous head above the water, and snorting violently in a manner somewhat resembling the noise made by a porpus. The instant the head was exposed, three of the party fired, but though the contents of their guns appeared to hit it on the forehead, the animal merely turned its head round with an angry look, and making a sudden plunge, sank down to the bottom, uttering a noise that was something between a grunt and a roar.

“Mr. Salt and his companions could not but fancy they had killed, or at least seriously wounded, the monster, and expected every moment to see its huge body float up to the surface. But a hippopotamus is not so easily killed. In a few minutes, indeed, it rose up, and nearly at the same place, but apparently unhurt, and little concerned at what had happened, though rather more cautious than at its former appearance. Again several guns were fired at it, with no more effect than before; and though some of the party, eager in the sport, remained at their post all day, and fired at every hippopotamus that appeared, there was, after all, no evidence to show that the slightest impression was made on any of them. ‘This,’ says Mr. Salt, ‘can only be attributed to our having used leaden balls, which are too soft to enter the impenetrable skulls of these creatures, as we

repeatedly observe that the balls strike against their heads. Balls composed of tin mixed with lead would have been more effective.'

"Towards the end of the day, and after all the firing, they came up with extreme wariness, merely putting their nostrils above the level of the stream, breathing hard and spouting up the water like the jets of fountains.

"It appears from what Mr. Salt witnessed, that the hippopotamus cannot remain more than five or six minutes at a time under water, being obliged to come up to the surface in the course of some such interval for the purpose of respiration. One of the most interesting parts of the amusement was, to observe the ease with which these animals quietly dropped down to the bottom; for the water being clear, they could be distinctly seen so low as twenty feet beneath the surface."

Burekhardt met with the hippopotamus in abundance in Dongola, as also did Dr. E. Ruppell. This latter traveller states, that the natives of Dongola attack it with the harpoon while asleep, or while grazing at night in the corn-fields, but that the danger is great, for that if the hippopotamus discovers the huntsman before he can throw his weapon, the animal rushes at him with the utmost fury, and crushes him at once in his wide open mouth.

In the water, to which, when wounded, the animal plunges, the danger is very great; irritated by the pain of the harpoon, to which a line is attached, the monster endeavours to upset the boat, in which are his assailants, ready with fresh harpoons to throw when he rises; and he often succeeds, and destroys both boat and men. In fact, so hazardous is this mode, that one or two only are yearly killed; and Dr. Ruppell observes, that from 1821 to 1823 inclusive, only nine were killed, of which his own party despatched four by means of their guns, a swivel, (small cannon,) from which latter five balls, besides balls from muskets, were fired, before one of those in question was destroyed.

Richard and John Lander observed these animals in the Niger "in incredible multitudes," and ran some narrow risks from them, as they splashed, snorted, and plunged around the canoe. The first fired at, of course without injury, though almost within a gun's length off, roused a multitude from the bottom of the river, which gave chase to the canoes

and it was with the utmost difficulty that the party escaped. We might extend our pages upon this animal with extracts from Clapperton, Owen, Sparrmann, and others, but we have said enough to give the reader some idea of the tremendous power of this formidable animal, and of the danger of attacking it. "His bones are as strong pieces of brass; his bones are like bars of iron. He lieth under the shady trees, in the covert of the reed and fens. The shady trees cover him with their shadow; the willows of the brook compass him about. Behold, he drinketh up a river, and hasteth not: he trusteth that he can draw up Jordan into his mouth. He taketh it with his eyes: his nose pierceth through snares." Job xl. 15—24.

THE ELEPHANT.

ORDER.—*Pachydermata*, or Thick-skinned Quadrupeds.



THE ELEPHANT.

THE elephant is well known as the largest, strongest, and, excepting perhaps the dog, the most intelligent of any existing species of quadruped. There are two kinds, the African and the Asiatic. The latter differs from the former not only in its greater size, and in the characters of the teeth

and skull, but also in the comparative smallness of the ears, the paler brown colour of the skin, and in having four nails on the hind feet instead of three. The height of a full-grown one is nine, or perhaps ten feet, and the body has been found to weigh between four and five thousand pounds.

The trunk, or proboscis, is an organ peculiar to this animal. It is composed of many thousands of small muscles, variously interlaced, so as to render it capable of extension, contraction, and motion in every direction; possessing exquisite sensibility, nearly eight feet in length, and stout in proportion to the size of the animal. This organ, as the elephant pleases, will uproot trees, gather grass, raise a piece of artillery, or pick up a comfit, kill a man, or brush off a fly. It conveys the food to the mouth, and pumps up enormous draughts of water, which, by bending it back, can be poured into the throat, or showered over its own body, or other objects. Its length supplies the place of a long neck, which would have been incompatible with the support of its large head and weighty tusks. The grinders, which are very solid and heavy, are changed in rotation, so that there are either one or two, on each side in the upper and lower jaw. In the African, the flat surfaces of these teeth are marked with large, irregular, lozenge-shaped ribands, passing from side to side; while in the Asiatic, these ribands are narrow, with indented edges, and fold upon each other in parallel lines.

Elephants have no canine teeth, but in the upper jaw are two incisors, or cutting teeth, better known by the name of tusks. As they continue to grow during the animal's life, their weight is variously stated; but the usual weight of those brought to England is from seventy to a hundred pounds each; but some have been sent from Pegu and Cochin China that weighed an hundred and fifty pounds. Their length is from seven to fourteen feet. The substance of which they are formed is called ivory, and is mentioned in several passages of the sacred writings, though the elephant itself is not noticed. The first place in which it occurs is in 1 Kings x. 18, where we are told that Solomon "made a great throne of ivory, and overlaid it with the best gold." In Psalm xlv. 8, mention is made of "ivory palaces." Supposing the reference to be to the royal palaces, it would intimate that the internal decorations were principally formed

of ivory. The practice of inlaying the walls of state apartments with valuable metals, woods, and other substances, was no means uncommon among the eastern and classical nations of antiquity. Ivory is thus mentioned by Homer, in his description of the palace of Menelaus; and by the Latin poet Lucan, in depicting the banqueting hall of Cleopatra, queen of Egypt. Among the Romans also, ivory inlaying was common about the time of the Christian era. In Ezek. xxvii. 6, the benches of the Tyrian ships are said to be made of (that is, overlaid, or ornamented with) ivory.

Mankind have in all ages been at great pains in taming elephants, and when once brought under control, they are, perhaps, the most gentle and tractable of all animals. They were formerly much used in war. When Alexander invaded India, Porus resisted his passage of the Hydaspes with horsemen and chariots, and a multitude of trained elephants. About a century later, Pyrrhus brought them into Italy, in his war with the Romans. The Carthaginians, also, employed them in the Punic wars; as many as one hundred and forty elephants were drawn up in one line. Under the Roman emperors, they were often exhibited at their triumphal processions, and in the public games. In the present day, they are often made use of in India, both by the natives and Europeans, in hunting the larger beasts of prey. There is a well authenticated anecdote of an English officer, who was mounted on an elephant, in a lion hunt. While he was in the act of leaning forward to fire at a lion that was already wounded, the houdah, or seat, gave way, and he was precipitated over the head of the elephant, into the very jaws of the furious beast. The lion, though severely hurt, immediately seized him, and would, doubtless, soon have put a fatal end to the conflict, had not the elephant, urged by his mahout, or driver, stepped forward, though greatly alarmed, and grasping in her trunk the top of a young tree, bent it down across the loins of the lion, and thus forced the tortured animal to quit its hold. The officer's life was thus preserved, though his arm was broken in two places, and he was severely clawed on the breast and shoulders.

THE RHINOCEROS.

ORDER.—*Pachydermata*, or Thick-skinned Quadrupeds.

SEVERAL kinds of rhinoceros are found in India and the islands of Java and Sumatra, and also in Africa. The one-horned rhinoceros of India is exceeded in size only by the elephant, and in strength and power is inferior to no other creature. It is, at least, twelve feet in length, six or seven feet in height, and the circumference of the body is nearly equal to the length.

It is particularly distinguished by the remarkable weapon it carries on its nose, from which it derives its name, compounded of the two Greek words, (*ρην*, *rin* nose, and *κερας* *keras*, horn.) This is a very hard horn, solid throughout, and has been seen four feet in length. In Africa, more than one species has been found, with two horns, one behind the other, and not half its length. Mr. Brown, in his Travels, however, says that the Arabians call the rhinoceros, *abu-kurn*, that is "father of the one-horn;" and Burckhardt states, that there is, in the country above Sennaar, a one-horned rhinoceros, to which the negroes give the name of the "mother of the one horn." It is possible that the animal alluded to by Brown, and that noticed by Burckhardt, may be the same.

Our reason for introducing a notice of the rhinoceros into this work is, that many eminent critics have supposed it to be the animal which, in our English version of several passages of Scripture, is called a UNICORN. But there is nothing in the Hebrew word *reem*, Job xxxix. 9, to imply that the animal was one-horned; it is, indeed, mentioned as horned, but the only passage which is quite distinct on this point clearly intimates that it had two horns. "His horns are like the horns of unicorns," (*reem*,) Deut. xxxiii. 17: the word here is singular, not plural, and should have been "a unicorn," not unicorns;" but it would have been inconsistent to have said "horns of the unicorn," (one-horned,) and, therefore, the word was put in the plural. The second passage is Psa. xxii. 21, "The horns of the unicorns," (*remim*,) which leaves the question undetermined. The third is Psa. xcii. 10, "My horn shalt thou exalt like the horn of the *reem*." If *horn* be supplied, as in our version,

then there would be nearly the same evidence for concluding the *reem* had one horn, as the text first cited affords for its having two; but we must consider that it is not unusual in poetry, or even in common discourse, to speak of the *horn* of an animal that has actually two horns, but never of the *horns* of a creature that has but one. It seems, therefore, not improbable that a wild buffalo, or some such animal, is intended. This opinion derives some support from the *reem* being mentioned in connection with animals of the ox kind, in Isa. xxxiv. 7: "The unicorns, (*rēmim*) shall come down with them, and the bullocks with the bulls." The language also employed in Job xxxix. 9-12, seems to imply that it was an animal similar to those used in husbandry, but wild and difficult of domestication. "The Ghawarineh, a tribe of Arabs living in tents, have large herds of horned cattle, among which are many buffaloes. These buffaloes are, of course, a different species from the vast herds bearing that name which roam over the western wilds of North America. They are very common in Egypt, being kept both for milk and for labour; and are found also in Italy, especially in the Pontine marshes. They are shy, ill-looking, ill-tempered animals. They, doubtless, existed anciently in Palestine, though probably in a wild state, or unsubdued to labour, as at the present day in Abyssinia. The actual existence of this animal in Palestine leaves little doubt that it is the *reem* of the Hebrew Scriptures, for which both ancient and modern versions have substituted the fabulous unicorn."*

THE WHALE.

ORDER.—*Cetacea*.

THERE is an order of animals with the fore-limbs formed like paddles, and which live in the water exclusively. They have no hind limbs, and the tail is expanded into a sort of oar. Of these animals the whale is an example. Animals of this order (*Cetacea*) have a double heart or a heart with two ventricles, and warm red blood, like all the mammalia. In the structure of their bones, they bear little resemblance to fishes. The skeleton of a whale, or a dolphin, might be supposed to belong to a quadruped; but the parts that in

* ROBINSON'S *Biblical Researches*, vol. iii. 305, 306.

quadrupeds would form the fore-feet, are covered with flesh and skin, are changed into fins or paddles, without distinct fingers; the hind feet are blended so as to form a tail, placed horizontally, and not vertically; a position that enables them, by means of a few powerful strokes, to rise or dive with the utmost rapidity. Instead of gills they have lungs, and can remain only a short time under water, and may more properly be said to live *upon* the water than *in* it.

The skin is naked, and between it and the muscles there is a layer of fat, forming the substance called blubber, varying in its depth in different species, and in the same at different ages. In the common Greenland whale it ordinarily varies from ten to twenty inches; and a single individual of moderate size will yield forty tons; but sixty, or even eighty tons are sometimes produced, the depth of the blubber being in proportion.

The use of the blubber appears to be twofold; by its elasticity it defends the internal organs against the pressure of the surrounding water at immense depths, but its principal use is to preserve the vital heat of the body. Were it not for this casing of blubber (one of the slowest conductors of heat) the whale would perish from cold in the very low temperature of the Polar seas. To this may be added, that by its greater specific lightness the blubber makes the vast bulk of these animals more buoyant in the water. The thick fur of the land animals would be quite useless. Such is the admirable adaptation everywhere observable in the works of God.

The SPERMACETI WHALE, OR CACHALOT, has a head much larger than that of the common whale, being nearly half the length of its whole body; the upper jaw is destitute of teeth, and also of the plates called whalebone; but the lower jaw is armed with a range of teeth which fit into the corresponding cavities of the upper jaw, the gum of which is as hard as gristle. The upper part of the skull consists of a number of large cells filled with a clear oily fluid, which hardens on cooling, and in the solid state is called spermaceti, or adipocire; it is also contained in various other parts of the body. Another substance, called ambergris, (used chiefly as a perfume,) is found in the intestines of this animal; it is solid, opaque, of a bright grey colour mixed with yellow stripes; when heated or rubbed, it gives

out an odour that is agreeable to most persons. A cachalot was captured in Whitstable Bay during the month of February, 1819; the heart measured three feet across; the aorta, or main artery, arising from the left ventricle of the heart, was one foot three inches in diameter. The total length of the animal was sixty-three feet, and the circumference thirty-six. The cachalot is said to reach sometimes the length of one hundred feet. This species feeds on lump-fishes, dog-fishes, cuttle-fishes, and occasionally swallows the shark, which the width of its gullet enables it to do entire.

The COMMON, or GREENLAND WHALE, is entirely destitute of teeth; their place is supplied in the following manner: the upper jaw having the shape of a boat reversed, is furnished along its two sides with long plates of a horny substance, called whalebone, or baleen, eight or nine hundred on each side, with the broad end fixed to the gum, and the other end tapering to the middle of the palate; these plates have a loose fringed edge; they begin small, but increase to ten feet in length, and then diminish gradually. The lower jaw contains a thick fleshy tongue, and is arched outward, so as to embrace these fringed plates, and when the mouth is shut form a kind of strainer of whalebone filaments, which retain the small marine animals which are the food of the whale.

The Greenland whale is now seldom found more than seventy feet in length; its blubber is of considerable thickness, and yields from seventy to one hundred barrels of oil. The affection of the whale for its mate, and of the parents for their young is very great, and they have been known to perish rather than desert each other when in danger.

Great danger often attends the destruction of the whale; and many instances are on record in which the boat has been shattered to pieces, and the boat's crew submerged. The common Greenland whale has been known to throw a boat, with its men and apparatus, fifteen feet into the air; but the cachalot is far more dangerous, and will rush open-mouthed upon the frail boat which is filled with its pursuers, and its attack is not to be avoided without difficulty. Too often, indeed, its aim is true, and it scatters death around. Every year fatal accidents thus occur in the South Seas, where the fishing of the cachalot is carried on.

It is very doubtful whether the whale is ever expressly mentioned in the Scriptures. The Hebrew word *tannin*, in one or two passages, evidently means the crocodile; Job vii. 12; Ezek. xxxii. 2; Isa. li. 9; xxvii. 1. In Gen. i. 21, it probably includes all the larger aquatic animals and reptiles. Of the fish that swallowed Jonah, we are only told in the narrative that it was a "great fish," Jonah i. 17; and the Greek word *ketos*, used by the evangelist Matthew, xii. 40, is not restricted to the whale in Greek authors. In Homer it is used for an animal of the seal kind.

CLASS II. — BIRDS.

WE now turn with pleasure from the quadrupeds of the earth, and the whales of the ocean, to the birds of the air. The first order, in which we meet with the birds of prey, is indeed not peculiarly adapted to make a pleasing impression on the mind of the observer. It is not, however, difficult to perceive the utility of these, as well as the benefits arising from the rest of this class of animals. Birds of prey free the countries where they dwell from an immense number of noxious creatures, such as serpents, and, some of them at least, clear away the carrion. Singing birds devour an innumerable multitude of caterpillars and insects. Birds, in proportion to their size, require much more food than mammiferous animals, and thus become much more useful. Many species of birds serve mankind for food; and their eggs are both nutritious and pleasant. Their plumage serves partly for warmth, and partly for ornament. The instincts of most birds are very remarkable. Many delight us by the exquisite modulation of their notes; nor is our admiration less excited by the skill displayed in the construction of their nests. The migratory habits of various birds are also highly deserving of our notice. Some are only partially migratory, removing from one district or locality to another, as from the borders of the sea into the interior of the country, or from the mountains to the plains, and *vice versa*.

Others remove to a distant country, like the stork, which is found in Holland in the summer, but makes its winter abode in Egypt and Barbary. The swallow tribe quit England, and other parts of Europe in the autumn, and pass in large troops over to Africa; they arrive in Senegal early in October. "Yea, the stork in the heaven knoweth her appointed times; and the turtle and the crane, and the swallow observe the time of their coming." Jer. viii. 7. But many kinds, which among us are birds of passage, are stationary in the milder climate of Palestine,

and never leave the place of their birth, unless for a very short time. The number of species of birds is much greater than that of quadrupeds; many of them also are very short-lived. The swan is said to attain the age of an hundred years. The organs of breathing in birds are admirably constructed for the purpose of enabling them to fly with greater ease. The air passes through their lungs into air cells, which either surround or are joined to the heart and liver, and other internal parts: there are even air-cells in the bones, which are supplied in the same way. In the wild swan (*cygnus ferox*) the wind-pipe after passing down the long neck of the bird, is curiously coiled up, within the breast-bone for the same purpose. Naturalists state, that in the tame swan, (*cygnus olor*.) the trachea does not make this convolution. There is a closer resemblance than appears at first sight between the wings of birds and the fore-legs of quadrupeds: the joints are similar, and in both, the upper part of the limb consists of a single bone, and the lower of two. The brain in birds is larger in proportion than that of quadrupeds. The eyes are so large that there is no brain between them, but only a thin plate of the skull. The organ of smell lies at the root of the beak. The tongue in most kinds is gristly, and not formed for any delicacy of taste. In the parrot it is thick and fleshy, and also in the duck and goose. They have no outward ear like quadrupeds, but an opening covered with feathers.

Birds of prey are known by their bent beak and crooked talons, very powerful weapons, which they employ to take other birds, and even weak quadrupeds and reptiles; they have all four toes; the nail of the hind toe, and that of the internal toe, are the strongest.

They form two families, the diurnal and the nocturnal: those that seek their prey by day, and those that seek it by night. The diurnal birds of prey have a quick and piercing sight; a membrane, called the *cere*, covers the base of the beak, in which are placed the nostrils; they have three toes before, and one behind; the two outward toes are almost always united at their base by a short membrane; the plumage is close; the feathers are strong, and the flight powerful.

THE EAGLE.

ORDER.—*Raptors*, or Birds of prey.

THE GOLDEN EAGLE.

THE erect, majestic air of this bird when at rest, its extraordinary strength, its lofty soaring, and its noble appearance in general, have obtained for it the title of King of birds. Though not the largest of birds, specimens of the golden eagle have been met with measuring nearly four feet in length, and about nine feet across the wings: one specimen measured eleven feet three inches from the tip of one wing to that of the other, and weighed eighteen pounds. The female, as is the case with other birds of prey, is larger than the male. Its colour varies with its age: when young

all the plumage of the body is of a clear reddish-brown, but when old the top of the head and the nape are covered with feathers of a lively golden-red. The tarsi, or feet bones of the eagle, are closely feathered down to the very division of the toes. The beak is straight at the base, with a very strong, hooked, and sharp point, bluish at the base, but coal-black at the tip. In confinement it has been known to live above one hundred years, and in a state of freedom it no doubt exceeds this age. Its crop, which is a large pouch into which the food enters immediately on being swallowed, is above twelve times as large as the stomach properly so called; so that, after it has once been filled, the eagle can go without food for a long time, while the contents of its crop are gradually received into the stomach. A tame eagle has been known to fast for above a month. As it can quench its thirst in the blood of its victims, it can go without water for a long time; though it is an erroneous opinion that it never drinks.

When two eagles are once mated, they continue together for life, and rear their successive broods on the same spot. Their nest is formed of sticks of from five to six feet in length, crossed by supple branches, and then covered with rushes and weeds. They generally hunt together. The male soars aloft, or sits on the summit of a rock ready to pounce upon its prey, while the female explores the woods and coppices, to drive out the animals from their retreats. The young ones are plentifully supplied with game by their parents, till they are able to fly, when they are driven from the nest. Birds of prey, and especially eagles, are very sickly during the moulting season, which renders their vigour and beauty afterwards more striking. We find allusions to this fact in the Scriptures: "Thy youth is renewed like the eagle's." Psal. ciii. 5. "They that wait upon the Lord shall renew their strength; they shall mount up with wings as eagles." Isa. xl. 31. There is a beautiful allusion to the parental care of the eagle in the song of Moses, Deut. xxxii. 11, 12: "As an eagle stirreth up her nest, fluttereth over her young, spreadeth abroad her wings, taketh them, beareth them on her wings; so the Lord alone did lead him, and there was no strange god with him." These birds do not confine themselves to smaller animals, but will attack full-grown deer, and even foxes, wolves, and bears; they

generally fasten on the heads of larger quadrupeds, tear out their eyes, and then beat them to death with their wings. In Prov. xxx. 17, it is said, "The eye that mocketh at his father, and despiseth to obey his mother, the ravens of the valley shall pick it out, and the young eagles shall eat it."

The rapidity of the eagle's flight is frequently alluded to in Scripture; as in Deut. xxviii. 49, "The Lord shall bring a nation against thee from far, from the end of the earth; as swift as the eagle flieth." Jeremiah, describing the march of Nebuchadnezzar's army, says, "His horses are swifter than eagles," iv. 13; and describing the conquest of Moab by that monarch, he exclaims, "Behold, he shall fly as an eagle, and shall spread his wings over Moab:" xlviii. 40. And in the Lamentations it is said, "Our persecutors are swifter than the eagles of the heaven:" iv. 19. Job thus describes the rapid flight of time: "My days are passed away, as the eagle that hasteth to the prey," ix. 25; and Solomon says of riches, "They make themselves wings; they fly away as an eagle toward heaven." Prov. xxiii. 5. We find several striking allusions in Scripture to the eagle's nest, or eyrie, built in the clefts of the loftiest rocks: "Though thou exalt thyself as the eagle," (says the prophet Obadiah, addressing Moab,) "and though thou set thy nest among the stars, thence will I bring thee down, saith the Lord," verse 4. Jeremiah thus foretells the doom of Edom: "O thou that dwellest in the clefts of the rock, that holdest the height of the hill: though thou shouldest make thy nest as high as the eagle, I will bring thee down from thence, saith the Lord:" xlix. 16. The king of Egypt is described by Ezekiel as "a great eagle with great wings and many feathers;" while in the same beautiful parable the king of Babylon is said to be "a great eagle with great wings. long-winged, full of feathers, which had divers colours." Ezek. xvii. 3, 7. The figure of an eagle, it is well known, was employed as an ensign by the Assyrians, Persians, and Romans.

THE OSSIFRAGE.

ORDER.—*Raptors*, or Birds of prey.

It is doubtful whether the word thus translated, Lev. xi 13, means a species of vulture, or the great sea-eagle called

ossifrage, or bone-breaker, from the circumstances that fragments of bones, of considerable size, have been found in its stomach. Though it is most frequently found in colder climates, Russia and Siberia, it has been met with in Barbary, and on the rocky coasts of the Mediterranean. It feeds principally on fish, but also preys upon fowls, geese, young seals, lambs, and goats. It hunts and fishes both by night and day. Its flight is not so lofty or so rapid as that of the golden eagle, nor does it pursue its prey so far

THE OSPRAY, or FISH HAWK.

ORDER.—*Raptores*, or Birds of prey.

ITS beak and feet are like those of the sea-eagle, but its nails are round underneath, while in other birds of prey they are bent and channeled. With its sharp eyes it perceives the fishes among the waves, and darts upon them like an arrow. While conveying the fish it has captured to its eyrie, it is often pursued by the sea-eagle, who obliges it to relinquish its prey, which he seizes before it falls again into the water. Some think the black eagle is intended in Lev. xi. 13.

THE VULTURE.

ORDER.—*Raptores*, or Birds of prey.

BIRDS of this tribe are mostly distinguished from the eagle by the bareness of the head and neck. Their beaks and talons are much more feeble than in the eagle, and they also differ in having their eyes on a level with the head, while those of the eagle are deeply sunk. They stand in a stooping attitude, and in walking their wings hang down, and their tails trail along the ground, so that the end of the pen-feathers is worn away. They fly heavily, and seek their prey in flocks. Unlike many other birds of prey, they relish carrion; hence in hot countries, such as India and Egypt, they are of great service in devouring the remains of dead animals and other garbage. They do not carry food to their young ones in their talons, but fill their own crop, and

then, like pigeons, empty its contents into the beaks of the nestlings.

The bird called in the English version "the gier eagle," Lev. xi. 18, is probably a species of vulture known in Egypt by the name of Pharaoh's chicken; by the Turks it is called *akbobas*, which means white father, and by the Egyptians and Moors *rachama*, which is the same as the Hebrew *racham*, Lev. xi. 18, and *rachama*, Deut. xiv. 17. It is described by Bruce as having a very strong and pointed beak, the end of which is black for about three quarters of an inch; the remainder is covered with a yellow fleshy membrane, which also covers the fore part of the head, and the under part of the neck; this membrane is very wrinkled, and the under part of it is thinly set with a few hairs.

The thigh of the *rachama* is covered with very soft down, as far as the joint of the leg. Hasselquist says, that the inhabitants of Egypt cannot be too thankful to Providence for this bird. All the places round Cairo, he tells us, were in his time filled with the dead bodies of asses and camels; and thousands of these birds fly about, and devour these carcasses, which would otherwise fill the air with pestilent exhalations. The fields of Palestine would remain uncultivated, if these vultures did not clear them of prodigious numbers of rats and mice, which breed there. They were considered sacred by the ancient Egyptians, and in the present day it is considered in Cairo a crime to destroy them. They are said even to follow the yearly caravan to Mecca, that they may devour the offal of the slaughtered beasts, and the bodies of the camels that die by the way.

THE KITE.

ORDER.—*Raptores*, or Birds of prey.

THE word rendered "vulture," in Job xxviii. 7, is translated "kite" in Lev. xi. 14, and Deut. xiv. 13.

The common kite is found in Europe, Asia, and Barbary. In France it frequents the marshes, and pursues ducks and other aquatic birds. It is said to attack hares and rabbits; field-mice, moles, rats, and large insects, are its ordinary food, and it also devours dead fish which float on the surface

of the water. It darts rapidly from a great height in the air, and hovers so lightly that the motion of its wings is not perceptible. It is easily scared away from its prey by birds much inferior to itself in size. The smallest of the hawks, it is said, puts it to flight; and two rooks more than match it. It will not dare to take the chickens from a very watchful hen; but when it succeeds in getting prey, it is so intent on devouring it, that it may often be knocked down by a person cautiously coming behind it. Though its beak is tolerably powerful, its claws are much weaker than those of other birds of prey, which may explain its inferiority in boldness.

The kite (says the author of the "British Naturalist") usually builds in trees; its nest is formed of twigs and lined with wool. The female lays generally three eggs of dusky white, larger than those of the domestic hen, occasionally blotched with rusty brown at the thick end. The young are produced early in the season; and on the Continent the bird is migratory, proceeding southward to Greece and Italy, or even to Africa, to winter, and returning as far as the shores of the Baltic in summer; but in Britain they do not leave the country, but descend towards the sea, where they prey on dead fish, aquatic insects, sandpipers, and other birds.

"Glede" is an ancient English name for the kite, (derived, Pennant says, from the Saxon *glida*.) It occurs only once in the Bible, Deut. xiv. 13; and is generally supposed to mean the same as the word translated *vulture* in Lev. xi. 14, and to be of the species we have already described as known by the name of "Pharaoh's chicken."

THE HAWK.

ORDER.—*Raptores*, or Birds of prey.

VARIOUS kinds of hawks are spread over every part of the world. The largest European species is the goshawk. The female is about two feet in length, and five in the expansion of its wings; and the male about a third less in each dimension. Though many hawks remain constantly in Europe, others, as the peregrine falcon, migrate in the win-

ter to milder climates. The sailors in the Mediterranean call them corsairs, as during their passage they prey on various kinds of birds. In Job xxxi. 26, the migratory instinct of this bird is alluded to: "Doth the hawk fly by thy wisdom, and stretch her wings toward the south?" See Lev. xi. 16



PEREGRINE FALCON.

The Greeks consecrated the hawk to Apollo, and among the Egyptians no animals were held in such high veneration as the hawk and the ibis.

The common sparrow-hawk has the same colours as the goshawk, but its legs are higher, and its size about a third less.

THE OWL.

ORDER.—*Raptores*, or Birds of prey.

OWLS are *nocturnal* birds of prey. They are distinguished by their thick heads and their large eyes, surrounded with a circle of feathers. The enormous pupils of their eyes admit

so much light, that they are blind in open day, and see best at dusk or by moonlight. Their hearing is quicker than that of most birds. Some of them have tufts of feathers over each eye, usually called horns. The external toe may



COMMON BARN OWL.

be moved forward or backward at pleasure. They live mostly on small birds and mice, which they swallow whole, and return the bones, feathers, or hair, in small pellets, by the mouth. Their quill-feathers are so light and downy

that they make scarcely any noise in flying, which assists them in taking their prey unawares.

“The little owl,” Lev. xi. 17; Deut. xiv. 16; Psa. cii. 6, is supposed to be the common white owl, which is found in every quarter of the globe. It frequents barns and out-houses in search of mice and rats. It builds its nest in the clefts of old walls, or in hollow trees.

The word rendered “great owl” in Lev. xi. 17; Deut. xiv. 16; Isa. xxxiv. 11, most probably means the ibis. “The screech owl,” in Isa. xxxiv. 14, is perhaps the great-eared, or, rather, tufted owl, which measures two feet, or more, from the extremity of the beak to that of the tail, and is little inferior in size to the common eagle. The legs are feathered to the toes. In Europe, it is most common in Germany, Russia, and the Rock of Gibraltar, and is sometimes, though rarely, seen in Scotland and England.

A very different word is also translated “great owl” in Isa. xxxiv. 15, which occurs nowhere else in the Bible. Some have supposed it to mean a kind of serpent; but the prophet’s language respecting making a nest and gathering “under her shadow,” are contrary to this construction; for though serpents are oviparous, yet they make no nests to receive their eggs, which are hatched by the warmth of the sun and soil. On the other hand, the actions alluded to are certainly those of a bird, though whether it be one of the owl kind cannot be positively determined.

“The night hawk,” Lev. xi. 16, is perhaps the passerine owl, which is found in Europe, Egypt, and Nubia. It is the *noctua* of the ancients, the emblem of Minerva. The word, or rather phrase, translated “owl” in Lev. xi. 16, occurs also in Job xxx. 29; Jer. l. 39; Isa. xliii. 21; xxxiv. 13; xliii. 20; Mic. i. 8; Deut. xiv. 15. In two of these passages the marginal reading is “ostriches,” and in three, “daughters of the owl;” but the former is generally approved by the most eminent critics.

Various birds are alluded to in the Scriptures which are not of the rapacious order; and which, at the same time, are neither aquatic in their habits, as the duck, nor waders, as the stork, nor yet of the gallinaceous order, as the fowl. Their food consists of insects, fruits, and grains. They are

more exclusively granivorous in proportion to the thickness of their bills, and insectivorous as that organ is attenuated. They belong to the passerine order, or order incessores.

THE COMMON HOUSE-SPARROW,

ORDER.—*Passeres*,

furnishes an illustration. It is a familiar bird, and lives much in the society of man. Sparrows are robust and hardy, and can accommodate themselves to the greatest extremes of heat or cold in our climate, and in more northern countries. In Siberia, however, the sparrows and pie:s are not found farther north than the banks of the Pellidoni, a river that falls into the Lena, which is the last spot in that quarter where corn is grown; and Commodore Billings states that when he visited that part of the globe, they had been seen there only for five years, which was precisely the time during which grain had been cultivated. They make their nest of hay and feathers, which they lay somewhat negligently under tiles, or in the crevices of walls; but when they build it in trees, it is formed with more compactness and regularity. Some take possession of the nests of swallows. They lay five eggs, of a whitish-ash colour, with a number of brown spots. In Italy there is a distinct species of the sparrow, the male of which has its head of a chestnut colour; and in Spain, Sicily, Greece, and Egypt, another kind is found, with a darker plumage, and the black of the throat extending over the whole of the chest.

There is an allusion to the domestic habits of this bird in Psa. lxxxiv. 3: "Yea, the sparrow hath found an house, and the swallow a nest for herself, even thine altars, O Lord of hosts, my king, and my God." The Hebrew word is used not only for a sparrow, but for all sorts of clean birds, or those whose use was not forbidden by the law. It is, indeed, translated *bird* or *birds*, in Gen. vii. 14; xv. 10; Lev. xiv. 5, 50, 52; Deut. xiv. 11; xxii. 6; Job xli. 5; Psa. xi. 1; civ. 17; cxxiv. 7; Prov. vi. 5; vii. 23; xxvi. 2; xxvii. 8; Eccl. ix. 12; xii. 4; Isa xxxi. 5; Ezek. xxxix. 4; Lam. iii. 52; Amos iii. 5; Hos. xi. 11; *fowl*, Deut. iv. 17; Psa. viii. 8; cxlviii. 10; Ezek. xvii. 23; xxxix. 17; Neh. v. 18: and, *sparrow* Psa. lxxxiv. 3; cii. 7. In the New Testament the Saviour alludes to this little bird, when

encouraging his disciples to faith in the care of their heavenly Father: "Are not two sparrows sold for a farthing? and one of them shall not fall on the ground without your Father," Matt. x. 29: also in Luke xii. 6, "Are not five sparrows sold for two farthings, and not one of them is forgotten before God?" On both occasions he draws the encouraging conclusion, "Fear ye not therefore; ye are of more value than many sparrows." Matt. x. 31; Luke xii. 7. While this beautifully illustrates the universal providence of God, and leads us to acknowledge his hand, even in comparatively minute events, let us recollect that though he is the Saviour, the Preserver of all men, he is "especially" so "of them that believe." Are we, then, in the highest and noblest sense, his children? "Ye are all," said the apostle, "the children of God by faith in Christ Jesus." Gal. iii. 26. Without this affectionate trust in the Saviour, this practical acknowledgment of his redeeming character, our faith in the providence of God will be devoid of its most precious element of consolation; for without "faith in Christ Jesus," we are not "obedient children," but disobedient, and turn away from the brightest manifestation of our Father's love.

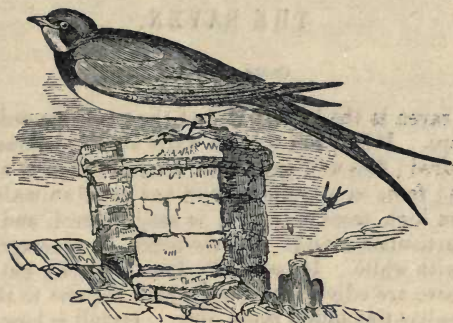
THE SWALLOW.

ORDER.—*Passeres*

THE swallow tribe live entirely on insects; they are all remarkable for the closeness of their plumage, the length of their wings, and the rapidity of their flight. They live almost entirely on the wing or in the nest; since they catch and eat their prey, and even drink, and sometimes feed their young ones, while on the wing.

Four birds of this family visit England, the swift, the swallow, the martin, and the sand martin. The swift arrives about the middle of April, and retires southward early in August. It is seldom observed to maintain a low flight, like the swallow or the martin, but generally sails at a considerable height. The wings are of enormous length, far exceeding the tip of the tail when closed.

The swallow visits England rather earlier than the swift or martin. It generally breeds in the inside of chimneys in



which no fire is kept, but often in barns, and various places about buildings; while the martin selects for the same purpose the corners of windows, or the eaves of houses.

The sand-martin, or river swallow, is the smallest of the British swallows. Its favourite haunts are the banks of rivers, particularly if composed of a sandy soil, in which it can make burrows, using its bill as a pickaxe. It often works so deep that its nest can scarcely be reached without digging.

The prophet Jeremiah alludes, in a very striking manner, to the migration of the swallow tribe, and other birds. Rebuking the Jews for disobedience, he says, "Yea, the stork in the heaven knoweth her appointed times; and the turtle, and the crane, and the *swallow*, observe the time of their coming; but my people know not the judgment of the Lord." Jer. viii. 7. It is, indeed, most melancholy and striking to observe the incessant violation of the great moral law of the Creator (the law of love) by his rational creatures, in contrast with the regular and never-failing operations of instinct in the inferior animals! But more than this, does not conscience tell us that we are among these transgressors, that we ourselves are exposed to the cutting rebuke, "The ox knoweth his owner, and the ass his master's crib: but Israel doth not know, my people doth not consider." Isa. i. 3. And if this be the case, can we be satisfied to be unreconciled to Him whose law we have violated, but who has sent his Son to be the propitiation for our sins?

THE RAVEN.

ORDER.—*Passeres*.

THE raven is the largest bird of the passerine order found in Europe. It is found both in warm and cold climates. It lives retired; flies well and high; smells carrion at a league's distance; feeds on all sorts of fruit and small animals; builds singly on high trees or rocks; is easily tamed, and may be taught articulate sounds. In the north, its plumage is often mixed with white. Its general colour is black; but the feathers above are edged with blue, which imparts to the whole that peculiar tint called raven-grey. Its bill is long, strong, and a good deal curved, with a ridge on the upper mandible, and is capable of inflicting a severe wound. When it attacks any animal, it generally aims in the first place at the eyes. It will often dart upon a hare while sitting on her form, pounce upon one eye, and repeat the stroke on the other, before the animal can escape. In the case of leverets and young rabbits, one such stab on the head will be sufficient to kill them. It will attack much larger animals, such as lambs, and even sheep, if it find them sickly and unguarded.

The thievish habits of the tame raven, and other birds allied to it, as the magpie, are well known; but it is remarkable, Dr. Richardson observes, that, inhabiting in a wild state the most secluded and worst peopled districts of America, it should exhibit the same disposition to carry off shining metallic bodies, and other articles totally unfit for food, or for use in the construction of its nest. Mr. Kendall, in crossing the height of land which divides the waters that flow towards Hudson's Bay, from those which fall into the Arctic Sea, saw a raven flying off with something in his claws, pursued by a number of his clamorous companions. The bird, being fired at, dropped the object of contention, which proved to be the lock of a chest.

A curious instance of the proficiency in articulate sound, that this bird is capable of, is mentioned by Mr. Swainson, who says, that a raven, living in the vicinity of the guard-house at Chatham, has more than once turned out the guard, who thought that they were called by the sentinel on duty.

Among heathen nations, even the wisest and most highly

civilized, the Greeks and Romans, a superstitious importance was attached to certain birds, which were considered fortunate or unfortunate, either by their own nature, or from the time and manner of their appearance.

Ravens were very much noticed; if they croaked on the right hand, it was thought a tolerably good omen; if on the left, a very bad one. The raven of Odin was depicted on the standard of the Danes when they invaded England, and they believed it possessed prophetic powers; that, as a sign of victory, it would stand erect and soaring, but if a defeat was impending, it would hang its head and droop its wings. The loss of this magical banner in their first battle, after landing in Devonshire, contributed not a little to their final overthrow.

Happy are those who, instead of regulating their conduct by such superstitious notions, seek daily to be strengthened by God's Spirit, and enlightened by his word, remembering that "he that walketh uprightly walketh surely." Prov. x. 9.

THE LAPWING.

ORDER.—*Grallatores*, or Waders.

IN the list of unclean birds, Lev. xi. 19; Deut. xiv. 18, is one called the lapwing. This is a bird of the sandpiper and snipe kinds, which are common in marshy places, where they search in the mud for their food, consisting of worms and insects. It is abundant in England, particularly in Norfolk and the fens of Lincolnshire and Cambridge. It is remarkable for the artifices it makes use of to decoy persons or dogs away from its nest, flying slowly before them, or running along the ground, with its wings hanging down as if wounded.

In summer these birds retire from the sea-coast to the moors, but towards the end of the season return again to the coast, where they spread themselves over the low swampy grounds in quest of food.

It is generally thought, however, by the best commentators, that the bird intended in the texts quoted above, is not the lapwing, but the *hoopoe*. This bird, which belongs to the passerine order, is found in all parts of Africa, India, and

China, and visits the south of Europe every spring, returning in the autumn to pass the winter in Africa.

It is a bird of great beauty, with a handsome crest, which it can raise or lower at pleasure. Its general colour is of a vinous red; the wings and tail black; two white bands across the upper part of the wings, (or wing-coverts,) and four across the lower part, (or the quill-feathers.) In Egypt it is stationary, and almost domestic. Its food consists of



THE HOOPOE.

beetles, worms, snails, etc.; and moist and marshy places are of course its favourite resorts. It grows very fat in autumn, and is used for food in the Archipelago, Italy, and some parts of France.

Our barn-door fowl and many game birds, belong to the gallinaceous order, which takes its name from *gallus*, the common cock. We may first notice the peacock.

THE PEACOCK.

ORDER.—*Rasores*, or Gallinaceous.

THIS splendid bird, though originally brought from India, is so well known by its domestication in this country, that a minute description of it is needless. In its native country it is found in great abundance in the copses and jungles on the banks of the larger rivers, and especially of the Ganges; not less than twelve or fifteen hundred have been seen near one spot within an hour. They were probably introduced into Greece by Alexander the Great, who had never seen them till he marched to India, where he was so struck with their beauty, that he decreed a severe punishment on all who disturbed or injured them. In the degenerate days of Rome, the tongues and brains of peacocks formed a favourite dish at the imperial table.

The pea-fowl in general roosts on the tallest trees; but their nest is formed on the ground in a retired spot, and consists of a few sticks and twigs, with leaves.

In 1 Kings x. 22, and in 2 Chron. ix. 21, peacocks are mentioned as having been brought, with other oriental productions, to king Solomon by his fleet from Tarshish.

In Job xxxix. 13, the plumage of this bird is referred to, as a display of the creative power and wisdom of God: "Gavest thou the goodly wings unto the peacocks?"

White peacocks are occasionally to be met with, but are merely an accidental variety, and not a distinct species. In 1783, a pair of common peacocks, produced at Gentilles, near Paris, four young ones, two of which possessed the plumage of their parents, and two were entirely white.

THE DOMESTIC FOWL.

ORDER.—*Rasores*, or Gallinaceous.



is of Indian origin, of which the principal species are the Javanese and the wild cock of Sonnerat. We have no direct evidence that it was known to the Jews before the Babylonish captivity; but in the New Testament there are several allusions to the crowing of the cock, besides the

reference to the tender care shown by the hen to her young ones in our Saviour's pathetic lamentation over Jerusalem.

In Matt. xxvi. 34, our Lord is represented as saying that before the cock crew, Peter should deny him thrice; so Luke xxii. 34, and John xiii. 39. But, according to Mark xiv. 30, he says, "Before the cock crow *twice* thou shalt deny me thrice." These texts may be very satisfactorily reconciled by observing, that ancient authors, both Greek and Latin, mention *two* cock-crowings, the one of which was soon after midnight, the other about three o'clock in the morning; and this latter being most noticed by men as the signal of their approaching labours, was called, by way of eminence, "the cock-crowing;" and to this alone, Matthew, giving the general sense of our Saviour's warning to Peter, refers; but Mark, more accurately recording his very words, mentions two cock-crowings.

It may here be remarked, that before the Babylonish captivity the Jews divided the night into only three watches. The first is referred to in Lam. ii. 19; "Arise, cry out in the night: *in the beginning of the watches*, pour out thine heart like water before the face of the Lord." The second is mentioned in Judges vii. 16: "So Gideon, and the hundred men that were with him, came unto the outside of the camp, in the beginning of the *middle watch*:" and the last we find in Exod. xiv. 24: "In the *morning watch* the Lord looked unto the host of the Egyptians," etc. But when Judea became subject to the Romans, the division of the night into four watches of three hours each was adopted; these are all mentioned in Mark xiii. 35: "Watch ye therefore: for ye know not when the master of the house cometh, at even, or at midnight, or at the cock-crowing, or in the morning."

THE PARTRIDGE.

ORDER.—*Rasores*, or Gallinaceous.

THIS bird is referred to in 1 Sam. xxvi. 20, and Jer. xvii. 11. The particular species known in Palestine was probably that now called Greek. It is spread through the Turkish empire, the islands of the Archipelago, Sicily, and Naples. It ordinarily keeps among the rocks, but descends

into the plain to make its nest, in order that the young may find at their birth a ready subsistence. It lays from eight to sixteen eggs. Like the common hen, it will sit on the eggs of strangers for want of its own. Now, as Dr. Shaw remarks, if, in the absence of the proper owner, the partridge sits on the eggs of a stranger, when the stranger returns to the nest, and drives away the intruder before she can hatch them, the party so expelled resembles a man in low circumstances, who had possessed himself for a time of the property of another, but is forced to relinquish his acquisition before he can render it profitable; which is the simile employed by the prophet, Jer. xvii. 11.

The eggs of the Greek partridge are of a reddish-yellow colour with slight red spots, and are hatched in about three weeks. This species live on grain, seeds, insects, the larvæ of ants, and during the winter on the buds of different evergreens. The flesh is white, and much esteemed, though it has a slightly resinous taste, and is rather bitter.

The species of the partridge are numerous, and they are found in all climates, from the north pole to the torrid zone. They all agree in having rather a sluggish flight, but are uncommonly nimble in running. The Arabs make a practice of chasing them, and when they have wearied them out, knock them down with bludgeons. To this practice David referred when he said of Saul, "The king of Israel is come out to seek a flea, as when one doth hunt a partridge in the mountains." 1 Sam. xxvi. 20.

THE QUAIL.

ORDER.—*Rasores*, or Gallinaceous.

It is one distinguishing mark of the quail, that the first quill of the wing is as long as those that follow it; in other birds of the partridge tribe it is much shorter.

In Europe the quails are known as far as Lapland, but in no part of this quarter of the globe, excepting Portugal do they remain the whole year. In autumn they assemble in large flocks, and fly mostly by moonlight southward, cross the Mediterranean, and proceed to Africa, and some of them traverse that continent as far as the Cape of Good Hope. In their course they visit the islands of the Archipelago, and

the Shores of Italy and Sicily, in myriads. A hundred thousand have been destroyed in one day in the kingdom of Naples. They are sometimes so fatigued that they drop on the decks of vessels, and may be taken by the hand.

On two occasions the Israelites were supplied with immense numbers of quails for food: the first time was soon after crossing the Red Sea, when, we are told, "the quails came up, and covered the camp," Exod. xvi. 13; a second time, when the people murmured at Kibroth-hattaavah, and said, Who shall give us flesh to eat? "there went forth a wind from the Lord, and brought quails from the sea, and let them fall by the camp." The expression which follows, "As it were two cubits high upon the face of the earth," Num. xi. 31, is rendered by Dr. Boothroyd, (in which he is supported by the Septuagint, Josephus, and Jerome,) "At about two cubits *above* the face of the earth;" which indicates that they flew at so moderate a height above the ground as to be caught without difficulty. This appears much more probable than that they lay in heaps two cubits high, by which vast numbers must have been suffocated, and therefore rendered unfit for food. Hasselquist, speaking of the quail, says, "I have met with it in the wilderness of Palestine, near the shores of the Dead Sea and Jordan, between Jordan and Jericho, and in the deserts of Arabia Petræa. If the food of the Israelites in the desert was a bird, this is certainly it, being so common in the places through which they passed."—*Travels*, p. 203.

Quails are very pugnacious birds. They were kept for the purpose of fighting, like game-cocks, by the Greeks and Romans, and the same barbarous custom exists in China at the present day.

THE PIGEON, or DOVE.

ORDER.—*Rasores*, or Gallinaceous.

THE TURTLE DOVE.

PIGEONS, or DOVES, are found in a wild state, and inhabit all the warm and temperate regions of the earth. There are upwards of a hundred species, besides varieties.

The first mention of the dove in Scripture is in Gen. viii. 8, 10, 11, where Noah sends one from the ark to ascertain if the waters of the deluge were assuaged. This bird was very early used in sacrifice, Gen. xv. 9. Under the Mosaic law doves, or young pigeons, were the sacrifice of the poor who could not present anything more costly, Lev. i. 14; v. 7, 11; xii. 6, 8; xiv. 22, 30; xv. 14. 29; Numb. vi. 10; Luke ii. 24. It was to supply doves for these sacrifices that they were offered for sale in the temple: and we read that our Saviour "overthrew the seats of them that sold doves." Matt. xxi. 12; Mark. xi. 15.

The collard turtle, or laughing-dove, (so called from its uttering a sound resembling a laugh,) is probably the species referred to in the Scripture, as it is common in Syria and the adjacent countries. In the east it is usual to build

pigeon-houses, or dove-cotes, to attract the pigeons, for they sake of their dung, which is used as manure in raising melons, and other plants of that kind. Tavernier says, "There are above three thousand pigeon-houses in Ispahan. Every man may build a pigeon-house on his own farm, which yet is very rarely done: all the other pigeon-houses belong to the king, who draws a greater revenue from the dung than from the pigeons, which serves, as they prepare it, to cultivate their melons." Mr. Morier gives a similar account of these pigeon-houses at Ispahan; and describes them as being "large round towers, rather broader at the bottom than the top, and crowned by conical spiracles, through which the pigeons descend. Their interior resembles a honey-comb, pierced with a thousand holes, each of which forms a snug retreat for a nest. The extraordinary flights of pigeons which I have seen upon one of these buildings affords perhaps a good illustration of the passage in Isa. lx. 5, 'Who are these that fly as a cloud, and as the doves to their windows?' Their great numbers, and the compactness of their mass, literally looked like a cloud at a distance, and obscured the sun in their passage."—*See MORIER'S Second Journey, p. 140.**

THE OSTRICH.

ORDER. *Rasores*, or *Gallinaceous*.

THE ostrich is found in the sandy deserts of Asia and Africa. It is a gigantic bird, being from six to eight feet in height, and weighs as much as eighty pounds. Its muscular thighs, thicker than a man's, are destitute of feathers. It has only two toes to each foot; the interior toes are long, and have a strong claw at the end; the exterior toes are shorter and without a claw. The sole of the foot is broad, and adapted to walking on the sand of the desert. The length of its neck and legs, and some of its habits, have caused it to be compared to the camel, and by the Arabians and Greeks it was called the camel-bird. A remarkable feature in the camel is a naked swelling on the chest, upon which when reposing the animal throws a great portion of the weight of its body. The ostrich has a similar

* See "Evenings' Entertainments," published by the Board of Publication, for an account of the Wild Pigeons of the United States.

protuberance. The wings are each armed with two short plumeless shafts, resembling the quills of a porcupine, and, in place of true quill-feathers, are supplied with plumes of a pure and beautiful white. Similar plumes also terminate the tail. Several females have been known to lay their eggs in the same nest, and to sit upon them alternately. The eggs are of a dirty white colour, marbled with yellow; they weigh nearly three pounds. The ostriches make no nest, properly speaking, but merely hollow out a place in the sand. Under the torrid zone, the heat of the sun renders incubation unnecessary during the day. "On the least noise," says Dr. Shaw, "or trivial occasion, she forsakes her eggs or her young ones, to which perhaps she never returns, or if she does, it may be too late." Agreeably to this account, the Arabs meet sometimes with whole nests of these eggs undisturbed; some of them are sweet and good, others are addled and corrupted; others, again, have their young ones of different growth, according to the time it may be presumed they have been forsaken of the dam. The Arabs often meet with a few of the little ones no bigger than pullets, straggling and moaning about like so many distressed orphans. In this manner the ostrich may be said to be hardened against her young ones as though they were not hers; her labour in hatching and attending to them being vain, without fear or the least concern of what becomes of them afterwards. This want of affection is also recorded in Lam. iv. 3: "The daughter of my people is become cruel, like the ostriches in the wilderness." The ostrich is unable to fly, but runs with surprising swiftness. The fleetest horse could not overtake it, if it did not frequently turn in circles, and thus give its pursuers an advantage, though the chase often lasts for eight or ten hours. "What time she lifteth up herself on high, she scorneth the horse and his rider." Job xxxix. 18.

THE CRANE.

ORDER.—*Grallatores*, or Waders.

THE migratory habits of this bird, which belongs to the wading order, are alluded to in Jer. viii. 7, which has already been quoted. "They are met with," Latham observes, "in

great flocks, throughout northern Europe and Asia. They also breed in Spain; and are said to have been formerly bred in England, where they were regular visitors, before cultivation had deprived them of congenial situations, by the inclosing waste tracts of land, and the draining of wide swamps and marshes. In confirmation of this, we hear of statutes imposing a fine on those who take away the eggs of a crane or a bustard. No less than two hundred and four were served at the feast of Archbishop Nevil, in the reign of Edward IV.

In winter, the crane retires to the warmer regions of the



THE COMMON CRANE.

south, Syria, Egypt, Africa, and the adjacent countries. Their flight is very elevated, and often takes place during the night. The crane has a very loud, clanging note, which

can be heard when the bird is too high to be seen. To this peculiar sound Hezekiah compares his cries of pain and distress during his illness. Isa. xxxviii. 14.

THE HERON.

ORDER—*Grallatores*, or Waders.

UNDER the genus *Heron*s are comprehended the birds known by the name of egrets, bitterns, crab-eaters, etc. They dwell on the borders of lakes and rivers, or in marshes; they feed on fish, aquatic insects, and reptiles. Herons are melancholy birds, remaining for hours on the edge of the waters. But though they seek their food in a solitary manner, they build their nests in company. As many as eighty, nests have been seen on one tree.

The word *anapha*, translated heron, in Lev. xi. 19, and Deut. xiv. 18, has been variously understood. Some have rendered it the kite; others the woodcock—the curlew—the crane. Bochart thinks it the mountain falcon, the same that the Greeks call *anopea*, mentioned by Homer, Odys. i. 320, and this bears a strong resemblance to the Hebrew name.

THE BITTERN.

ORDER.—*Grallatores*, or Waders.

THIS bird is somewhat smaller than the heron. Its voice resembles the bellowing of a bull, which has occasioned its being known in some parts of England by the name of "bull of the bog."

"The bittern is, in many respects," says Mr. Mudie, in his work on the feathered tribes of Great Britain, "an interesting bird; but it is a bird of the wilds, almost a bird of desolation, avoiding alike the neighbourhood of man, and the progress of man's improvements. It is a bird of recluse habits; so that when any locality is in the course of being won to usefulness, the bittern is the first to depart; and when any one is abandoned, it is the last to return." "The bittern shall dwell there," is the final curse, and implies that the

place is to become uninhabited and uninhabitable. It bears not the whistle of the ploughman, or the sound of the mattock; and the tinkle of the sheep bell, or the lowing of the ox, (although the latter bears so much resemblance to its own hollow and dismal voice that it has given foundation to the name,) is a signal for it to be gone.

The habits and instincts of the bittern gives us a clue to the force and propriety of the prophetic denunciation against Babylon, in Isa. xiv. 23, "I will also make it a possession for *the bittern*, and pools of water; and I will sweep it with the besom of destruction, saith the Lord of hosts." Zephaniah employs similar imagery in his prophecy of the overthrow of Ninevah, "The Lord will make Ninevah a desolation and dry like a wilderness. Both the cormorant and *the bittern* shall lodge in the upper lintels of it; their voice shall sing in the windows; desolation shall be in the thresholds." Zeph. ii. 13, 14.

The bittern, when wounded, defends itself with great obstinacy, throwing itself on its back and darting its sharp beak with great force at its foe. The plumage is beautifully varied with spots, bars, and dashes of black on a fine reddish-yellow ground. The feathers of the head and neck are long, and are capable of being thrown forward.

THE STORK.

ORDER.—*Grallatores*, or *Waders*.

THE stork is mentioned in the following passages of Scripture: Lev. xi. 19; Deut. xiv. 18; Job xxxix. 13; Psal. civ. 17; Jer. viii. 7; Zech. v. 9.

The white stork is the species best known; it arrives in Holland about the beginning of April, where it is received as a public benefactor, as it frees the country from lizards, frogs and other reptiles. The north of Africa, and especially Egypt, is the wintering place of this bird. In spring it spreads itself over not only Holland, but France, Sweden, Germany, and Poland. In England it has been rarely seen. One was shot at Sandwich in Kent, in 1805, and another in Hampshire in 1808. The bill is long, sharp, furrowed from the nostrils to the point, and of a red colour; the legs also are long and red; the feathers are mostly white, except

the ends of the long wing feathers, which are black; its length is about three feet three inches. The stork is remarkable for its affection towards its offspring. The two parents guard and feed each brood, one always remaining with it while the other goes for food; they keep the young ones in the nest much longer than any other bird; to accustom them to fly and to venture themselves in the air, the mother exercises them in little circular flights around the nest, leading them about, and bringing them back to their habitation. The nest of the stork is formed of twigs and sticks and the



THE WHITE STORK.

eggs are seldom more than four in number, and often only two; a little less bulky, but more elongated, than those of a goose. In Lorraine, Alsace, and Holland, they nestle on the tops of the houses, and the inhabitants provide boxes for their accommodation. In Barbary, Dr. Shaw informs us,

they place their nest on the highest part of old ruins, in the canals of ancient aqueducts, frequently upon the very tops of the mosques and dwelling-houses. The firs, and other trees when these are wanting, are a dwelling for the stork. In ancient Egypt this bird was treated with the greatest reverence, and this is still the case in many parts of Africa and the East. Among the Romans, the appearance of a stork in their auguries signified union and concord. Its departure in any calamity was deemed a most fatal presage. Attila, we are told, continued the siege of Aquileia, which he was about to raise, because he had seen some storks flying from the city, and bringing their young along with them.

The black stork is in many points of its disposition, as different from the white as in its colour. It is fond of solitude, fixes its nest in the depth of woods, on old trees, particularly fir trees. It is common in the Alps of Switzerland, but very rarely seen in Holland. There is but one appearance of this bird recorded in England. One was taken alive in 1814, at Stoke St. Gregory, in Somersetshire.

THE IBIS.

ORDER.—*Grallatores*, or Waders.

THOUGH the name of this bird is not found in the English authorized version, many eminent critics have supposed that it is intended by the word translated "great owl" in Lev. xi. 17. Two species of this bird are natives of Egypt, one black and white, the other entirely black. They were venerated by the ancient Egyptians, admitted into their temples, and embalmed after death. The former, is, however, generally distinguished as the sacred ibis. It is about the size of a common fowl. When young, the neck is partially covered with down, or small feathers of a blackish tint, which fall off when the plumage is mature, leaving the head and neck bare, which, with the beak and feet, are of a decided black-colour. The general plumage is a clear spotless white, with the exception of the tips of the quill feathers, which are glossy black, with a violet reflection, as are also the last four secondaries, which are elongated, so as to form a graceful plume hanging down over the wings and tail

It is found in Ethiopia, and is there called *Abou-Hannes*, or Father John, and by the Arabians, *Abou-Menjel*, or Father of the Sickle.

Truly aquatic birds are distinguished by their feet and legs formed for swimming, with webs between the toes. They have a close, shining plumage, moistened by an oily secretion, and furnished near the skin with a thick down to protect them from the water. The first of the order of swimming birds which we shall notice is the pelican.

THE PELICAN.

ORDER.—*Natatores*, or Swimmers.

Is one of the largest of swimming birds. It measures nearly six feet from the point of its bill to the end of its tail, and from ten to twelve feet in the expanse of its wings. The membranous pouch below the under mandible, is capable, of holding twenty pints of water. To feed their young, these birds empty the contents of their pouch by pressing it against their breast, which has given rise to the vulgar notion that the pelican wounds itself in order to nourish its offspring with its own blood. Though so bulky a bird, it is able to fly with considerable facility, and to a great height, owing in part to the extreme lightness of its skeleton, which does not weigh above a pound and a half. All the larger bones are hollow, and there is also an immense quantity of air contained under the skin. Excepting in the northern latitudes, this bird is found in abundance in every quarter of the globe, particularly near the mouths of large rivers, as those of the Danube, and the shores of the Caspian and Red Seas; they are very common in Africa, on the borders of the Senegal and the Gambia, and are called by the negroes *poko*; the Arabians call it *Djimmel el bahar*, or "the river camel," and *Sarcari*, "the water carrier." It perches on trees, but does not nestle there, but builds its nest on the ground. After filling its pouch with fish, it often retires to some lonely spot at a great distance. "We have often seen one of the species," says the editor of the Pictorial Bible, "sitting on the ledge of a rock, a foot or two above the surface of the water, in pensive silence

during the whole day; the continuity of its proceeding being only interrupted at distant intervals by the near approach of some unlucky fish, upon which it darted with



THE WHITE PELICAN.

unerring certainty, and then resumed its wonted stillness. At other times, we have observed them urging their way with rapid flight, thirty or forty miles into the country, after a day's fishing, to feast in the lonely wilderness upon the contents of their well-stored pouches; and were then reminded of the words, 'I am like a pelican of the wilderness.' " Psal. cii. 6. The pelican is also mentioned in Lev. xi. 18; Deut. xiv. 17; Isa. xxxiv. 11; and Zeph. ij. 14.

In the last two passages "the cormorant" is given in the authorized version, but "pelican" is the marginal reading, which in these, as in many other instances, is to be preferred.

Quite a different word is translated "cormorant" in Lev xi. 17; Deut. xiv. 17.

The common CORMORANT is a bird similar in its general habits and appearance to the pelican, though smaller. The species of cormorant are widely spread over the globe, along the shores of the sea, and the mouths of the larger rivers.



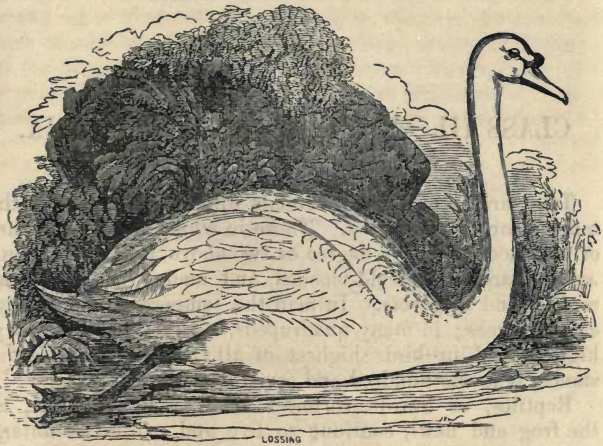
THE COMMON CORMORANT.

In many places, especially in China, these birds have been employed in fishing, a ring being put on the lower part of the neck to prevent them from swallowing the fish, which they are trained to bring to their master. They are frequent in England, France, and Holland.

THE SWAN.

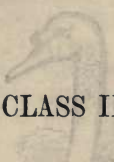
ORDER.—*Natatores*, or Swimming Birds.

THE common swan, in its wild state, inhabits the great inland seas or lakes, especially towards the eastern parts of



THE TAME SWAN.

Europe; but it has become domestic in most countries. There is considerable ambiguity in the meaning of the word translated swan in Lev. xi. 18, and Deut. xiv. 16. The Septuagint version favours the opinion that the purple gallinule is intended. This is one of the wading birds, and not web-footed. It is found in most parts of the Levant, and is noted for the beauty of its plumage, which is indigo mingled with red. Others suppose it to be the flamingo, a singular bird, remarkable for the length of its legs and neck, and its brilliant colour; in its third year, the back is of a purple red and the wings rose-coloured. The Indians make bonnets of the feathers, and the Sardinians employ the bones of the legs for flutes, the tone of which is said to be very fine.



CLASS III.—REPTILES AND AMPHIBIA.

THE various classes of animals differ very much in the temperature of the blood. Those in which the temperature of the blood is only a degree or two above the surrounding medium are called cold-blooded, and among these are the reptiles and amphibia. In man the temperature is ninety-eight degrees; in many quadrupeds, such as the sheep, it is higher; and in birds highest of all: in the duck, for instance, it is one hundred and seven degrees.

Reptiles, as lizards, tortoises, snakes, and amphibia, as the frog and newt, continue to live and exhibit voluntary motion after having lost the brain, and even after the loss of the head entirely. Their heart will beat for several hours after it is taken out of the body. Not possessing warm blood, they have no occasion for coverings of fur capable of retaining the heat, and are covered with scales or a simple skin.

Amphibious animals and reptiles produce their young from eggs, which they lay in situations where the heat of the sun is a substitute for the careful incubation, or sitting, practised by birds, though some of them watch the eggs to guard them from animals, such as the ichneumon and the vulture, that would otherwise devour them.

THE CROCODILE. (*Leviathan.*)

THE word leviathan, like behemoth, is introduced from the Hebrew into our Bibles without translation, except in one passage, where it would have been better retained, and is, indeed, given in the margin; Job iii. 8. For a long time it was supposed to mean the whale, but is now generally admitted to be the crocodile. This animal is the largest

of the lizard tribe. It abounds in various parts of Asia and Africa. Besides the crocodile, properly so called, there are two other kinds closely allied to it, namely, the gavials, which inhabit the Ganges, and other large rivers of India; and the alligators, or caymans, in America: but no one of the three has been discovered in any part of Europe or Australia. The crocodile is from twenty to thirty feet in



HEAD OF A CROCODILE.

length. The feet are short, so as to bring the body near the ground, but are moved by strong muscles, and enable the animal to run with great swiftness. The upper jaw, which is fixed, (contrary to the opinion of the ancients,) has thirty-six, and the lower thirty, sharp, but strong and massy teeth. It is furnished with a coat of mail, so scaly and hard as to resist the force of a musket ball in every part, except under the belly. The ancient Egyptians employed the eye of the crocodile as a hieroglyphic to denote the rising of the sun; not that its eyes are remarkably brilliant, but because they become first visible when it rises above the water. In one part of Egypt it was considered a sacred animal; it was ornamented about the head and feet with gold and precious stones, and fed with cakes, roast meat, and mulled wines. Yet at Elephantine it was an article of food. Herodotus narrates that, in his time, it was taken by means of a hook baited with a hog's chine. It is said that the common crocodile is no longer seen in the Delta, but that it is found sometimes in great numbers in the Thebaid and the Upper Nile.

The crocodiles lay, two or three times in the year, about twenty eggs at least, and bury them in the sand; those of

the Egyptian crocodile are about twice as large as the egg of a goose; but the eggs of a cayman are hardly equal to those of a turkey; they are good eating, though with a strong smell of musk. As soon as the young are born they hasten to the water; but great numbers become the prey of tortoises, voracious fish, and even, it is said, of the old crocodiles. At first they are small and feeble; in the second year they acquire teeth, and the skull becomes thick enough to sustain blows without injury. In Africa, the leopards, and the cougars in America, make war on the crocodiles, though generally on the young ones. But their most dangerous enemy, without doubt, is the ichneumon.

The forty-first chapter of Job contains a magnificent and poetical description of the crocodile. The impenetrability of its skin, the closeness and hardness of its scales, its strength and fierceness, and the difficulty and danger of contending with it, are represented in the most vivid colours. "Who can open the doors of his face? his teeth are terrible round about. His scales are his pride, shut up together as with a close seal. One is so near to another, that no air can come between them. They are joined one to another, they stick together, that they cannot be sundered. By his neesings a light doth shine, and his eyes are like the eyelids of the morning. He esteemeth iron as straw, and brass as rotten wood. Darts are counted as stubble: he laugheth at the shaking of the spear." Job xli. 14—18, 27, 29.

In the twenty-ninth chapter of Ezekiel, Pharaoh, king of Egypt, is addressed as "the great dragon that lieth in the midst of his rivers," where, no doubt, there is an allusion to the crocodile, though the term leviathan is not used, but a word (*tannim*) which is generally applicable to the larger aquatic animals or reptiles. It is the same word which is translated whales in Gen. i. 21, where it most probably is used in a comprehensive sense; and serpents in Exod. vii. 12, in reference to the rods of the Egyptian magicians.

DRAGONS.

THE term dragon is now applied by naturalists to a family of lizards, distinguished from the rest of that tribe by having their first six false ribs, instead of supporting the under

part of the body, extended in nearly a straight line, and sustaining a production of the skin forming wings like a bat's, but independent of the four feet. These wings bear up the animal when it leaps from branch to branch, but are not made to beat the air like a bird's, so as to enable it to fly. They can be folded up, or spread, at the will of the animal.

All the dragons are very harmless animals, of a small size, living in the bosom of the African forests, and in some of the East India islands, particularly Java and Sumatra. They live on insects, and rarely descend to the earth, on which they crawl with difficulty. They lay their eggs in the hollows of trees with a southern aspect. But these are not the dragons referred to in the Scriptures.

We find the word "dragons" very often in our Bibles, answering to the Hebrew words *tan* and *tannim*, Psal. xlv. 19; Isa. xxxiv. 13; xxxv. 7; xliii. 20; Jer. ix. 11; x. 22; xlix. 33; li. 37, etc.; which are also translated "whales," Ezek. xxxii. 2; "sea-monsters," Lam. iv. 3. Comparing the various passages together, the terms seem applicable to animals of considerable size; of great strength, fierceness, and cruelty; inhabiting lonely and desolate places, both in the water and upon land; having a mournful wailing cry, with the habit of snuffing up the air, and suckling their young like quadrupeds, Jer. xiv. 6; Micah i. 8; Lam. iv. 3. The last mentioned peculiarities would be descriptive of animals of the seal kind, one species of which is found in the Mediterranean. But, after all, it is very doubtful whether any animal is specifically intended by this term; not improbably, it denotes, like the English word "monster," any strange wild animal, of unusual form and ferocious disposition, either living in the water, or infesting lone and desolate places on land.

LIZARDS.

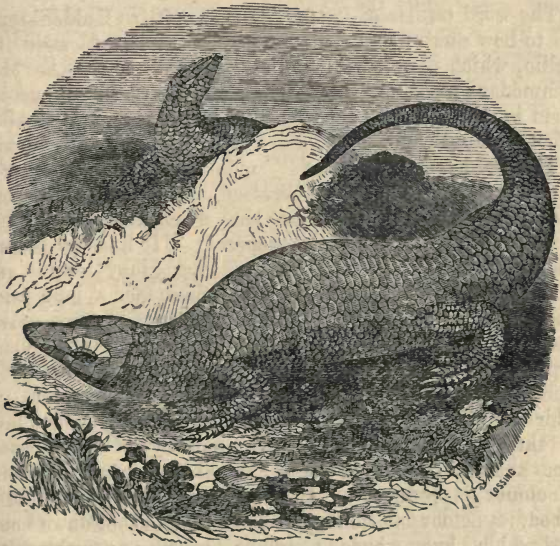
WE have already described by far the largest animal belonging to this tribe; but there are several species much smaller, though bearing some resemblance in shape which abound in warm countries. In the eleventh chapter of Leviticus there are several animals mentioned, which probably all belong to this class of reptiles. The word translated "tortoise"

in the English version (*isab*,) most probably means a kind of lizard. As the word imports a swelling, it may have been applied to the *stellio spinipes*, which has a swollen body; it is entirely of a beautiful green, with small spines upon its thighs and upon the ridge of the tail. It is found in the deserts about Egypt.

The word translated ferret, (*anaka*,) is also thought to mean a lizard, perhaps the gecko, which is found in countries bordering on the Mediterranean. It is of a reddish grey, spotted with brown. At Cairo, they name this animal *about-burs*, (father of the leprosy,) because they pretend that it communicates this malady by poisoning with its feet provisions of all kinds, more especially such as are salted. It produces redness and inflammation by walking on the skin, Its voice resembles the croaking of a frog, and the cry it is said, may be expressed by the syllables *geck-o*. It is neither from its bite, nor its saliva, that this animal is hurtful. The Swedish naturalist, Hasselquist,* (who travelled in the Holy Land and the adjacent countries, on purpose to investigate their natural history,) has remarked, that it is through its toes that the poison oozes out. In 1750, he saw, at Cairo, two women and a girl, who were at the point of death, in consequence, as supposed, of having eaten some cheese new salted, over which this reptile had dropped its poison. At another time, he saw the hand of a man, who rashly laid hold of a gecko, instantly covered with red pustules, inflamed and attended with an itching equal to that produced by the stinging of a nettle. We are told that the cats pursue the gecko, and feed upon it. It is driven from the kitchens in Egypt by keeping there a large quantity of garlick. It feeds on insects, and its eggs are about the size of a large nut.

* A pupil of Linnæus, born at Tornvalla, in East Gothland, January 3d, 1722. He sailed from Stockholm to Smyrna in August, 1747, thence to Egypt, and afterwards to the Holy Land. His constitution sunk under the exertions of his enterprising spirit, and he died at Smyrna, on his return homewards, on February 9th, 1752, in the thirty-first year of his age. The result of his investigations was published by Linnæus, in 1757, under the name of "*Iter Palæstinum*." It is rich in observations on the animals, plants, minerals, and *materia medica* of the countries he visited, and is, to this day, a standard work of reference; it contains sound information, of which use may be made so long as science endures. Vide *Penny Cyclopædia*, article *Hasselquist*.

The original of the word translated "lizard" in Lev. xi. 30, signifies to adhere, and may, therefore, very well apply to the wall gecko. It is an ugly animal, covered with tubercles and of a grey colour. It conceals itself in holes of walls and heaps of stones, and covers its body with dirt. It is fond of warmth, and avoids low and damp places. It is often found under the roofs of ruined houses, where it passes the winter, though not in a completely torpid state. In the first days of spring it comes forth and basks in the sun. It feeds on insects, and fastens itself to the walls by means of its crooked claws and a sucking apparatus with which the under part of its toes is furnished. It is sometimes seen to walk in a backward position, along the ceilings of rooms. It has been reported, but erroneously, to be venomous. It



THE OFFICINAL SKINK.

utters no sound. An animal of the same kind is probably referred to by Solomon in Prov. xxx. 28, where the English version translates the original by "spider."

10*

The word translated "chameleon" occurs only once, as the name of an animal, in the Bible, and is by some supposed to be the lizard called the skink, (*lacerta scincus*.) It is found in Arabia, near the Red Sea, Nubia, and Abyssinia. It is six or eight inches long; the tail shorter than the body; the latter is of a silvery yellowish colour, with some blackish bands across. It is remarkable for the readiness with which it forces its way into the sand when pursued. For a long time it was regarded by the Arabian physicians as a sovereign remedy against a variety of maladies, particularly leprosy and other diseases of the skin. It was hunted in the south of Egypt, as Hasselquist states, and sent, when dried, to Grand Cairo and Alexandria, whence it was carried to Venice and Marseilles, and from thence to all the apothecaries' shops of Europe.

The word translated "snail," Lev. xi. 30, in Chaldee signifies to bow down; it, therefore, may be the lizard called the stellio, which is noted for bowing its head, so that the Mohammedans pursue and kill it, because they say it mimics them in the mode of repeating their prayers. It is about a foot in length, and of an olive colour shaded with black.

The word translated "mole" comes from a root signifying to breathe; it appears, therefore, to suit the chameleon, which has lungs of such a size that when filled, the body is so swollen as to appear transparent. It lives on insects, which it seizes by means of its long gluey tongue, and bruises between its jaws. It can remain for a long period without food; according to the experiments of some naturalists, the longest time is four months. It has the curious property of changing its colour according to the state of its feelings and health. Its outer skin is transparent, the under skin is yellow, and the blood of a lively violet blue; so that, as a greater or a smaller quantity of blood passes from the heart to the surface of the skin, a variety of shades of colour is produced. In its natural state, when undisturbed, its colour is a fine green, with the exception of some parts which have a shade of reddish brown or greyish white. When angry it changes to a deep blue green, a yellow green, and a grey, more or less blackish. If unwell, its colour becomes yellowish grey. Its motions are singularly slow, and it delights to bask in the sun. Each eye acts independently of the other, so that it cannot only turn them about in various, but in opposite directions.

SERPENTS.

WITHOUT hands or feet, crawling on their belly, nearly dumb, without limbs, apparently defenceless, but of great flexibility and quickness, capable of great efforts when irritated, armed with sharp teeth, and, in some species, with long fangs which are poisonous, serpents are a fit emblem of insidious and malicious men, who would make up for their unwillingness to benefit the world, by their ardour and bitterness in doing mischief. "O generation of vipers, how can ye, being evil, speak good things?" Matt. xii. 34. If there be an animal in whose form and habits there are the most opposite qualities and traits of weakness and strength—of malicious cunning and stupid sluggishness—of unintelligent apathy and fiery irritability—it is the serpent. The kinds of it are, indeed, very numerous, and exceedingly varying in size, strength, and form; there are great and small, thick and slender; some are long and pointed, others short and blunted: yet the sight of any serpent, and the contemplation of its qualities, are suited to remind us of our fallen condition, and to give us an image of the corruption of the human heart. Human nature feels a peculiar and involuntary disgust at the sight of a serpent. The element, of beauty in the art of drawing lies concealed in serpentine lines, and yet men are horrified if they see the animal, by whose movements those lines are formed, winding its course towards them. It is not the dread of its bite, for we shrink even from the harmless blind-worm, and other kinds which are well known not to be poisonous. But what renders these animals objects of aversion, is rather an impression made by their general appearance, than a fear of their poison, excepting among ignorant persons, who fancy that all serpents are poisonous. The serpent's skin is adorned with beautiful colours and markings, lines, streaks, or spots of varied forms, often shining with a metallic lustre—What can be more beautiful? and yet who does not shrink from it? The fiery eye, with all its glare, is vacant and unmeaning. The sharp teeth, with which the wide jaws are crowded, serve only for seizing or wounding, but not for chewing the food, which is always swallowed whole. Their voice is a mere hiss. The forked tongue which they dart forth

from their horrid jaws, and vibrate this way and that so quickly, gives them an ugly, not less than a terrific look, Psal. cxl. 3. Their voracity is very great, and the capability of their throat for swallowing is almost incredible. "I once caught a snake," says Dr. Barth, "in whose inside I saw something moving up and down. As I was anxious to release the living creature it had swallowed from its confinement, I trod on the snake's tail, and gave it several smart strokes, which forced it to disgorge its prey. It was a full-grown frog, as large as a young child's fist, which was no sooner set free, than it hopped off; but the snake's throat, as soon as it had thrown out the frog, went back to its natural size, and was not thicker than a little child's finger." A boa whose neck, in ordinary circumstances, it is not thicker than a man's arm, will swallow a goat or a antelope, having first broken and crushed the bones of its victim, which it destroys by twining forcibly around its neck and chest. Most serpents, especially the larger sorts, eat only one meal every two or three weeks; when they have eaten to the full, they remain for some days in a state of complete insensibility, and can scarcely stir themselves, till the process of digestion is over. A gentleman who acted as physician among the Dutch troops in the East Indies for many years, relates the following incident:—"One day I went a short excursion with an officer through a wood. On account of the heat of the sun, we halted whenever we came under a shady tree. We were standing and talking together under a tree, and, being rather tired, I sat down on what seemed a dark-coloured log lying in the grass. But how was I startled when this supposed log began to stir! it was a huge serpent swollen with food: with some difficulty it raised its head, and opened its wide jaws upon us. Yet we had no need to run away; it only stretched itself for a few minutes, in order to roll away from the bed in which it had been disturbed."

Poisonous serpents have, on each side of the upper jaw, at its extremity, one hollow fang, very long, and containing a canal for the passage of a poisonous fluid. Beneath these poison fangs, there are others in a rudimentary state, concealed within the gum, which are intended to replace them when, as it often happens, they are torn out by accident. The glands, or bags, which contain the poison, are situated

on the sides of each branch of the upper jaw, and two muscles cross them from front to back, one outwards, the other underneath, in order to raise the hollow teeth. When these teeth are raised, the closing of the jaw presses their roots against the poison-bags, and this pressure causes the poison to flow with great force through the canal or tube, which opens aslant at the point of the teeth, like the slit of a pen. The poison exerts its destructive power only when it mixes with the blood by an open wound. Experiments have proved that it retains its venom even after the death of the animal which secretes it. In temperate or cold climates, it loses its strength during winter, and regains it in summer. The flesh of serpents, in general, even of the poisonous kinds, may be eaten without injury, and, according to some, with advantage. The anaconda, and other boas, supply the natives of the countries they inhabit with wholesome nourishment; and adders are used for food in many parts of the south of France. But they were forbidden to the Israelites. "Whatsoever goeth upon the belly, and whatsoever goeth upon all four, or whatsoever hath more feet among all creeping things that creep upon the earth, them ye shall not eat; for they are an abomination." Lev. xi. 42.

Snakes are covered with scales; in most species, those of the back are small, and arranged like pointed tiles; those of the under parts broad, and like plates of armour. In the slow-worm, all the scales are small, smooth, and tile-like.

These animals are, many of them at least, very ready, on the slightest alarm, to hide themselves; and there may be a reference to this cautious quality, in the precept our Lord gave his apostles, when he first sent them out: "I send you forth as sheep among wolves: be ye therefore wise as serpents." Matt. x. 16. They make their lurking places in the crevices of rocks, walls, and holes in the ground. They feed on living animals, such as frogs, toads, mice, small birds, insects, and worms. It has been stated that serpents never drink but this is a mistake; they digest slowly, and are capable of enduring a long fast.

With respect to the animals of this class mentioned in Scripture, little can be said with certainty. Besides the word used in Gen. iii. 1, (*nachash*), which seems a general term, including, besides serpents, other large animals, such as the crocodile, there are several words which probably sig-

nify particular kinds. Three of these occur only once *Akshub*, Psal. cxl. 3, "Adders' poison is under their lips." *Shephiphon*, Gen. xlix. 17, "An adder," (arrow-snake, marginal reading,) "in the path." *Tsepha*, Isa. xiv. 29, "a cockatrice."

Tsiphoni, Isa. xi. 8; lix. 5; Jer. viii. 17, is also translated "cockatrice;" in Prov. xxiii. 32, an "adder," but in the margin "cockatrice."

Ephēh occurs in Job xx. 16; Isa. xxx. 6, and lix. 5; and is translated, in all these passages, "viper," though in the Septuagint each has a separate meaning, corresponding to the English words *serpent*, *asp*, and *basilisk*.

The word *pethen* is found in Psal. lviii. 4; Isa. xi. 8; Psal. xci. 13; Deut. xxxii. 33; Job xx. 14, 16. In all these it is translated "asp," excepting Psal. lviii. 4, "adder," (but "asp" in the margin.)

Saraph, "fiery serpent," occurs in Numb. xxi. 6-8; Deut. viii. 15; Isa. xiv. 29; xxx. 6.

The *shephiphon*, "adder," in Gen. xlix. 17, is generally



THE CERASTES.

supposed to be the cerastes, or horned snake, so called from a small prominence, or horn, above each eye. It is nearly two feet long, and of a greyish-red colour, which renders it difficult to distinguish it from the sand in which it lurks. Its congenial abode is the sandy desert, beneath a burning sun; it is common in Egypt, Arabia, and Syria. "It

moves with great rapidity," says Mr. Bruce, "and in all directions, forward, backward, and sideways. When inclined to surprise any person who is too far from it, it creeps with its side towards the person and its head turned, till, judging the distance, it turns round, springs, and fastens on the part next to it." Its bite is very venomous.

The *pethen*, (asp,) is probably the *aspic* of antiquity, and the *batan* of the Arabians. It is about a foot in length, and two inches in circumference; its colour is black and white. It is strongly poisonous; the body of the sufferer swells, and death almost immediately ensues. The inhabitants of Cyprus called it *kufi*, deaf, and in Psal. lviii. 4, we find allusion to "the deaf adder that stoppeth her ear."

The *epheh*, (viper,) is probably the same as that now called by the Arabs *el effah*. It is one of the most common and venomous of the serpent tribe in northern Africa and south-western Asia. It is about two feet long; and as thick as a man's arm, beautifully spotted with yellow and brown, and sprinkled over with blackish specks. Their hiss is so loud, as to be heard at a considerable distance. They abound in the desert of Suse, where their holes are so numerous that it is difficult for a horse to pass without stumbling. Their poison is subtle, and occasions death in fifteen minutes.

It is disputed whether the epithet "fiery" applied to the *saraph*, Numb. xxi. 6—8, is on account of its brilliant appearance, or the burning sensation occasioned by its bite. The latter is the most probable. It is also called the "fiery flying serpent," which probably is intended to describe the swift darting motions of this animal. The celebrated traveller, Niebuhr, informs us, that "there is, at Basra, a sort of serpent which is called *heie sursuire*, *heie thiare*. They commonly keep upon the date trees; and, as it would be laborious for them to come down from a very high tree, in order to ascend another, they twist themselves by the tail to a branch of the former, which, making a spring by the motion they give it, throws them to the branches of the second. Hence it is that the modern Arabs call them *heie thiare*, 'flying serpents.'"

Serpent-worship, under one form or other, was one of the most widely diffused forms of idolatry in the ancient world. In Egypt, the cerastes, or horned snake, was sacred to Ammon, and was interred after death in his temple. The aspic,

or hajè, was made an emblem of Cneph, the protecting divinity of the world. They sculptured it on two sides of globe, on the portico of all their temples. The hooded snake (cobra di capello) makes a conspicuous appearance on the



COBRA DI CAPELLO.

sculptures at Ellora, Salsette, and Elephanta. A large serpent of the boa tribe is also worshipped in the kingdom of Dahomey, and regarded with veneration in other parts of Africa,

In Psal. lviii. 6, we read of the voice of the serpent-charmers, a class of persons still found in Africa and India. Eusebius mentions that Palestine abounded, in his time, with them, and that they usually employed a verbal charm. This

is still one of the processes of the serpent-charmers in India and Egypt. The practice is alluded to in Eccles. x. 11, and Jer. viii. 17; but it was expressly forbidden by the Mosaic law, "There shall not be found among you a charmer." Deut. xviii. 11. Hasselquist gives the following account of a female Egyptian serpent-charmer, whom he met with at Alexandria:—"She handled the most poisonous and dreadful creatures, alive and brisk, without their doing or offering to do her the least harm. When she put them into the bottle where they were to be preserved, she took them with her bare hands, and handled them as our ladies do their lace. She had no difficulty with any but the *viperæ officinales*, which were not fond of their lodging. They found means to creep out before the bottle could be corked. They crept over the hands and bare arms of the woman without occasioning the least fear to her. She had taken these serpents in the field with the same ease she handled them before us; this we were told by the Arab who brought her to us. Doubtless this woman had some unknown art which enabled her to handle those creatures. It was impossible to get any information from her, for, on this subject, she would not open her lips. The art of fascinating serpents is a secret among the Egyptians. How ancient this art is among the Africans, may be concluded from the ancient Marii and Psylli, who were from Africa, and daily showed proofs of it at Rome. The art, as practised in Egypt, is known only to certain families, who transmit it to their offspring. The person who knows how to fascinate serpents, never meddles with other poisonous animals, such as scorpions, lizards, etc. There are different persons who know how to fascinate these animals, and they, again, never meddle with serpents. Those that fascinate serpents eat them both raw and broiled, and even make broth of them; but, in particular, they eat such a dish when they go out to catch them. I have even been told, that serpents, fried or boiled, are frequently eaten by the Arabians, both in Egypt and Arabia, though they know not how to fascinate them. I have been told of a plant with which they anoint or rub themselves, before they touch the serpents; but I have not, hitherto, received the least description of it. It is said that the Indians in the West Indies charm serpents with the *aristolochia anguicida*, (snake-root, or birth-wort,) and Forskal, in

his travels, states that the Egyptians use a species of the same plant.*

The serpent was the instrument chosen by Satan, when he tempted our first parents to disobey the commands of God, and eat the forbidden fruit. They yielded to the tempter, and sin, with all its awful consequences in this life and the next, was introduced into our world. Satan himself is frequently called the serpent, Isa. xxvii. 1; 2 Cor. xi. 3; Rev. xii. 9, 15; xx. 2. The serpent is, in the Bible, the emblem of wicked men of every description; of malice, hatred, cruelty, and treachery, Gen. xlix. 17; Psal. lviii. 4; xli. 3; Eccles. x. 11; Matt. xxiii. 33. Sometimes the invading enemies whom God threatened to send against his rebellious people are called serpents. Jer. viii. 17; Amos ix. 3.

When the Israelites had wandered nearly forty years in the desert, they murmured against God and Moses, complaining of the want of food and water. To punish them the Lord sent the serpents to which we have already referred, by which many of the people were destroyed. Moses, after praying on their behalf, was directed to make a serpent of brass, and set it on a pole, and the Lord gave a promise, that all those who were bitten and looked upon it should live. Numb. xxi. 4-9; Deut. viii. 15. The serpent thus set up was a striking emblem, or type, of Christ, and he himself so spoke of it; "as Moses lifted up the serpent in the wilderness, even so must the Son of man be lifted up." John iii. 14. The brazen image appears to have been preserved as a memorial; for we find that, long afterwards, when the Jews fell into idolatry, this also became an object of worship, in consequence of which it was destroyed by Hezekiah. 2 Kings xviii. 4.

"In this troublesome desert we are all stung by that fiery and old serpent. O Saviour! it is to thee we must look and be cured; it is thou that wast to the Israelites their paschal lamb, their manna, their rock, their serpent. To all purposes dost thou vary thyself to thy church, that we may find thee everywhere; thou art for our nourishment, refreshment, cure; as hereafter, so even now, all in all. This serpent, which was appointed for cure to Israel, at last

* HASSELQUIST'S *Travels*, pp. 63-65.

stings them to death by idolatrous abuse. What poison there is in idolatry, that makes even antidotes deadly! As Moses, therefore, raised this serpent, so Hezekiah pulled it down. God commanded the raising of it; God approved the demolishing of it. Superstitious use can mar the very institutions of God; how much more the most wise and well-grounded devices of men!"

THE FROG.



THE COMMON FROG.

THE common frog, sometimes called the red frog, is tolerably abundant throughout Europe. It is produced from eggs, which remain in water for some time before the young animal comes forth; it has, at first, the form and structure of a fish. It has no feet, and its body is terminated by a very long tail, formed like a fin; it is then named a tadpole.

The muscles of frogs are large in proportion to their bulk, and peculiarly elastic, especial; those of the hind limbs;

hence the frog leaps with great alertness, and in the act of swimming, propels itself along by a succession of powerful strokes. These animals feed on aquatic insects, worms, flies, etc., and always choose a prey which is alive and in motion. Every dead and motionless animal is rejected by them. They catch their prey by means of their tongue, which is constantly covered with a glutinous fluid. They are useful in gardens by destroying slugs. They are usually found in moist places, in the grass of meadows, and on the banks of streamlets, into which they continually leap and dive. Frequently, at the close of warm rains in the fine season, they spread themselves through the country, and are so numerous as to be pressed and crowded against each other. This appearance has given rise to a mistaken belief, that frogs have actually been rained down; the truth is, that the rain draws them from the retreats in which they lie concealed, as it does snails and slugs. They are distinguished by a peculiar cry, which is termed croaking. It is particularly during rain, and in hot days in the evening and morning, that they croak. The noise which they then make is very great. During the feudal times, in France, when all the castles were surrounded with water, it was the occupation of the slaves or villains, as they were called, to strike the water of those dykes morning and evening, to prevent the frogs from breaking the repose of their masters. A large species, called the bull-frog, inhabits North America, and more especially Carolina; it makes a noise something like the bellowing of a bull. It is exceedingly partial to young ducks and goslings, which it swallows whole. Frogs multiply fast; each female lays annually from six to twelve hundred eggs. But to counterbalance this rapid increase, they have numerous enemies; serpents, pikes, vultures, and storks destroy a great number; while, in some countries, as in France, they are cooked for food: the species used for that purpose is the green frog. They are frequently taken, during the heat of summer, with a line baited with a small bit of scarlet cloth, which is kept in motion, so as to give it the appearance of being alive.

The frog of Egypt, (the animal made use of in the second of the awful plagues inflicted on the Egyptians, for disobeying the divine command "to let Israel go,") is the dotted frog, so called from its ash colour being dotted with green

spots. The feet are marked with transverse bands, and the toes are separate to half their length. It changes colour when alarmed, and is comparatively rare in Europe.

Frogs are still very abundant in the Nile, and other waters of Egypt. This, and several of the other plagues, consisted in giving an unexampled intensity and magnitude to some of the greatest nuisances of the country. The astonishing extent of this miraculous invasion of frogs is shown, not only by the immense heaps of their carcasses which corrupted the land, but by the fact, that their numbers were so great as to oblige them to forego their natural habits, and intrude into the bedchambers, and even the ovens. They could do this with greater ease, because the bedrooms were simply recesses on the ground floor, and the Egyptian ovens were not, like ours, built near a fire-place, where the glowing heat would deter these animals from approaching, but a hole was dug in the ground, in which they placed an earthen pot, in which, after being heated, the cakes were placed inside to be baked. Here, as in other instances, the objects of superstition became the instruments of punishment. The frog was one of the sacred animals of the Egyptians, but whether because they esteemed or disliked it, has not been distinctly ascertained. By this creature God humbled Pharaoh's pride, and chastised his insolence. What a mortification it must have been to this haughty monarch, to see himself obliged to submit by such despicable means! When Pharaoh, however, saw that there was a respite, he hardened himself against God. Till the heart is renewed by the grace of God, the impressions made by the force of affliction do not abide.

11 *

CLASS IV.—FISHES.

As the element in which fishes live is different from that of land animals, the Creator has made a corresponding difference in their structure. The head is not elevated on a neck rising at an angle greater or less from the body, but forms a straight line with it. Their horizontal cylindrical form is admirably adapted for moving swiftly through the water, and resembles that shape which belongs to what mathematicians call "the solid of least resistance," because it is least affected by the resistance of a fluid. Instead of arms and legs, or wings, they are furnished with fins. In most fish, beside the great fin, the tail, we find two pair of fins on the side; those in front are the pectoral, and those behind the ventral; one or two single fins on the back, and one between the belly and tail. They serve both for balancing and for motion. The pectoral, and more particularly the ventral fins, serve to raise and depress the fish. When the fish desires to have a backward or retrograde motion, a stroke forward with the pectoral fin produces it; if the fish desires to turn either way, a single blow with the tail the opposite way sends it round at once; if the tail strikes both ways, the motion produced by the double lash is progressive, and enables the fish to dart forward with surprising velocity. A bonito will swim round and round a ship which is sailing fourteen miles an hour; a thing almost as surprising as a fly circling round a horse's ear for a whole stage. Instead of lungs, fish breathe by means of branchiæ, or gills. These consist of several leaves (*laminæ*) on each side of the neck, which are covered with innumerable blood-vessels, so constructed as to present a considerable surface to the water. Their breathing is carried on by the small quantity of air mixed with and held in solution by the water, for if the air be expelled by boiling, they cannot live in it; and many species are obliged to rise to the surface for the pur-

pose of breathing in the atmosphere, particularly when the quantity in the water is exhausted. This is proved in several cases by merely keeping fish in such water, below the surface, under a net of gauze, which produces suffocation. Having no elastic air to act upon, they are destitute, or nearly so, of voice. One species, the pagoniæ, or drum-fish, have indeed the power of making a loud noise resembling the instrument from which they take their name; but by what organs this is effected has not been determined. The eyes of fishes are in general large, and their sight acute, but limited in its range. In some kinds they are placed near one another, and directed upwards; in others far apart, and directed somewhat downwards; while in what are commonly called flat-fish, such as soles, both the eyes are on the same side, which is uppermost when the animal swims, and is always strongly coloured, while the side in which the eyes are wanting is invariably whitish. They have no external ear, but there is evidence of their possessing the sense of hearing. There are also reasons for believing that their sense of smell is tolerably acute; the nerves for this purpose are large, and cover a large surface. Many kinds of fish have an air-bladder, which, as it is contracted or distended, assists the animal in sinking or rising.

The facts ascertained by naturalists respecting the fecundity of fishes are truly astonishing, and serve strikingly to illustrate the divine creative command, "Let the waters bring forth abundantly the moving creature that hath life." Gen. i. 20. More than one hundred and forty-eight thousand eggs have been counted in a single pike; and sixty-eight thousand six hundred and six in a herring. Of the latter fish there are few years in which four hundred millions are not taken in Norway; and yet this bears no comparison to the numbers taken by the fishermen of England, France, the United States, and above all, of Holland. For a series of generations the annual destruction of the codfish by man has been so prodigious that, but for its immense resources of reproduction, the species must long since have become extinct; every year a vast number of vessels are employed in this fishery, and bring back more than thirty-two millions of cods, salted or dried. Shoals of haddocks appear during the winter on the eastern coast of England, three miles in breadth, and eighty miles in length, from Flamborough Head to the mouth of the Tyne below Newcastle.

The migratory habits of some fishes are very extraordinary. The salmon, for instance, is born in fresh water; it grows in the sea; during winter it takes refuge in the ocean; it passes the summer in rivers, and ascends towards their source. In the more northern regions they enter the rivers at the moment the snow begins to melt on the shores of the ocean. They are almost impelled to enter those streams in which they have been born. This was proved by an experiment of Deslandes, who bought a dozen salmon from the fishermen of Chanteaulin, placed a ring of brass on the tail of each, and set them at liberty. In the following year, five, in the second, three, and in the third, three more of these fishes were retaken. An invisible power traces the route they have to follow, brings them back exactly to the places of their birth, and all of them re-assemble without tumult, following its guidance with implicit obedience.

On re-ascending the rivers, the salmons are united in enormous shoals. They proceed in long bands, disposed in two lines, which form the sides of a triangle, the summit of which is occupied by the largest female, who leads the van, while the younger or smaller males bring up the rear. When a dam or cascade opposes them, they make the most strenuous efforts to shoot beyond it. With one of their sides resting on some large stones, they bend the end of their tail to the mouth, and thus form an arch, which makes a powerful spring; this they let go with inconceivable rapidity, strike the water with violence, and spring to a height of twelve or fifteen feet, and fall down beyond the obstacle which arrested their progress. If any danger appears to threaten them, the rapidity of their swimming is such, that the eye can scarcely follow them. In tranquil lakes they can go eight or ten leagues in an hour, and about twenty-four feet in a second.

The Nile, the Jordan, and the Sea of Galilee, contain a multitude of wholesome and savoury fish of various kinds. Robinson says, "The lake of Tiberias is full of fish of various kinds; and Hasselquist was the first in modern times to note the remarkable circumstance, that some of the same species of fish are met with here as in the Nile; namely, *scherus* and *mugil*, (chub,) and likewise another, which he calls *sparus Galilæus*, a species of bream." The coasts of the Mediterranean Sea also abound with fish. As the Jews were not a seafaring people, the Phenicians supplied them with fish, in exchange for wheat, honey, oil, and balm, Neh

xiii. 16; Ezek. xxvii. 17. The prophetic denunciations that Tyre should be "a place for the spreading of nets," Ezek. xxvi. 4, show the abundance of fish in its vicinity. The implements made use of in fishing are frequently mentioned in the Old Testament. Thus in Habakkuk i. 15, "They take up all of them with the angle, they catch them in their net, and gather them in their drag."

By the Mosaic law, all marine or aquatic creatures with fins and scales were considered clean, Lev. xi. 9, 10; and apart from the Divine command, the preference is generally given to these kinds as articles of food, while many that differ from them in these respects are objects of aversion and dread. The shark, the ray, and the sunfish, are examples of fish, or finned marine animals, without scales. Numerous marine animals are finless. A reference to the distinction made by this precept is probably implied in that parable of our Lord, in which he compares the kingdom of heaven unto "a net, that was cast into the sea, and gathered of every kind: which when it was full, they drew to shore, and sat down, and gathered the good into vessels, but cast the bad away. So shall it be at the end of the world: the angels shall come forth, and sever the wicked from among the just, and shall cast them into the furnace of fire: there shall be wailing and gnashing of teeth." Matt. xiii. 47-50. A thought is suggested by this parable, which we would earnestly press on the attention of the reader; namely, that though the awful separation is represented as taking place in the future world, the difference on which that separation depends, exists in the present state. The separation will not create the difference but only fix upon it the stamp of eternity. What then is our present state, our present character? Can we leave these questions undecided, till the day of separation shall for ever exclude the possibility of change? It has been remarked—"The preaching of the gospel is the casting of the net into the sea. This net gathers of every kind, as large drag-nets do. There is a time coming when this net will be full, and will be drawn to shore, when the mystery of God shall be finished. Hypocrites and true Christians shall be parted: miserable will be the condition of those that shall then be cast away. While the net is in the sea the fisherman cannot distinguish what is in it; but they draw all that is in it to the shore, for the sake of the good that is therein."

CLASS V.—INSECTS.

IN former times, the name of *worms* was given to all animals with long and soft bodies which bore a resemblance to the common earth-worm. We find it, therefore, employed in the authorized version for worm-like creatures of very different kinds.

1. The grubs, or larvæ, of flies, and other winged insects that breed in putrefied bodies. Exod. xvi. 20, 24; Job vii. 5; xvii. 14; xxi. 26; xxiv. 20; xxv. 6; Isa. xiv. 11.

2. Those which eat woollen garments, Isa. li. 8; “For the moth shall eat them up like a garment, and the worm shall eat them like wool.” “The ravages which grubs commit among the most costly stuffs and choicest furs, can scarcely be imagined by those who have had no opportunity of observing their effects. Moths so abound in the east as to occasion far greater damage than we are accustomed to witness; and as the orientals are in the habit of forming extensive wardrobes, often containing articles of great price and richness, the loss thus produced is the more sensibly felt, and accounts for the frequent allusions in Scripture to the devastations of the moth.”—*Pictorial Bible*. See also Matt. vi. 19, 20; Luke xii. 33.

3. The kermes insect, whence is made a crimson dye. This insect lives on a species of small oak, a shrub that rises to the height of two or three feet. Since the discovery of the cochineal insect, which is found in Mexico, and other parts of the new world, on a plant of the cactus kind, the kermes has ceased to be considered of so much importance as formerly. The “scarlet,” Exod. xxv. 4, is supposed to be the dye obtained from the kermes.

4. The worm destructive of the vines, referred to in Deut. xxviii. 39—the insect called *pyralis vitis*.

5. The larvæ of several species of beetles are also very destructive to plants, by feeding on the roots. Of this kind, probably, was the worm mentioned in Jonah iv. 7

The most destructive animal of this class known in England, is the larva of the cockchaffer, commonly called the white worm. The ravages committed, both by the larva



MALE.



FEMALE.

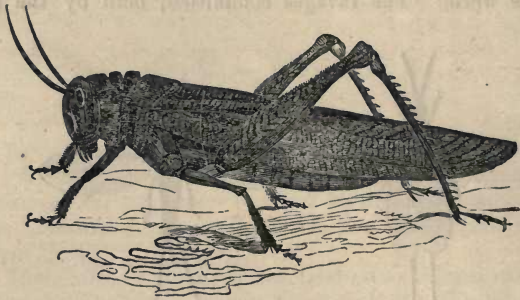
THE KERMS.

and the animal in a winged state, are almost incredible. In 1574, we are informed, that so great a number of cockchaffers were driven into the river Severn, that they hindered the mills from working. In 1751, many crops in Norfolk were totally destroyed by them. One farmer gathered no less than eighty bushels of these insects. In 1785, many provinces of France were so infested by them, that the government offered a reward for the best method of destroying them. The larvæ live three or four years in the ground before they assume their perfect form. Their only nutriment is the roots of plants and trees. It is more particularly in order to feast upon this grub, that the rooks follow the plough. Indeed, for nearly three months of the spring, rooks do little else than walk about the fields in quest of it.

THE LOCUST.

THE common great brown locust is about three inches in length; it has two antennæ, or feelers, about an inch long, and two pair of wings. The head and horns are brown;

the mouth and inside of the larger legs bluish; the upper wings brown, the former spotted with black, and the latter



THE LOCUST.

with dusky spots; the back is defended by a shield of a greenish hue; the under wings are of a light brown hue, tinged with green, and nearly transparent. These creatures are frequently mentioned in the Old Testament. They were employed as one of the plagues for punishing the Egyptians, and awful as that visitation was, there have not been wanting later instances of their destructive agency scarcely less terrible. They often migrate from their native country, probably in quest of a greater supply of food. These flights are very frequent in Barbary, and generally happen at the latter end of March, or the beginning of April, after the wind has blown from the south for some days. Mr. Barrow informs us that, in South Africa, (in 1784 and 1797,) two thousand square miles were literally covered with them. Being carried into the sea by a north-west wind, they formed, for fifty miles along the shore, a bank three or four feet high, and, when the wind was in the opposite point, the horrible odor they exhaled was perceptible one hundred and fifty miles off.

Charles XII., in Bessarabia, imagined himself assailed by a hurricane, mingled with tremendous hail, when a cloud of locusts, suddenly falling and covering both men and horses, stopped the progress of his army. In 1748, they invaded Europe in myriads, and literally darkened the sun. They were four hours in passing over Breslau. In

August of that year a portion of them reached London. In Norfolk, the trees were as leafless as in winter. Happily, however, we have been comparatively exempted from the awful visitations of this pest.

The armies of these terrible invaders are magnificently described in Scripture :

Hear this, ye old men,
 And give ear, all ye inhabitants of the land.
 Hath this been in your days,
 Or even in the days of your fathers?
 Tell ye your children of it,
 And let your children tell their children,
 And their children another generation.
 That which the palmer-worm hath left hath the locust eaten;
 And that which the locust hath left hath the canker-worm eaten;
 And that which the canker-worm hath left hath the caterpillar eaten.
 Joel i. 2-4.

A fire devoureth before them;
 And behind them a flame burneth.—Joel ii. 3.

They consume like a general conflagration. “Wherever they feed,” says Ludolphus, “their leaving seems as if it were parched with fire.” Neither herbage, nor shoots, nor leaves, escape them.

The appearance of them is as the appearance of horses;
 And as horsemen, so shall they run.—Joel ii. 4.

This may refer principally to the fierceness and rapid motion of horses; but European travellers have been struck with a resemblance in figure between the locust while browsing and horses; and, in Germany, one of the names of the locust is grass-horse; and, in Italy, it is still termed *cavalletta*. The integuments about its neck, it has been remarked, have some resemblance to the trappings of a horse. Dr. Robinson, in travelling from Cairo to Suez, found an insect, either a species of black locust, or much resembling it, which his Bedouin guide called *faras-el-gundy*, “soldiers’ horses.”*

Like the noise of chariots on the tops of mountains shall they leap,
 Like the noise of a flame of fire that devoureth the stubble,
 As a strong people set in battle array.—Joel ii. 5.

How accurately this description applies to the locusts is attested by several authors. They may be heard at six miles’ distance; and, when they are eating the fruits of the

* ROBINSON’S *Biblical Researches*, vol. i. p. 59.

earth, the sound is like that of a flame driven with the wind.

They shall run like mighty men;
 They shall climb the wall like men of war,
 And they shall march every one on his ways,
 And they shall not break their ranks;
 Neither shall one thrust another;
 They shall walk every one in his path;
 And when they fall upon the sword, they shall not be wounded.

Joel ii. 7, 8.

In perfect accordance with the description of the prophet, it has been remarked by naturalists, that though voracious, and though the plains on which they alight may not be sufficient to supply the whole of their countless myriads, yet there is an appearance of subordination among them. They are not observed to scramble for the portion which a more fortunate neighbour may have alighted on, but each takes that which falls to his lot.

These insects, terrible scourges as they are to man, are not productive of unmixed evil. They clear away multitudes of rank and noxious weeds which choke the soil, and thus allow the earth to produce delicious herbage for the wild cattle and game. They turn up the surface of deserts, and loosen the soil, in the instinctive process of depositing their eggs; and, as the rains are destructive to them and their young brood, they furnish a manure in places inaccessible to man. They also serve as food, not only to birds, but to man. Pliny mentions that they were an ordinary delicacy among the Parthians; and Diodorus Siculus asserts that the Ethiopians subsisted on them. In the present day, they are a common article of food in the east, not only for the poor, but among all classes. In some towns, there are shops exclusively for selling them. In times of scarcity at Mecca, they have them dried, ground, or pounded, and made into a sort of bread. The Bedouins of Egypt roast them on the coals, having removed the wings and feet. In western Asia, it is usual to throw them alive into boiling water, mixed with a quantity of salt. They are commonly mixed with butter, and spread on thin cakes of bread. We need not, therefore, think it strange, when the evangelist informs us, that John the Baptist ate "locusts and wild honey," though some learned men have misemployed their ingenuity in attempting to prove, that by "the locusts" was meant the fruit of the "locust tree."

In the passage which has already been quoted from Joel i. 4, it has been supposed, by some interpreters, that the locust is described in its different stages and transformations by the four terms translated *palmer-worm*, *locust*, *canker-worm*, and *caterpillar*. The females lay their eggs in the autumn, which are hatched in the following spring. The larvæ, or grubs, crawl in the day-time over the fields, and in the evening, or on cold days, collect under the hedges; but when the sun arises, they pursue their march of devastation. To this fact the prophet Nahum, iii. 17, has been thought to allude, when he says, "Thy crowned are as the locusts, and thy captains as the great grasshoppers, which camp in the hedges in the cold day, but when the sun ariseth they flee away, and their place is not known where they are." Thus Mr. Barrow, referring to the South African locust, tells us that, "when the larvæ, which are still more voracious than the parent insect, are on the march, it is impossible to make them turn out of the way, which is usually that of the wind. At sunset the troop halts, and divides into separate groups, each occupying, in bee-like clusters, the neighbouring eminences for the night."

After fourteen days, the grubs cast their skins for the first time, and again when they are four weeks old. In this first form they are called by the Moors, *devouers*, which corresponds to the Hebrew, (*gezem*), translated "palmer-worm." They now obtain their full size and winged form, but are not yet strong enough to mount in the air. This is the "canker-worm," (*yelek*), Joel i. 4; ii. 25; Nahum iii. 15; or "caterpillar," mentioned in Psal. cv. 34; Jer. li. 27. But after the fourth change, they fly aloft in clouds that darken the sun. Several writers, among whom is Bochart, suppose the four insects mentioned by Joel to be so many different species of locust. To this opinion the editor of the Pictorial Bible objects, that the three words rendered "palmer-worm," "canker-worm," and "caterpillar," in our version, were not regarded as locusts by the Septuagint translators; and he adopts the interpretation of the terms given in that ancient version. Accordingly, he explains the "palmer-worm" to be a species of caterpillar; the "canker-worm" a large insect of the cockchaffer tribe; and the "caterpillar" as equivalent to our terms blight and mildew. The mildew is a species of fungus that vegetates on the half-decayed material of the

bark, which is greatly promoted by moisture, damp air, or a want of free circulation. Blight, or honey-dew, is a secretion flowing from a pair of horn-like tubes, on the back of a minute insect called *aphis*, or plant-louse.

A recent traveller, Dr. Robinson, when in the neighbourhood of Nazareth, came to a spot which had been burnt over, and was informed that this had been done to destroy the young locusts, which were lying dead in great numbers. "We had seen them occasionally," he says, "for several days, and had passed some fields of cotton which had been greatly injured by them. At Jenin, we were told that the governor, who had extensive fields upon the plain, fearing for his cotton and other crops, had mustered the peasants of the neighbouring villages, and destroyed the locusts by burning or otherwise. But, every few miles, as we travelled across the plains, the ground was covered by the young swarms. They were green, and yet too young to fly, but just at the right age to eat. The environs of Nazareth, for some distance around, were covered with them, devouring vineyards, gardens, and every thing green. The bird which follows and destroys the locusts had not yet reached Nazareth, but was reported to be at Haltin. It is called *semerner*, (a species of thrush,) and the Arabs say it does not eat locusts, or, at least, not many, but attacks them with beak and talons, killing as many of them as possible." *

THE BEETLE.

THE word translated "beetle" is found only in Leviticus xi. 22. Two species of beetle were esteemed sacred by the Egyptians, and occur very frequently in their sculpture and painting. They belong to the subgenus *Ateuchus*, (*Scarabæus*, Linnæus.) These insects are found chiefly in Africa; they inclose their eggs in a ball of dung, which they roll into a hole prepared for its reception. This ball serves both as food and lodging for the larva which issues from the egg. This beetle is often to be met with in the Egyptian hieroglyphics, and was symbolical of the world, the sun, and a courageous warrior. On account of the last-mentioned

* *Biblical Researches*, iii. 195

symbolical meaning, the Roman soldiers wore its image on their signets. The Egyptians not only represented it on their monuments, but separately, making use of the most precious substances for the purpose, such as gold. They employed its figure for seals and amulets, which they buried with their mummies. The insect itself has been found enclosed in some of their coffins. In the British Museum there is a remarkable colossal figure of the Egyptian beetles in greenish-coloured granite. Figures of beetles in green-coloured stone occur very frequently in the ancient Egyptian tombs, either plain or with hieroglyphics cut on their backs.



SCARABÆUS SACER.

THE BEE.

THE bee, which with us is the emblem of industry, is in the Bible employed to represent the violence of persecution, or of hostile attacks. "They compassed me about like bees; they are quenched as the fire of thorns: for in the name of the Lord I will destroy them." Psal. cxviii. 12. See also Deut. i. 44. But we must recollect that the sting of this insect is much more painful and dangerous in warm climates than in ours. This wonderful little insect has excited great attention among naturalists, some of whom have spent years in studying its habits, and have written volumes on the subject.

Every hive contains three classes of bees,—workers, males, or drones, and one female called the mother, or queen bee. The number of drones in a hive is very irregular, varying from six or seven hundred to two thousand. The number of workers in a well-stocked hive is about fifteen or twenty thousand. Their employment is to collect honey, pollen,

and propolis, to build the combs, and to attend upon the young. Honey is extracted from that part of the flower called the nectary, which is very conspicuous in some flowers, as the nasturtium, crown imperial, columbine, and larkspur; but less visible in others, and in some appears to be entirely wanting. For the purpose of collecting this fluid, the bee is furnished with a trunk or tongue, which it can



THE DRONE.

double up or lengthen at pleasure. By this the honey is conveyed into the mouth, and then passes into the first stomach, or honey-bag. The pollen, or yellow dust, which loosely adheres to the central part of flowers, is another substance eagerly collected by the bee. The breast, legs, and many other parts of the body, are covered with a fine down or hair. The insect enters the cup of a flower, rolls itself round, and soon becomes quite covered with this vegetable dust. The thighs of the last pair of the insect's legs are furnished with two cavities fringed with hair; in these the dust, after being kneaded into little pellets, is stowed. When a bee loaded with this dust reaches the hive, it enters one of the cells head-foremost. The pellets are detached from the bee, and being moistened and mixed with a small portion of honey, are kneaded into what the country-people call "bee-bread." An adequate supply of this food is indispensable for the health and strength of the bees during the winter. Bees may be robbed of their honey, and will thrive if treacle be substituted for it. But take away the bee-bread, and they pine away and die. It is a curious fact, that the bee, whatever flower it takes pollen from first, will continue to collect it only from flowers of the same kind; so that if it begins to load from a daisy, it will pass by all other flowers, though they may be much more abundant, and collect from daisies alone.

The third substance collected by bees is called propolis. It is a resinous substance, of a reddish colour, collected from the bodies of certain trees, such as the birch, willow, and poplar. It is used not only in lining the cells of a new comb, but is mixed with wax, and used in repairs and stopping crevices.



THE QUEEN BEE.

The queen bee has a bent sting; in the workers the sting is straight, and the drones have none. It is composed of three very slender threads, which are enclosed in a sort of cap or sheath. The two pieces which form the true sting are scaly, and furnished with ten or sixteen small points or barbs like a fish-hook. If the bee be much agitated, it will leave the sting in the wound, at the cost of its own life. A solution of salt, or merely salt water, is an ancient but simple and efficacious remedy for the sting of the bee. An essential precaution, however, for lessening the pain and shortening its duration, is, in the first instance, to extract the sting.

In Mungo Park's last visit to Africa, some of his people having disturbed a colony of bees, were so furiously attacked, that both man and beast were put to instant flight. "In the evening," he tells us, "when the bees became less troublesome, and we could venture to collect our cattle, we found that many of them were very much stung and swelled about the head. Three asses were missing; one died in the evening, and one the next morning, and we were forced to leave one at Sibikellin—in all six; besides which our guide lost his horse, and many of our people were much stung about the face and hands."—*Travels*. ii 37, 38.

The most wonderful instinct of bees is that shown in the construction of their cells, which are made with consummate geometrical exactness, so as to occupy the least possible space required for their use, with the least possible consumption of material. But on this and many other, interesting topics, we must refer our readers to the valuable works devoted expressly to the history of the bee.

Cleanliness is one of the most marked qualities of bees; they cannot endure the least filth in their abode. It

is not inconsistent with this characteristic that the carcase of the lion slain by Samson was taken possession of by a swarm of bees. A short time would suffice in such a region to render the carcase fit for their use. The fleshy parts would soon be devoured by insects, birds, and beasts of prey, and the heat of the sun would exhale all the moisture.



THE WORKER.

Wild honey was so abundant in Palestine, that it is frequently described in the Old Testament as "the land flowing with milk and honey." Exod. iii. 8; xiii. 5; Lev. xx. 24; Numb. xiii. 27; xiv. 8; xvi. 13, 14; Deut. vi. 3; Josh. v. 6. Allusions and metaphors taken from this substance are frequent in the Scriptures. Thus Solomon, in exhorting to the pursuit of wisdom, says, "My son, eat thou honey, because it is good; and the honeycomb, which is sweet to thy taste." Prov. xxiv. 13. He admonishes against the indulgence of appetite by saying, "Hast thou found honey? Eat so much as is sufficient for thee, lest thou be filled therewith, and vomit it." Prov. xxv. 16. He reproves the ambitious by saying, "It is not good to eat much honey: so for men to search their own glory is not glory." Prov. xxv. 27. It is no unusual thing for bees to form their nests in hollow trees, and sometimes even in the hides of quadrupeds. Thus in 1 Sam. xiv. we read of the honey dropping in the wood, and of Jonathan's thrusting his rod into the honeycomb. In eastern countries the forests often swarm with bees. "The forests," says Mr. Roberts, "literally flow with honey; large combs may be seen hanging on the trees, as you pass along, full of honey." Such wild honey partly formed the food of John the Baptist, in the wilderness. In Psal. lxxxii. 16, and Deut. xxxii. 13, we read of "honey out of the rock."

Milk and honey were the chief dainties of the earlier ages, and continue to be so with the Bedouin Arabs now. So butter and honey are several times mentioned in Scripture, as among the most delicious refreshments. Compare 2 Sam. xvii. 29; Cant. iv. 11; Job xx. 17; and Isa. vii. 15.

Honey was used in some of the idolatrous ceremonies of the ancient heathens. On this account, probably, it was

forbidden to be used in any burnt-offering. Lev. ii. 11. It was, however, included among the first-fruits.

THE HORNET.

THE hornet is an insect of the wasp kind, but twice as large as the common wasp. Its nest is a very curious piece of work; with its jaw it cuts off little fibres of decayed wood, or of the inner bark of trees; these fibres are made, by masticating them, into a kind of paste, and then flattened out, till a coarse but strong paper-like sheet is formed. With this paper it first builds the outer walls of its nest, beginning always at the top; and within it constructs several platforms of cells, each platform hanging from the one above it by a number of rods or upright beams of the same material. The platforms are circular, and each contains a large number of cells, which are shaped like those of the bee, but never contain honey, being intended only to deposit the young in.

The word translated "hornet" occurs in Exod. xxiii. 28, and Deut. vii. 20, in which passages Jehovah promises to send these formidable insects among the Canaanitish nations, to assist the Israelites in their extirpation; in Josh. xxiv. 12, the fulfilment of this promise is recorded. "I sent the hornet before you, even the two kings of the Amorites."

Bruce, the traveller, supposes that, in these passages, the same insect is referred to that is mentioned in Isa. vii. 18, under the general designation of "the fly," and it is the kind known in Abyssinia by the name of *zimb*. He thus describes it: "It is very little larger than a bee, but of thicker proportions, and with wings which are broader than those of a bee; they are of pure gauze, without colour or spot upon them; the head is large; the upper jaw, or lip, is sharp, and has at the end of it a strong pointed hair, of about a quarter of an inch long; the lower jaw has two of these pointed hairs; and this pencil of hairs, when joined together, makes a resistance to the finger nearly equal to that of a strong hog's bristle. Its legs are serrated in the inside, and the whole covered with brown hair or down. As soon as this plague appears, and

their buzzing is heard, all the cattle forsake their food, and run wildly about the plain till they die, worn out with fatigue, fright, and hunger. No remedy remains, but to leave the black earth, and hasten down to the sands of Atbara; and there they remain while the rains last, this cruel enemy never daring to pursue them further.

“Though his size be as great as his strength, and his body covered with a thick skin, defended with strong hair, yet even the camel is not capable of sustaining the violent punctures the fly makes with its pointed proboscis. He must lose no time in removing to the sands of Atbara; for, when once attacked by this fly, his body, head, and legs, break out into large bosses, which swell, break, and putrefy, to the certain destruction of the creature. Even the elephant and rhinoceros are obliged to roll themselves in mud and mire, which, when dry, coat them over like armour, and enable them to stand their ground against this winged assassin; yet I have found some of these tubercles upon almost every elephant and rhinoceros I have seen, and attribute them to this cause. All the inhabitants of the sea-coast of Melinda, down to Cape Guardafui, to Saba, and the south coast of the Red Sea, are obliged to remove to the next sands, (of Beja,) in the beginning of the rainy season, to prevent all their stock of cattle from being destroyed.” Mr. Bruce goes on to remark: “Of all those that have written on these countries, the prophet Isaiah alone has given an account of this animal, and the manner of its operation, Isa. vii. 18, 19: “And it shall come to pass in that day, that the Lord shall hiss for the fly that is in the uttermost part of the rivers of Egypt. And they shall come, and shall rest all of them in the desolate valleys, and in the holes of the rocks, and upon all thorns, and upon all bushes;” that is, they shall cut off from the cattle their usual retreat to the desert, by taking possession of those places, and meeting them there, where ordinarily they never come, and which, therefore, were the refuge of the cattle.

“We cannot read the history of the plagues which God brought upon Pharaoh by the hands of Moses, without stopping a moment to consider a singularity, a very principal one, which attended the plague of this fly. (Exod. viii. 21.) It was not till this time, and by means of this insect, that God said he would separate his people from the Egyp-

tians. It is well known, as I have repeatedly said, that the land of Goshen, or Geshen, the possession of the Israelites, was a land of pasture, which was not tilled or sowed, because it was not overflowed by the Nile. But the land overflowed by the Nile was the black earth of the valley of Egypt; and it was here that God confined the flies; for he says it shall be a sign of this separation of the people which he had then made, that not one fly should be seen in the sand, or pasture ground, the land of Goshen; and this kind of soil has ever since been the refuge of all cattle emigrating from the black earth to the lower part of Atbara. Isaiah, indeed, says that the fly shall be in all the desert places, and consequently the sands; yet this was a particular dispensation of Providence to a special end; the desolation of Egypt was not a repeal of the general law; it was an exception, for a particular purpose and a particular time."—BRUCE'S *Travels*, vol. i. p. 5; v. p. 191.

THE ANT.

Go to the ant, thou sluggard; consider her ways and be wise; which having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest.—Prov. vi. 6-8.

The ants are a people not strong, yet they prepare their meat in the summer.—Prov. xxx. 25.

THESE texts do not directly assert that these ants collect their food *for the winter*; yet it is not improbable that, in warm climates, the ants lay up food against the rainy season. The species known to us are in a torpid state during the winter, and require no food. But in the summer they are very industrious, and the skill they show in constructing their habitations is truly wonderful. Ants are divided, like bees, into three classes—males, females, and neuters, or labourers; the two former are each furnished with four wings, of which the latter are wholly destitute. What are commonly called ants' eggs, are the young, termed nymphs, which in the spring or fine weather, are brought out and laid in the sun by the labourers, and in the evening are carried back to their cells.

The strength and perseverance of ants are most remarkable. It is related of the celebrated conqueror, Timour, that, being once forced to shelter from his enemies in a ruined

building, he sat alone for many hours. Desirous of diverting his mind from his hopeless condition, he fixed his observation on an ant, which was carrying a grain of corn, or a nymph, larger than itself, up a high wall. Numbering the efforts that it made to accomplish this object, he found that the grain fell sixty-nine times to the ground, but the seventieth time it reached the top of the wall. "This sight," said Timour, "gave me courage at the moment, and I have never forgotten the lesson it conveyed."



NEST OF COMMON YELLOW ANT.

Perhaps it would have been well for mankind if Timour had forgotten it, unless he had also been taught other lessons, which would have led him from his course of selfish ambition, to devote his energies to the service of God and the welfare of his fellow men. Happily we have examples before us of the highest excellence, of perseverance in the best cause. Such was that of the apostle Paul, who counted not his life dear unto himself if he could finish his course with joy, and the ministry which he had received of the Lord Jesus. Acts xx. 24. But pre-eminently let us con-

template the blessed Saviour, who "for the joy that was set before him endured the cross, despising the shame." Heb. xii. 2.

"The little ants for one poor grain
Labour, and toil, and strive;
Yet we who have a heaven to obtain
How negligent we live!"

THE FLY.

THE kinds of flies are very numerous—some with two, others with four wings. They abound in warm and moist regions, as in Egypt, Palestine, and many parts of Africa, and during the rainy seasons are very troublesome.

The name of the insect with which Jehovah humbled the pride and defeated the obstinacy of Pharaoh, Exod. viii. 21, and Psa. lxxviii. 45, has been variously rendered; in our version it is translated, "swarms of flies," and in the margin, "a mixture of noisome beasts." That it was one particular insect, and not a mixture of different animals, is pretty clear. According to the Septuagint, it was the dog-fly, which must have been peculiarly hateful to the Egyptians, because they held dogs in the highest veneration, and worshipped Anubis under the form of a dog. "The imposers of names," says Philo, "who were wise men, gave this insect an appellation from the qualities of two most impudent animals—a 'dog' and a 'fly;' for this species of fly attacks with fearless fury, and will not be driven away nor quit its hold, till it is satisfied with flesh and blood." The editor of the Pictorial Bible is inclined to believe that it was the sacred beetle of the Egyptians, which we have already described. Baal-zebub (mentioned in 2 Kings i. 2-6, as an idol of the Philistines) means "lord of flies," because he was supposed to defend his votaries from the flies which infested those regions. Those who live in hot climates, where the soil is moist, (which was the case of the Ekronites,) are generally infested with flies. And it seems not improbable that a general persuasion of his power of driving away flies, might be the reason why the god of Ekron was called Baal-zebub; for it was customary with the heathens to call their gods by the name of those insects from which they were believed to deliver their wor-

shippers. "The god of flies," and "the fly-hunter," were titles ascribed by the Greeks to Jupiter as well as to Hercules. The Septuagint translators have constantly rendered Baal-zebub by "Baal the fly." And Josephus says that Ahaziah sent "to the god-fly (for that was his name) of Ekron." This name was afterwards used by the Jews to signify "the prince of the devils." That this deity was supposed to have power over evil spirits, and to be capable of expelling them, appears from the opinions of the Pharisees, Matt. xii. 24; Mark iii. 22; Luke xi. 15; where they accuse our Lord of combination with Baal-zebub. That he was considered the patron deity of medicine, is clearly implied in the conduct of Ahaziah, 2 Kings i. 2. This will account for the conduct of the Pharisees in attributing the cures wrought by our Lord to the power of Baal-zebub. "The Scribes said, He hath Baal-zebub." Mark iii. 22.

LICE.

THE mention of these insects occurs in Exod. viii. 16-18, and Psal. cv. 31. They formed the third plague of the Egyptians.

Mr. Bryant, in illustrating the propriety of this miracle, has the following remarks: "The Egyptians affected great external purity, and were very nice both in their persons and clothing; bathing and making ablutions continually. Uncommon care was taken not to harbour any vermin. They were particularly solicitous on this head; thinking it would be a great profanation of the temple which they entered, if any animalcule of this sort were concealed in their garments." "The priests," says Herodotus, "are shaved, both as to their heads and bodies, every third day, to prevent any louse or any other detestable creature being found upon them, when they are performing their duty to their gods." The same is mentioned by another author, who adds, that all woollen was considered as foul, and as the product of a perishable animal; but flax, the product of the immortal earth, affords a pure and delicate covering, and is not liable to harbour lice. We may hence see what an abhorrence the Egyptians showed to this sort of vermin, and what care was taken by the priests to guard against them. The judgment, therefore,

inflicted by the hand of Moses, was adapted to their prejudices. It was consequently not only most noisome to the people in general, but was no small odium to the most sacred order in Egypt, that they were overrun with these filthy and detestable vermin.

It should be remarked, however, that the Septuagint renders the original by a word meaning the mosquito-gnats.

THE GNAT.

THE mention of this insect occurs in Matt. xxiii. 24. In eastern countries gnats are very apt to fall into wine, if it be not carefully covered; and passing the liquor through a strainer, that no gnat or part of one might remain, became a proverb for exactness about little matters. This may help us to understand that passage in Matt. xxiii. 24, where the proverbial expression of carefully straining out a little fly from the liquor to be drunk, and yet swallowing a camel, intimates, that the Scribes and Pharisees scrupled about little things, and yet disregarded those of the greatest moment. The sense requires us to read the text, "Ye strain out" (not at) "a gnat," and thus it stands in Tyndal's version, (1534,) in Cranmer's Bible, (1539,) and in the Geneva New Testament, (1557.)

The ancient Geeek interpreters render those words, Amos vi. 6, which we translate "that drink wine in bowls," by "who drink strained wine, but are not grieved for the affliction of Joseph." This contradictory affectation of external purity, combined with want of sympathy for the sufferings of God's chosen people, agrees well with the scope of the above.

It has been remarked of the gnat tribe, that there are few insects so greedy of the human blood. It infests the coldest, not less than the warmest climates. In Lapland their numbers are so prodigious as to be compared to a shower of snow, when the flakes fall thickest, or to the dust of the earth; the natives cannot take a mouthful of food, or lie down to sleep in their cabins, unless they be fumigated almost to suffocation. Near the Crimea, the Russian soldiers are obliged to sleep in sacks, to defend themselves from the mosquitos; and even with this precaution many die in

consequence of mortification produced by the bites of these insects. The late Dr. Edward Clarke tell us, that, in spite of gloves, clothes, and handkerchiefs, the bodies of himself and his companions were rendered one entire wound. In a most sultry night, when exhausted by fatigue and pain he sought shelter in his carriage; and, though almost suffocated, he could not venture to open a window. Swarms, nevertheless, found their way into his retreat, and filled his mouth, nostrils, and ears. In the midst of his torment, he lighted a lamp, but it was put out in an instant by a prodigious number of these insects, whose bodies formed a large conical heap over the burner. In the Island of Java, Dr. Arnold relates that their bite is the most venomous he ever felt, occasioning a most intolerable itching, which lasts for many days. It is not, therefore, incredible, that Sapor, king of Persia, should have been compelled to raise the siege of Nesibis by a plague of gnats, which, by attacking his elephants and beasts of burden, caused the rout of his army.

Herodotus says, that as the wind will not allow the gnats to ascend to any considerable elevation, the inhabitants of Upper Egypt sleep in turrets; but that in Lower Egypt the people protect themselves by their fishing-nets, which they spread over their beds at night. This has puzzled commentators and translators; but it is a remarkable fact, that mosquitoes and other flies will not pass through nets, the meshes of which are much more than large enough to admit them. This is practically known in some parts of Italy, where net curtains are used, which freely admit the air, while they keep out gnats and flies.—(*Pict. Bible*, Exod. viii.)

THE FLEA

A WELL known insect, of trifling size, but troublesome in its habits, and living upon blood. By folding its legs under its body and suddenly expanding them, it can spring to two hundred times its own height. It belongs to the warm and temperate climates; among the Esquimaux and Northern Indians it is not found; on the contrary, it swarms in the tents of the Arabs.

To this little insect David twice compared himself, addressing, Saul, who was in pursuit of him; signifying that he was

beneath the notice and hatred of the king of Israel. 1 Sam xxiv. 14; xxvi. 20.

THE SPIDER.

THOUGH spiders are generally classed among insects, they differ from them in various particulars. They have no antennæ; the eyes are in most species eight, and when there are only two, they are never placed laterally on the head; the legs are usually eight, though in some species six, and in others ten; the construction of the organs of respiration is also peculiar. The body of a spider is in two divisions; the forepart contains the head and the chest, covered with a hard skin, and having the legs attached to it; the hind part is larger, of an oval shape, pointed, more or less hairy, with a softer skin. At the mouth is a pair of sharp pincers, with which it seizes flies and other prey. The legs are eight in number, hairy and jointed, ending in three crooked claws, one of which is so placed as to act against the others like a thumb: these claws enable the creature to run along its threads, and also to clean itself and its web from dirt and loose threads. But the most remarkable part of the spider is the instrument with which it spins its web. This is situated near the end of the body, and consists of four, or in some of six, little knobs or tubercles, called spinnerets, covered with a multitude of tubes so exceedingly fine, that, according to Reaumur, a thousand of them occupy a space not much bigger than a pin's point. Hence from each spinneret proceeds a compound thread. At the distance of about one-tenth of an inch from the spinneret, these threads again unite, and form together one of the common visible threads composing a web. Thus a spider's thread is not a single line, but a rope consisting of at least four thousand strands. The creator has given the spider power to close the mouths of the spinnerets at pleasure; and this enables it, when descending from a height by its line, to stop at any point of its progress downwards.

Few things (it has justly been remarked) are better suited to remove the disgust into which young people are betrayed, (too often by those who ought to set them a better example,) on the view of some natural objects, than this of the spider

They will find that the most despised creature may become a subject of admiration, and may be selected to exhibit the marvellous wisdom of the Creator. The very names given to these creatures, direct our attention to some of the most interesting points in their habits; they have been divided into vagrants, hunters, swimmers, and water-spiders, sedentary and mason-spiders; thus evincing a variety in their condition, activity, mode of life, and vital functions, (for example, in their mode of breathing,) as well as in their extremities and instruments. Of these instruments, the most striking is the apparatus for spinning and weaving, by which they not only fabricate webs to entangle their prey, but form cells for their residence and concealment, sometimes living in the ground, sometimes under water, yet breathing the atmosphere. Corresponding with this very singular organization are their instincts. We are familiar with the watchfulness and voracity of some spiders, when their prey is indicated by the vibration of the cords of their network. Others have the eye and disposition of the lynx or tiger, and, after crouching in concealment, leap on their victims. Some conceal themselves under a silken hood, or tube, six eyes only projecting. Some bore a hole in the earth, and line it as finely as if it were done with the trowel and mortar, and then hang it with delicate curtains. A very extraordinary degree of contrivance is exhibited by the trap-door spider. The door from which it derives its name has a frame and hinge on the mouth of the cell, and is so framed that the claw of the spider can lay hold of it, and, "whether she enters or goes out," says Mr. Kirby, "the door shuts of itself." But the water-spider has a retreat still more curious. It is under water, with an opening at the lower part for her going in and out; and though this cell be under water, it contains air like a diving-bell, so that the spider breathes the atmosphere. It first spins some loose threads, which it attaches to the leaves of aquatic plants; it then varnishes them with a glutinous secretion, which resembles liquid glass, and is so elastic as to admit of considerable distention and contraction; it next lays a coating of this same substance over its own body, and underneath this coating introduces, by a process not clearly understood, a bubble of air. Thus clothed, and shining like a ball of quicksilver, it darts through the water, and disengaging the bubble, dexterously introdu-

ces it into a web formed at the bottom. After taking repeated journeys of this kind, and each time of its descent filling its cell with a fresh bubble of air, at length the lighter fluid completely expels the heavier, and the spider takes possession of its airy abode, commodious and dry, finished in the very midst of the waters. It is about the size and shape of half a pigeon's egg. From this curious chamber the spider hunts, searching sometimes the waters, and sometimes the land for its prey, which it transports to this under-water mansion, and devours at leisure. The male, as well as the female, exhibits the same instincts. Early in the spring, the former seeks the residence of the latter, and, having enlarged it by the introduction of a little more air, takes up its abode with its mate. About the middle of April the eggs are laid, and, packed up in a silken cocoon in a corner of their house, are watched with incessant care by the female.

In modern times, much interest has been excited by the elevation of bodies in the air by means of a balloon. The discovery consisted in finding out a manageable substance, which was, bulk for bulk, lighter than air; and the application of the discovery was, to make a body composed of, or filled with, this substance, bear up, along with its own weight, some heavier body which was attached to it. This expedi-



GOSSAMER SPIDER.

ent, so new to us, is no other than what the Author of nature has employed in the *gossamer* spider. We frequently

see this spider's thread floating in the air, and extended from hedge to hedge across a road or brook of four or five yards' width. The animal which forms the thread, has no wings wherewith to fly from one extremity of this line to the other, nor muscles to enable it to spring or dart to so great a distance; yet its Creator has made for it a path in the atmosphere, and, though the insect itself is heavier than air, the thread which it spins from its bowels is specifically lighter. This is its balloon. By this contrivance it mounts into the air to such great heights, that, when Dr. Lister ascended York Minster, he saw the gossamer spiders floating above him.

There are no living creatures so susceptible of atmospheric changes as spiders. If the weather is likely to be rainy, or even windy, the master thread to which they attach their web is always short. The barometer may point out that the weather will be fine to-morrow, but if the spider works with long threads, you may depend on its continuance for a fortnight.

In the book of Job, it is said of the hypocrite that his trust shall be as a "spider's web," (literally house,) Job. viii. 14. There is a similar allusion in the prophet Isaiah, lix. 5, 6, "They hatch cockatrice eggs, and weave the spider's web; their webs shall not become garments, neither shall they cover themselves with their works." In Prov. xxx. 28, a very different word is also translated spider in our version; but, according to the Septuagint and Vulgate, it means an animal of the lizard kind, and such reptiles frequently infest houses in the East.

THE SCORPION.

THIS animal is generally classed with the spider family, which it resembles in its form and habits. It is from two to four inches long in Europe, but, in warmer climates, is sometimes found a foot in length. It has eight jointed legs and two large feelers, armed with pincers. The poison of this animal is in its tail, at the end of which is a small, curved, sharp-pointed sting, similar to the prickle of a buck-thorn tree; the curve being downwards, it turns its tail upwards when it strikes a blow. It lurks under stones, among

furniture and goods, and in holes and crevices. It is exceedingly irritable, striking immediately at whatever happens to disturb it. In warm countries, the wound of a scorpion is most painful and dangerous. The part becomes highly inflamed and swollen; the pain and swelling extend to other parts of the body; sickness comes on, followed by convulsions and death. In the Sacred Scriptures, we find the scorpion and the serpent generally mentioned together. Thus Moses, in his farewell address to Israel, Deut. viii. 15, reminds them that God led them through the great and terrible wilderness, wherein were fiery serpents and scorpions.



THE SCORPION.

We find them united in the promise of protection made by our Lord to his disciples, "I give unto you power to tread on serpents and scorpions, and over all the power of the enemy." Luke x. 19. Also, when assuring them of the willingness of God to answer prayer, "If a son shall ask bread of any of you that is a father, will he give him a stone? or if he ask a fish, will he for a fish give him a serpent? or if he shall ask an egg, will he offer him a scorpion?" Luke xi. 11, 12. In this passage, the scorpion is probably compared with an egg on account of its oval shape. Some species are also of a white colour, and about the size of an egg. In 1 Kings xii. 11, 14, and 2 Chron. x. 11, 14, the word is either used altogether metaphorically, or a kind of knotted scourge is meant, which in ancient times was called a scorpion. *Akrabbim*, Numb. xxxiv. 4; Josh. xv. 3; and Judges i. 36, was so named from being infested with scorpions. It was afterwards called *Acrabatae*.

THE HORSELEECH.

THE horseleech, (*hirudo sanguisuga*, Linn.; *hiemopis sanguisorba*, Savig.) The name of this creature occurs only in Proverbs, (xxx. 15,) and, as the ancient versions prove, in the sense in which it is ordinarily received. Mr. Kitto observes, that the insatiable and disgusting thirst for blood which the leech exhibits, and of which we avail ourselves for medical purposes, is not unknown in the East, "and it is hence spoken of with unmingled horror and aversion, particularly as it causes the destruction of many valuable animals, by fastening under their tongues when they come to to drink, when it often happens, that, though the leech be taken away, the wounded beast continues to bleed slowly till it dies." Much, indeed, has been said of the blood-thirsty instincts of the horseleech, and not without foundation; it will, certainly, fasten upon both men and animals, and, being of large size, extract a considerable quantity of blood; but we cannot agree with Linnæus that nine are able to kill a horse, unless he alludes to the subsequent flow of blood, which has continued unstopped till the animal died. On the other hand, the assertion of Messrs. Huzard and Pelletier, that it attacks no vertebrate animal, is erroneous, and we agree with M. Blainville, in thinking the mistake they have made arises from considering the common black leech, (*pseudobdella nigra*,) of ponds and ditches, as that more formidable species. The common black leech has no teeth, and, therefore, cannot pierce the skins of vertebrate animals; whereas in the horseleech the teeth are larger than in the medicinal leech, and inflict dangerous wounds, from the inflammation they produce, which is often succeeded by ulceration. Both species prey upon worms. Leeches constitute a family of annulose animals, (*annelida*,) or red-blooded worms of Cuvier; they have no distinct heart, but the circulation is effected by the agency of contractile vessels; they have a nervous system, consisting of ganglia, or knots, united by nervous threads, and giving off nerves to the layers of muscles, etc., and to the oval disc, on the under surface of which are several extremely minute eyes, in a semicircular row. According to Professor Müller, these are of the simplest structure, being merely the expansion of

the extremity of minute nervous fibrils, covered by a delicate transparent convex cornea, derived from the epidermis, and lined posteriorly with a layer of black pigment, to which their appearance as black specks is to be attributed. No crystalline lens, nor aqueous or vitreous humours, for the refraction or condensation of the rays of light, have been detected; and their situation and simplicity prove that their use is restricted to the close and exclusive examination of food, or objects on which the animal is about to seize, or to which it is about to apply the oval sucker. Of the distinctness of vision possessed by such an apparatus no idea can be formed; it is probably at a low ratio. The teeth are three in number, so placed as to make three incisions, at three points forming a triangle. The stomach is furnished with sack-like appendages for the reception of the blood with which the leech gorges itself, whenever an opportunity happens. The respiratory organs consist of a series of small membranous sacs, down both sides, each opening by a minute orifice for the admission of water; on these membranous sacs, vessels of extreme fineness abundantly ramify.

The leech undoubtedly possesses the sense of taste, and can, most likely, appreciate the odour of bodies by the same sense, tasting, as it were, the invisible particles emanating from them. The leech can live for a long time out of the water, and, in Chili, and also in Ceylon, certain species are altogether terrestrial, crawling upon plants and trees, and attacking the legs of persons travelling through the woods, to their great discomfort. The general form and habits of the leech are too well known to need a detailed description.

CLASS VI.—MOLLUSCOUS ANIMALS,

OR ANIMALS OF A SOFT COMPOSITION, DESTITUTE OF A TRUE SKELETON.

THE SNAIL.

WE find the snail mentioned in two places in our Bibles. The first is among the unclean animals in Lev. xi. 30, where the Hebrew word is thought rather to mean some kind of lizard. The other passage is in Psa. lviii. 8; where it is said of the wicked, "As a snail which melteth, let every one of them pass away." The allwise Author of nature not having furnished them with feet and claws to creep and climb, has compensated them in a way more commodious for their state of life, by the broad thin skin along each side of the belly, and the undulating motion observable there; by the latter they creep; by the former, assisted by the glutinous slime emitted from their body, they adhere firmly and securely to all kinds of surfaces, partly by the tenacity of their slime, and partly by the pressure of the atmosphere. Thus the snail appears to waste itself by its own motion, every undulation leaving something of its own moisture behind it; and in the same manner the actions of wicked men prove their own destruction. They may, like the snail, carry their defence along with them, and retire into it on every appearance of danger; but the principles of ruin are at work within them, and although their progress may be slow, the result is certain.

THE WHELK

THIS may be a suitable place for mentioning, that the purple dye, for which the Tyrians were so famed, and to

(156)

which there is frequent reference in the Scriptures, is supposed to have been obtained from two molluscous animals called by Linnæus and other naturalists, *murex*, and *buccinum*, or *whelk*. The principal information we possess on



THE MUREX.

the ancient modes of dyeing, is derived from Aristotle and Pliny. The price of the dyed wool varied according to the supply of these mollusca; but as only a few drops of the fluid could be obtained from each animal, it almost equalled the precious metals in value. A single shell, according to Aristotle, sold for a mina, or about three pounds. In the time of the Emperor Augustus, one pound of wool dyed with the Tyrian purple could not be bought for thirty pounds. The purple was worn by the magistrates of Rome, but as it became scarcer, the use of it was confined to the emperors under pain of death.

The *buccinum* was found in 1686, by Cole, in great plenty on some parts of the Irish coast, and on the shores of Somersetshire and South Wales. The juice of the *buccinum*, when first taken out of the vein or reservoir, was white and clammy. When this viscid juice was squeezed on linen or silk, and exposed to the sun, it immediately acquired a pale yellowish-green hue, then a blue, and lastly a deep purple red. On washing the cloth with scalding water and soap, and again exposing it to the sun, the colour changed to a

beautiful crimson, and then became fixed. The linen, when first marked with the juice, yielded a fetid smell like garlick, which was the case with the purple dye of the ancients. The high estimation in which purple stuffs were held, may be known from the various references to it in the Bible. The curtains and veil of the tabernacle, the veil of Solomon's temple and the garments of Aaron and his sons, were made in part of materials of this colour, Exod. xxv. 4; xxxv. 6; xxxvi. 8, 35; xxxix. 29; 2 Chron iii. 14. Purple, either the dye itself, or dyed cloth, was an article of commerce, as appears from Ezek. xxvii. 7, 16. Lydia, who was converted by Paul's preaching, was "a seller of purple." Acts xvi. 14.

Purple and scarlet robes were worn by the rich, Luke xvi. 19; by kings, and others high in office and honour, as Daniel and Mordecai; (Dan. v. 7, 29; Esth. viii. 15; Judg. viii. 26 :) and the idols were sometimes clothed in purple. Jer. x. 9. It was in mockery of Christ that the Roman soldiers put upon him a purple robe. Mark xv. 17; John xix. 2.

THE PEARL-OYSTER.

THIS belongs to the same class of molluscous animals as the common oyster. They have no apparent head, but a mere mouth concealed in the bottom or between the folds of their mantle, which encloses the body as a book is clasped by its cover.

The pearl is a body of variable size and form, composed of layers of the substance called mother-of-pearl. The two most celebrated pearl fisheries in the old world are on the west coast of Ceylon, and at the Bahrein Islands, in the Persian Gulf; in the new world, those on the coast of Columbia, and the Bay of Panama. In Europe a certain number of pearls are obtained from a molluscous animal called the *unio margaritifera*, found in the great northern rivers and lakes; those of the Tay, in Scotland, are held in some esteem. But though these *union* pearls, as they are called, are sometimes fine and large, they have little or no brilliancy.

The fishing season at Ceylon begins in February and ends

early in April. Each boat contains, besides the pilot, ten rowers and ten divers; the latter descend into the sea five at a time; each man makes perhaps forty or fifty plunges in a day, bringing up every time about one hundred oysters. The usual time of remaining under water does not exceed two minutes, though instances have been known of submersion for five and even six minutes; but the shortest time so often repeated produces most serious injury to the divers, who are in consequence seldom long-lived; they are also in constant hazard of being the prey of the ground-shark. Ignorant of the true God, who "made the depths of the sea," they seek protection from this formidable enemy in the charms of their priests and conjurors, who are known in the Malabar language by the name of *pillal-karras*, or *binders of sharks*. During the time of the fishery, the conjurors stand on the shore till the boats return in the afternoon, muttering prayers, distorting their bodies into various strange attitudes, and performing ceremonies. All this time they ought to abstain from food and drink, but they sometimes regale themselves with intoxicating liquor till they are unable to stand at their devotions!

The oriental pearls have a fine polished gloss, and are tinged sometimes with yellow; some are of a pure white, and others have a beautiful blush of red.

We find the word "pearl" but once in our translation of the Old Testament, Job xxviii. 18; answering to a word which means "hailstones" in Ezek. xiii. 11, 13, and xxxviii. 22; and when applied to precious stones it would seem to refer to a kind resembling hail in form or colour, or in both. The word translated rubies in Job xxviii. 18; and in Prov. iii. 15; viii. 11; xx. 15; xxxi. 10; Lam. iv. 7, undoubtedly signifies pearls.

In Matt. xiii., our Lord compares the kingdom of heaven to a merchant in quest of pearls, "who, when he had found one pearl of great price, went and sold all that he had, and bought it." It is thus that we must value the blessings of the gospel, or we shall never obtain them. In the parable, it is evidently implied that *all* the merchant possessed was no more than enough to purchase the pearl. Had he offered to part with half his possessions, or even with the whole, *a small part excepted*, he would not have gained his object

How many, it is to be feared, there are, who would part with *some* things, yea with *many* things, if by so doing they could gain heaven, and yet retain some favourite earthly good!

But must I part with *all* !
My heart still fondly pleads :
Yes—Dagon's self must fall :
It beats, it throbs, it bleeds ;
Is there no balm in Gilead found,
To soothe and heal the smarting wound ?

O yes, there is a balm,
A kind Physician there,
My fever'd mind to calm,
To bid me not despair.
Dear Saviour! help me—set me free—
And I will *all* resign to thee!

JANE TAYLOR.

CLASS VII.—CORAL.

THERE are many kinds of coral, and one of a fine red is well known, and much used for ornamental purposes. It is the coral of commerce. Coral of every kind is the production of myriads of little animals of the polypus kind, for which it answers the same purpose as the shell of the oyster. It is fixed to the bottom of the sea, and to the surfaces of sunken rocks; and some kinds increase in time to immense masses, forming the foundation of many islands in the Pacific and Indian Oceans, and extending round them like reefs of rocks. Coral assumes various shapes; some kinds resemble the stem and branches of a tree; others, as the brain coral, are large irregular masses, with cells, pits, and meandering elevations, on their surface. Others are indefinite in figure, and spread in layers. In the red coral, the surface of the calcareous



Coral of Commerce, with the polypi
The ends of the branches are represented
as stripped of their living envelopes.

stem and branches is smooth; but in the extensive group termed madrepores, whether branched, convex or spreading, the surface presents innumerable cells, each containing a distinct individual, called a polypus, or polype, with its mouth and tentacles, which latter it extends in quest of food. These polypes, though acting each for themselves, constitute a compound whole, being vitally united to each other, by means of a living gelatinous expansion which covers the calca-



Gorgonia pustulosa.—The pustular covering, and also the flexible horny stems denuded.

reous coral, as with a sort of soft bark or skin; thus the calcareous portion acts as an internal support, or rude skeleton, deposited by the living gelatine.

Coral is mentioned among the costly merchandise of Tyre. Ezek. xxvii. 16. Pliny informs us, that the coral was highly esteemed by the ancients, and says that “the Indians value coral as we value pearls.” (xxxii. 2.)

THE VEGETABLE KINGDOM.

MANY productions of the vegetable kingdom are noticed in the Scriptures; many herbs and trees are alluded to; and it is desirable that the reader should understand them, in order to appreciate the allusions, or the full meaning of the passages wherein they are mentioned. Plants are all more or less important to men and animals; and of some, the productions have been deemed in all ages of the highest value—the sustenance of man and the domestic beasts of labour depending upon them. We allude to the grains, or corn, of various kinds of grasses, as wheat, barley, rye, rice, maize, oats, and others. Nor are the fruits of trees, of shrubs, and various plants, as of the fig, the vine, the melon, the gourd, etc., gifts to be undervalued by man, who, condemned to eat his bread in the sweat of his brow, is bound to receive all supplies from the hand of Providence with gratitude and thanksgiving.

CORN.

CORN is the general name in Scripture for grain of all kinds, as wheat, rye, barley, etc. The word (*bar*) translated “corn,” Gen. xli. 35, and “wheat,” in Jer. xxxiii. 28; Joel ii. 24; Amos v. 11, is undoubtedly the *burr*, or wild corn of the Arabs.

The land of Canaan produced corn in great abundance. It was a land of “wheat.” Deut. viii. 8; xxxii. 14. From this country the markets of Tyre were supplied, the best of it coming from Minnith, on the east of Jordan. Ezek xxvii. 17. This appears also, to have been the case long after, when the country of Tyre and Sidon was nourished by King Herod’s country, that is, drew supplies of provisions from it. Acts xii. 20.

WHEAT, as separate from chaff, is used, in a figurative sense, to represent divine truth, as distinguished from the



doctrines of false teachers. Jer. xviii. 28. In the same way, it represents the righteous as separated from the wicked in their characters and future destiny. Matt. iii. 12. Blessings are promised to the obedient, under the figure of a plentiful harvest. Psal. lxxxi. 16; Joel ii. 24. On the other hand, of the disobedient it is said,

“They have sown wheat, but shall reap thorns.” Jer. xii. 13.

BARLEY is named very frequently in the Bible. Twenty thousand measures of barley were paid by Solomon to Hiram’s workmen, who assisted in building the temple. With twenty barley loaves Elisha miraculously fed one hundred men, 2 Kings iv. 42; and with five loaves of the same kind, and two fishes, the Saviour fed five thousand. John vi. 9. The crops of barley in Egypt were destroyed by the plague of hail; and the sacred historian informs us, that the wheat and rye were not smitten, for they were not grown up. The mention of this simple fact answers a valuable purpose, in enabling us to fix the date of these extraordinary judgments. Flax is ripe in March, and must, therefore, have been bolled, or risen in stalk, in February; and as the wheat harvest takes place in Lower Egypt in May, and in Upper Egypt in April, the barley must have been in ear in February.* The priority of the barley harvest to the wheat harvest is implied in Ruth ii. 23. Barley is the common food of horses in eastern countries, as oats do not flourish there. 1 Kings iv. 28.

MILLET is mentioned only in Ezek. iv. 9. It has been supposed to be the grain called *dhourra*, which, according to Niebuhr, “when made into bad bread, with camel’s milk, oil, butter, or grease, is almost the only food which is eaten by the common people in Arabia Felix.” In Egypt there are three harvests of *dhourra* in the course of a

* “In Palestine the barley harvest precedes the wheat harvest by a week or fortnight.”—ROBINSON’S *Biblical Researches*, vol. ii. 99.

year. The grains are three times as large as those of the common millet known in this country. Its fruitfulness is very great, so that it often yields two hundred fold. "In the hottest season of the year, the only green thing which is to be seen in Palestine is the foliage of the scattered fruit-trees, and occasional vineyards and fields of millet. The deep green of the broad fig-leaves, and of the millet, is delightful to the eye in the midst of the general aridness; while the foliage of the olive, with its dull greyish hue, scarcely deserves the name of verdure."—ROBINSON'S *Biblical Researches*, ii. 99

LENTILES.

THIS is the leguminous or podded vegetable of which the "red pottage" was made, for which Esau parted with his birthright. Gen. xxv. 30-34 Mr. Kitto states, that he "has often partaken of this self-same 'red pottage,' (made by scething lentiles in water, and then adding a little suet, to give them a flavour,) and found it much better food than a stranger would be apt to imagine. The mess had the redness which gained for it the name of 'adom,' and which, through the singular circumstance of a son selling his birthright to satisfy the cravings of a pressing appetite, it imparted to the posterity of Esau. The stem of the lentile is branched, and the leaves consist of about eight pair of leaflets. The flowers are small, and in the upper division of the flower prettily veined. The pods contain about two seeds, which vary from a tawny red to a black. It delights in a dry, warm, sandy soil. Three varieties are cultivated in France; small brown, yellowish, and the lentile of Provence. In the former country they are dressed and eaten during lent as a haricot. In Syria they are used as food, after they have undergone the simple process of being parched in a pan over the fire." (*Illustrated Commentary*, vol. i. p. 68.) Dr. Robinson mentions that, in travelling from Mount Sinai to Jerusalem, he purchased at Akaba a supply of lentiles, or small beans, which are common in Egypt and Syria, under the name of *adas*, (in Hebrew *adash*,) the same from which the pottage was made for which Esau sold his birthright. "We found them," he adds, "very palatable, and could well conceive that, to a

wearry hunter faint with hunger, they might be quite a dainty." *Biblical Researches*, vol. i. p. 246. The other passages of the Bible in which lentiles are mentioned are 2 Sam. xvii. 28; xxiii. 11; Ezek. iv. 9.

BEANS.

THE sorts of this well-known vegetable, which are most usually cultivated in Syria, are the white horse-bean, and the kidney-bean, called by the natives *urasch*. The Hebrew name is *phul*; the Arabic *phoulon*. The prophet Ezekiel was directed to mix beans and other vegetables with wheat, for the purpose of making a coarse bread, of which he was to eat for three hundred and ninety days, as an action symbolical of the straits to which the Jews would be reduced. A similar method of making bread has been adopted by the Romans and several other nations, in time of great scarcity. Ezek. iv. Beans were among the provisions brought to David when flying from Absalom. 2 Sam. xvii. 28.

THE COTTON PLANT.

COTTON, in its native state, is a downy substance enveloping the seeds of plants belonging to the genus called by botanists *Gossypium*. These plants are herbaceous, or nearly so, and vary in height from three or four, to fifteen or twenty feet. The flowers are either yellow or dull purple, and are formed like the rest of the mallow tribe, to which they belong, according to the natural arrangement of plants. These are succeeded by a pod as large as a pigeon's egg, which when ripe turns black, and divides at top into three or five parts, disclosing the seeds enveloped in



the soft wool-like substance called "cotton."

"Cotton plants are found wild in both the old and new

world Herodotus and Arrian speak of the cotton plant as indigenous in India, and the cloth found in Persian tombs sufficiently attests its having existed in that country long before it could possibly have been carried to America by Eastern intercourse. In fact, the wild American cotton plants are specifically different from those of the old world; but at the present day, the cotton of the West is cultivated in Asia and Africa, while that of the East has long since been introduced to the American plantations."—*Penny Cyclop.* art. COTTON.

The word rendered "fine linen" in our bibles, is considered by the best critics to include cloth manufactured of cotton as well as of flax. The same word is improperly rendered "silk," which we have no reason for believing the Jews were acquainted with till a comparatively late period.

FLAX

FROM time immemorial, Egypt, and especially that part called the Delta, was celebrated for the production of flax; the stalks grew upwards of three feet in height, and were the thickness of a reed. Wrought into linen garments, it constituted the principal dress of the inhabitants, and the priests never put on any other kind of clothing. It was also cultivated in Palestine. In Josh. ii 6, we are informed, that Rahab hid the spies "with stalks of flax," which were probably laid on the roof to be dried in the sun. Linen was manufactured by the Hebrews for wearing apparel, 2 Sam. vi. 14; Prov. xxxi. 13; Ezek. xliv. 17; Luke xxiv. 12; John xix. 40; for girdles, Jer. xiii. 1; for measuring-lines and cords, Ezek. xl. 3; Judg. xv. 13. Flax was also used for the wicks of lamps, Isa. xlii. 3; xliii. 17

LEEKs, ONIONS, AND GARLIC.

THE names of these three vegetables occur in the English version of Numb. xi. 5. The first word is nowhere else translated "leeks," but in twelve passages "grass." Yet the authority of the Septuagint supports the common translation. Some critics suppose it means lettuce, and salads in general, and observe that succory and endive are much

relished by the people in Egypt. The leek, however, has been from the earliest times, cultivated in Egypt. "The poor people," says Hasselquist, "eat it raw, with bread, especially for breakfast, and would scarcely exchange their leeks and a bit of bread for a royal dinner."

Onions and garlic were highly esteemed in Egypt, where they acquire a much more delicate flavour than in colder countries. "Most of the people of Western Asia," Mr. Kitto observes, "are remarkably fond of onions. The Arabs, in particular, have even a childish passion for them. We have known poor Arabs wait for more than an hour, till the refuse of onions employed in cooking should be thrown away."—*Illustrated Commentary*, i. 305.

The Egyptians have been reproached with swearing by the leeks and onions of their gardens. Thus the Roman satirist ridicules those people who did not dare to eat these vegetables for fear of injuring their gods. But, then, it may be asked, would the Israelites have been permitted to make use of these sacred objects for food while under the Egyptian yoke? The answer is, that, at that early period, the Egyptians do not appear to have fallen into such gross superstition; indeed, the contrary may be inferred from a fact stated by Herodotus, that, in his time, there was an inscription on the great pyramid, recording the expense of radishes, onions, and garlic, consumed by the workmen during the progress of that vast undertaking, (an indirect corroboration, we may remark by the way, of the sacred narrative). And, though the priests might abstain from them, this might be affirmed of several other vegetables, which, nevertheless, were freely eaten by the people.

BITTER HERBS.

IN the directions given for eating the paschal lamb, it is said, "And they shall eat the flesh in that night, roast with fire, and unleavened bread; and with bitter herbs they shall eat it." Exod. xii. 8; Numb. ix. 11. The Jewish writers reckon five species of these bitter herbs. 1. *Chuzareth*, or lettuce. 2. *Ulsin*, supposed to be endive or succory. 3. *Tamca*, probably tansey. 4. *Charubbinim*, or camomile. 5. *Meror*, sow-thistle, dandelion, or wild lettuce. Forskal,

the friend and fellow traveller of Niebuhr, says, that the Jews in Sana and in Egypt, eat the lettuce with the paschal lamb.

CUCUMBERS AND MELONS,

MENTIONED only in Numbers xi. 5. These vegetables abound in the East, particularly in Egypt, and are much superior to those of this country. The water melon is cultivated on the banks of the Nile, in the rich clayey earth which subsides during the inundation, from the beginning of May to the end of July, or the beginning of August; and in the Delta, especially at Beulos, whence the largest and best are brought. They serve the Egyptians for meat, drink, and physic. The common people eat them with bread, and scarcely ever taste them ripe. They serve them



EASTERN MELON GARDEN.

like wine for drink, the juice refreshing these poor creatures. When the fruit is almost putrid, they hollow part of it, gather the juice there collected, and mixing it with rose water and a little sugar, they give it in burning fevers, being the only medicine the common people use in those distempers. The common cucumber grows with the water melon. The common people boil and eat it with vinegar; the richer

people fill it with flesh and aromatics, and make a kind of pudding, which eats very well. It ripens a little later than the water melon, but then it is in season longer, and until the latter end of the autumn. "A traveller in the east," says Mr. Kitto, "who recollects the intense gratitude which the gift of a slice of melon inspired, while journeying over the hot and dry plains, or one who remembers the consciousness of wealth and security which he derived from the possession of a melon, while preparing for a day's journey over the same plains, he will readily comprehend the regret with which the Hebrews in the Arabian Desert looked back upon the melons of Egypt."—*Illust. Comment.* i. 304.

The prophet Isaiah pathetically describes the desolation of his country by saying, "The daughter of Zion is left as a cottage in a vineyard, as a lodge in a garden of cucumbers." Isa. i. 8. On this passage the writer last quoted has the following interesting remarks: "Cucumbers, melons, and the like, are cultivated in large open fields quite exposed to the depredations of men or beasts. To prevent this, a slight artificial mound is raised, if required, and on this is constructed a hut or booth just sufficient for one person, who remains constantly watching the ripening crop. Very often has our travelling party, paused on arriving at such melon grounds, to bargain with the watchmen for a supply of his refreshing fruit; and on such occasions, often seeing no object around to a great distance in the plain but this one man and his solitary shed, we have been most forcibly reminded of the peculiar appropriateness of the image of desolation suggested by the prophet."—*Illust. Comment.* iv. 2.

FITCHES.

THERE are two words in the Hebrew which our translators have rendered "fitches." One, used in Ezek. iv. 9, is translated "rye," in Exod. ix. 32, and Isa. xxviii. 25; the other occurs only in Isaiah xxviii. 25, 27, and must be the name of some kind of seed. The general opinion is in favour of *nigella*, a ranunculaceous plant, well known in the East, and the seeds of which are used as a condiment, as we use carraway seeds. The leaves of the plant are small, like those of the crow-foot: the flower is blue, which disap-

pearing, the ovary shews itself on the top like that of a poppy, furnished with little horns, oblong, divided by membranes into several partitcons, in which are enclosed seeds of a very black colour, not unlike those of the leek, but of very fragrant smell. Pliny says it is of use in bake-houses, and affords a grateful seasoning to bread. It forms a striking exception to other plants of the same family, which are many of them (such as the aconite) strong poisons, while the seeds of this are not merely innocent and agreeable, but even medicinal.

CORIANDER.

THIS is an annual plant of the umbelliferous kind, common in the south of Europe and in Egypt. It has a round slender stalk; the leaves that grow next the root are nearly entire or gashed; the stem-leaves are doubly cleft, and their segments are deeply divided, while the uppermost leaves are parted into many narrow linear segments. The flowers grow in an umbel, and are of a pale pink colour. In most plants of this family, (as parsley for example,) the fruit separates into two similar halves, which are the seeds; but in the coriander, the globular fruit remains undivided after it is ripe. It was used by the Egyptians chiefly to give an aromatic flavour to their food.

MINT, DILL, CUMMIN, and RUE. The first three plants are mentioned in our Lord's denunciation of the hypocrisy of the Pharisees, Matt. xxiii. 23; but in the parallel passages, Luke xi. 42, only the first and last are specified. Dill is the plant meant by the word incorrectly translated "anise" in our English version, owing probably to the great similarity of the names in the original. Mint and rue are so well known in this country, that a description of them is needless. Of dill and cummin it may suffice to say, that they are both umbelliferous plants, resembling the coriander in their general appearance and the qualities of their seeds.

SESAMUM.

THE SESAMUM (*sesamum orientale*; natural family *Sesamiæ*) has been cultivated in the East from the earliest times,

and is supposed, by some critics, to be referred to by Isaiah, (xxviii. 25,) under the phrase "the appointed barley." Herodotus, speaking of the productions of Babylonia, says, "As for millet and sesame, *σησαμη*, or *σησαμον*, sesamé or sesamon,) the plant becomes a tree of such magnitude, that though I have a personal acquaintance with the fact, I forbear to mention the size; feeling assured that those who have never visited the province of Babylonia will deem what I have already said of its produce as incredible. They (the people) use no oil except what is obtained from sesame." *Simpson*, or *simsen*, is the Egyptian and Arabian name of one of the species or varieties most remarkable for the quantity and quality of the oil expressed from its seed. This oil, which is very delicate, is employed as an article of diet in eastern nations, and hence the plant is cultivated in India, Syria, and Egypt, and has been introduced into the West Indies.

Sesamum seeds are sometimes added to broths, or soups, and frequently to cakes, by the Jews and modern orientals. The leaves of the plant are mucilaginous, and used for poultices; and in India, the oil, which is bland, and will keep many years without becoming rancid, as salad or olive oil in Europe. Two varieties of the seeds are known in commerce, a black and white sort, the products of two distinct species; sesamum seed and oil are imported into this country from India and Egypt, but the seed from the latter country is of the finest quality. Four or five species are distinguished by botanists, but many are disposed to consider them as the cultivated varieties of one single species, and with some reason.

The sesamum is an annual plant, with opposite and alternate leaves, and axillary flowers, and attains to the height of three or four feet; in some varieties the lower leaves are three-lobed, the upper entire, and the branches very numerous. The generic characters, as presented by the flower, are as follow: calyx five-parted, corolla with a short tube, and bell-shaped throat, the limb quinquifid, somewhat bilabiate. Stamens four, didynamous, with the rudiments of a fifth stamen. Stigma bilamellate. Capsule oblong, four-celled, two valved. Seeds numerous.

MUSTARD.

“THE kingdom of heaven is like to a grain of mustard seed, which a man took, and sowed in his field: which indeed is the least of all seeds: but when it is grown it is the greatest among herbs, and becometh a tree, so that the birds of the air come and lodge in the branches thereof.” Matt. xiii. 31, 32.

“Our Lord’s words on this occasion are to be interpreted by popular use; and that there was a species of mustard, (*sinapis*,) or, at least, what the orientals comprehended under that name, which rose to the size of a tree, appears from the writings of the rabbies, men who will not be suspected of partiality when their testimony happens to favour the writers of the New Testament.”—(Dr. G. CAMPBELL.)



A. B. Lambert, F. R. S. etc., in the *Linnean Transactions*, vol. xvii. p. 449, contends that it is the *sinapis nigra* of botanists. “I am convinced,” he says, “it is the mustard now in daily use among us. Mustard seed was used by the Romans and other nations of antiquity in medicine, as it is at this day. I shall endeavour to prove from the New Testament that the *sinapis nigra* is the plant our Saviour alluded to in Matt. xiii. 31, 32; Mark iv. 31, 32.

“Our Saviour is not to be understood as speaking scien-
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tifically or specifically, when he said the 'smallest of seeds'; he was speaking only comparatively, and meant no more than a small seed; and when he spoke of it as the greatest of herbs, and becoming a tree, he may be supposed to have meant no more than that it bore a resemblance to a tree of low stature. Its branches would give it the appearance of a tree, and small birds might lodge or rest upon it.

"Now in the two last verses quoted, (Mark iv. 31, 32.) we find it described as a great herb, and branched, so that the fowls of the air might lodge under it, as the partridge and quail do under our corn.

"The following passage, in Luke xvii. 6, 'And the Lord said, If ye had faith as a grain of mustard seed,' plainly shows that it was a grain in common use, and he therefore chose it as his figure, that it might be understood by the meanest capacity. What Mr. Frost says about the *phytolacca* he took from some conversation he heard in my library, not relating to the mustard seed of Scripture, but to a plant mentioned by Captains Irby and Mangles, of which they brought me a specimen, and which proved to be *salvadora persica*, found by them growing in a hot valley of the Holy Land, although a very common plant in the East Indies.

"Now, as there is but one mustard seed mentioned in three different places in the Scriptures, the oldest records appear to prove that the mustard so common in those days, and to which our Saviour so often alludes, was a species of *sinapis*, and most probably *sinapis nigra*.

"Captains Irby and Mangles inform me, they have seen our mustard plant in the Holy Land, growing as high as their horses' heads; and other travellers have seen the *sinapis nigra*, growing to the height of ten feet."

HYSSOP.

THE plant usually known by this name has bushy stalks, growing a foot and a half high; small, spear-shaped, close-sitting, opposite leaves, with several smaller ones rising from the same joint; and all the stalks and branches terminated by erect whorled spikes of flowers, of different colours in the varieties of the plant. The leaves have an aromatic smell, and a warm pungent taste.

Under the law, it was commonly used in purifications, for the purpose of sprinkling blood or water. When the people of Israel came out of Egypt, they were commanded to take a bunch of hyssop, to dip it in the blood of the paschal lamb, and sprinkle it on the lintel, and the two side-posts of the door. It was also used in sprinkling the leper, Lev. xiv. 1-7, and those who had defiled themselves by touching a corpse. Numb. xix. 18. The hyssop is extremely well adapted to such purposes, as it grows in bunches, and puts out many suckers from a single root. This peculiarity of form, and not any cleansing property of the plant itself, seems to be a sufficient reason for its use. The expression of the fifty-first Psalm, "Purge me with hyssop," may most naturally be understood as an allusion to the use of the plant already mentioned, in scattering either blood or water over persons and things. In John xix. 29, it is observed that, at the crucifixion of our Lord, "they filled a sponge with vinegar, and put it upon hyssop, and put it to his mouth;" while in Matt. xxvii. 48, and Mark xv. 36, the sponge filled with vinegar is said to be "put on a reed." Some commentators have supposed that there must have been some plant in Judea, of the lowest class of trees or shrubs, which was either a species of hyssop, or had a strong resemblance to what the Greeks called by that name, the stalk of which is what is meant by the reed in Matthew and Mark, and others, that there was a species of hyssop whose stalk was sometimes two feet long, which was sufficient to reach a person on the cross. The height to which the cross reached was seldom above eleven or twelve feet; thus the feet of the person suspended would not be more than four feet from the ground, a height by no means so great as some persons have imagined. It, therefore, seems unnecessary to suppose, with some critics, that it was not the common hyssop, but a larger plant, possessing detergent, or cleansing qualities. The *phytolacca decandria* has been fixed upon, because it has a long straight stem, and contains, like others of the same tribe to which it belongs, (*chenopodium*, or goose-foot,) a very large proportion of potash; a hundred pounds of its ashes afford forty-two pounds of pure caustic alkali. This plant, however, is chiefly found in Mexico and other parts of the new world; nor is it likely that a plant only rarely, if at all, to be met with in Palae

tine, would be fixed upon to be used in the Mosaic ritual on so many occasions. Now the hyssop grows in abundance on the mountains near Jerusalem. It is also found in great plenty, with other fragrant plants, such as lavender and wild marjoram, on Mount Sinai. "This vegetation," says Dr. Robinson, "extends quite up to the foot of the highest peak, an immense pile of huge blocks of coarse red granite, thrown promiscuously together"

WORMWOOD.

THE common wormwood (*artemesia absinthium*,) is a small plant with a branching stem; its leaves have a silky, hoary appearance, owing to a thick covering of very fine hairs, and are very much divided; they have a disagreeable smell, and are proverbial for their intense bitterness. The English name of this plant alludes to its virtue in expelling worms from the human body.



From the passage of Scripture where this plant is mentioned, something more than the bitterness of its qualities seems to be intimated, and effects are attributed to it greater than can be produced by the European species. It is used in the Bible in a figurative sense, to express what is destructive, injurious, and detestable, and is frequently joined with gall and hemlock. Moses compares an apostatizing Israelite to "a root that beareth gall and wormwood." Deut. xxix. 18. Of a wicked woman, Solomon says, "Her end is bitter as wormwood." Prov. v. 4. Those who pervert justice are said, by the prophet Amos, to "turn judgment to wormwood:" v. 7. Jehovah thus denounces punishment on the people of Israel; "Behold, I will feed them with wormwood, and give them water of gall to drink." Jer. ix. 15; xxiii. 15. Jeremiah, speaking of his own sufferings, says, "He hath filled me with bitterness, he hath made me drunken with wormwood." Lament. iii. 15. In the Book of Revelation, the Divine judgments are

depicted under the image of a star falling from heaven, "and the name of the star is called Wormwood: and the third part of the waters became wormwood; and many men died of the waters, because they were made bitter." Rev. viii. 11.

Hasselquist met with this plant on Mount Tabor.

BROOM.

THE word translated "juniper," 1 Kings xix. 4, 5, in the English version, is the same as the Arabic name for "broom." This is the largest and most conspicuous plant found in the deserts of Arabia and Palestine, and grows thickly in the water-courses and valleys; it has small whitish, variegated blossoms. The Arabs who accompanied Dr. Robinson in his journey through these parts, always selected, if possible, for their nightly encampment, a spot where this plant grew, in order to be sheltered by it at night from the wind; and, during the day, when they often went in advance of the camels, they were, not unfrequently, found sitting or sleeping under a bush of *retem* to protect them from the sun. There appears little reason to doubt, that under this shrub the prophet Elijah lay down and slept. The roots are very bitter, and regarded by the Arabs as yielding the best charcoal. This illustrates the reference to "coals of juniper," in Psal. cxx. 4. In travelling from Hebron to Petra, Dr. Robinson noticed in the valleys various trees, and shrubs, and also the *retem* in great quantities, all very large. On the rocks above, he found the juniper tree, Arabic *'ar'ar*, which he considers to be the same as the Hebrew *aroer*, Jer. xlvi. 6, where the English version and Luther's read "heath." Its berries had the appearance and taste of the common juniper, except that there was more of the aroma of the pine. The trees were ten or fifteen feet in height, and hung upon the rocks, even to the very summit of the cliffs.

NETTLE.

WE find this name given to two different words. The first occurs in Job xxx. 7; and Zeph. ii. 9. It is not easy to determine what species of plant is here meant. Some

have conjectured that it is the *paliurus*, or Christ's thorn, so called from its being supposed to be the plant from which the Jews plaited the crown of thorns for our Saviour. It is armed with short, stiff, curved spines; has small shining ovate leaves, yellowish-green clustered flowers, and a broad brown fruit, convex in the middle, but thin and uneven at the margin. In this country it is not uncommon in shrubberies, where it forms a beautiful bush when in flower, but does not rippen its fruit. From the passage in Job, it is evident the nettle could not be intended, for a plant is referred to large enough for people to take shelter under. The word used in Isa. xxxiv. 13, and Hos. ix. 6, very probably means the nettle.

WILD GOURD.

WE read of the wild gourd in 2 Kings iv. 39. The prophet Elisha being at Gilgal, during a great famine, bade one of his servants prepare an entertainment for "the sons of the prophets" who were in that place. "And one went out into the field to gather herbs, and found a wild vine, and gathered thereof wild gourds his lap full, and, came and shred them into the pot." But when they were brought to table, and his guests tasted them, they cried out, "There is death in the pot." Immediately the prophet called for meal, threw it into the pot, and they received no injury from



the food. The plant is generally supposed to have been that species of gourd called *colocynth*, or bitter apple. It is termed a wild vine from the shape of its leaves, and its climbing mode of growth. The leaves of the plant are large and alternate; the flowers white; the fruit is about the size of an orange, but of a lighter colour; the rind smooth, and underneath it there is

a white spongy pulp, or pith, which is employed in medicine as a purgative. It requires caution in its use, as an over dose has a decidedly poisonous effect. Dr. Robinson, in travelling from Suez to Mount Sinai, observed it growing in

the valley of Feiran, with its yellow fruit already ripe towards the end of March.

The gourd mentioned in Jonah iv. 6, has quite a different name in the original from the colocynth, and is supposed to have been the *ricinus*, or castor-oil tree. It is called at Aleppo *palma Christi*. Dr. Robinson found it in the neighbourhood of Jericho of a large size, and it is there considered a perennial plant, though usually described as a biennial. It rises with a strong herbaceous stalk, to the height of ten or twelve feet, and is furnished with very large leaves, not unlike those of the plane tree. It belongs to the *euphorbiaceæ*, and hence is allied to the spurge, and the *iatropha*, or tapioca tree.

MANDRAKES.

THIS name is put in the English Bible for a Hebrew word, (*dudaim*,) which occurs only twice, Gen. xxx. 14-16, and Sol. Song. vii. 13. The plant generally known by this name, bears a bell-shaped flower and small round berries. It has a long, thick, dark-coloured root, like a radish, sometimes single, but more frequently forked and twisted. From the top of this root rise a number of large, broad leaves, of a dark green colour and an unpleasant smell. It is poisonous, and was formerly supposed to promote sleep. Hasselquist found it in abundance growing in a valley near Nazareth. "I had not the pleasure," he says, "to see this plant in blossom, the fruit now hanging ripe to the stem, which lay withered on the ground; but I got several roots, which I found difficult to procure entire, as the inhabitants had no spades, but a kind of hoe or ground axe; with this they cut up the earth, and hurt the root, which, in some plants, descended six and eight feet under ground. From the season in which this mandrake blossoms and bears fruit, one might form a conjecture that it was Rachel's *dudaim*. These were brought her in the wheat harvest, which, in Galilee, is the month of May, or about this time, and the mandrake was now in fruit. This plant grows in all parts of Galilee, but I never saw or heard any thing of it in Judea. The Arabs in this village call it by a name which signifies, in their language, the devil's victuals."

From the connection in which it is mentioned in Solomon's

Song, some critics have inferred that it must have been a plant of a very fragrant smell, and have fixed upon the plantain, or its variety the banana, as intended by the Hebrew word *dudaim*. "We can speak," says one writer, "from observation, and can bear witness, without exaggeration, that there is no fruit which is at once so grateful and nutritive as that of the banana. The leaves of this tree are remarkable for their size, being three or four feet in length, and more than six inches in breadth. We have here a tree which agrees with the terms of Holy Scripture, one that deserved a place in the pleasure grounds of Solomon, which requites the pains of the cultivator by a plentiful harvest of delicious fruit, and perfumes the air with its ripe fragrance. The mandrakes give a [good] smell." The fruit is of an oblong three-cornered shape, and grows in thick clusters. The skin is tough and leathery, and finally turns to a bright yellow. The pulp is of an orange colour, with scarcely any traces of a seed. On the fruit-stalk the eye discovers a bare space with a few scales, once occupied by barren flowers, which fall off before the fruit ripens. These flowers contain a great quantity of honey, and for that reason they are visited in South America by the humming birds, which are said to live chiefly on the nectareous juices of flowers. It is a native of Egypt, and, in better times, of Palestine.

APPLES OF SODOM.

THE Bible speaks only of "the vine of Sodom," and that metaphorically, in Deut. xxxii. 32; but, as Sodom stands so conspicuous in Scripture history, it will hardly be overstepping the proper limits of this work to notice the remarkable production which derives its name from that place; we allude to the apples of Sodom, supposed by Dr. Robinson, to be the fruit of a tree called by the Arabs *'oskar*. We give the description in the words of Dr. Robinson: "*Apples of Sodom*. One of the first objects which attracted our notice on arriving at 'Ain Jidy, (a beautiful fountain which bursts forth from



a mountain near the Dead Sea, at the height of four hundred feet above its level,) was a tree with singular fruit, which, without knowing at the moment whether it had been observed by former travellers, or not, instantly suggested to our minds the far-famed fruits

‘which grew
Near that bituminous lake where Sodom stood.’

• This was the ‘oskar of the Arabs, (the *calotropis gigantea* of botanists,) which is found in abundance in Upper Egypt and Nubia, and also in Arabia Felix, but seems to be confined, in Palestine, to the borders of the Dead Sea. We saw it only at ‘Ain Jidy; Hasselquist found it in the desert between Jericho and the northern shore; and Irby and Mangles met with it of large size at the south end of the sea, and on the isthmus of the peninsula.

“We saw here several trees of the kind, the trunks of which were six or eight inches in diameter, and the whole height from ten to fifteen feet. It has a greyish, cork-like bark, with long oval leaves, and, in its general appearance and character, it might be taken for a gigantic species of the milk-weed, or silk-weed, found in the northern parts of the American States. Its leaves and flowers are very similar to those of the latter plant; and, when broken off, it in like manner discharges copiously a milky fluid. The fruit greatly resembles externally a large smooth apple or orange, hanging in clusters of three or four together, and when ripe, is of a yellow colour. It was now fair and delicious to the eye, and soft to the touch; but, on being pressed or struck, it explodes with a puff, like a bladder or puff-ball, leaving in the hand only the shreds of the rind and a few fibres. It is, indeed, chiefly filled with air, like a bladder, which gives it the round form; while in the centre a small tender pod runs through it from the stem, and is connected by thin filaments with the rind. The pod contains a small quantity of fine silk with seeds, precisely like the pod of the silk-weed, though very much smaller, being, indeed, scarcely the tenth part as large. The Arabs collect the silk, and twist it into matches for their guns, preferring it to the common match, because it requires no sulphur to render it combustible.

“The most definite account we have of the apples of

Sodom, so called, is in Josephus, who, as a native of the country, is a better authority than Tacitus, or other foreign writers. After speaking of the conflagration of the plain, and the yet remaining tokens of the divine fire, he remarks that 'there are still to be seen ashes reproduced in the fruits, which, indeed, resemble edible fruits in colour, but on being plucked by the hands are dissolved into smoke and ashes.' In this account, after making due allowance for the marvelous in all popular reports, I find nothing which does not apply almost literally to the fruit of the 'oskar as we saw it. It must be plucked and handled with great care, in order to preserve it from bursting. We attempted to carry some of the boughs and fruit with us to Jerusalem, but without success.

"Hasselquist finds the apples of Sodom in the fruit of the *solanum melongena*, (night-shade, mad-apple,) which we saw in great abundance at 'Ain Jidy and in the plains of Jericho. These apples are much smaller than those of the 'oskar, and when ripe are full of small black grains. There is here, however, nothing like explosion, nothing like 'smoke and ashes,' except occasionally, as the same naturalist remarks, 'when the fruit is punctured by an insect, (*tenthredo*,) which converts the whole of the inside to dust, leaving nothing but the rind entire, without any loss of colour.'" We saw the *solanum* and 'oskar growing side by side, the former presenting nothing remarkable in its appearance, and being found in other parts of the country, while the latter immediately arrested our attention by its singular accordance with the ancient story, and is, moreover, peculiar in Palestine, to the shores of the Dead Sea."

The opinion of Dr. Robinson and others, that the silk-bearing fruit of the 'oskar is the apple of Sodom, has been contradicted by A. B. Lambert, the botanist, in a paper to be found in the Linnean Transactions, vol. xvii. p. 445. We shall quote largely from it, leaving it to our readers to form their own conclusions. "Some time ago," says Mr. Lambert, "I had the honour to submit to the Society the branch of a shrub from Monte Video, bearing galls, containing a new insect, brought by Mr. Earle, who accompanied Captain Fitzroy in the Beagle. I have now the pleasure to exhibit specimens and a drawing of the far-famed apple, *mala insana*, from the mountains east of the Dead

Sea, and which now proves to be a gall on a species of oak, containing an insect. These galls were brought from the Holy Land by the Hon. Robert Curzon. They are the first that have been seen in England, and will enable us to clear up the many great mistakes that have been made by travellers about them. Mr. Curzon tells me the tree that produces them grows in abundance on mountains in the neighbourhood of the Dead Sea, and is about the size of our apple tree.

“There appear to be two or three different plants for whose fruit these galls have been mistaken, namely the *solanum sodomeum*, which appears to have been confounded with *solanum melongena*, and *calotropis gigantea*, etc.

“I shall refer to what Hasselquist says of the *mala insana*, and likewise the account given of it in that useful work, ‘The Modern Traveller,’ by Mr. Conder, who seems to have brought together all that has been said or written on this most interesting subject; and, what is very extraordinary, and greatly to the praise of that gentleman, having probably never seen the production itself, he rightly guessed its real nature. Mr. Curzon informs me, that these galls, when on the tree, are of a rich purple, and varnished over with a soft substance of the consistence of honey, shining with a most brilliant lustre in the sun, which makes the galls appear like a most delicious and tempting fruit. Having had the curiosity to taste a small quantity of the interior of one, I found it the strongest of bitters, and that it may truly be said of it, ‘As bitter as gall.’

“The gall is pear-shaped, with a circle of small sharp-pointed protuberances on the upper part of it, which appear to be formed by the insect for air, or defence, or some other purpose. In each of the galls there is an aperture through which the insect escapes, and in the centre there is a small round hole, or nidus, (nest,) where it has lodged.” The tree is the *quercus infectoria* figured in Olivier’s Travels in the Levant, and growing abundantly throughout Syria. The following are extracts from Conder’s “Modern Traveller.”

“Tacitus and Josephus both mention this fruit as beautiful to the eye, but crumbling at the touch to dust and bitter ashes. Reland, Maundrel, and Shaw, all express themselves sceptical concerning its existence. But none of them explored the borders of the lake sufficiently to entitle them to

give a decided opinion on the subject, having only seen its northern shore. Pococke is inclined to lay more stress on the ancient testimonies, and he supposes the apples to be pomegranates, which having a tough hard rind, and being left on the trees two or three years, the inside may be dried to dust, and the outside remain fair. Hasselquist pronounces the *poma sodomica* to be the fruit of the egg-plant nightshade, or mad apple, (*solanum melongena*,) which he states is found in great abundance round Jericho, in the valleys near Jordan, and in the neighbourhood of the Dead Sea. It is true he says, these apples are sometimes full of dust, but this appears only when the fruit is attacked by an insect which converts the whole of the inside into dust, leaving nothing but the rind entire. M. Seetzen, differing from Hasselquist in opinion, supposes the apple of Sodom to be the fruit of a species of cotton tree which he was told grows in the plain of El Ghor, in appearance resembling a fig-tree, and known by the name of *abeschæz*. The cotton is contained in the fruit, which is like a pomegranate, but has no pulp. Chateaubriand follows with his discovery of what he concludes to be the long-sought-for fruit. The shrub which bears it, he says, grows two or three leagues from the mouth of the Jordan; it is thorny, with small taper leaves, and its fruit is exactly like the little Egyptian lemon, both in size and colour. Before it is ripe, it is filled with a corrosive and saline juice; when dried, it yields a blackish seed, which may be compared to ashes, and which in taste resembles bitter pepper.

“Next comes Mr. Joliffe. He found in a thicket of brushwood, about half a mile from the plain of Jericho, a shrub five or six feet high, on which grew clusters of fruit about the size of a small apricot, of a bright yellow colour; and observes, that possibly when ripe they may crumble into dust upon any violent pressure. This shrub is probably the same as that described by Chateaubriand.

“Lastly, Captains Irby and Mangles have no doubt that they have discovered it in the 'oskar plant, which is probably the same as that to which M. Seetzen refers.”

Excluding the pomegranate, and the egg-plant nightshade, as having no claims to be regarded as the deceitful fruit in question, Mr. Conder argues with respect to the 'oskar, that there is little resemblance between cotton or

thistle down, and ashes or dust; and that the fruit noticed by Chateaubriand, full of bitter seed has more resemblance to the fruit as described by Tacitus and Josephus; but that it is after all possible that "what they describe may have originated like the oak galls in this country, in the work of some insect; for these remarkable productions sometimes acquire a considerable size and beauty of colour."

Such are the galls discovered by the Hon. Mr. Curzon in the neighbourhood of the Dead Sea, and described by Mr. Lambert, who records them as the *poma sodomica*, the far-famed apple of Sodom.

HEMLOCK

OCCURS in Deut. xxix. 18; xxxii. 32; Psa. lxxix. 21; Jer. viii. 14; ix. 15; xxiii. 15; Lam. iii. 15, 19; Hosea x. 4; and Amos vi. 12. In the two latter places our translators have rendered the word "hemlock," in the others "gall."

It is evident from Deut. xxix. 18, that some herb or plant is meant of a malignant or nauseous kind, being there joined with "wormwood," and in the margin of our Bibles, explained to be "a poisonous herb."

Hemlock has a long, taper root, like a carrot; an erect branched, bright green, spotted stem, from five to ten feet high, on which are planted, smooth, finely cut, large fern-like leaves. The flowers are very numerous, arranged in umbels, and consist of five small white heart-shaped petals. Each flower is followed by two seeds, flat on one side and round on the other, with five ribs. It has an extremely unpleasant smell, and when it grows in the field it is not easily got rid of. It is very poisonous, though not so violent as the water-hemlock.

The poisonous principle of hemlock appears to be an alkaline substance termed *conia*, which is volatile and oleaginous. It has been obtained from the leaves, and from the fully developed but still green seed. Its activity is increased by union with acids, both mineral and vegetable.

TARES.

Gather ye together first the tares.—Matt. xlii. 20.

It is not easy to determine what plant or weed is here intended, as the word *zizania* is mentioned neither in any other part of the Scripture nor in any ancient Greek writer. It appears from the parable itself, (as Dr. Campbell remarks,) 1st. That this weed was not only hurtful to the corn, but otherwise of no value, and therefore to be separated and burned. 2dly. That it resembled corn, especially wheat, since it was only when the wheat was putting forth the ear, that these weeds were discovered. Now neither of these characters will suit the tare, which is excellent food for cattle, and sometimes cultivated for their use; and which, being a species of vetch, is distinguished from corn the moment it appears above ground. Now, as it cannot be the tare that



is meant, it is highly probable that it is the *darnel*, (in Latin *lolium*,) that species called by botanists *temulentum*, which grows among corn, not the *lolium perenne*, commonly called

ray and corruptly *rye-grass*, which grows in meadows. For first, this appears to be the Latin word, by which the Greek was wont to be interpreted. Secondly, it agrees to the characters above mentioned. It is a noxious weed; for when the seeds happen to be mingled and ground with the corn, the bread made with this mixture always occasions sickness and giddiness in those who eat it; and the straw has the same effect upon the cattle; it is from this quality, and the appearance of drunkenness which it produces, that it is termed *ivraie* in French, and has the specific name *temulentum* given it by botanists.* It is well known to the people at Aleppo, says Forskal; the reapers do not separate the plant, but after the threshing they reject the seeds by means of a van or sieve. Other travellers mention, that in some parts of Syria the plant is drawn up by the hand in the time of harvest along with the wheat, and is then gathered out and bound in separate bundles. In the parable of the tares, our Lord states the very same circumstances; they grew among the grain; they were not separated by the tillers, but suffered to grow up together till the harvest; they were then gathered from among the wheat and bound in bundles.

While we are desirous to furnish our young readers with the amplest information relative to the natural objects which are mentioned in Scripture, we are far more anxious to fix their attention on those truths of infinite moment which these objects are employed to illustrate. May we presume that some of them at least will not be indisposed to serious reflection, nor turn away with impatience from suggestions intended to affect their consciences, or to answer the question, What is all this to *me*? In the parable of the tares, as in that of the draught of fishes, which has been already noticed, there is a great truth presented, which cannot be too deeply impressed on our hearts, that, amidst all the apparently infinite shades and diversities of human character, there are still two great classes represented by the tares and the wheat. With respect to numbers of our fellow creatures it is impossible for *us* to determine to which class they belong, and it would be easy to find good reasons why this ability is not granted to us. "What shall this man do?"

* CAMPBELL on the Gospels, Notes on Matt. xiii.

was the question of the over-curious disciple, which his Divine Master imperatively checked by saying, "What is that to thee? follow thou me." If, then, we would know whether we are to be ranked with the tares or the wheat, let us put to ourselves the question, Am I following Christ?

"I am the light of the world," said our blessed Lord: "he that followeth me shall not walk in darkness, but shall have the light of life." John viii. 12. Deal honestly with your own hearts when you read these words. It will be an evidence that they have made some salutary impression on your mind, if you feel that they contain a depth of meaning which at present you cannot comprehend; while you turn to them again and again, with intense desire, like a miner who has unexpectedly met with a rich vein in a gold mine, but *how* rich, *how* deep, he knows not.

REEDS

OCCUR in Job xl. 21; Isa. ix. 14; xix. 15; lviii. 5; Matt. xi. 7; and several other places in the New Testament.



Reeds are a tribe of plants including several species greatly differing from each other in size; they resemble the grasses

in their mode of growth, and belong to the same natural family. They have slender, round, smooth stems, very solid and hard externally, either hollow or filled with pith, and jointed or divided at certain distances by woody partitions. From these joints spring long, narrow leaves, and clusters of chaffy flowers. The plants called in the Bible calamus, cane, and flag, were different species of reeds.

The calamus is mentioned in Exod. xxx. 23; Cant. iv. 14; and Ezek, xxvii. 19. The same word is rendered "sweet cane" in Isa. xliii. 24; Jer. vi. 20. In the New Testament the corresponding Greek word is rendered "reed."

The *calamus aromaticus* is a plant of India and Arabia. While growing it scents the air with a fragrant smell; and, when cut down, dried, and powdered, makes an ingredient in the richest perfumes. This plant was probably among the number of those that the queen of Sheba presented to Solomon, and it is still very much esteemed by the Arabians on account of its fragrance. Some have supposed the sugarcane to be intended. Others consider it to have been one of the sedge family, a *cyperus*; several plants of that genus have odoriferous roots, and are used as perfumes by the natives of the regions where they grow.

One kind of reed was used for writing, and answers to the word rendered "pen" in our translation, as in 3 John 13, "I had many things to write, but I will not with ink and pen write unto thee."

Hasselquist mentions that there are two sorts of reed growing near the Nile. One of them has scarcely any branches, but numerous leaves, which are narrow, smooth, and channelled on the upper side; the plant is about eleven feet high. The Egyptians make ropes of the leaves. They lay them in water like hemp, and then make good and strong cables of them, which, with those made from the bark of the date tree, are almost the only cables used in the Nile. They make floats of this reed, which they use when they fish with nets. The other sort is of great consequence. It is a small reed about two or three feet high, full branched, with short, sharp, lancet-like leaves; the roots, which are as thick as the stem, creep and mat themselves together to a considerable distance. This plant seems useless in ordinary life; but to this is the very soil of Egypt owing, for the matted roots have stopped the earth which floated in the

waters, and formed out of the sea a country that is habitable. The former of these seems to be the celebrated papyrus, or "paper reed," Isa. xix. 7, and the same as "the bulrushes," of which the ark in which Moses was laid, and the "vessels" mentioned in Isa. xviii. 2, were composed. When the outer skin or bark, is taken off, there are several films, or inner pellicles, one within another. These, when separated from the stalk, were laid on a table, carefully matched and flatted together, and moistened with the water of the Nile, which, dissolving the glutinous juices of the plant, caused them to adhere closely together. They were afterwards pressed, and then dried in the sun; and thus were prepared sheets, or leaves, for writing upon in characters marked by a coloured liquid passing through a hollow reed. This formed the most ancient books, and from the name of the plant is derived the word *paper*.

The long stalk of a reed was used for a measuring rod. Compare Rev. xi. 1; xxi. 15, 16, with Ezek. xl. 5. Also for a balance, Isa. xlvi. 6, probably after the manner of a steelyard, whose arm, or beam, was a graduated reed.

A calamus, or reed, was placed in our Saviour's hands by the Roman soldiers, in mockery of his claim to the title of king. Matt. xxvii. 29. To express the gentleness of Christ, and his tenderness towards the afflicted and the penitent, it is said, "A bruised reed shall he not break." In allusion to the unbending firmness of John the Baptist, our Lord asked the people, "What went ye out for to see? A reed shaken with the wind?" Matt. xi. 7; Luke vii. 24. The word (*suph*) translated "weeds" in Jon. ii. 5, is rendered "flags" in Exod. ii. 3, 5, and some other passages, and seems to be a general term for aquatic plants. What is now called the Red Sea, is in Hebrew called the Sea of Suph, owing, it is supposed by some, to the sea-weed with which it abounds.

THORNS AND THISTLES.

WE shall consider these in the same article, because they are frequently mentioned together in the Bible, and because it is very difficult, if not impossible, to ascertain the particular plants intended. In our translation, the same original

word is sometimes variously rendered in different places, and in some cases, the same English word is put for different words in the original. In the curse denounced against the earth, Gen. iii. 18, its produce is threatened to be "thorns and thistles." The word here rendered "thorns" is so translated elsewhere, but we are uncertain whether it means a specific kind of thorn, or is a generic term for all plants of a thorny kind. In Gen. iii. 18, it seems to be general for all those obnoxious plants by which the labours of the husbandman are impeded. If the word means a particular plant, it may be the rest-harrow, (*ononis spinosa*), a prickly weed, which grows promiscuously with the large thistles in uncultivated ground, and covers entire fields and plains in Egypt and Palestine.

The bramble mentioned in Jotham's beautiful apologue of the trees choosing a king, Judges ix. 7-15, is supposed to have been a species of buckthorn which is common in Syria, (*zizyphus vulgaris*), and was brought into Italy in the time of Augustus, and known by the name of the Jewish thorn.

Thorns afford a number of allusions, from their sharpness, uselessness, and power of checking the growth of valuable plants. The Jews, for their wickedness, are compared to briars and thorns. Ezek. ii. 6. "The best of them is a brier; the most upright is sharper than a thorn hedge." Mic. vii. 4. The bad consequences of indolence are represented by the thorns and thistles that overrun the field of the slothful. Prov. xxiv. 31. Worldliness, and the desire of riches, are the thorns that choke the seed of the word. Matt. xiii. 7, 22. "Men do not gather grapes of thorns, nor figs of thistles:" an evil life is the natural result of an evil heart. Matt. vii. 16; Luke vi. 44. What prayer, then, can be more suitable for each of us than that of the psalmist, "Create in me a clean heart, O God; and renew a right spirit within me?" Psa. li. 10. But we cannot offer this prayer sincerely, or, in other words, really pray, unless we are also obeying the precept to "cleanse ourselves from all filthiness of the flesh and spirit, perfecting holiness in the fear of God." 2 Cor. vii. 1. "Keep thy heart with all diligence; for out of it are the issues of life." Prov. iv. 23.

THE LILY.

THIS beautiful flower is mentioned in the following passages: 1 Kings vii. 19, 22, 26; 2 Chron. iv. 5; Cant. ii. 2, 16; iv. 5; v. 13; vi. 23; vii. 2; Hos. xiv. 5; Matt. vi. 28; Luke xii. 27. By "the lily of the valley," in Cant. ii. 1, we are not to understand the flower generally so called, but most probably the yellow amaryllis, which resembles our yellow crocus, and overspreads the fields of Palestine in autumn.



a. *Fritalaria Persica*. b. *Ornithogalum Arabicum*. c. *Pancreatum Maritimum*.

The lily is said to have been brought originally from Persia, whose chief city was called Shushan, (the Hebrew name for a lily,) and one of its provinces Susiana, from the number of these beautiful flowers which grew there spontaneously. It was introduced into England in 1596.

THE ROSE.

THE rose (class *Icosandria*, order *Polygynia*, Linn.) has from the earliest times been celebrated, not only by the Greeks and Romans, but also by the orientals, who esteemed it above all flowers. The beauty and fragrance of this flower have, indeed, been the theme of poets in all ages; and it is celebrated alike in the odes of Anacreon and Horace, in the strains of Hafez, the Persian, and in the lyrics of modern writers. Many species are known; of these the damask rose, (*rosa damascena*) is supposed to have been originally brought from Damascus, and to be a native of Syria. Its perfume, even in our climate, is very rich, and he blossoms are very lovely. Another species, the musk

rose, (*rosa moschata*) is indigenous in North Africa, and the warmer provinces of Spain, and, like the damask rose, is cultivated in our gardens. It is supposed to be the rose of Persia, in the branches of which the *bulbul* delights to sing. In that country it attains to a very great elevation. According to Sir R. Ker Porter, the rose tree rises fourteen feet high, and when laden with flowers, the scent of which is exquisite, presents a most attractive spectacle.

It has, however, been questioned by many if the rose is intended by the Hebrew word *chabatzeleth*, Cant. ii. 1; Isa xxxv. 1. Some regard it as the asphodel, on no tangible grounds; others consider it to be a cistus, white or red, which abounds in Judea. Mr. Kitto contends that the rose is the flower alluded to, and gives the *rosa berberifolia* as the rose of Sharon. The Septuagint and Vulgate translate the original word, *chabatzeleth hy avθos* (*anthos*), and *flos* a flower; and Sharon they do not give as a proper name, but as signifying a field; but as the word *chabatzeleth* stands in conjunction with the word *shoshanna*, a definite name for some flower, a lily or amaryllis, we conceive that it must have reference to a particular flower also. If, then, in its general sense, it should mean a flower, applied particularly, it most probably means a rose; as the Persian *gul*, and the Arabic *ward*, which mean a flower, generally—the rose, *par excellence*. From the earliest times, attar of roses has been prepared in the east as a costly perfume, and chaplets of roses have been used on festal occasions. In the apocryphal book of Wisdom, the sensualists are represented as saying, “Let us crown ourselves with rose-buds, before they are withered;” and in another apocryphal book, Ecclesiasticus, the writer praises “the rose-plants of Jericho.” That the rose was well known in Syria we cannot for a moment doubt, nor that in common with all the orientals, its inhabitants held it in high estimation.

CAMPHIRE.

CANT. i. 14; iv. 13. This is supposed to be the plant called by the Arabians *al-henna*. In India there are two species, one with thorns, the other without, but the latter is the *henna*. In Upper and Lower Egypt, it flowers from

May to August. It is one of the plants which are most grateful to the eye and the smell. The deep colour of its bark, the light green of its foliage, the softened mixture of white and yellow in its flowers, which hang in long clusters like the lilac, form a most pleasing combination. Women, in Egypt and the east, make use of this plant as a dye. The leaves are pulverised, and made into a paste with water; they bind this paste on the nails of their hands and feet, keeping it on all night. This gives them a deep yellow, which is greatly admired by eastern nations. The colour lasts for three or four weeks, before there is occasion to renew it. The custom is so ancient in Egypt, that Hasselquist says he has seen the nails of mummies dyed in this manner.

BALSAM TREE.

THE balm, or balsam, of the Old Testament, is a resinous substance obtained from the balsam tree. This tree is an evergreen, growing to the height of about fourteen feet. The trunk is about eight or ten inches in diameter; the wood light and open, gummy, and outwardly of a reddish colour, incapable of receiving a polish, and covered with a smooth bark, like a young cherry tree; flattened at the top; having few leaves. The flowers are like those of the acacia, small and white, only that three hang upon three filaments, or stalks, where the acacia has but one. Two of these flowers fall off, and leave a single fruit; the branches that bear these are the shoots of the present year, they are of a reddish colour, and tougher than the old wood. After the blossoms follow yellow fine-scented seeds, enclosed in a reddish black pulpy nut, very sweet, and containing a yellowish liquor, like honey. They are bitter, and a little tart; of the same shape and size as the fruit of the turpentine tree; thick in the middle, and pointed at the ends.

There were three kinds of balsam extracted from this tree. The first was most highly esteemed, which dropped spontaneously, or by means of incision, and was sold for double its weight of silver. The second was obtained by pressure from the nuts; the third was produced by boiling the buds and twigs in water.

In ancient times, Judea, and especially Gilead, was famed for its balsam. In the time of the patriarchs, Ishmaelitic merchants brought it, with other spices, from Gilead into Egypt. Gen. xxxvii. 25. It was, also, among the productions which the Jews traded in with Tyre. Ezek. xxvii. 17. In modern times, Mr. Bruce found it growing all along the coast of the Red Sea to Babelmandel.

MYRRH.

THIS name is given in the English translation to two perfectly distinct words. The myrrh, mentioned in Gen. xxxvii. 25, and xliii. 11, is believed, on good grounds, to be the gum called *ledum*, or *ladanum*. It is obtained from the plant called the cistus rose,— (or *cistus creticus*.) This shrub grows about two feet high; the leaves are smooth, and of a dark green above, and whitish on the under surface; the flowers are of a reddish purple. The gum is collected before sunrise, by a particular instrument, from the leaves, or, in the greatest purity, from the beards of the goats that browse upon this plant. If sprinkled on live coals, it gives out a very fragrant and reviving smell.



The other kind of myrrh is mentioned in Exod. xxx. 23; Esther ii. 12; Psa. xlv. 8; Prov. vii. 17; Cant. i. 13; iii. 6; iv. 6, 14; v. 1, 5, 13; also in Matt. ii. 11; Mark xv. 23; John xix. 39. It is the product of the *balsamodendron myrrha*, a small scrubby tree, found near Gison, in Arabia, Felix. Both its wood and bark have a strong and remarkable odour. The resin is at first oily, and of a yellowish white, then of the consistence of butter, and gradually becomes of a gold colour, and at last reddish.

Myrrh is mentioned among the articles brought by Nicodemus to embalm the body of the Saviour. Herodotus and others, also, mention this gum as among the principal ingredients for embalming the dead.

The *stacte*, a word that occurs only once, in Exod. xxx.

34, is supposed to have been the myrrh that oozed spontaneously from the tree mentioned above, instead of being obtained by incision.

The *onycha* mentioned in the same passage, was most probably an odoriferous gum, but of what kind is quite uncertain. The Arabic version renders it *ladanum*, which has been already described.

GALBANUM.

THIS word occurs only in Exod. xxx. 34. It is the name of a gum-resin which has been long known, but the plant from which it is procured is still undetermined. Two sorts are used in commerce; the African galbanum, which is either in tears, or drops, being probably the spontaneous oozing from the plant, or in masses; and the Persian which being soft and tenacious, is sent in skins or chests.

FRANKINCENSE.

FRANKINCENSE was the produce of a kind of balsam tree, and, therefore, nearly related to the balm of Gilead, as well as to the myrrh. What is now sold under the name of olibanum, has generally been reputed to be the same as the ancient frankincense; but from what tree it was gathered botanists had no means of ascertaining. Very lately, however, a drug was brought to England from India, so exactly like the olibanum in every respect, that persons in the habit of selling the latter could not tell the difference. This afforded a very strong presumption that the drug from India and the olibanum were the productions of the same kind of tree. Now the tree from which the Indian drug was gathered in the *Boswellia thurifera*, a native of the mountainous parts of India. It yields a most fragrant resin from incisions made in the bark. The Arabian olibanum is now seldom to be met with; the East Indian is obtained from the tree just mentioned, and is met with in two degrees of fineness. The odor is pleasantly balsamic, and increased by heat; when inflamed, it burns with a clear, steady light, which is not easily put out, and diffuses a very agreeable

smoke. It leaves behind it a black ash. It is principally employed to burn as incense by the Roman Catholics.

SPICES.

GEN. xxxvii. 25, spicery; Gen. xliii. 11, spices. The word thus rendered occurs no where else in the Bible. By some, (among whom is the ancient Greek translator Aquila,) it is considered to mean *storax*, the resin of a tree of the same name, frequent in Syria, of a reddish colour, and a peculiarly pleasant fragrance; others have supposed it to be the gum *tragacanth*. Two other words are also translated "spices" and "incense," and appear to be general terms for various productions of this class, which abound in eastern countries, and have formed, from very early times, an important branch of commerce.

In the account of our Lord's burial given by the evangelist John, we are informed, that Nicodemus brought a mixture of myrrh and aloes,* about an hundred pound weight, and that "then took they the body of Jesus, and wound it in linen clothes, with the spices, as the manner of the Jews is to bury." John xix. 39, 40. We are not to understand by this, that embalming in this manner was a general practice with the Jews. In the greater number of cases, the dead were laid in the grave without the use of aromatics; but for persons in affluence, or who were distinguished characters, spices were used in great abundance. Thus we are told, that on the death of Rabbi Gamaliel, the elder, eighty pounds of opobalsam were used.† It had been predicted of our Lord, (as Dr. Campbell remarks,) not only that he should be numbered with transgressors, not only that his grave should be appointed with the wicked, but that he should be joined "with the rich in his death," a prediction most exactly fulfilled in the honour thus paid by Joseph

* This is the name of a tree, (the lign-aloë, or *agallochum*,) which grows in India and the Moluccas, the wood of which is highly aromatic. It is used by the orientals as a perfume, and was employed by the Egyptians for embalming. It must not be confounded with the herb which produces the aloes used in medicine.—ROBINSON'S *Greek and English Lexicon for the New Testament*, p. 36, ἀλόη.

† At Herod's funeral, Josephus informs us, the procession was followed by five hundred of his domestics carrying spices.

and Nicodemus. These were circumstances which before they happened, it was very improbable should ever meet in the same person.

Highly interesting as it is to notice this minute fulfilment of prophecy, let us not be satisfied with what may be little more than an intellectual gratification. May our hearts be more deeply impressed with the great end for which those stupendous events, (the death and resurrection of the Saviour,) were ordained to take place. And what was that end? Listen to the apostle:—

“FOR TO THIS END CHRIST BOTH DIED, AND ROSE, AND REVIVED, THAT HE MIGHT BE LORD BOTH OF THE DEAD AND LIVING.” Rom. xiv. 9.

Reader! is Christ your Lord? and in what sense? If, while you are “living,” he be not your Lord to save, when you are “dead,” he will be your Lord to condemn.

SPIKENARD.

CANT. i. 12; iv. 13, 14. This is a species of valerian, a native of India, and found in great abundance on the Himalaya mountains. It was known to the Jews through



the Persians and Arabians. Its name in Sanscrit is *jatumansi*. The “ointment of spikenard,” mentioned in Mark xiv. 3; John xii 3, is the essential oil of this plant. The classical writers bear witness to its costliness; Horace, for instance, represents as much of it as could be contained in a small box of precious store, as equivalent to a cask of wine.

SAFFRON

OCCURS only in Cant. iv. 14. The crocus, or saffron, is a small plant with a bulbous root, and long, narrow, pointed leaves. The flowers are funnel-shaped, in six parts, of a blue or violet colour, with different shades; some varieties

are yellow. The pistil is divided at the top into three threads of a bright yellow colour; when dried and pressed into cakes, they form the substance formerly much used in medicine.

CINNAMON.

AN agreeable aromatic; the inward bark of the canella, a species of laurel. It is mentioned, Exod. xxx. 23, among the materials in the composition of the holy anointing oil; and in Prov. vii. 17; Cant. iv. 14; and Rev. xviii. 13, among the richest perfumes. The cinnamon of commerce is the inner bark of a tree of the same name, a native of various parts of India, but particularly of the island of Ceylon. The tree grows to the height of more than twenty feet. Besides the aromatic oil contained in its bark, its root yields camphor, its inner bark (or *liber*) oil of cinnamon, the leaves oil of cloves, and the fruit a peculiar ethereal oil. The finest cinnamon is said to be obtained from the middle-sized branches, that of the youngest shoots being of inferior quality, and that of the oldest branches of very little value. About five thousand bales of cinnamon are annually imported to England from Ceylon.

CASSIA.

Exod. xxx. 24; Psalms xiv. 8; Ezek. xxvii. 19.

THE cassia is a species of *laurus*, or bay tree, and very closely resembles the cinnamon tree, which is a species of the same genus. The leaf is smooth, and of a shining green on the upper surface, with three well-marked nerves running lengthwise upon the under. In Mindanao, one of the Philippine islands, it grows to the height of forty or fifty feet, and has a straight stem, which is covered with an ash green bark. The bark is less fragrant than that of the cinnamon tree, and more mucilaginous, so that it is far less valuable as an article of commerce. The leaves, when gathered fresh, are grateful to the taste, and soothing to the stomach of the hungry traveller, who, in the absence of better fare, is glad to take a hint from his native guide. It is

stated by Rheede, a very good authority, that the root, in Malabar, yields a kind of camphor, which we may easily believe, as the true camphor tree of China belongs to this genus. It is not unlikely that this camphor is the substance referred to in Scripture, as the perfume yielded by the bark must have been far inferior in strength and choiceness to that of the gum, or resin. The laurus or bay tree group, presents a beautiful variety of trees, not less characterized by the never-fading verdure of the foliage, or the curious structure of the flowery cluster, than by the agreeable odour and medicinal qualities of the bark and gummy secretions. In the Spice Islands, a member of this family, called the *culilawan*, is in high repute for its stomachic qualities. In Zamboanga, a city on the south side of Mindanao, the inhabitants are remarkable for their good health, which is ascribed by themselves to the sassafras, a member of the same family. This tree lets fall its leaves into a crystal stream, of which they all drink as the main part of their daily beverage, and deem that in this way they fortify themselves against disease. They are indebted perhaps more to their daily ablutions than to any healing property which these leaves may impart, but it shows in what estimation the tree is held.

LIGN-ALOES.

Numb. xxiv. 6; Psal. xlv. 8; Prov. vii. 17; Cant. iv. 14.

THERE is considerable uncertainty respecting the vegetable production referred to in these passages; the original term is translated "lign," or "wood aloes," in the first, and simply "aloes," in the rest. It cannot mean, as we have already remarked, the aloes which is used for medicinal purposes; but, from the connection, in the last three passages quoted, evidently must have been a fragrant aromatic. Supposing it to have been a foreign production, the *aquilæ lignum*, or eaglewood, of the East Indies, might be the substance intended, which has been employed from very early periods, as incense, by the natives of India and China. In the latter country, the wood, after being reduced to a fine powder, is mixed with gum, and a thick coating of it spread over a small slip of wood; it is then lighted, and gives out a delicate perfume.

ALMUG, OR ALGUM.

1 Kings x. 11, 12; 2 Chron. ii. 8; ix. 10, 11.

THE almug tree was most probably a species of fir, or pine tree, whose length and straightness rendered it fit for pillars. We find it associated with the cone-bearing family. "Send me also," (was Solomon's request to Hiram, king of Tyre,) "cedar trees, fir-trees, and algum trees, out of Lebanon." 2 Chron. ii. 8. We see then that it grew in Lebanon; but a much better kind was brought from Ophir, or some region in the east. The wood we are told by Josephus, was used in the construction of harps and psalteries which amounts almost to a proof that the algum tree was a kind of fir, since fir wood seems to have been uniformly employed in making stringed instruments. And it may be remarked, that a fir has been found in India, (*pinus spectabilis*,) which deserves the commendation bestowed by the sacred writer on the algum. This tree, which may be called the purple-coned pine of India, grows to the height of eighty or ninety feet; and is about three or four feet in its diameter. The cone is three feet and a half long, and one foot and a half thick. The leaves are about an inch long, of a beautiful bright green, with a white line running along their middle. The wood, in the texture of its grain, and in its fragrance, equals the Bermudian cedar, or that of which our black lead pencils are made. The odour which is breathed from the tree while growing, greatly exceeds that of any other yet known. The silvery hue of its bark, the beautiful contrast of the leaves with the rich purple of the cones, glittering with globules of transparent resin, produce in combination, one of the most striking objects that can be imagined. There is also the *pinus deodara*, or sacred pine of India, which is very stately and beautiful, and yields a wood that is hard, sweet-scented, and delightfully variegated with wavy rings. Temples, and other works of cost and durability, are made of it.

EBONY.

A HARD black-coloured wood, a native of hot countries, particularly India and Ethiopia. It admits a fine polish, and, when inlaid with ivory, forms a beautiful contrast.

In ancient times it was much used for ornamental furniture. The only place in which the word occurs in Scripture is Ezek. xxvii. 15, where it is mentioned as brought to Tyre by the men of Dedan. The true ebony, and which is considered of the best quality, is a native of Mauritius, Ceylon, and Madagascar. Another species is found on the Coromandel coast. As in other species, it is only the centre of large trees that is black and valuable. The outside wood is white and soft, and soon destroyed by insects. It bears a perry that is eaten by the natives.

SHITTIM, SITTIM, OR SITTAH.

THIS is generally supposed to be a species of acacia, or mimosa. There are two sorts known in Egypt and Arabia. One is the *acacia Arabica*, from which the substance called



gum Arabic is obtained, by making an incision in the bark of the tree; the sap runs out, and hardens in transparent lumps, similar to what is often seen on cherry trees in this country. The wood of the acacia is hard, smooth, and

handsome, and does not easily rot, it was, therefore, very suitable for the purposes for which Moses employed the shittim wood. The ark of the tabernacle, the table of shew-bread, the altar of burnt-offering, the altar of incense, the staves, or poles, with which these were carried, the pillars, and the boards, and bars, which formed the frame of the tabernacle, were all made of this wood; see Exod. xxv. 5, 10, 13, 23, 28; xxvi. 15, 26, 32; xxvii. 1, 6; xxx. 1, 5; xxxv. 7, 24; xxxvi.; xxxvii.; xxxviii.; Deut. x. 3.

Its flowers are generally of a bright yellow; its leaves of the pinnate, or winged kind; its fruit is contained in pods; the branches are armed with thorns.

In Isa. xli. 19, the shittah tree is mentioned, with others of great usefulness and beauty, to denote, figuratively, the happy effects of a general spread of the gospel.

FOREST TREES.

TEREBINTH, OR TURPENTINE.

THE word translated "plain" in Gen. xii. 6, and in some other passages, is generally supposed to mean a large tree, most probably of the kind called terebinth, or turpentine tree. It is an evergreen of moderate size, says Mariti; but having the top and branches large in proportion to the body. The leaves resemble those of the olive, but are of a green colour, intermixed with red and purple. The twigs that bear them always terminate in a single leaf; the flowers are like those of the vine. The fruit is of the size of juniper berries, hanging in clusters, and each containing a single seed, of the size of a grape stone. They are of a ruddy purple, and remarkably juicy. The wood is hard and fibrous; a resin or gum distils from the trunk.

The terebinth under which Abraham entertained three angels, Gen. xviii. 1-4, is very famous in antiquity. Josephus says, that six furlongs from Hebron, they showed a very large terebinth, which the inhabitants of the country thought to be as old as the world itself. Eusebius states, that, in his time, the terebinth of Abraham was still to be seen. Jerome says that this terebinth was two miles from Hebron. Sozomen, the ecclesiastical historian, says that it existed in the time of Constantine, at the distance of six miles from Hebron. Such superstitious reverence was paid to it, both by Jews and Christians, that the emperor Constantine wrote to Eusebius, the bishop of Cesarea, to check the idolatry, and to destroy an altar that had been erected before the tree, while, at the same time, he gave orders for building a church on the spot. Sanatus states, that the trunk of the tree remained as late as the year 1300, and

that pieces of it were carried away as relics by the pilgrims to the Holy Land.

When Dr. Robinson visited Hebron, he found no large terebinth tree in its immediate vicinity, but a venerable oak, which had been described by former writers as a terebinth. On approaching, however, the mountains of Judah, he frequently noticed the *pistacea terebinthus*, with other low trees, scattered over the limestone hills. Hasselquist also says, "Near Jerusalem, grow different sorts of plants on these hills, especially the carob tree, the myrtle, and the terebinth, or turpentine tree."

OAK.

VARIOUS species of oak are found in Palestine. The oak forests of Bashan are especially celebrated, Isa. ii. 13; Zech. xi. 2; of these the Tyrians made their oars, Ezek. xxvii. 6. Bishop Lowth thinks that neither the oak nor the terebinth will answer to Isa. i. 29, 30, from the circumstance of their being deciduous, for the prophet's design seems to require an evergreen; "otherwise the casting of its leaves would be nothing out of the common established course of nature, and no proper image of extreme distress and total desertion, parallel to that of a garden without water, that is wholly burned up and destroyed. Upon the whole, he chooses to make it the *quercus ilex*, commonly called the evergreen oak. Its leaves vary considerably in size and shape, according to the locality in which it grows; they remain on the tree till they are thrust off by the young leaves in the spring. Its acorns are bitter and unfit for food.

The following is the interesting description given by Dr. Robinson of the oak which he saw growing, in 1838, in the vicinity of Hebron: "The venerable oak, (Siudiân,) to which we now came, is a splendid tree; we hardly saw another like it in all Palestine, certainly not on this side of the plain of Esdraelon. Indeed, large trees are very rare in this quarter of the country. The trunk of this tree measures twenty-two feet and a half around the lower part. It separates almost immediately into three large boughs, or trunks; and one of these, higher up, into two. The branches

extend from the trunk, in one direction, forty-nine feet; their whole diameter, in the same direction, being eighty-nine feet; and in the other, at right angles, eighty-three



THE OAK OF PALESTINE.—*Quercus Ægilops*.

feet and a half. The tree is in a thriving state; and the trunk sound. It stands alone in the midst of the field; the ground beneath it is covered with grass, and clean; there is a well with water near by; so that a more beautiful spot for recreation could hardly be found. I am not sure that this is the tree which Sir John Mandeville saw near Hebron, of which he relates, [the absurd legend,] that it was green in Abraham's day, but dried up at the time of our Saviour's crucifixion, like all the other trees then in the world. It seems to be mentioned by Belon, in the sixteenth century, as a terebinth, and is described as such by writers in the following century. But this is not a terebinth; nor is there any large tree of that species in the vicinity of

Hebron. Least of all can this be the tree of Abraham, or its successor; for his terebinth probably stood more towards Jerusalem, and had already disappeared in the days of Jerome."—*Biblical Researches*, vol. ii. p. 443.

CAROB.

THE carob tree is never mentioned in the Old Testament; but in the parable of the prodigal son, recorded by the evangelist, Luke xv. 16, we read, "He would fain have filled his belly with the husks that the swine did eat." The word here translated "husks," appears to signify something more than the mere shell or pod of a vegetable production, and is generally understood to mean the fruit of the carob tree, one of the numerous tribe of leguminous plants, found wild in all the countries bordering on the Mediterranean. The pods were anciently given for food to swine, and are thus used for horses, in the present day, by the Spaniards. It is sent from Palestine to Alexandria in ship-loads, and as far as Constantinople, where it is sold in all the shops.* The pulp resembles manna in taste and consistence, and is sometimes used as sugar, to preserve other substances. Some of the fathers assert that the "locusts" of John the Baptist were a vegetable substance, and that the wild honey was the saccharine matter of this pod. Hence the German name of the tree, *der Johannisbrodbaum*, John's bread tree.†

* "The modern Greeks call this fruit by the same name as that used by the evangelist (*κεράρια*), and sell it in the markets. They are given to swine, but not rejected as food, even by man."—Rev. J. HARTLEY'S *Researches in Greece and the Levant*, p. 241.

† Dr. Robinson, in the third volume of his *Biblical Researches*, has the following observations on this plant:—the *ceratonia siliqua* of Linnæus; English, *carob*; French, *caroubier*; German, *Johannisbrodbaum*; common in Syria, Egypt, Greece, and all the southern parts of Europe, and sometimes growing very large. The tree produces slender pods, shaped like a horn, or sickle, containing a sweetish pulp, and several small, shining seeds. These pods are sometimes eight or ten inches long, and a finger broad. They are eaten with relish by the common people, and are used extensively by them as an article of sustenance. We had them dry on board of our boat, on the Nile, in January; steeped in water, they afford a pleasant drink. These are the *κεράρια* of Luke xv. 16, (English version, incorrectly, "husks,") on which the swine were fed, as is not uncommon at the present day. pp. 57, 58.

TAMARISK.

THERE is good reason for believing that the word translated "grove," in Gen. xxi. 33, and "tree," in 1 Sam. xxii. 6, and xxxi. 13, means a particular kind of tree, the tamarisk. It grows wild in the desert, but is frequently cultivated for the sake of the gum that exudes from it. There is a species which grows in Germany, on the banks of the Rhine; its pale green leaves, growing alternately, and its numerous purplish red flowers, make a very pleasing sight. The eastern species, which grows in the deserts of Arabia and Palestine, is very much like it, but is a tree, instead of a shrub, and grows to the height of twenty feet. From this tree that sweetish secretion called manna is obtained, which is so relished by the Arabians, and preferred to honey. The manna sold by our apothecaries as a medicine is the dried juice of a species of ash, a native of the South of Europe, which, though it has a sweetish taste, is also bitter, and leaves altogether a disagreeable impression. We hardly need say, that neither of these substances is to be confounded with that miraculous supply of food which was granted to the Israelites in the wilderness. In the valley of the Jordan it is of a brownish colour, and is gathered in May and June; that found in Arabia is yellow, and the Persian kind is whitish. At the time of the manna harvest, the Arabians of the desert, men, women, and children, may be met with in companies among the tamarisk thickets about Mount Sinai, busily engaged in collecting the manna that drops from the trees. When they have finished their task, they pour boiling water over the manna, and take the scum off, to purify it.

WALNUT.

I went down into the garden of nuts.—Cant. vi. 11

THE plant referred to in the Canticles was probably the walnut: the Persian and Arabic name for this tree is nearly the same as the word here used in the Hebrew. Josephus mentions that it is to be met with wild on the borders of the lake of Genesaret.

A different word is rendered "nuts," in Gen. xliii. 11, which are supposed to have been the fruit of the pistachio terebinth tree, already noticed. It was introduced into Europe by the Roman governor, Lucius Vitellius, and has since spread over the shores of the Mediterranean.

PLANE.

THE tree which is mentioned only in Gen. xxx. 37, and Ezek. xxxi. 8, is by the Septuagint and Jerome rendered "plane tree," and most modern interpreters render it the same. There are two species of this tree, the western, or American, and the eastern.

The American plane has long been known in England, where it attains a considerable growth, though inferior to that of its native soil. Its trunk is smooth, of a light ash-colour, and has the property of throwing off its bark in scales, thus naturally cleansing itself from moss, and other foreign substances. Its leaf is large, smooth, and seldom injured by insects.

The Asiatic, or eastern plane, is a tree nearly of the same kind, only its leaf is more palmated. It is perfectly well suited to the climate of England, and grows readily even in the valleys of Scotland. The tree rises to a great height in its native soil. The stem is covered with a smooth bark, which falls off annually. The bark of the young branches is of a dark brown, inclining to purple. The leaves are large and palmated, being cut into five divisions; their upper sides are of a deep green, and the under sides pale. This tree was much esteemed by the ancients; one is mentioned by Pliny, in Lycia, the hollow in the trunk of which was capable of sheltering for the night Licinius Mucianus, the Roman consul, and eighteen persons of his company, being no less than seventy-five feet in circumference.

WILLOW.

Lev. xxiii. 40; Job xl. 22; Psa. cxxxvii. 2; Isa. xv. 7; xliv. 4.

THE weeping willow is a native of the Levant. It is of comparatively recent introduction into England. It is
18 *

said that Pope, the poet, having received a present of figs from Turkey, observed that one twig of the basket in which they were packed was putting out a shoot. He immediately planted it in his garden at Twickenham, and it soon became a fine tree, the parent stock of all the weeping willows now in England.

The following beautiful lines, "On a weeping willow growing on the banks of the Thames," will be read with interest, as the production of the late Marquis Wellesley, written in his eightieth year :—

THE WEEPING WILLOW OF BABYLON.

Dishevelled, mournful, beauteous type of grief,
That seem'st in tears to bend o'er Thames's tide,
And still to rue the day, when Babel's chief,
High on thy parent stream enthroned in pride,

Beheld upon thy melancholy boughs
The harps unstrung of Israel's captive band,
When heart, and voice, and orisons and vows,
Refused the haughty victor's stern command,

To move great Sion's festal lay sublime,
To mingle heavenly strains of joy with tears,
To sing the Lord's song in a stranger's clime,
And chant the holy hymn to heathen ears.

Down by Euphrates' side they sat and wept,
In sorrow mute, but not to memory dead.
O Sion! voice and harp in stillness slept,
But the pure mindful tear for thee was shed.

To thee, beloved Sion! vain were given
Blessing and honour, wealth and power; in vain
The glorious present majesty of Heaven
Irradiates thy chosen, holy fane.

Fall'n from thy God, the heathen's barbarous hand
Despoils thy temple, and thine altar stains;
Reft of her children, mourns the parent land,
And in her dwellings death-like silence reigns.

Rise, sacred tree, on Thames's gorgeous shore,
To warn the people, and to guard the throne;
Teach them their pure religion to adore,
And foreign faiths, and rites, and pomp, disown.

BOX.

THE BOX, *buxus sempervirens*, which in our garden borders is so diminutive a shrub, becomes, in warmer climates, a handsome tree of considerable height. Its hardness,

durability, and yet comparative lightness, render it an invaluable wood for the turner, mathematical instrument maker, and especially for the wood engraver. The



prophet Isaiah mentions the box-tree as one of the chief ornaments of Mount Lebanon. "The glory of Lebanon shall come unto thee, the fir tree, the pine tree, and the box together." Isa. lx. 13. And in depicting the future glorious state of the church, he says, "I will set in the desert the fir tree, and the pine, and the box tree together." Isa. xli. 19.

There are two species of this plant. One of these is the common box, which is found all over the south of Europe, and reaches even to the north of Persia. It varies considerably in size, and is found wild in France, from three to fifteen or twenty feet in height. Great quantities are imported into this country from Turkey. The leaves have sometimes been used for medicinal purposes, instead of Peruvian bark.

The other kind of box, *buxus balearica*, is a native of the island of Majorca; it is a handsome plant, with broader leaves, and of a more rapid growth, but not so hardy.

BAY.

It is mentioned only in Psal. xxxvii. 35, 36, "I have seen the wicked in great power, and spreading himself like a green bay tree. Yet he passed away, and lo, he was not: yea, I sought him, but he could not be found."

The laurel, or sweet bay, is a native of the north of Africa, and the south of Europe and Asia. It attains the height of twenty or thirty feet. Its leaves are lanceolate and evergreen, and possess an aromatic fragrance. The fruit is small, of a dark purple colour, and rather juicy.

The bay tree, or true laurel, from which wreaths were made among some ancient nations for their victorious generals, is entirely different from the bush often called laurel among us.

MYRTLE.

Neh. viii. 15; Isa. xli. 19; Iv. 13; Zech. i. 8-11.

THE myrtle tree has a shrubby, firm, upright stem, branching thickly into a bushy head about eight or ten feet high, though in warmer climates it is often double that height. The leaves are very numerous and closely set, of a pointed oval shape, small, smooth, shining, and evergreen; the flowers consist of five petals, white in the common species, and in others with a crimson tint. The fruit is a small oval berry. The transparent dots or oil-cysts on the leaves are a characteristic of the myrtle family. A species of this tree affords the pimento or allspice of commerce. In the south of Europe, and in Judea, the landscape is highly adorned with groves of myrtles remarkable for the rich green of their leaves, the profusion of beautiful flowers, and their agreeable perfume. The myrtle is mentioned in Neh. viii., among the trees whose branches were gathered for celebrating the feast of tabernacles on the return of the Jews from their captivity in Babylon.

CYPRESS.

THE cypress is an evergreen, cone-bearing tree, of a beautiful upright form ; it is not more than twenty or thirty feet high, but attains to a great age. Its yellowish red and fragrant wood is one of the most enduring, and is not liable to rot, or to be eaten by insects. For these qualities it was made use of by the ancient heathens in constructing the statues of their gods. The gates of St. Peter's church at Rome, which had lasted from the time of Constantine



A. D. 306-337, to that of Pope Eugene the fourth, A. D. 1431, that is to say, eleven hundred years, were of cypress, and had in that time suffered no decay.

The "gopher wood," or rather *tree*, of which Noah built the ark, is with some probability supposed to have been the cypress.

In Isa. xlv. 14, a tree is mentioned, which in the English version is called a cypress, but, as the word occurs nowhere else, its precise meaning must be left undetermined.

PINE.

THE pines form a large family of plants belonging chiefly to the cold and temperate climates. They are most of them evergreen; the leaves are long, slender, needle shaped, and grow in pairs, threes, fours, or fives, with a membranous sheath at their base. The wood of some kinds is useful for timber, and in most of them abounds an oily and resinous substance, known by different names, according to the places or the different trees from which it comes. Burgundy pitch, common frankincense, Canada balsam, Venetian and other turpentine, are obtained from various sorts of pines. Common turpentine flows from the pine by incisions. From this the oil is got by distillation, and what remains is resin, or rosin. Tar is obtained by burning the wood in a sort of oven or kiln, and flows into a hole beneath; this, by long boiling, becomes pitch. The pine is mentioned in our translation three times. Neh. viii. 15; Isa. xli. 19; lx. 13.

FIR.

THE fir constitutes a genus of coniferous trees, which was formerly classed with the pine, but modern botanists have distinguished it. Its species form four very natural tribes, of the first of which the silver fir may be taken as the representative; of the second, the Norway spruce; of the third, the larch; and of the fourth, the cedar of Lebanon.

In 2 Sam. vi. 5, it is mentioned that David, and all the house of Israel, "played on all manner of instruments made of fir wood;" and Dr. Burney observes, "This species of wood, so soft in its nature and sonorous in its effects, seems to have been preferred by the ancients, as well as moderns to every other kind, for the construction of musical instruments, particularly the belly of them, on which their tone chiefly depends. Those of the harp, lute, guitar, harpsichord, and violin, in present use, are constantly made of this wood."

The doors, rafters, and part of the interior finishing of the temple were of this wood. 1 Kings v. 10; vi. 15, 34. ix. 11; 2 Chron. ii. 8; iii. 5. It was also used in other costly edifices, Sol. Song. i. 17; in building ships, Ezek. xxvii. 5; for making spears and other warlike weapons; which are meant by the fir trees being shaken, in Nahum ii. 3. Kings are sometimes represented under the image of firs, cedars, and other majestic trees, Isa. xiv. 8.

The word translated "ash" in Isa. xlv. 14, is rendered in the Septuagint a "larch." It is a species of fir, and a very fast growing tree, and therefore very suitable for one who wished to have a god made out of a tree planted by himself. It has been remarked, that "whilst the red wood or heart wood is not formed at all in the other resinous trees till they have lived for a good many years; the larch, on the other hand, begins to make it soon after it is planted; and, whilst you may fell a Scotch fir of thirty years old, and find no red wood in it, you can hardly cut down a young larch large enough to be a walking stick, without finding just such a proportion of red wood, compared to its diameter, as you will find in the largest larch in the forest. Experiments also have shown, that, compared with other timber, it is "a tree that will not rot." Isa. xl. 20. Oak posts have decayed, and been twice renewed, in the course of a very few years, whilst those of larch, that were exposed to exactly the same alternations of being wet and dry, remained unchanged. The larch also shares with the oak another property—the tanning powers of its bark.

CEDAR.

MOUNT LEBANON, and the range of Taurus, are the native seats of this magnificent tree. It is called by Isaiah "the glory of Lebanon," lx. 13. In former times it must have flourished on that mountain in great abundance. It has been doubted whether the cedars at present found there are of the same kind with those so often mentioned as employed in the erection of Solomon's palace, and the temple, as their timber possesses little fragrance, and is in other respects of inferior quality. The accounts of travellers, for

a very long period, have represented the cedars of Lebanon as gradually diminishing in number. But this seems to be true only of the older trees, of which Dr. Richardson, in 1818, reported only seven to be remaining. "The celebrated cedar grove of Lebanon," says Dr. Robinson, "is at least two days' journey from Beirut, near the northern, and perhaps highest summit of the mountain. It has been often and sufficiently described by travellers for the last three centuries; but they all differ as to the number of the oldest trees, inasmuch as in counting, some have included more, and some less of the younger ones. At present the number of trees appears to be on the increase, and amounts in all to several hundred. This grove was long held to be the only



Cedar tree whose top is lost in the thick branches.

remnant of the ancient cedars of Lebanon. But Seetzen, in 1805, discovered two other groves of greater extent; and the American Missionaries, in travelling through the mountains,

have also found many cedars in other parts. The distinguished naturalist, Professor Ehrenberg, spent a considerable time on Lebanon; and informs me, that he found the cedar growing abundantly on those parts of the mountain lying north of the road between Ba'albek and Tripolis. The trees are of all sizes, old and young; but none so ancient and venerable as those usually visited."—*Biblical Researches*, iii. 440.

The wood is bitter to the taste, which preserves it from insects: it is so durable, that some beams have been known to last more than two thousand years.

We are informed that cedars were used in the erection of the second temple. Ezra iii. 7. The masts of Tyrian ships, and their chests of merchandize, were made of it. Ezek. xxvii. 5, 24. Cedar wood was also employed in the cleansing of lepers, and in the waters of purification. Lev. xiv. 4; Numb. xix. 6.

The cedar of Lebanon is often introduced figuratively by the prophets, and in the Psalms. But the fullest description of this tree is in Ezek. xxxi. 3–9. "Behold, the Assyrian was a cedar in Lebanon, with fair branches, and with a shadowing shroud, and of an high stature; and his top was among the thick boughs. His boughs were multiplied, and his branches became long. The fir trees were not like his boughs, and the chesnut trees were not like his branches; nor any tree in the garden of God was like unto him in his beauty."

"In this description two of the principal characteristics of the cedar are marked. The first is the multiplicity and length of its branches. Few trees divide so many fair branches from the main stem, or spread over so large a compass of the ground.

"The second characteristic is what Ezekiel calls, with great beauty and aptness, his 'shadowing shroud.' No tree in the forest is more remarkable than the cedar for its closely woven, leafy canopy. Ezekiel's cedar is marked as a tree of full and perfect growth, from the circumstance of its top being among the boughs. Almost every young tree, and particularly every young cedar, has what is called a leading branch or two, which continue to spring above the rest till the tree has attained its full size; then the tree becomes in

the language of the nursery-man, clump-headed; but in the language of eastern sublimity, its 'top is among the thick boughs,' that is, no distinction of any spiry head, or leading branch, appears; the head and the branches are all mixed together. This is generally, in all trees, the state in which they are most perfect and most beautiful.

"But, though Ezekiel has given us this accurate description of the cedar, he has left its strength, which is its chief characteristic, untouched. But the reason is evident. The cedar is here introduced as an emblem of Assyria, which, though vast, and wide-spreading, and come to full maturity, was, in fact, on the eve of destruction. Strength, therefore, was the last idea which the prophet wished to suggest. Strength is a relative term. The Assyrian was strong, compared with the powers on earth; but weak, compared with the arm of Providence, which brought him to destruction. So his type, the cedar, was stronger than any of the trees of the forest; but weak, in comparison with the axe which cut him off, and left him, as the prophet expresses the vastness of his ruin, spread upon the mountains and in the valleys, while the nations shook at the sound of his fall.

"Such is the grandeur and form of the cedar of Lebanon. Its mantling foliage, or 'shadowing shroud,' as Ezekiel calls it, is its greatest beauty; which arises from the horizontal growth of its branches, forming a kind of sweeping irregular penthouse. And when to the idea of beauty that of strength is added, by the pyramidal form of the stem, and the robustness of the limbs, the tree is complete, in all its majesty and beauty."—The Rev. W. GILPIN'S *Remarks on Forest Scenery*, vol. i. pp. 161, 162.

Several specimens of the cedar have attained considerable size in England. One, brought direct from Lebanon, and planted at Enfield, about the middle of the seventeenth century, had a girth of fourteen feet in 1689. After eight feet of the top had been blown down by the hurricane, in 1703, it was still forty feet high. In 1821, it was seventeen feet in girth, at one foot from the ground, sixty-four feet in height, and contained five hundred and forty-eight cubic feet of timber, exclusive of the branches, which stretched eighty-seven feet horizontally. At Whitton, in Middlesex, a cedar was blown down, in 1779, which had grown to the

height of seventy feet, and the branches covered an area of one hundred feet in diameter.

“Lebanon is not sufficient to burn, nor the beasts thereof sufficient for a burnt-offering.” Isa. xl. 16. Here Jehovah himself declares the utter insufficiency of the most costly offering to atone for sin. But Jesus Christ has made an all-sufficient sacrifice, and offers pardon and eternal life to all that repent and believe in him.

FRUIT TREES.

VINE.

THE climate and structure of Palestine were peculiarly adapted for the cultivation of the vine. The hills and rising grounds furnished innumerable natural terraces, fitted to bring its fruit to the highest perfection. In the Scriptures, the vine is frequently mentioned as one of the principal productions of the Holy Land. Deut. vi. 11; viii. 8; Numb. xvi. 14; Joshua xxiv. 13. Vines and fig trees are spoken of together in Jer. v. 17; Hos. ii. 12; vineyards are joined with olive yards in Joshua xxiv. 13; 1 Sam. viii. 14; 2 Kings v. 26; we find frequent allusion to the vine in the promises and denunciations of the prophets. Isa. vii. 23; lxi. 5; Jer. v. 17; Hos. ii. 12; Zech. viii. 12; Mal. iii. 11. A proverbial expression for a state of settled peace and prosperity was, that “every man dwelt” (or sat) “safely under his vine and under his fig tree.” 1 Kings iv. 25; Micah iv. 4; Zech. iii. 10. Though the vine was cultivated throughout Palestine, particular spots are mentioned in which it especially flourished, such as the mountains of Engedi, Cant. i. 14; the district of Hebron, where was the brook, or rather vale, (see marginal reference in the English version,) of Eshcol, (which means “a cluster of grapes,”) Numb. xiii. 24. At the present time, this region abounds with vineyards, and the grapes are the finest in Palestine.* Other places were, the environs of Shechem, Judges ix. 27;

* ROBINSON'S *Biblical Researches*, vol. i. p. 314.

Mount Carmel, 2 Chron. xxvi. 10; Jezreel, 1 Kings xxi. 1. Lebanon, Hos. xiv. 7; the country beyond Jordan, Sibmah, belonging to the Moabites, Isa. xvi. 8: "O vine of Sibmah, I will weep for thee with the weeping of Jazer: thy plants are gone over the sea, they reach even to the sea of Jazer: the spoiler is fallen upon thy summer fruits and upon thy vintage." Jer. xlvi. 32. Some towns took their name from their vicinity to vineyards, such as Beth-haccerem (the house of the vine,) Jer. vi. 1; Neh. iii. 14; and Abel cheramim, (translated in the English version "the plain of the vineyards,") Judges xi. 33; which even in the time of Eusebius was noted for its vines. Vineyards were situated most generally on hills, Isa. v. 1: "Thou shalt yet plant vines upon the mountains of Samaria," Jer. xxxi. 5; Amos ix. 13; though sometimes they were on plains. To protect them from wild beasts, they were surrounded with a fence or hedge, Isa. v. 5; Matt. xxi. 33; sometimes with stone walls. Numb. xxii. 24. It is said of "the vineyard of the man void of understanding," Prov. xxiv. 30, 31, "The stone wall thereof was broken down." Sometimes the vineyard was protected both by a hedge and a stone fence, Isa. v. 5; and small watch towers were built, in which the vine-dressers or the owners lived. Isa. i. 8; v. 2; Matt. xxi. 33. And even now, "each vineyard has a small house or tower of stone, which serves for a keeper's lodge; and during the vintage we were told," says Dr. Robinson, "that the inhabitants of Hebron go out and dwell in these houses, and the town is almost deserted."—*Biblical Researches*, i. 314; ii. 442. Yet the Jews were enjoined to permit persons passing through these vineyards to eat of the fruit, though not to carry it away. Deut. xxiii. 24. The vines of Palestine were distinguished formerly, as at the present time, by their height and straightness. Schulz, in 1754, saw in the south of Lebanon, a vine thirty feet high, its trunk one foot and a half in diameter, and its branches covered a shed fifty feet broad and as many in length. They generally bore red or deep purple grapes, and often in very large clusters; modern travellers mention having seen some that weighed twelve pounds, and with berries the size of small plums. The most noted kind was the vine of Sorek, Gen. xlix. 11; Isa. v. 2; Jer. ii. 21; the fruit is said to have been small, but of extraordinary sweetness; they are still grown in Syria and Arabia,

and are known by the same name, or one very similar; in some parts they are called *serki*. It is not certain in what manner the Israelites cultivated the vine; whether they allowed it to trail on the ground, or trained it to upright supports. The present mode of culture is thus described by Dr. Robinson. "They are planted singly in rows, eight or ten feet apart in each direction. The stock is suffered to grow up large, to the height of six or eight feet, and is then fastened in a sloping position to a strong stake, and the shoots are suffered to grow and extend from one plant to another, forming a line of festoons. Sometimes two rows are made to slant towards each other, and thus form by their shoots a sort of arch. These shoots are pruned away in autumn."—*Biblical Researches*, ii. 442. The vintage in Palestine took place in September and October, and, as in all vine countries, was a season of festivity, Judges ix. 27; Isa. xvi. 10; Jer. xxv. 30; the grapes were gathered amidst singing and shouting, and brought in baskets to the winepress. Jer. vi. 9. The expressed juice of the grapes, part of which was offered among the first fruits, Deut. xviii. 4; Neh. x. 37, was put into skins, or leathern bottles, Job xxxii. 19; Matt. ix. 17; Mark ii. 22; and also into large earthen jars, (which are at present common throughout the east,) while it underwent fermentation; part was also made into a thick syrup. Dr. Robinson mentions that at Hebron "the finest grapes are dried as raisins; and the rest being trodden and pressed, the juice is boiled down to a syrup, which, under the name of *dibs*, (the Hebrew word *d'bash*, which signifies "honey," and also "syrup of grapes,") is much used by all classes, wherever vineyards are found, as a condiment with their food. It resembles thin molasses, but is more pleasant to the taste."—*Bibl. Researches*, ii. 442. Three pounds of grapes yield one pound of *dibs*. Three hundred camel loads of *dibs*, it is said, were carried annually from Hebron to Egypt. The fermented wine, kept in jars or pitchers, was often poured from one vessel to another, in order to improve it. This practice is alluded to in Jer. xlviii. 11.

The prescriptions of the Mosaic law relative to the cultivation of the vine, were:—1. It was subject to the law of the sabbatic year, Exod. xxiii. 11; Lev. xxv. 3. 2. The vineyards were not to be sown with the seeds of any other

plant. Deut. xxii. 9. 3. At the vintage, a gleaning was to be left "for the stranger, for the fatherless, and for the widow." Lev. xix. 10; Deut. xxiv. 21. 4. Whoever had planted a vineyard, but had not gathered its fruit, was exempt from military service.

Whether the Hebrews drank wine mixed with water, like the Greeks and Romans, is uncertain. The expression in Isa. i. 22, refers to the adulteration of wine. The orientals of the present day do not mix water with wine, but drink it separately. But the ancient Israelites, (as is now practised in the east,) made their wine stronger by the addition of spices, such as myrrh and opium, Isa. v. 22; Psal. lxxv. 8; Cant. viii. 2. Drunkenness was one of the crimes that marked the degenerate state of the Jewish nation, as may be inferred from the denunciations of the prophets, Isa. v. 22; xix. 14; xxviii. 1; Hosea vii. 5; Jer. xxiii. 9. It is mentioned as one of the vices of the rebellious son. Deut. xxi. 20.

With the vintage were connected the laborious, and yet joyful operations of the wine-press, which was commonly placed, or rather built, in the vineyard. It was either dug *in* the ground, and lined with masonry, or built of stone *upon* the ground, six or eight feet in length and breadth, and about four feet in depth; at the bottom the juice flowed out through a grated opening into another vessel. The grapes were thrown in, covered with some boards, and then five or six men trod or jumped upon them. The use of that powerful mechanical instrument, the screw, was, at that period, unknown. We learn, from Jer. xxv. 30, "He shall give a shout, as they that tread the grapes," and xlvi. 33, "None shall tread with shouting," that they enlivened their toil with joyful sounds, probably keeping time with their feet.

The must, or new wine, was put into goatskins, either with or without the hair, smeared on the inside with pitch, or soaked in pure oil. While the wine was fermenting, the skins could not be tied up, otherwise the new bottles, and much more the old ones, would burst. Matt. ix. 17. The jars they buried in the earth, but the bottles were hung up in store-rooms, or cellars. "Over the increase of the vineyards for the wine-cellars, was Zabdi the Shiphmite." 1 Chron. xxvii. 27.

The vinegar mentioned both in the Old and New Testa-

ment, seems to have been a kind of weak, inferior wine, which formed (as it does now in the south of Europe) the ordinary beverage of the common people.

The Jewish people are often compared to a vine or a vineyard, as in Isa. v. 1-7; Psal. lxxx. 8-15; Jer. ii. 20, 21; Ezek. xvii. 5-10; Hos. x. 1. On various occasions, allusions to the vine are introduced with exquisite beauty and propriety. In the New Testament, our Lord frequently employs it in his parables, and especially in that part of his farewell discourse contained in John xv., where he makes use of it to illustrate the spiritual union between himself and his disciples. "I am the vine," said he, "ye are the branches." "The branches," Mr. Jay remarks, "are of the very same kind of wood as the vine, and the very same sap pervades them both. And they that, are joined to the Lord are of one spirit. The same mind is in them which was also in Christ Jesus. But the branch does not bear the tree, but the tree the branch. Whatever likeness there may be, in all things he has the pre-eminence. He is our life and strength. Let me accustom myself," he adds, "to derive spiritual reflections from all the material objects around me. A taste for natural scenery is pleasing and good in itself. But let me not approach it as a creature, only to enjoy, or as a philosopher, only to admire, but as a Christian, also to improve. Let sense be the handmaid of faith. Let that which is seen and temporal, raise me to that which is unseen and eternal."—JAY'S *Morning Exercises*.

OLIVE.

THIS tree is one of the principal productions of Palestine, and, as such, is often mentioned in the Scriptures, in connection with wheat, vines, and fig trees, Exod. xxiii. 11; Deut. vi. 11; viii. 8; xxviii. 40; Josh. xxiv. 13; Judges xv. 5; 2 Kings v. 26; xviii. 32; Mic. vi. 15. The olive gardens were situated chiefly on the hills, as the tree prefers a dry and sandy soil. Its trunk is knotty; its bark is smooth, and of an ash colour; its wood is solid and yellow; the leaves are oblong, thick and stiff, almost without a stalk, of a dark green colour on the upper side, whitish, underneath, and retaining their verdure through the year, Psal. lii. 8; cxxviii. 3; Jer. xi. 16. In the month of June, it puts forth white flowers, growing in bunches, each of

one piece, (monopetalous,) widening towards the top, and dividing into four parts. These are followed by the berries, which sometimes grow to the size of a pigeon's egg, and are first green, then pale, and at last turn to a dark purple, or black colour; they enclose a hard stone, filled with oblong seeds. They ripen in September. The tree attains a



great age. From comparing Isa. xxiv. 13, and Deut. xxviii. 40, it appears that the unripe fruit was partly shaken, and partly beaten off the tree with a long pole. Ripe, or very pulpy fruit, furnished bad oil. The Israelites carried on a considerable traffic with the Tyrians in oil, Ezek. xxvii. 17; 1 Kings v. 11; and when they wished to conciliate the Egyptians, they could devise no more suitable means than sending to them large quantities of oil. At the present time,

the Egyptians make great use of oil, though their own country affords only an inferior sort. It was not unusual to eat olives raw, or steeped in brine. The olive tree grew wild, Rom. xi. 17, 24, but its fruit and oil were very inferior; when the cultivated plants began to degenerate, it was customary to graft in a wild olive, the opposite process to that usually adopted with fruit trees, or, as the apostle Paul calls it, "contrary to nature." Rom. xi. 24.

Olive branches were employed to make booths Neh. viii. 15. The cherubim in Solomon's temple were made of the olive tree. 1 Kings vi. 23. Among the Greeks, images of their gods were frequently made of the same material, as it was durable, and took a good polish. One of the three celebrated statues of Minerva, on the Acropolis at Athens, was of olive wood. An olive branch or leaf has been, from the earliest times, a symbol of reconciliation and peace; this use of it probably originated in the leaf brought by the dove to Noah, when the waters of the deluge had abated.

Olive oil, mixed with spices to render it fragrant, was employed at the consecration of the priests and the sacred utensils. Exod. xxx. 22-30. Kings, also, were anointed with it when invested with their office. Anointing with oil was so customary with the orientals, that among the judgments denounced against the Israelites, in case they proved rebellious, it is said, "Thou shalt have olive trees throughout all thy coasts, but thou shalt not anoint thyself with the oil; for thine olive shall cast his fruit." Deut. xxviii. 40.

In the first Epistle of John, the influence of the Holy Spirit on believers is spoken of as an unction, or anointing, probably in allusion to the use of oil at the consecration of kings and priests. All true Christians are "kings and priests unto God." Rev. i. 6. Have we this unction from the Holy One? Without it, our religion will be at best a form of godliness, without the power; the outward act, without the indwelling principle.

FIG.

THIS tree was and is still, very common in Palestine. It is of a considerable size, crooked and knotty; it has a smooth, dark grey bark, and leaves shaped somewhat like those of the mulberry; on the upper side, rough, and of a

dark green; underneath, white and downy. Its branches are spreading, and afford a refreshing shade. The fruit is produced from the trunk and large branches, and not from the smaller shoots, as in most other trees. The flowers are contained in a fleshy receptacle, which is concave, so that its edges are drawn together into a narrow opening, and hence the ancients supposed that the fig tree never blossomed. As the leaves do not appear till after the fruit is formed and somewhat advanced, a tree on which the foliage appeared might reasonably be expected to have fruit. This fact serves to explain the account of the barren fig tree, in Matt. **xxi.**; Mark **xi.** The transaction there mentioned took place a short time before the passover, or towards the beginning of April, and the early figs were ripe about the end of June. But as the appearance of the leaves was a sign of the approach of summer, (as we learn from our Lord's words in Matt. **xxiv.** 32, "When the fig tree putteth forth leaves ye know that summer is nigh,") this tree was evidently more forward than others, and had there been fruit upon it, it would have been in a proportionably advanced state, and have sufficed to appease hunger, though not so gratifying to the palate as when ripe. The expression, "The time of figs was not yet," Mark **xi.** 13, evidently means the time of gathering the ripe fruit, like the more general phrase, in Matt. **xx.** 34. "The time of the fruit."

The early fig is alluded to by the prophet Nahum, **iii.** 12, "All thy strong holds shall be like fig trees with the first ripe figs: if they be shaken, they shall even fall into the mouth of the eater." The second kind, the summer figs, or kermos, ripened in August. These were usually dried, in order to preserve in store, or to send to distant parts. Such were the "clusters of raisins" sent by Abigail to David, 1 Sam. **xxv.** 18, (see also 1 Sam. **xxx.** 12,) and the "lump of figs" laid on Hezekiah's boil. 2 Kings **xx.** 7; Isa. **xxxviii.** 21. The third kind were the winter figs, which ripened after the tree had shed its leaves, and, in a mild winter, would hang till spring. They are longer than the summer figs, and have a dark violet colour.

A thousand tons of figs are annually imported into Great Britain from the Mediterranean and the south of Europe. The fig tree grows with some success in the southerly and milder parts of England, but is seldom found in the northern parts, or Scotland, except under glass. In the palace

at Lambeth are two celebrated fig trees, which, on good grounds, are supposed to have been planted by Cardinal Pole, who died in 1558. They cover a space of wall fifty feet in height, and forty in breadth. The circumference of the stem of one is twenty-eight inches, and of the other twenty-one. They are of the white Marseilles kind, and produce delicious fruit.

Some critics have supposed that the tree mentioned in Gen. iii. 7, was the banana, which, on that account, has been called Adam's fig tree, or *musa paradisiaca*. The leaves of this plant, to which we have already referred, are of enormous size, being twelve feet long and two feet wide.

THE SYCAMORE.

THE sycamore, or Egyptian fig tree, must not be confounded with our sycamore, one of the maple tribe, (*acer*.) It belongs to the same genus as the common fig tree, but, in its leaves and outward appearance, bears a strong resemblance to the white mulberry. It grows very frequently in the plains and valleys; thus, in 1 Kings x. 27, we read of "the sycamore trees that are in the vale." Its stem is uncommonly knotty. It is lofty and wide-spreading; its head is often forty yards in diameter. The tree is always green, and bears fruit several times in the year, without observing any certain seasons. The fruit has the figure and smell of real figs, but is inferior in taste, having a cloying sweetness. Its colour is yellow, inclining to an ochre, shaded by a flesh colour. One curious fact has been noticed by naturalists, namely, that the fruit must be cut or scratched, either with the nail, or with iron, or it will not ripen; but four days after this process, it will become ripe.

Though the grain of sycamore wood is coarse, it was used in building; but it cannot compete with the cedar for beauty and ornament, and, therefore, to "change sycamores into cedars," Isa. ix. 10, is a phrase well adapted to express the ambitious designs of a vain-glorious people.

Jericho, in ancient times, was famous for the number of trees and vegetable productions in its vicinity, especially palms and sycamores, Luke xix. 4; but very few of these now remain. When Dr. Robinson visited it in 1839, the groves of palms had disappeared, and only one solitary tree of that kind still lingered in the plain. The henna, the opobalsam, and the sycamore, had entirely vanished; the

myrobalanum alone seems to thrive there, being probably identical with the tree called by the Arabs *zukkum*. This is a thorny plant, which bears a green nut, having a very



small kernel, and a thick shell, covered with a thin flesh outside. The kernels of this fruit, according to Maundrell, the Arabs bray in a mortar, and then, putting the pulp into scalding water, they skim off an oil, which rises to the top. This is the modern balsam, or oil of Jericho, highly prized by the Arabs and pilgrims for wounds and bruises; the pilgrims call it "Zaccheus' oil," because, according to the monks, this was the tree climbed by Zaccheus, although the Scripture says the latter was a sycamore.

CITRON.

THE word translated "apple tree" and "apples" in our version, is, with great probability, supposed to mean the citron tree and its fruit. There are five passages in which it occurs. In Joel i. 12, it is mentioned among the things

that gave joy to the inhabitants of Judea; but the apple tree has never been noted for flourishing in that country, and, in the present day, the apples eaten there are of foreign growth, and of inferior quality. On the other hand, the account Josephus gives of the pelting of king Alexander Jannæus by the Jews, with citrons, at one of their feasts, plainly proves that they were acquainted with that fruit long before the Christian era, and it is supposed to have been of much longer standing in that country; the Jews still make use of it at their yearly feast of tabernacles. From the passages alluded to, we learn, that it was thought the noblest of the trees of the wood, and that its fruit was very sweet or pleasant, Cant. ii. 3; of the colour of gold, Prov. xxv. 11; extremely fragrant, Cant. vii. 8; and fit to revive those who were ready to faint, Cant. ii. 5. The fifth passage, Cant. viii. 5, contains nothing particular, but the description which the other four give agrees perfectly with the citron tree and its fruit. The citron belongs to the same genus as the orange, lemon, lime, shaddock, and similar fruits; and is supposed to be the Median, Assyrian, or Persian apple of the Greeks. The trees are constantly in vegetation; the flowers appear, even in mid-winter, and there is so continual a succession of them, that flowers, young fruit, and ripe fruit, may always be seen at the same moment. The foliage is studded with minute glands, which contain the odorous juice to which the tree owes its fragrance.

MULBERRY,

MENTIONED in 2 Sam. v. 23, 24; 1 Chron. xiv. 14, 15; Psal. lxxxiv. 6. Jewish writers have generally understood the Mulberry tree to be denoted by the word used in these passages. This tree is frequently to be met with in Lebanon and Syria, but is less common in Palestine. In travelling from Sidon to Beirut, Dr. Robinson found the whole region full of fig and mulberry orchards, intermingled with the pride of India, and other ornamental trees. He noticed that the trees were kept trimmed very close, in order to make them put forth a greater quantity of leaves for the supply of the silk worms; thus they come to have almost the character of dwarf trees, and contribute little to the beauty of the country, except by their verdure. The tract round Beirut is covered with mulberry groves, the culture of silk being the chief employment of all the inhabitants.

Some, however, have supposed that the plant intended was not a mulberry tree, but a large shrub which the Arabs still call *baca*, and which give name to the valley where it abounded. It distils an odoriferous gum, a fact that agrees with the meaning of *baca*, which signifies "weeping."

ALMOND.

A TREE resembling the peach tree in its leaves and blossoms; but the fruit is longer and more compressed, the outer green coat is thinner and drier when ripe, and the shell of the stone is not so rugged. This stone or nut contains a kernel, which is the only esculent part. The whole arrives at maturity in September, when the outer tough cover splits open, and discharges the nut. In England, it is grown only for the sake of its beautiful flowers, which appear early in the spring, before the leaves. It seems to have derived its name in Hebrew, (which signifies haste or vigilance,) from its early blossoming, and we find an allusion to this property in Jer. i. 11, 12.

Almonds were among the presents which Jacob charged his sons to take with them on their second journey to Egypt. Gen. xliii. 11. The ornaments of the golden candlesticks were made after the pattern of almonds. Exod. xxv. 33.

Aaron's rod, which budded, and by this means secured to him the priesthood, was a branch of this tree. Numb. xvii. 8.

POMEGRANATE.

THIS is a tree which grows to the height of eight or ten feet, and is very common in the south of Europe, Arabia, Palestine, and other parts of the east, as well as in the West Indies.

It is a bushy plant, and sends out numerous side shoots.



on some of which are thorns, The leaves are narrow and spear-shaped; the flowers large, handsome, of a deep scarlet colour, and formed of five petals. The fruit is of the size of an orange, divided into nine or ten compartments, containing a quantity of subacid juice and purplish kernels; it is ripe about the end of August.

“Wine of the juice of the pomegranate,” Cant. viii. 2, may mean either wine acidulated with the juice of this fruit, or a cool summer beverage, made by mixing the juice with water, such as is commonly drunk in the east at the present day. The juice is used with various dishes, much in the same manner, as we use lemon juice. The form of the fruit was so beautiful, that it was used as an ornament at the bottom of the high priest’s robes, Exod. xxviii. 33; and it was also a principal ornament of the columns of Solomon’s temple. 1 Kings vii. 18; 2 Kings xxv. 17; 2 Chron. iii. 16; Jer. lii. 22, 23.

The Hebrew word signifying the pomegranate, (*rimmon*) is employed either singly, or in combination with some other terms, as the name of various places, in whose vicinity, most probably, this plant flourished in great abundance. Thus we read of “Gath-rimmon,” Josh. xix. 45, a town which existed in the time of Eusebius; “Remmon-methoar,” Josh. xix. 13; Rimmon-parez, a station of the Israelites in their journey through the wilderness, between Rithmar and Libnah, Num. xxxiii. 19; “the rock of Rimmon,” not far from Gibeah, Judges xx. 45, 47; perhaps the same place is meant in 1 Sam. xiv. 2, “Saul tarried in the uttermost part of Gibeah, under a pomegranate tree which is in Migron.”

PALM.

THE palm, or date tree, is a native of the warm climates of Africa and Asia. It rises to a great height, sometimes as much as ninety or a hundred feet. The stalks, or trunks, are generally full of rugged knots, which are the vestiges of the decayed leaves, for the trunk of this tree is not solid; but its centre is filled with pith, round which is a tough bark, full of strong fibres when young, which, as the tree grows old, hardens and becomes woody. To this bark the leaves are closely joined, which in the centre rise erect; but, after they are advanced above the sheath that surrounds them, they expand very widely on every side of the stem, and as the older leaves decay, the stalk advances in height. The main stems of the leaves are from eight to twelve feet long, and each embraces, at its insertion, a considerable part of the trunk. The leaves are pinnated, or in the form of feathers, each leaf being composed of a great number of

long, narrow leaflets, which are alternate, and of a bright lively green. Near the base of the leaf, these leaflets are often three feet long, but, even then, they are not one inch in breadth; neither do they open flat, but have a ridge in the middle, like the keel of a boat. When the leaves are young, they are twisted together and matted up with loose fibres, which open and disperse as the leaf expands. The young leaflet is also armed at the extremity with a hard black spine, or thorn. The fruit-bearing flowers, and those which are not so, grow on different trees; and, in order to insure fructification, the pollen is sometimes conveyed artificially from the latter to the former. The fruit which ripens in about five months, is produced in clusters, which grow from the trunk of the tree, between the leaves. In a good tree, and in a productive season, there may be from fifteen to twenty clusters, each weighing about as many pounds. A considerable part of the inhabitants of Egypt, Arabia, and Persia, subsist almost entirely on this fruit. The Egyptians make a conserve of the fresh dates with sugar. The stones they break and grind in their hand-mills, and give them to their camels for food. In Barbary, they turn handsome beads of these stones. Of the leaves they make baskets, fly-traps, mats, and brushes. The hard boughs they use for garden fences, and cages for fowls. The wood is soft and spongy, but burns well. They lay a whole tree across their cisterns, on which they wind the rope when they draw water. The threads of the integument at the basis of the leaves are twisted into ropes, and used as rigging for small vessels. By cutting off the head of a palm, and scooping out a hollow in the top, three or four quarts of sap may be obtained daily from a single palm for ten days or a fortnight, after which the quantity gradually lessens, till in about two months the tree is fit only for fuel. This liquor is sweetish at first, but soon ferments, and by distillation a spirit is obtained which is one kind of arrack.

Large quantities of the fruit are dried before they have acquired their greatest mellowness, and form a valuable article of food, particularly for the caravans in passing through the desert.

As the uses of the date tree are so numerous and valuable, we can scarcely be surprised that the inhabitants of the countries where it grows consider it essential to comfort and

prosperity. An Arabian who once visited England, found it difficult to satisfy the curiosity of his countrymen respecting the buildings and other wonders of the metropolis; till at last he said, "In the whole city and country I never saw a single palm tree!" "What a wretched country that has no dates!" exclaimed the Arabians of the desert, and wished to hear no more about England.

Palm trees formerly abounded in Palestine. Jericho was called "the city of palm trees." Deut. xxxiv. 3; Judges, i. 16; iii. 13; 2 Chron. xxviii. 15. Deborah, we are told, "dwelt under the palm tree of Deborah, between Ramah and Bethel." Judges iv. 5. Solomon built a city in the desert, most probably in the first instance as a resting-place for the caravans of the merchants who carried on the traffic between eastern and western Asia. This city was called Tamar or Tadmor, 1 Kings ix. 18; 2 Chron. viii. 4; Ezek. xlvi. 19; xlviii. 28; and afterwards Palmyra, names taken from the numerous palm trees in its vicinity; at present it is occupied by an Arabian horde, who have erected their miserable hovels amidst the ruins of its magnificence.

The presence of the palm tree is an unerring sign of water; so that when the Israelites came to Elim, where there were seventy palm trees, they found likewise twelve wells. Exod. xv. 27.

Palm branches were emblems of victory and were carried before conquerors in triumphal processions; to this practice allusion is made in Rev. vii. 9; and for this purpose they were borne before Christ on his entry into Jerusalem. John xii. 13. They were also used by the Jews, with the branches of other trees, at the feast of tabernacles, as a memorial of their deliverance from bondage in Egypt. Lev. xxiii. 40; Neh. viii. 15.

The present comparative rareness of palm trees in Palestine is not the consequence of any alteration in the climate, but of those frequent wars by which the land has been laid waste; for the climate itself is one of the most desirable in the world. There are few countries in which both the date tree and the vine can flourish. In Egypt, Arabia, and North Africa, the date tree flourishes, but the climate is too warm for the vine. In Spain, Naples, and Sicily, where the vine grows excellently, the date-palm is frequently

planted, but its fruit does not ripen. But the climate of Palestine is exactly a medium between Egypt and Naples, or Algiers and Spain: it possesses that mean temperature which is in the highest degree suitable for the vine, and the lowest for the date tree.

The palm tree anciently held so conspicuous a place among the vegetable productions of Palestine, that it became a symbol of the nation. Jewish coins, struck in the time of the Maccabees, have on one side the palm, and on the other vine leaves, as emblems of the country. Also a medal was struck by the Emperor Vespasian upon the conquest of Judea, representing a captive woman under a palm tree, with this inscription, "JUDÆA CAPTA." And on a Greek coin of his son Titus, we see a shield suspended upon a palm tree, with a figure of Victory writing upon it. Pliny also calls Judea "*palmis inclyta*," renowned for palms.

THE INORGANIC KINGDOM.

IN this kingdom are included all substances which cannot be termed animals or vegetables, or which have not been parts of such; all substances which have never lived and died. It therefore includes earths, stones, crystals, water, ice, minerals of all kinds, the metals, sulphur, acids, and alkalies. This kingdom is governed by the laws of chemistry alone, including those of attraction, repulsion, and gravitation. Though crystals assume definite forms, they are not organized; their form, unless changed by external agency, would remain for ever unaltered; they neither grow, nor decay, nor die, like animals and plants; they have no vital powers, no vital functions, no vital organs; and hence their general term, inorganic substances. Some of these demand our notice.

I.—PRECIOUS STONES.

PRECIOUS STONES, or gems, Rev. xvii. 4, are a class of mineral substances, remarkable for their brilliancy, hard-

ness, and rich colouring. Upon these qualities depends their value, and according to the greater or less degree of these, together with their size, they are more or less valuable. They are usually found in small masses, but sometimes large specimens occur, which fetch an enormous price. They are composed chiefly of earthy matter; in most of them is a small portion of metallic substance, to which they owe their great variety of colours. The diamond, although ranked among the precious stones, is not properly one, as its chemical composition is different.

The most brilliant and costly gems come from the East Indies and South America. Syria supplied the city of Tyre with emeralds and agates, Ezek. xxvii. 16; while Sheba and Raamah, southern parts of Arabia, furnished all precious stones and gold, v. 22; from Sheba also, the queen of that country brought them as a present to Solomon. 1 Kings x. 2, 10. From different parts of the Bible, as well as from other histories, it appears that gems were known and highly valued in very early times. Moses speaks of the onyx being found in the land of Havilah. Gen. ii. 12. Job alludes to several kinds of precious stones in his sublime discourse on true wisdom. xxviii. 6, 16-19. They were used as the most splendid ornaments for robes, vessels, furniture, and costly houses. The high priest's robe was brilliant with them; on each shoulder was a large onyx stone, and on the breast-plate were twelve different gems set in sockets of gold. Exod. xxviii. 9-20. Among the materials collected by David for the temple, were "onyx stones, and stones to be set, glistering stones, and of divers colours, and all manner of precious stones," 1 Chron. xxix. 2, which were used in adorning the temple, as appears from 2 Chron. iii. 6. The robes of the king of Tyre were covered with the most brilliant gems. Ezek. xxviii. 13. The art of cutting and polishing precious stones seems to have been very ancient, and was carried to great perfection. On each of the twelve stones in the sacred breast-plate was engraved the name of one of the twelve tribes of Israel; and the onyx stones on the high priest's shoulders contained these twelve names, six on each, "with the work of an engraver in stone." Exod. xxviii. 9-21.

Engraving on precious stones is either what is called in *intaglio* (an Italian word from *in* and *tagliare* to cut,) or in

relicvo, (raised.) Of the former we have the earliest account in the Old Testament. When Tamar desired a pledge of Judah, he gave her his signet. Gen. xxxviii. 18. The high priest's breast-plate, which we have already mentioned is another instance. The earliest Greek artist mentioned as an engraver of stones is Theodorus of Samos, who flourished at least seven hundred years later than the time of Moses.

The art of cutting gems, on account of their hardness and value, requires great nicety and skill in the workmen. In cutting one kind of stone, it is necessary to make use of another equally hard, or harder than itself. Thus the diamond can be cut only by its own powder, while it will cut all the other kinds. One method of cutting and polishing is, by means of a wheel of iron or copper turning rapidly, with the proper sort of powder mixed in oil or water. The powder commonly used for this purpose is that of emery, a variety of the stone called *corundum*, a substance of the same nature as the sapphire, which is obtained chiefly from the island of Naxos, though found also in Italy, Spain, and Saxony.

In a figurative sense, precious stones are employed to signify the highest degree of excellence, beauty, strength, value, and durability, in the objects with which they are compared. In this light we may understand the figures or comparisons in Cant. v. 14; Lam. iv. 7; Rev. iv. 3; the meaning of the blessings promised to the church, Isa. liv. 11, 12; and the description of the heavenly city beheld in vision by John. Rev. xxi. 10-21. After these general observations, we shall proceed to give some account of the precious stones mentioned in Exod. xxviii., and in Rev. xxi.

SARDIUS.

THE name of this stone was probably derived from Sardis, where it was originally found. It is known to us more familiarly by the name of carnelian, which it has received on account of the flesh colour (Latin, *carnis*) of some of its varieties. Carnelians are never figured or striped; the colours are shades of red and yellow; the deep red being most esteemed. The Hebrew name refers to its red colour. They are found in Japan in great abundance, and in the neighbourhood of Surat.

TOPAZ

is supposed to be the same as the modern chrysolite; it is found in Upper Egypt. The colour is green, sometimes brownish or yellowish. A variety called *olivine* is found in Hungary and on the banks of the Rhine.

CARBUNCLE

Is a very elegant and rare gem, known to the ancients by the name of *anthrax*, or coal, because when held up to the sun it appears like a piece of bright burning charcoal. It is a variety of the garnet; the best specimens are met with in the Birman empire.

EMERALD

Is a variety of the beryl, and distinguished by its peculiarly rich, deep green colour. The finest specimens are brought from Peru; it has also been found in Upper Egypt, where are old mines, from which it is supposed the ancients were supplied with this stone. The value of the emerald depends not only on its size, colour, and brilliancy, but on its freedom from flaws. Exod. xxviii. 18; Ezek. xxvii. 16; xxviii. 13; Rev. xxi. 19.

SAPPHIRE

Is a transparent stone, of a rich sky blue lustre, inferior in hardness only to the ruby and the diamond. In the choicest specimens it is of the deepest azure, and in others, varies in shades of all degrees between that and the pure crystal brightness of water without the least tinge of colour, but with a lustre much superior to crystal. Exod. xxiv. 10; xxviii. 18; Job xxviii. 6, 16; Cant. v. 14; Isa. liv. 11, Ezek. i. 26; x. 1; xxviii. 13; Rev. xxi. 19.

DIAMOND

Is the most splendid and costly of the precious stones, and the hardest. It unites in itself the clearness of the purest water, and the glowing splendour of fire. It is however sometimes found coloured green, yellow, red, brown, blue,

and black. Owing to its hardness, it can be cut, or rather worn down, only by rubbing one diamond against another, and it is polished by dust of the gem itself; but it may be broken without difficulty. It has been established, by numerous experiments, that the diamond and charcoal are identical in their chemical nature, though otherwise presenting so many points of difference. The term adamant is used for the diamond, and sometimes as a general term for a stone of extraordinary hardness. Exod. xxviii. 18; xxxix. 11; Ezek. xxviii. 13.

LIGURE

Is a transparent, hard stone, of a deep red colour, with a considerable tinge of yellow. When exposed to the action of fire it loses its colour.

AGATE

Is a siliceous stone, containing ninety-eight parts in one hundred of pure silica. The Mocha stones and moss agates are semi-transparent chalcedony; they receive their name from being brought from Mocha, though they are also found in Guzerat, South America, and the United States. A name of agate more familiar to us is Scotch pebble.

AMETHYST.

THE oriental amethyst is a variety of corundum or adamantine spar. Its colour varies from a rose red to a deep purple or violet, but it is sometimes colourless and transparent. The term amethyst is also applied to a variety of quartz, or rock crystal, which is met with in India, and in many countries of Europe.

BERYL,

- Called also aquamarine, is in fact only a variety of the emerald, presenting different shades of sky blue or mountain green. It is found principally in Siberia and Brazil. An enormous specimen was found at Acworth, New Hampshire, United States: its dimensions are stated to have been four feet in length, and five inches and a half across the lateral planes, and the weight to have been two hundred and thirty-

eight pounds. The beryl has also been met with in Ireland; those from the granite of the Moone Mountains, county of Down, are the finest. In Scotland, it is found in the granite of Rubeslaw quarries near Aberdeen, and in broken pieces in the sands of the rivers of that country. The beryl is mentioned in Exod. xxxix. 13; Dan. x. 6; Rev. xxi. 20.

ONYX,

A precious stone, so called from the Greek word for a (human) nail, to the colour of which, in the part close to the base, it nearly approaches. It is first mentioned with the gold and bdellium of the river Pison in Eden; but the meaning of the Hebrew word is not easily determined. The Septuagint renders it in different places the sardius, beryl, sapphire, emerald, etc. Such names are often ambiguous even in Greek and Latin, and no wonder if they be more so in Hebrew. It is certain that Arabia abounds with precious stones of all sorts, as appears from Ezek. xxvii. 22; where the prophet, in enumerating the chief commodities in which the Arabian merchants from Sheba and Raamah trafficked with Tyre, mentions "spices, precious stones, and gold," agreeably to what Moses says of the bdellium, gold, and onyx of Havilah. And it may be observed that in the next verse the prophet mentions Eden as one of the countries in the neighbourhood of Sheba, which directs us to seek for the situation of Paradise in those parts.

In 1 Chron. xxix. 2, onyx stones are mentioned among the things prepared by David for the temple. The late Mr. C. Taylor observes on this passage, that "the word onyx is very equivocal, signifying 1st, a precious stone or gem; and 2dly, a marble, called in the Greek *onychites*, which Pliny in his *Natural History*, xxxvii. 6, mentions as a stone of Caramania. Antiquity gave both these stones this name because of their resemblance to the nail of the fingers. The onyx of the high priest's pectoral was no doubt the gem onyx; the stone prepared by David was the marble onyx, or rather onychus: for one would hardly think that gems of any kind were used externally in such a building, but variegated marble may readily be admitted."

Onyx stones are sometimes found of a large size. In the cathedral church at Cologne, in Germany, there is one exceeding a palm or hand's breath.

JASPER

Is a stone of the quartz family; there are many varieties of different colours: one of them is found among the sands of Egypt, striped alternately with brown of various shades, and black, Exod. xxviii. 20; Ezek. xxviii. 13. The jasper mentioned in Rev. xxi. 11, is supposed to have been a variety of the diamond.

CHALCEDONY

DERIVES its name from Chalcedon in Bithynia, where it is found. It is semi-transparent, of a milky white, or pale yellow, with shades of other colours. It is found in the Faroe islands, and Iceland, also in Cornwall, and other parts of Great Britain.

SARDONYX

Is a variety of the onyx, which is supposed to have been so called from Sardis in Lydia: others derive it from Sardo, the Greek name of the island Sardinia, there being some reason for thinking that the Carthaginians brought it from that island. In this stone bands of opaque white alternate with a rich, deep orange brown.

CHRYSOLITE

Is the topaz of the moderns. It is of the softest of the gems. The Indian topaz is of a yellowish green colour.

THE CHRYSOPRASUS

Is a rare apple-green chalcedony, found in Siberia. It is nearly all flint or silica, and owes its colour to a minute portion of the oxide of nickel.

JACINTH

OR hyacinth, is a gem of a violet colour, probably a variety of the amethyst. "The following statement," says the author of the *Illustrated Commentary*, "is very nearly true,

and will be easily remembered; a certain gem in hardness and brilliancy next to the diamond was called a jacinth or hyacinth by the ancients, when of a violet colour; an amethyst, when of a rosy red; a sapphire, when blue; and an emerald, when green." The ruby is considered by mineralogists as a variety of the sapphire.

We shall now briefly notice some other mineral substances mentioned in the Sacred Scriptures.

MARBLE.

MARBLES, strictly speaking, may be considered as calcareous or limestone rocks, of lively colours, and capable of taking a fine polish. Some are of one plain colour; of these the pure white is most esteemed, obtained by the ancients from the island of Paros, and by the moderns from Carrara in Italy. In the book of Esther, the pavement of the banqueting court of king Ahasuerus is said to be composed "of red, and blue, and white, and black marble." Other marbles are variegated with two or more colours. A large and beautiful class contains shells, and corals, and other extraneous bodies, of which specimens exist in great abundance in England; as, for example, in the Plymouth and Ashburton limestone, and the marbles of Flintshire, Derbyshire, and Garsdale in Yorkshire.

Limestone is referred to in Isa. xxvii. 9, where it is said, "When he maketh all the stones of the altar as chalkstones that are beaten in sunder;" as Dr. Lee explains it, "As stones of burnt lime dissolved or slaked, *i. e.* so that such altars shall be no more reared." Limestone is the prevailing constituent of all the mountains of Syria. The whole of Mount Lebanon, (which signifies "the white mountain,") consists of whitish limestone; or at least the rocky surface, as it reflects the light, exhibits very where a whitish aspect. The country around Jerusalem is all of a hard limestone formation, which towards the Dead Sea, is exchanged for one of a looser friable texture.

ALABASTER.

THERE are two kinds of stone to which this name is applied, the one a carbonate, the other a sulphate of lime.

The former was the material frequently used by the ancients for perfume boxes. Such was the alabaster box, containing the precious ointment poured by Mary, the sister of Lazarus, on the head of the Saviour. Matt. xxvi. 6, 7. The expression "she brake the box," Mark xiv. 3, probably means, that the seal which closed it, and kept the perfume from evaporating, had never been removed, but that it was on this occasion broken, that is, first opened.

The sulphate of lime forms the softest kind of alabaster; when pure, it is a beautiful semi-transparent snow-white substance; that of the finest quality is found in Tuscany, and is much employed in various works of art. The name alabaster is derived from Alabastron, a town in Middle Egypt, the stone being obtained from a mountain about thirty miles south-east of the town.

CLAY,

AN earthy substance, which is generally soft, and feels greasy to the touch; it is adhesive to the tongue; when moistened, has a peculiar smell; and is capable of being cut with a knife, and polished by rubbing with the finger nail. Some kinds, when wet, fall into a powder, and are used as paints. Others, with a proper quantity of water, form a kind of stiff paste, which may be worked into shape, and by exposure to heat becomes hard and solid. These last, from which various articles of pottery are made, are more strictly called clays. The two chief constituents of all clays are *alumina*, (called also argil, or argillaceous earth,) to which their plastic quality is owing, and *silica*, or flint, (flint, commonly so called, containing ninety-eighth parts per cent. of silica.)

The first use of clay mentioned in the Scriptures, is that of making bricks of it for building the tower of Babel. Gen. xi. 3. The bricks manufactured for that purpose appear to have been baked in the fire like our own; but the bricks made by the Israelites in Egypt were composed of clay, mixed with straw, and sun-dried. Such bricks may be seen in the pyramids at Dasham and Faioum, and the straw which is still visible proves that they were not prepared in a furnace.

Methods of working in clay, similar to those now in use, appear to have been employed by the ancients. The knead-

ing or treading of the clay is spoken of in Isa. xli. 25; the potter's wheel in Jer. xviii. 3; and the kiln, 2 Sam. xii. 31. Jer. xliii. 9; Nah. iii. 14.

Fuller's earth is a particular kind of clay, formerly much employed in fulling, or cleaning cloth. In its chemical composition, it appears to differ from potters' clay chiefly in having a larger proportion of water. The occupation of a fuller is referred to both in the Old and New Testament; but the "soap" mentioned in Mal. iii. 2, "For he is like a refiner's fire, and like fullers' soap," is not the earthy substance just mentioned, nor exactly the same as our modern soap, but probably an alkali collected from plants, and used in combination with oil, so as to answer a similar purpose.

NITRE.

THE nitre of the Scriptures, Prov. xxv. 20; Jer. ii. 22; the nitron or nitrum of the Greeks and Romans, is not the nitrate of potash or saltpetre, which we commonly call by this name; but the carbonate of soda, which is found in vast quantities in Egypt. The Natron valley is situated in the western desert, which borders on Lower Egypt. It contains six lakes, ranged in succession along the valley for sixteen miles, and separated from each other by barren sands. These lakes are remarkable for the quantity of their saline deposits, which consist both of muriate of soda, or common salt, and carbonate of soda, called natron or trona. The lakes are supplied with water, which oozes from the side towards the Nile; and the quantity of water in the lake seems to be regulated by the state of that river. The banks of the lakes below the springs are covered with crystallizations. The natron is collected once a year, and is used both in Egypt and Syria, as also in Europe, for manufacturing glass and soap, and for bleaching linen. Herodotus states, that it was made use of by the ancient Egyptians in embalming their dead. Hasselquist says, that "the Egyptians use it for two purposes; (1) to put into bread instead of yeast; (2,) to wash linen with instead of soap."

SALT.

THIS well-known substance is found in large masses in a mineral state, and is also obtained by evaporation from sea water, and from the water of saline springs.

Under the Mosaic economy, salt was used in all the sacrifices. "Every oblation of thy meat-offering shalt thou season with salt; neither shalt thou suffer the salt of the covenant of thy God to be lacking from thy meat-offering: with all thine offerings thou shalt offer salt." Lev. ii. 13. "Salt," as an eminent commentator remarks, "was the opposite to leaven, for it preserved from putrefaction and corruption, and signified the purity and persevering fidelity that are necessary in the worship of God. It was called 'the salt of the covenant of God,' because, as salt is incorruptible, so were the covenant and promise of Jehovah. Among the heathens, salt was a common ingredient in all their sacrificial offerings; and as it was considered essential to the comfort and preservation of life, and an emblem of the most perfect corporeal and mental endowments, so it was supposed to be one of the most acceptable presents they could make to their gods.

Salt, among eastern nations, anciently was and still is a symbol of hospitality and friendship. To have eaten of a man's salt, is to be bound to him by the ties of friendship. Among the Arabs of the desert, the ratification of a covenant or engagement by the parties eating salt together, is considered more solemn and binding than any oath; and so far is this sentiment carried, that if a person who is an object of enmity to another has accidentally eaten salt with him, it will be a sure protection from any outrage. Salt is often an equivalent expression for food in general, of which the Scripture phraseology will supply an instance. In Ezra iv. 14, it is said in our version, "We have maintenance from the king's palace;" but the marginal and more literal translation is, "We are salted with the salt of the palace."

In Palestine, the most extraordinary specimen of fossil salt is that on the south-western extremity of the Dead Sea. The mountain is called Khasm Usdum, and is a solid mass of rock salt. "The ridge," says Dr. Robinson, "is in general very uneven and rugged, varying from one hundred to one hundred and fifty feet in height. It is indeed covered with layers of chalky limestone or marle, so as to present chiefly the appearance of common earth or rock; yet the mass of salt very often breaks out, and appears on the sides in precipices *forty or fifty feet high, and several hundred feet in length, of pure crystalized fossil salt.* We could at first hardly be-

lieve our eyes, until we had several times approached the precipices, and broken off pieces to satisfy ourselves both by the touch and taste. As we advanced, large lumps and masses broken off from above lay like rocks upon the shore, or were fallen down as debris. The very stones beneath our feet were pure salt. This continued to be the character of the mountain, more or less distinctly marked, throughout its whole length, a distance of two hours and a half, or five geographical miles. The Arabs affirmed, that the western side exhibited similar appearances. The lumps of salt are not transparent, but present a dark appearance, precisely similar to that of the large quantities of the mineral salt which we afterwards saw at Varna, and in the towns along the lower Danube, the produce of the salt mines of those regions.

“The existence here of this immense mass of fossil salt, which, according to the latest geological views, is a frequent accompaniment of volcanic action, accounts sufficiently for the excessive saltiness of the Dead Sea. At this time the waters of the lake did not indeed wash the base of the mountain, though they appear to do so on some occasions; but the rains of winter, and the streamlets which we still found running to the sea, would naturally carry into it in the course of ages a sufficiency of salt to produce most of the phenomena.”—Robinson’s *Biblical Researches*, vol. ii. p. 482.

The powerful evaporation from the Dead Sea, produces a saline deposit on its shores during the summer, from which the Arabs obtain a supply for themselves and their flocks. The water has a slightly greenish hue, and is not perfectly transparent. It is most intensely and intolerably salt, and leaves behind a bitter nauseous taste, like that of Glauber’s salts. The water is exceedingly buoyant. Dr. Robinson states, that though he could never swim before either in fresh or salt water, yet in this he could sit, stand, lie, or swim without difficulty. By the analysis of eminent chemists, it appears that one hundred pounds of this water contain from forty-one to forty-five pounds of salts.

PITCH.

THERE are two substances, one vegetable, the other mineral to which this name is applied. They are both mentioned

in the book of Exodus as employed in rendering waterproof the ark, or boat, in which Moses was laid by his mother on the banks of the Nile. We are told, "she took for him an ark of bulrushes, and daubed it with slime and with pitch." Exod. ii. 3. The word rendered "slime" is the same as that employed in Gen. xi. 3. "They had brick for stone, and slime had they for mortar." It appears to have been *asphaltum*. frequently called slaggy, or compact mineral pitch; it is one of the varieties of bitumen, and arises from the decomposition of vegetable matter. It is found in masses of a dark brown or black colour, and a resinous lustre. It is opaque, and very brittle at a low temperature, but softens and fuses by the application of heat. It is found in most countries, but most abundantly at Hit, above Babylon, on the Euphrates; near the Tigris, on the shores or surface of the Dead Sea, and on the island of Trinidad; in the latter is a lake, or basin, of *asphaltum*, three miles in circumference, and of unknown depth.* As to the Dead Sea, the Arabs who accompanied Dr. Robinson informed him that, after an earthquake, in 1834, a large quantity of *asphaltum* was cast on shore near the south-west part of the sea, of which above five hundred weight was brought into market. Also, after the earthquake of January 1, 1837, a large mass of bitumen, one said like an island, another like a house, was discovered floating on the sea, and was driven aground on the west side. One tribe of Arabs swam off to it, and cut it to pieces, so as to bring it to shore. Another tribe heard of it, and went to get a share of the prize. They found seventy men upon it and around it. It was carried off by camel loads, and sold; one party gained more than five hundred dollars, and the other between two and three thousand. Except in those two years, the sheikh of the Jehâlûr, a man fifty years old, had never known of bitumen appearing on the sea, nor heard of it from his fathers. This information, however, serves to illustrate and confirm the account of Josephus, that "the sea, in many places, sends up black masses of *asphaltum*, which float on the surface, having the form and size of headless

* A paper in the Transactions of the Royal Geological Society of London, by Dr. Nugent, 1811, quoted by Dr. Robinson in his *Biblical Researches*, vol. ii. 675.

oxen." Diodorus Siculus also relates that the bitumen is thrown up in masses, bearing the appearance of islands.

"The vale of Siddim," we are informed by the sacred historian, "was full of slime-pits," Gen. xiv. 10, that is to say, wells of asphaltum, or bitumen, the Hebrew word being the same as that used in Gen. xi. 3. The same word is also used respecting the ark, in Gen. vi. 14, but in our version is rendered "pitch."

The vegetable pitch is obtained from various sorts of pines which abound in oily and resinous matter. Common turpentine flows from the pine by incisions. From this the oil is got by distillation, and what remains is resin. Tar is obtained by burning the wood in a sort of oven, or kiln, and flows into a hole beneath; this by long boiling becomes pitch.

BRIMSTONE,

THE common name for sulphur, which seems to have been given to that substance from its very inflammable quality, meaning the burning, or fiery stone.

Sulphur, or brimstone, is a simple substance, very widely diffused over the earth, but found most abundantly in volcanic regions. It exists, in combination with iron, to a great extent, in which state it is called *iron pyrites*: the proportion of sulphur in this is above one half, or more than fifty-two out of a hundred parts.* The first mention of brimstone in the Scriptures is in the account of the destruction of "the cities of the plain." "Then the Lord rained upon Sodom, and upon Gomorrah, brimstone and fire from the Lord out of heaven," Gen. xix. 24; and in several other passages it occurs in allusion to this awful event. "Upon the wicked," says the Psalmist, "he shall rain snares," ("quick burning coals," marginal reading,) "fire and brimstone and a horrible burning," (marginal reading,) "tempest," Psal. xi. 6. See also Deut. xxix. 23; Job xviii. 15; Isa. xxx. 33; xxxiv. 9; Ezek. xxxviii. 22; and in the New Testament, Luke xvii. 29; Rev. ix. 17, 18; xiv. 10; xix. 20; xx. 10; xxi. 8.

Analysis of bisulphuret of iron, by Hatchett,	
Sulphur . . .	52.15.
Iron . . .	47.85.

At the present day, sulphur is found in various parts of the borders of the Dead Sea; Dr. Robinson and his friends picked up pieces of it as large as a walnut, near the northern and western shore, and the Arabs informed him that it was found in the sea, near the fountain Ain-el-Feshkah, in lumps as large as a man's fist; the water of that spring has also a slight taste of sulphuretted hydrogen. They find it in sufficient quantities to make from it their own gunpowder. There are also hot sulphur springs on the eastern coast, near the ancient Callirrhœ.

AMBER.

THIS is a mineral substance, of which the chief constituent is carbon; it is found in beds of fossil wood, (or lignite,) in several countries of Europe, and also floating on the sea, particularly on the coasts of the Baltic, where it is thrown on shore in considerable quantities, between Königsberg and Memel. There have been various conjectures respecting its origin. Recent experiments favour the conclusion that it is a hardened vegetable juice, which agrees very well with the fact, that small insects are found imbedded in it. Such, indeed, was the opinion expressed by Tacitus, who tells us, that the barbarians who gathered it, attached no value to it, and only wondered at the Romans, who were eager to obtain it, in order to convert it into ornaments and articles of luxury. The ancient Germans called it *glesum*, from a word signifying bright or shining; but their descendants have transferred the term to glass. Pliny states that, in his time, a small piece of wrought amber was deemed more than equivalent to the price of a robust slave. By the Greeks it was called *electron*, and the science of electricity derives its name from it, in consequence of its possessing the property of attracting light bodies, after it has been excited by friction. The Jews might have become acquainted with amber through the medium of the Phenicians, with whom we have the authority of Herodotus for saying, it was an article of commerce. There is, however, no allusion to it before the time of the Babylonish captivity, since it is only mentioned by Ezekiel, when that prophet "was among the captives by the river of Chebar, and saw visions of God." Ezek. i. 1, 4, 27; viii. 2.

In the opinion of many eminent critics, this substance is not intended by the Hebrew term, because amber loses its lustre when heated; but a mixed metal is meant, of four parts gold and one part silver, which was distinguished for its brilliancy, and was also called *electron*.* But as the allusion is only to the native colour of amber, it seems unnecessary to look for another substance.

II.—METALS.

ALL the accounts of ancient writers agree with those of the sacred Scriptures, that gold, silver, and copper, were the first metals with which mankind were acquainted. Before the flood, Tubal-Cain taught the use of iron and copper, in manufacturing tools of various kinds. Gen. iv. 22.

The Israelites in the wilderness made use of iron instruments, Numb. xxxv. 16; Deut. xix. 5; xxvii. 5; we find allusions to the smelting of iron in Deut. iv. 20. At a later period, we read of iron axes, 2 Kings vi. 1-7; of "northern iron" in Jer. xv. 12, which probably means that which was manufactured by the Chalybes, a nation dwelling near the Euxine Sea, and consequently north of Palestine. Moses expressly speaks of the promised land as containing stores of iron and brass, (copper,) "a land whose stones are iron, and out of whose hills thou mayest dig brass." Deut. viii. 9. We find mentioned in the Old Testament the following articles manufactured of iron; axes, Deut. xix. 5; 2 Kings vi. 5; saws and harrows, 2 Sam. xii. 31; pick-axes, Deut. xxvii. 5; pans, Ezek. iv. 3; spears, 1 Sam. xvii. 7; bedsteads, Deut. iii. 11; war-chariots, Josh. xvii. 16; Judg. i. 19; of copper, or brass, vessels of various kinds; pots, Lev. vi. 28; censers, Numb. xvi. 39; shovels and other

* ROBINSON'S *Greek Lexicon* s. v. Χαλκολιθων, and FURST'S *Hebrew Concordance*, s. v. לְשֵׁן

instruments belonging to Solomon's temple, 2 Chron. iv. 16; "two vessels of fine copper, precious as gold," Ezra viii 27; instruments of war, as Goliath's armour. 1 Sam. xvii. 5, 6, 38; Ishbi-benob's spear, 2 Sam. xxi 16; fetters, Judg. xvi. 21; and mirrors, (in the English version, "looking-glasses,") of which "the laver of brass" was made, Exod. xxxviii. 8; (doors were overlaid with it, 2 Chron. iv. 9.) The larger vessels were molten, as well as the pillars, which required architectural ornaments, and these were the work of the son of a foreign artist; "King Solomon sent and fetched Hiram out of Tyre. He was a widow's son, of the tribe of Naphthali, and his father was a man of Tyre, a worker in brass: and he was filled with wisdom, and understanding, and cunning, to work all works in brass." 1 Kings vii. 13, 14. Various ornaments and vessels belonging to the temple were also made of gold and silver. Ezra. v. 14. Lead was also made use of for weights, plummets, and measuring lines. Amos vii. 7; Zech. iv. 10; v. 8. We find the following instruments of workers in metal mentioned in the Bible; the anvil and the nails, Isa. xli. 7; the hammer and the tongs, Isa. xlv. 12; the bellows, Jer. vi. 29; "the fining pot for silver, and the furnace for gold," Prov. xvii. 3; Ezek. xxii. 18. Of the operations in this art, we find 1. The melting of metals, not only to reduce them to a fluid state for casting, but in order to separate and purify the precious metals from mineral substances of inferior value, as tin mixed with silver, Isa. i. 22; Ezek. xxii. 18-20; the impurities, or dross, thus separated, are referred to in Psal. cxix. 119; Prov. xxv. 4, and several other passages. 2. The operation of casting or founding the melted metal. "The workman" ("melteth," our version, but more correctly Bishop Lowth) "casteth a graven image," Isa. xl. 19; also Exod. xxv. 12, "cast four rings;" Exod. xxvi. 37, "cast five sockets of brass." These passages refer only to gold, silver, and copper. Iron founding is not mentioned, and indeed was altogether unknown to the ancients. 3. The art of hammering and beating into plates, Numb. xvi. 38, compared with Isa. xlv. 12; Jer. x. 9; "silver spread into plates is brought from Tarshish." 4. Soldering and nailing together. Isa. xli. 7. 5. Smoothing and polishing, 1 Kings vii. 45, "bright (that is, polished) brass." 6. Overlaying with gold, silver, or plates of brass, Exod. xxv. 11, 24; 1 Kings vi. 20-22; 2 Chron. iii. 4-10; Isa. xl. 19.

It is worthy of notice, that the representations of sacred history respecting the knowledge and use of metals in the earlier ages of the world, are strikingly corroborated by the information derived from the most ancient heathen writers.

In Hebrew, the same word denotes copper, and that alloy of it with zinc, called brass; the latter is the word employed in our version, though in some passages the sense evidently requires that it should be translated copper. Deut. viii. 9; Job xxviii. 2.

CONCLUDING REMARKS.

WE have now finished our description of the various objects of natural history to which allusion is made in the Bible. We shall be gratified if the facts here collected from various quarters should not only afford temporary pleasure in the perusal, but stimulate the minds of our readers to the acquisition of a more extensive knowledge of the works of God. "They are great," says the Psalmist, "Sought out of all them that have pleasure therein." Psal. iii. 2. Of course, the extent to which each individual may pursue these studies must be determined by various considerations, the facilities afforded by his situation in life, and a conscientious adjustment of the relative claims of duty. But it would be most injurious to the cause of religion, to admit that in itself the investigation of the works of God is at all inconsistent with the profoundest regard to the divine word. They both proceed from the same Author, and both reflect his glory, though with unequal lustre. If by "the things that are made," the eternal power and Godhead of the Almighty are so clearly manifested, that the heathen are left without excuse for their impious substitution of the creature for the Creator, much more will the discoveries of modern science be fitted for the same purpose; or, if they fail of effecting it, so much the greater will be our condemnation; the blame will rest not on scientific inquiry, but on the disposition with which its results are contemplated. And this suggests a most important subject for reflection, with

which we will conclude. What is the state of our own disposition towards the great Author of our being? Is it one of friendship and conformity, or of estrangement and unlikeness? This is an inquiry on which the book of nature leaves our minds uninformed, and our hearts unsatisfied. Let us turn then to that other volume, that "greater light" which reveals to us "God in Christ, reconciling the world unto himself, not imputing their trespasses unto them." 2 Cor. v. 19.

"Acquaint thyself with God, if thou wouldst taste
His works. Admitted once to his embrace,
Thou shalt perceive that thou wast blind before;
Thine eye shall be instructed; and thine heart
Made pure, shall relish with divine delight,
Till then unfelt, what hands divine have wrought."

COWPER

THE END.



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Scripture natural history.

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