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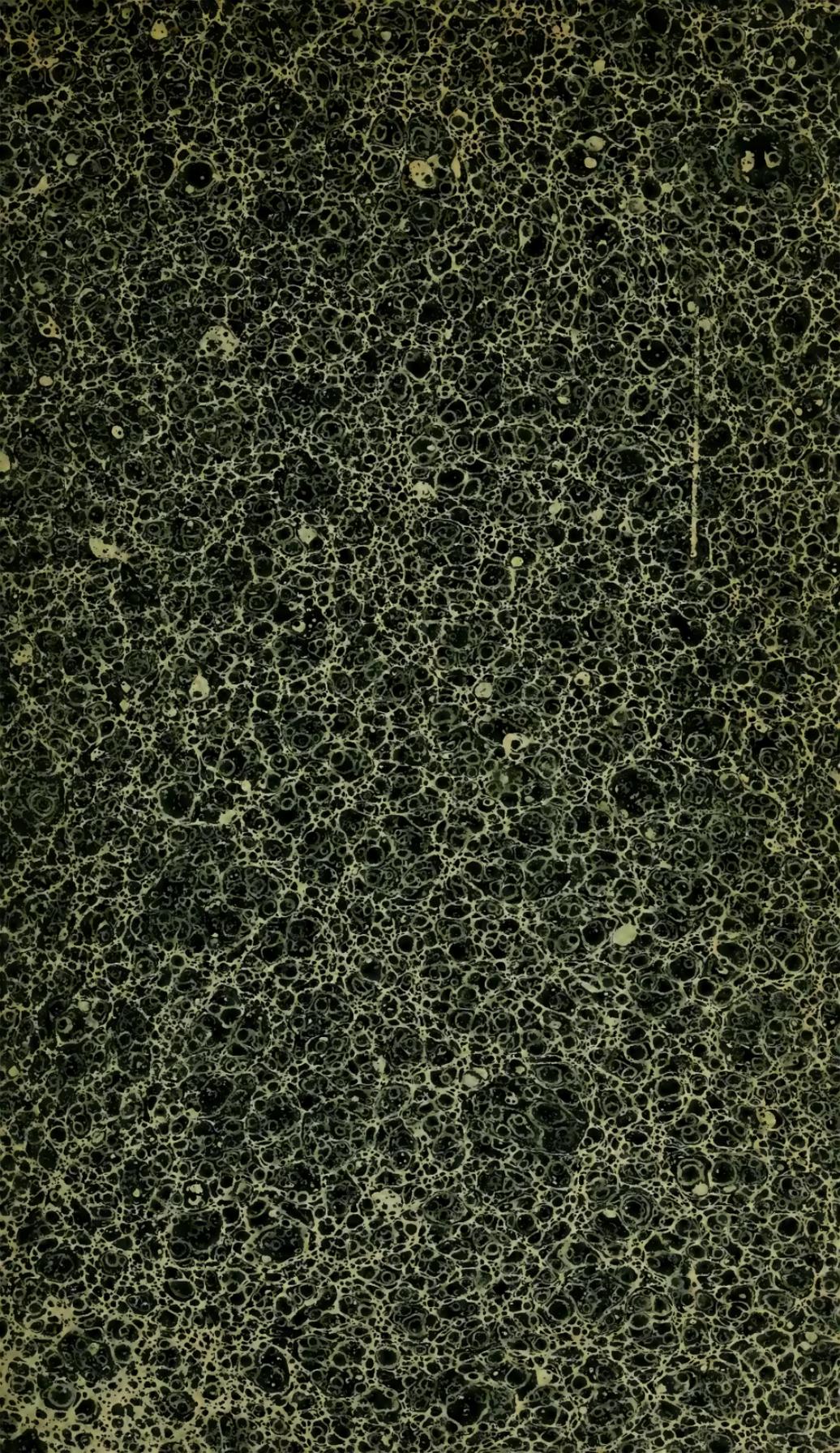
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X-5

THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN;
OR
COLOURED FIGURES AND DESCRIPTIONS
OF THOSE
REMAINS OF TESTACEOUS ANIMALS
OR
Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

BY JAMES SOWERBY, F. L. S. G. S. W. S. &c.
AUTHOR OF BRITISH MINERALOGY, EXOTIC MINERALOGY, BRITISH MISCELLANY, ENGLISH FUNGI, AND A BOTANICAL DRAWING BOOK;
PUBLISHER OF ENGLISH BOTANY, &c.

Many, O Lord my God, are thy wonderful works which thou hast done: they cannot be reckoned up in order to thee: if I would declare and speak of them, they are more than can be numbered.

PSALM xl. 5.

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MDCCCXII.

TO

JOHN BAKER, Esq. F. L. S. &c.

Whose long friendship and gentle manners, with a constant attachment to useful pursuits, has long pleasingly engaged my esteem and gratitude, I beg permission to dedicate this part of my labours. That he may partake of that happiness he constantly deals to others, is the fervent hope of his most humble and faithful Servant,

JAMES SOWERBY.

**2, Mead Place, Lambeth,
May 25th, 1812.**

PREFACE.



ENGLISH Botany and British Mineralogy being now nearly finished, it is the desire of many, that those plants of ancient formation, which have been preserved in the rocks may be elucidated. I have long been attentive to the subject, and hope to indulge my friends and myself in a short time.

At present the digging for the Archway at Highgate, having led to many unexpected discoveries, and causing a still louder call for the Elucidation of the remains of Shells, I do not delay to publish them, especially as they greatly help to form a catalogue that includes many other habitats, even some foreign ones, so that when this work is complete, very little will remain to be done to include what are foreign, as one place will identify another through the whole known world.

The remains of Shells are sometimes so well preserved that many recent ones are not equal to them, either in preservation or beauty, and it often happens that the peculiar nature of their situation preserves them in a manner that excels all our art in representation. The pearly lustre is, in some, even superior to that of the most recent Shells, and the changes into Carbonate of Lime with the crystallized structure, into Flint, Calcedony, &c. are generally such as to excite our admiration; every minutia being so well cast as to preserve the most attenuated striæ or elaborate markings; and even the polish and colour are often admirably retained, and additional splendour gained under ground, by means of Sulphuret of Iron, giving a metallic lustre which equals, if it does not surpass every thing else.

It is thought that Generic names of Shells, without the termination *lites* or *ites*, to signify the stony substance of which they consist, as *Nautilus*, not *Nautilites*, are preferable, as it often happens that the slight change Shells have undergone may not warrant them, and the cast shewn may be considered quite inconsistent with such a term. The description will say in general what change a specimen may have

undergone, and the figures will be done in such a way as to help the description as much as may be, with the shining pearly stony or metallic brilliancy. Many species of one genus may be included in a plate, as it might be thought insignificant to figure a single small Shell alone. I have long since possessed a tolerable collection of British Fossil Shells. To the addition of a fine series from Highgate, by favour of my indefatigable friend B. G. Snow, Esq. may be attributed my more particular attention to this branch of Natural History. I here beg leave to thank him and other kind friends for the many specimens received, and hope the present undertaking will meet their approbation.

JAMES SOWERBY.

TAB. I.

NAUTILUS Imperialis.

GEN. CHAR. Shell univalve; divided into chambers by numerous transverse septæ, connected by a siphunculus or tube.

SPEC. CHAR. Involute, umbilicate; aperture lunate; septæ entire, concave, broadest in the middle, truncated and slightly recurved at their ends; siphunculus nearest to the inside.

THE axis of this species measures about two thirds of its greater diameter, and the septæ are about one eighth of their width distant from each other: the umbilicus is probably open, in which it differs from *Nautilus Pompilius*: the external coat is striated in the younger Shells and often of a light brown colour, under this the Shell is beautifully pearly; the inside also is pearly.

The upper figure shows a specimen from the great Clay stratum lately laid open at Highgate, and has some of the brownish outer coat remaining. It is broken at the mouth, which is closed by a pearly concave septa showing the aperture of the siphunculus, the other parts of the remains of the Shell are also pearly, and more or less iridescent. The broad undulations of the septæ are seen in one part separated by shining brown Carbonate of Lime bearing a slight resemblance to a Lobster's tail; in another part the chambers are opened, the first of which is lined with the yellowish more waxy Carbonate of Lime and shows part of the siphunculus. The other septæ are more or less broken, and show the chambers coated on the inside with brilliant variously coloured crystals of Pyrites, chiefly very small

cubo-octaëdrons. The left hand figure below is from a continuation of the same Clay formation near Minster, on the Isle of Sheepy, and is from the inside of one of the same species, appearing more perfect; it has, however, none of the epidermis, and the pearly lustre is almost lost in an opaque whiteness; it serves well to shew the contour of the Shell; the dotted outline underneath shows the form of a septa, and the situation of the siphunculus: the middle figure is part of the largest siphunculus I have ever met with. This Shell is often found of a considerable size at Sheepy, and, as Mr. Trimmer informs me, at Brentford; at Highgate large portions have been found, and I met with three pieces that nearly fit, and when put together indicate a proportion larger, I believe, than usual for this species, viz. 12 inches for the longest diameter, $7\frac{1}{2}$ inches for the axis, and 8 inches for the shorter diameter, making a fine specimen. The largest piece has retained most of its epidermis, of a brownish buff colour, elegantly netted with dull Pyrites formed in knots or drops; the rest of the Shell is variegated and pearly; and the last chamber, which is generally understood to be the habitation of the animal, is filled with marly Clay. I was about to give a folded outline of this in the work, but was persuaded to publish a full sized coloured figure, which I have done for the convenience of those who wish for such a representation.

It may be understood, that, in general, while a Shell retains a pearly lustre, there remains some of the animal gluten. I have a specimen of this Nautilus from Brentford, by favour of Dr. Sutton of Norwich, which has some of the cuticle or filmy skin of one of the septæ remaining quite elastic, partly covered with Pyrites. A specimen I have lately got from Highgate, besides Pyrites, contains fine spiculæ of Sulphate of Lime.

It may not be amiss here to observe, that the Highgate

Clay, and that of Sheepy, and several other places, are considered as detached portions of the highest known stratum but one, which is Sand. As it lays not far above the Chalk, it may be sought for in those districts which are bounded by Chalk, but as Mr. Farey has observed to me, in a valuable letter upon this subject, this "being the uppermost stratum but one, it is mostly denudated and gone; and, except in some particular tracts in and near where the Sand upon it is found, this blue Highgate Clay will be found only in particular hummocks or isolated patches on the Clays and Sands beneath it (in which the London wells are sunk)." Mr. Farey has also favoured me with a detail of the boundaries of the three great tracts on which the strata covering the Chalk are found; the Northernmost extending along the coast a considerable way on each side of the mouth of the Humber; the middle or greater tract covering the South of Norfolk, greater part of Suffolk, Essex, Middlesex, parts of Berkshire, and Wiltshire, the South of Hampshire, Surrey, and Kent; the Southern tract extends from Brighton to Axminster in Devonshire. It would be doing a service to Geology, if persons resident in these tracts would search for and compare the fossils with each other.

NAUTILUS centralis.—*Left hand figure.*

SPEC. CHAR. Involute, umbilicate; aperture bluntly lunate, septæ entire, concave, not recurved at their ends; siphunculus central.

THIS Shell is about three-fourths of its diameter in thickness, and the concavity of the septæ is gentle and regular without recurving; see the outline below it. The distances of the

septæ are nearly the same as in the last, as I find from separated specimens which I possess. It appears to be a new species, and I have called it *centralis* because the siphunculus is central.

The specimen is from a well dug in Richmond Park, 175 feet deep in the great Clay formation. It is filled up with a dullish Pyrites, and the Shell is slightly pearly.

NAUTILUS *ziczac*.—*Lowest figure*.

SPEC. CHAR. Involute, inner turns concealed, aperture bluntly triangular, septæ concave much recurved at their ends with a deep indenture in the edge on each side, siphunculus nearest to the inside.

IT is about one third of its diameter in thickness, being a flattish Shell. The remarkable zigzag appearance of the septæ and their broad edges distinguish this Shell pretty readily from any I before knew, except a large one figured by Mr. Parkinson in his *Organic Remains*, vol. 3, tab. 7, fig. 15, and which may perhaps prove to be an older specimen of the same Shell, but the great indentation in the edge of each septæ is contracted towards the middle so as to become suddenly acute, and not turning regularly round as in this, but it must be remembered that the specimen he has figured is a cast, and not the Shell. My specimen is from Highgate, and is the only one I have met with.

TAB. II.

AVICULA media.

GEN. CHAR. A free Shell, a little gaping near the beaks, fixing itself by a byssus, having valves of unequal size, the hinge linear, without a tooth, extended over the beaks into two wings. The Cartilage of the hinge oblong, broadest near the middle and marginal. Muscular impressions two, contiguous.

SPEC. CHAR. Ovate, depressed; wings large, unequal, one wing acute, valves nearly equal; length of the Shell and hinge nearly equal; surface smooth.

OUR Shell agrees sufficiently with the recent species of this genus to be ranked with them, and more correctly so than with those of any other genus. Its valves, however, appear to be nearly equal, and the hinge in the larger specimens shows some signs of a depression and tooth near the short wing, and a little elongated swelling on the opposite side, like *Mytilus Hirundo* Linn. We think also that there is some vestige of a constriction or fold around the short wing; that is most apparent in the large pearl muscle, *Mytilus margaritiferus*, Linn. Indeed it seems altogether very nearly allied to both of these, but is nevertheless a distinct species, the wings being shorter than in *M. Hirundo*, and longer than in *M. margaritiferus*. I therefore consider it as a species which comes between the two, and name it accordingly.

This species is from $\frac{1}{4}$ to $\frac{1}{2}$ an inch square, it has a brownish smooth epidermis, marked with distant concentric striae, and is pearly within.

Many masses of these Shells have been found, each as big as a bushel or more, chiefly in a rotting state, in a mixed darkish Clay in different parts of Highgate Hill, but they are difficult to preserve.

The right hand lower figure shows a fine specimen on a piece of Septarium of hardish brown Marle, with some fragments more or less enveloped in it. The figure of the inside near it is as distinct as I could make it with the help of many specimens, which all have a pearly appearance and lustre, both inside and out, when the epidermis is decayed. The upper figure shows a specimen of the same stone in a state of decay, full of smaller Shells; the outside has become ochraceous, and the Shells more chalky; the inside being less changed is darker, and the remains of Shells more pearly. The two casts taken from within the Shells of this specimen (see the left hand figures) seem to show them to be nearly equivalved, but like the pectens, the principal parts may be rather equal, while the wings of each valve do not meet each other. I do not know that this Shell has been discovered any where besides at Highgate. I have to thank Mr. Snow for this, among his other numerous favours, so likely to become instructive to the public. I have specimens of *Avicula Hirundo* from Marazion, found by Miss Elizabeth Pocock, and minute specimens from Bantry Bay in Ireland, by the friendship of Mr. Drummond, but it is certainly another species. I mention these here to show that we have still on our coasts Some Shells nearly allied to the fossil ones, which have frequently been considered as related more immediately to those of the East Indies.

TAB. III.

SOLENI affinis.

GEN. CHAR. An equivalve, transversely elongated bivalve, gaping on each side, the hinge teeth, single in each valve or double in one valve.

SPEC. CHAR. Shell linear subarcuate, rounded at each extremity, hinge placed near one extremity, surface smooth.

THIS Shell is about five times as broad as it is long, but slightly curved and very thin.

It has been found plentifully imbedded in Marle septariae at Highgate. Its similarity to *Solen pellucidus*, which has occasionally been found recent in several parts of England, is so great that we at first considered it as the same species, but in the fossil the extremity of each valve farthest from the hinge is uniformly rounded, which is not the case with the recent species, that being squarish at the end; this is, moreover, a rather straighter Shell. The teeth of the hinge could not be found in our specimens, but we suppose from the analogy of the greater part of the Shell, that they are like *S. pellucidus*. The sizes of both Shells vary, I have either from less than half an inch in breadth to above an inch, and of a proportionate length. They are of a darker or lighter horn colour. The fossil Shells are mostly placed in pairs.

CYPRÆA.

GEN. CHAR. Shell univalve, ovate, convex, margins involute. Spire small, covered. Aperture longitudinal, narrow, toothed on both sides.

CYPRÆA oviformis.

TAB IV.

SPEC. CHAR. Egg shaped, tumid, smooth, slightly marginate; aperture widest at the lowest end, left side of the aperture obscurely toothed; right lip involute, tumid.

THE shell is most gibbous at about one-third of its length downwards, then tapering to a short beak, which forms a broadish canal; the aperture vertical, narrowest where the body of the shell is most gibbous, and much widest towards the beak, dentated on both sides. The whole shell smooth and shining, with the striæ of growth generally delicately marked in elegant curves round the beak; there are some longitudinal angles, scarcely perceptible, surrounding the most swelling parts; colour pale brown buff. It does not appear that this shell was known any where before the opening of the hill at Highgate, not even in Hampshire. Some specimens are so well preserved as to retain entire the external shining porcelain coat, which is so admirable in some recent shells of this Genus, but not the transparent epidermis, although it looks almost as if it were in some of these preserved specimens; this china-like polished surface seems to prevent parasitical shells or animals from adhering to it. This coat is often more beautiful in consequence of

external marks, but the present species is sufficiently preserved to show if there had been any. The upper shell has a little remains of the shining outside, the upper part is a little broken, the lower part or beak is very entire, and shows some of the teeth; it is filled with hardish marle, so as to hide the remainder of the teeth, which, however, are seen in the right hand figure of a smaller shell, which is finely preserved with the polished coat and a brown stain of Iron Pyrites, the beak is enveloped in Pyrites. The left hand figure is the dorsal view of the same shell. The lower figure is more injured, showing by the breaks in two or three places the dark Pyrites which fills the shells, and adheres over the cracks. I am obliged to the generous Mr. Weatherell, who discovered this shell at Highgate, for the specimens figured.

It is to be observed that accidentally the plate of these shells has been reversed in the engraving, bringing the mouths to the left instead of the right side.

NATICA, *Lamarcke.*

GEN. CHAR. Univalve, nearly globose umbilicated shell; aperture entire, semi-orbicular; columella transverse, without teeth, externally callous, callosity contracting, and sometimes even covering the umbilicus.

NATICA *glaucinoides.*TAB. V.—*Three upper figures.*

SPEC. CHAR. Nearly globose, spire rather elongated; umbilicus simple, partly covered; upper part of each whorle slightly depressed.

WHORLES about five, the breadth of the lowest volution three-fourths of the length of the shell, the upper part a little flattened or even concave, the remainder gibbous. Umbilicus large, sometimes with a little appendage from the lip, projecting more or less conspicuously over it, and forming either a transverse ridge dividing the umbilicus, or a callous tooth. Shell externally glossy, of a light brown colour with some indications of darker brown bands.

The remark, that fossil shells differ from the recent ones, is here curiously verified. This shell in its general appearance so much resembles *Nerita glaucina*, that without comparison it was considered as the same species, but on observing it with attention it will be found sufficiently distinct, the spire in this will be found to be higher, nearly in the proportion of one-fourth to one-fifth, than in *N. Glaucina*. *N. Canrena* is yet shorter. I have seen twenty or more specimens all alike. The inner or umbilical lip is

coarser, and more apt to pass into a callous tooth-like projection over the umbilicus. These are found abundantly in the dark clay at Highgate, from the size of the upper figure down to the size of a small pea, varying somewhat in the spreading of the pillar lip, and having sometimes the lines of growth more worn and distinct; the outer lip being thinner or thicker according to its state of maturity. The middle figure shews the left lip more spread, thinner, and partly worn away on the body of the shell, and the projection half covering the umbilicus. I have named it as above, from its resemblance to *Nerita Glaucina*. The cast is sometimes found in clay, coated with dark Pyrites, or hollow, lined with crystallized iridescent Pyrites.

NATICA similis.

TAB. V.—*Two middle figures.*

SPEC. CHAR. Shell rather rhomboidal; spire short, umbilicus divided by a spiral projection, mouth slightly angular above.

SPIRE small, of three or four nearly flat volutions, giving a rhomboidal contour to the whole shell, the umbilicus double, or divided by a transverse spiral projection, terminating at the inner or left lip, forming an obtuse lobe, from which the lip afterwards spreads on the shell, and terminates abruptly against the curve of the upper part of the outer lip, a little like *Nerita pallidula*. I could not help being very much pleased with the extraordinary similitude of this specimen and a specimen of a recent shell, bearing the name of *Nerita rufa*, (see Mont. Test. Brit. Sup. tab. 30, p. 150) which it agrees with, excepting in colour and size, being smaller,

and the lobe not continuing the upper part of the outer lip: I have therefore designated it as a new and extraordinary species. It was found towards the surface of the Highgate clay stratum, where it is more or less mixed with the greenish sand. This shell bears some relation to *N. epiglottina* of Lamarcke, but differs in the general form, as well as in the form of the mouth and left lip, according to his figure. There being only these little distinctions between these species, I call this *Natica similis*. I have a cast about the size of the shell below, from Bognor, by favour of W. Borrer, Esq. that I judge indicates this species.

NATICA depressa.

TAB. V.—*Lower figures.*

Ampullaria depressa? Lamarcke, Ann. du Mus. t. 5, p. 32. t. 8, pl. 61, f. 3.

SPEC. CHAR. Nearly globose, subumbilicated; upper part and side of each whorle flattened, so as to appear nearly square; columella depressed beneath; mouth angular at the upper part.

SPIRAL volutions about six, flattened above; the large lower whorle loses that flatness at the upper part of the mouth; the right lip is undulated by the lateral depression, which reaches to the middle of the lower volution, which then becomes convex. The mouth is most acute at the upper part; the inner or left lip spreading a little, nearly in a straight line, gives it an almost lunate form. Umbilicus oblong, not very deep.

I have this shell only by favour of the Rev. P. Lathbury; from Woodbridge, Suffolk. It is whitish and chalky.

CASSIS, *Lamarcke.*

GEN. CHAR. Shell univalve, ventricose, gibbous; aperture longitudinal subdentated, terminating in a short reflected canal. Columella plicated on the lower part, lip flattened and forming a ridge on the body of the shell.

CASSIS *carinata.*TAB VI.—*Three upper figures.*

SPEC. CHAR. Shell pyriform; spire short; volutions depressed, angular, with many longitudinal striæ, and three nodose ridges; beak recurved.

SYN. *Buccinum nodosum, Soland. and Brand. Hantoniens.*

SPIRE short; rather acute; volutions six, angular, longitudinally striated, striæ rising, alternately large and small; mostly decussated with the striæ of growth. Three rows of prominences on the more gibbous part of the shell, the one at the edge of the depression most prominent, the other two concealed by each succeeding volution. Mouth oblong, a little contracted at the top by one or two tooth-like projections within the right lip, and two or three within the left lip; right lip reflected, broad, concave, retaining the striæ of the outside, joining the left lip at the top, which is also broad, plicated, and passes from the gibbous part of the shell over the umbilicus and the recurved beak.

This seems to be the shell figured in Brander's frontispiece. I received the specimens from Highgate, where several have been found in fine preservation. It is said to be found in

Arragon, and in the sandy hills of Tuscany. Thus we have something by which to make a comparison, as far as relates to similarity of formation. It is found either in the dark clay, or in the more sandy soil among it, at Highgate. The upper figures show the front and dorsal view of the shell. The middle figure is an internal cast, being yellowish Carbonate of Lime, showing the polished inside of the shell, which was filled with Indurated Clay and Pyrites; a little of the shell remains in a chalky state on some parts. It is always worth while attending to the casts of shells, as in some formations they only remain, and we may by practice learn to what shell they belong, which may prove abundantly useful. I have a small broken specimen, in which the inner lip is much spread, and having only one distinct row of projections on the edge of the more ventricose part, and the striæ are finer; perhaps it is a younger shell; it is filled with sandy clay. Also from Highgate.

CASSIS striata.

TAB. VI.—*Four lower figures.*

SPEC. CHAR. Shell ovate; spire acute; volutions oval, longitudinally striated, with one obscure nodose ridge; beak nearly straight.

SPIRE short, rather acute, volutions about six, covered with rising longitudinal striæ, which are all equal, except one close to the upper edge, and one between that and the nodose ridge, which are more prominent. Lines of growth indistinct. Mouth oblong, right lip reflected, broad, flat, toothed within; left lip broad, plicate, passing over the umbilicus

and part of the beak, which is straight in the young shells, but slightly curved in the old ones.

This species, as well as the last, is found at Highgate, and I do not know that it occurs elsewhere. It differs from the last in being longer in proportion to its width, and more regular in its form; it has but one row of little projections on a less angular ridge, below which the shell is most gibbous. The striae are mostly simple. The lips are nearly the same, but the right one is slightly toothed all along the inner edge; see the front and back views, right and left hand middle figures. The lower figures are from parts of larger and more mature shells, one showing the outer lip on the surface of the shell, which continues beyond it; thus it appears that this animal, like other shelly animals, may, after perfecting its shell, leave the former lip and continue its growth; it has some of the top of the newest lip left, joining the left lip, which is extravagantly spread over the body of the shell. The other figure is an amber coloured Carbonate of Lime cast of this species, it is distinguished from the cast of *C. carinata* by its regular surface wanting the nodose ridges.

These shells vary somewhat, so that some approach more than others to the last described. I am uncertain therefore whether it be correct to consider them as distinct species, and I am inclined to believe that Lamarcke supposes them to be only varieties. In either case the figures may prove useful.

MYTILUS.

GEN. CHAR. Bivalve longitudinal shell with an acute base; beaks straight, nearly acute, terminal; hinge mostly toothless.

MYTILUS amplus.

TAB. VII.

SPEC. CHAR. Shell depressed, triangular, acute-angled at the base; longitudinally striated, excepting over the posterior side; thin.

ALMOST twice as long as broad, depressed, triangular, length of the two sides unequal, two of the angles rounded, the third at the base acute. Valves acutely convex towards the base, with a slight curve; striæ impressed, arising from the beaks, and proceeding with some undulations to the extremity of the shell. Posterior side straight, a little waved, free from striæ. The shell very thin, and composed of fibres perpendicular to its surface.

I am obliged to my kind friend, Thomas Meade, Esq. for procuring me this specimen from the Limestone quarry at Mitford. It is worthy of remark, that this shell at first sight resembles a Pinna, it does not, however, appear even to have been open at the extremity, or gaping at the upper part, as the Pinna is.

MODIOLA.

GEN. CHAR. Bivalve nearly transverse, equilateral shell; posterior side very short, beaks lying towards the short side; hinge without teeth; a marginal linear groove to which the cartilage is fixed; only one muscular impression.

MODIOLA depressa.

TAB. VIII.—*Three upper figures.*

SPEC. CHAR. Much depressed, ovate, narrowing towards the posterior side; surface smooth.

THIS shell is about $2\frac{1}{2}$ times as broad as it is long, and thin, the margin even and very regularly curved, it is altogether very flat, but particularly so at the anterior side; the beaks are very slightly prominent, and are rounded. Lines of growth faint. External coat shining, pellucid, internal pearly.

This is not very rare at Highgate in the nodules of Septarium, at nearly the top of the great clay stratum, or in the clay itself, but then difficult to preserve, being so extremely tender, that, as the clay shrinks in drying, the shells crack and scale off in pieces, else the appearance of an epidermis is almost to be recognized. The pearly iridescent lustre of the inner coat inspires the finder with ecstacy, on account of the riches in his possession, which are perhaps to be preserved only for a few hours. The upper figure is from a specimen on a rather hard sandy piece of a Septarium, on the under side of which are a pair of Solen affinis. In the specimen below, taken out of the clay, the outer coat is preserved. The small specimen in the middle of the plate is from a Septarium found near Whitby, it is much thickened by fibrous Carbonate of Lime.

MODIOLA pallida.

TAB. VIII.—*Three right hand lower figures.*

SPEC. CHAR. Oblong, gibbous, smooth, inferior margin straight, posterior side slightly swelled, beaks obtuse.

BREADTH above twice its length, bluntish at the beak, and rounding at the other end with an angular turn towards the hinge; striæ of growth distinct; shell a little glossy.

I am indebted to our indefatigable friend, A. B. Lambert, Esq. for specimens of this in flinty Chert, found at Fonthill, adjoining the Limestone quarries, where many shells are partly dissolved as it were in Flint, Hornstone, or Calcedony. This shell, as well as most others, among which are Ammonites, Tellens, &c. are rather Calcedony.

MODIOLA lævis.

TAB. VIII.—*Left hand lower figure.*

SPEC. CHAR. Subtriangular, very smooth, convex, inferior and posterior margins nearly straight, united by a short curve; beaks small.

BREADTH rather less than twice its length, very smooth, scarcely showing the lines of growth, inferior margin nearly equal to the anterior margin, posterior side protuberating a little, anterior side rather depressed.

A little congregation of these are on a piece of foetid Limestone, or Swinestone, of some Authors, sent me by Miss E. Hill, who gathered it the ruins of Cærphilly Castle, Glamorganshire. With it I received this remark, that “this Castle was built by Robert Fitz-hammon, in the year 1110, and the stones of Barry Island have the same shell in much the same state, and consequently no visible change has taken place in 702 years.”

MODIOLA parallella.

TAB. IX.—*Upper right hand figure.*

SPEC. CHAR. Shell transverse, anterior and posterior sides parallel; covered with transverse furrows.

NEARLY twice as broad as long; acutely convex; beaks rather sharp; transverse furrows or striæ few, diverging from the beak; inferior margin straight, short, and almost at right angles with the sides, which are nearly straight and parallel.

I found this in a quarry near Maidstone; it is in a darkish Limestone which may perhaps be compared to the Blue Lias of Bath; it is only the impression of the outside. I have met with no other specimen of this species.

MODIOLA elegans.

TAB. IX.—*Left hand upper figure, middle figure, and lower figures.*

SPEC. CHAR. Oblong, gibbous, inferior margin straight, dentated; anterior side covered with transverse furrows; posterior side swelling, smooth, with a few transverse furrows near the base.

GENERALLY about twice as long as broad, moderately convex, beak a little curved; striæ neat, close, a little undulating, passing from the beak over the most prominent part of the shell, and diverging over the anterior side to the

base, and half way over the posterior side, when they become obsolete, but appear again close to the beak; the inferior edge is serrated so as to resemble an Arca.* The superior margin is semicircular. The coat looks like an epidermis; the inner coat is often richly pearly and iridescent.

Highgate has produced this species in great abundance, in very large clusters much crowded and jumbled together, from half an inch to two inches in breadth. They are very apt to scale into laminae coat after coat, till the surface is altogether pearly. I had a fine specimen found about 300 feet deep in the clay bed in Richmond Park, but the clay which I dried very carefully, yet shrunk from the shell, so that only the impression remains.

Bognor, in Sussex, affords this shell, I believe, but rarely, the specimen figured at the bottom of the plate is perhaps distorted by some accident; if not, it might be distinguished by its peculiar contour, as it is somewhat thicker than wide, with the posterior side depressed, which gives it a bow-like curvature. I had this specimen by favour of a great friend to the science, W. Boys, Esq. F. L. S.

* In *Mytilus Bidens*, which this shell much resembles, the serratures on the hinge are very prominent, and pass all round the edge of the shell, and are distinctly marked at the beak. Ours appears also to have hinge teeth at the beak.

HELICINA, *Lamarck.*

GEN. CHAR. Shell subglobose, without an umbilicus; Aperture entire, semi-ovate; Columella callous, flattened at the lower part.

HELICINA compressa.

TAB. X.—*Three middle figures.*

SPEC CHAR. Spire flattish, an elevated thread surrounding the upper part; Mouth a little angular above.

DIAMETER about half an inch, height about one-third of an inch, shell very thick and strong.

I was favoured with this specimen from Leicestershire, by Mr. Milne, F.L.S. it is in a dark coloured Limestone, and has the outside of the shell very perfect; the callous columella taking place, as it were, of the umbilicus, is very curious, and remarkably well preserved for a shell which is so completely mineralized. I am not sure that this will quite agree with Lamarck's Genus *Helicina*, and indeed he himself seems very doubtful whether the species he has given, and calls *dubia*, really belongs to it.

HELIX.

GEN. CHAR. Shell globular or orbicular, with a convex or conoidal spire; Aperture entire, wider than long, diminished in its upper part, by the projection of the last turn but one of the spire. A small spiral umbilicus runs nearly through it.

HELIX carinatus.

TAB. X.—*Upper and lower figures.*

SPEC. CHAR. Spire short, conoidal, of three or four turns; a raised, flat, ribband-like projection passes from the lateral edge of the mouth along the middle of the last turn, till it meets the inner edge of the mouth, whence it continues between the volutions to the end. Umbilicus open.

GREATEST diameter nearly two inches, length about one inch and an half. Upper part of the whorles, as well as the ribband-like projection, transversely striated.

I was favoured with this specimen from near Settle in Yorkshire, by Mr. Duckett; it is in solid grey Limestone; the inside cast is distinct in some parts where the shell appears to have been broken. That part of the shell which remains, is now nearly transparent Carbonate of Lime. I expect this is not common, as I have never seen it in any other collection.

SOLARIUM.

GEN. CHAR. Shell univalve, depressed, conical, nearly discoidal, umbilicated; Umbilicus spreading, crenulated or denticulated at the margin of the volutions: Aperture approaching to quadrangular. Axis oblique.

SOLARIUM patulum.

TAB. XI.—*The lower right hand figures.*

SPEC. CHAR. Depressed; whorles smoothish, margins keeled and crenulated; Umbilicus spreading; margin of the umbilicus strongly denticulated.

Lamarck *Ann. du Mus.* 4. 53. and 8. *Tab.* 35. *f.* 3.

DIAMETER from three-eighths to three-fourths of an inch. Length nearly half its width. The umbilicus is curiously and beautifully ornamented with a crenulated border, surrounded by a row or two of small denticulæ. The flattish disk-like surface swelling a little, has longitudinal striæ with more or less fine transverse marks over it. The outer angle of the shell is sharpest, the upper surface of the edge is milled, as it were, with oblique transverse striæ causing small oblong risings like the oblique milled edges of Guineas. The shell is also longitudinally striated beneath.

Found rather abundantly in the dark clay stratum at Highgate. It approaches very much to Brander's tab. 1. fig. 7 and 8. but is nevertheless distinct; it may be considered cotemporary with the Hampshire fossils.

TAB. XI.—*Left hand lower figure.*

THIS specimen is from Highgate. It appears to be an old specimen of the last species, in which the crenulations of the umbilicus, and the milling of the upper edge, are become nearly obsolete. The shell itself is in a very decayed state, but in those parts of the umbilicus where any of the shell remains, the crenulations have the appearance of ragged transverse wrinkles, except at the inner part of the umbilicus, where they resemble those of the last.

TAB. XI.—*Left hand upper figure.*

THIS is also from Highgate, it appears to be the cast of the inside of *Solarium patulum*, but is larger than usual, and there is some doubt if it be not the inner cast of a new species. It is however remarkable, and worthy of a figure,

being so very perfect and large ; besides it becomes instructive as it much resembles, and has been taken for a serpula.

SOLARIUM discoideum.

TAB. XI.—*Upper right hand figures.*

SPEC. CHAR. Discoid, outer edge sharply carinated ; edge of the umbilicus rounded, transversely wrinkled ; aperture obliquely elliptical, pointed at each end.

At first sight, the discoid appearance of this shell, when the spire is downwards, is perhaps sufficient to distinguish it. It is a remarkably neat shell. The outer margin on the under side is remarkably plain and almost longitudinally canaliculated. The outer edge is very acute. The upper side has a broadish margin, rather irregularly and obliquely striated transversely, and a little undulated, which is scarcely continued up the spire. The spire has six or seven whorles, and the whole though broadish is rather acuminate at the apex. The mouth has a long rhomboidal appearance, the outer edge being most acute.

This shell, which is remarkably well preserved, was found in Barton Cliff, Hampshire, by the Rev. F. Iremonger, by whom it was presented to me.

SOLARIUM conoideum.

TAB. XI.—*Three middle figures.*

SPEC. CHAR. Conical, smooth ; Aperture quadrangular ; Umbilicus deep, narrow.

THIS has apparently an almost square aperture, it is a higher cone than the former ones, and the middle of the volutions are a little depressed, otherwise it is exceedingly plain and smooth.

Sent me from Portland several years since by Mr. Bryer, whose loss I always regret when his favours come to hand. On account of its peculiar characters, I think it claims a place here.

The shell is almost worn away, and is chalky ; the cast of the umbilicus is figured at the bottom, which shows that the inner spiral edges were crenated ; this also indicates the height of the shell.

AMMONITES.

GEN. CHAR. Volute, chambered, siphuncled, septa of the chambers undulated at their margins.

AMMONITES discus.

TAB. XII.

SPEC. CHAR. Discoid, outer edge acuminate; Aperture sagittate, half the diameter of the shell in length, and one sixth in breadth. Volutions concealing each other.

SHELL apparently smooth on the outer surface, very much flattened and acuminate on the outer edge. Aperture spear-head shaped. Septa of the chambers irregularly undulated. About four inches in diameter, half an inch in thickness.

This specimen is from the stone quarry near the house of industry at Bedford; it is in the cabinet of the Rev. T. O. Marsh, who has favoured me with the loan of it. It is a rarity, and as far as I know, a new species. The umbilicus is probably covered, which seldom happens with an Ammonites; we see it on one side so nearly covered, although on the other it is less so, that we conclude it would be wholly covered in more perfect specimens. The septa show on one side their waved margins at different corroded depths in the shell, which is more than can be seen in more perfect specimens, and it is agreeable to learn by what is left us to distinguish species. A good Naturalist will know, sometimes, by a part the nature of the whole, in subjects of

this kind. We may perchance meet with better and better specimens, but often a mere memorandum is all that may be found for ages, and such will frequently serve as a geological identification of strata, which is often very convenient, and it will be highly desirable that those who meet with these or common subjects, will notice them wherever they be, that the Author or others may be able to point out every place of their occurrence.

NAUTILUS *discus*.

TAB. XIII.

SPEC. CHAR. Depressed, edge flat, aperture oblong, volutions not concealed by each other.

ABOUT four inches in diameter; greatest thickness or width of the aperture half an inch. Turns of the spire about five. Chambers very numerous. Septa distant from each other about one eighth of an inch. Outer edge of the aperture narrower than the inner one, notched, owing to a small groove which runs round the outer edge of the shell. Siphunculus nearer to the inner edge of the septa.

This specimen was found in the dark Limestone formation near Kendal, and was actually sent me as a petrified sheep's horn. Unfortunately the outer part of the shell, or as it was called the horn, was lost. As I had not any specimen resembling this in my collection, I considered it as rare. In the early part of this work, we shall not be able to distinguish rarities or localities so well as might be expected: that deficiency, however, now Geology is so much attended to, will be supplied as we advance.

CARDIUM.

GEN. CHAR. Shell an equivalved bivalve, subcordate; valves dentated on their inner margins; hinge with central and lateral teeth, the two central ones oblique, approximating; those in each valve crucially receiving each other by mutual insertion; lateral ones remote and inserted.

CARDIUM Hillanum.

TAB. XIV.—*Upper figure.*

SPEC. CHAR. Shell nearly circular, a little oblique, covered with numerous concentric striæ, anterior part straightish at the edge, longitudinally furrowed.

THIS species is rather wider than long, it is a little gibbous; the rising spaces between the striæ are smooth, giving a peculiar neatness to the shell: the longitudinal furrows occupy about one fourth of its breadth.

A remarkably elegant species, with fine specimens, of which I have been favoured by Miss E. Hill, of Tawstock, a Lady well known for her great attention to Fuci, &c. who desirous of seeing every thing figured from as good specimens as possible, presented me with her very best. Finding Mr. Parkinson at a loss for a name, and that the shell was sufficiently distinct from *Cardium discors* of Lamarck, I call it *Hillanum* thinking Miss Hill's attention and assiduity highly deserves to be remembered. The shells are siliceous, and are from the remarkable micaceous Sandstone stratum at Blackdown, near Cullumpton, Devonshire, a place rich in such curious productions, as will occasionally be shewn.

CARDIUM Plumstedianum.

TAB. XIV.—*Right and left hand upper figures.*

SPEC. CHAR. Subcordate, smooth; anterior part longitudinally furrowed.

IT has so much of the outer contour of the shell above, that it has been doubted whether they may not be the same species, the outside, however, does not seem at any time to have had the rising concentric lines, only the irregular and less distinct striæ of growth; and the lateral longitudinal pleated furrows cover but one fifth of the surface, and are terminated at the edge of the shell by longer and sharper serratures. The serratures round the other parts of the shell are not seen from the outside.

This is a rare species, but I was so lucky some time since, as to procure the specimens figured, and some smaller ones. It is fortunate when the inside of the shell is understood perfectly, on account of its preventing doubt as to the genus to which it belongs. The specimens are found in a loose mixture of sand, fragments of shells and gravel, above a stratum of gravel and covered by several layers of different sized gravel, one or two of which have such large pebbles, that they must have been laying very quiet when they were deposited, or they would have been inevitably crushed to pieces. The texture of shells found in gravel or clay is extremely delicate, and will scarcely allow the handling of them, indeed the contrast of a warm hand has made some specimens fall to pieces. Some of my friends soak them in Linseed oil to strengthen them, which protects them when dry, but gives them a disagreeable odour. I should imagine that to impregnate them with a little gum water would in most instances be pleasanter.

TAB. XIV.—*Middle figure*

represents a Cardium, of which I have many specimens, found in large masses of hard marle, near Bury St. Edmund's, which marle is replete with the Serpulæ with a sharp quadrate shell and round aperture. It resembles the upper one, but the concentric prominent striæ are wanting; and approaches nearer to the Plumstedianum, except in the breadth of the space covered by longitudinal striæ which continues further in proportion.

CARDIUM nitens.

TAB. XIV.—*Lower right hand figure.*

SPEC. CHAR. Roundish, hinge end rather shouldered; smooth, shining; marked all over with faintish longitudinal punctated lines, which are rather more distinct at the anterior side.

GENERALLY from one fourth to one half an inch in length as well as breadth; each shell nearly round, the end at which the hinge is situated is rather square, owing to a straightness of that end of the shell. Lines of growth indistinct, sometimes rendered visible by marks of a darker colour than the rest of the shells. It is most commonly white, but is rather variable, sometimes plain, but generally beautifully zoned with a dark bluish tinge.

This species is found abundantly at Highgate, and occasionally the specimens are not difficult to detach from the dark clay or marle which has enveloped them and preserved them so perfectly, that they resemble recent shells. They are conspicuous for their dark blue-grey concentric

striae of different widths, relieved by a more or less beautiful nearly white china-like ground. The insides are all so lined with marle or crystallized Carbonate of Lime, that the teeth of the hinge cannot be seen.

TAB. XIV.—*Left hand middle figure.*

This much resembles the last, and is probably only a variety of it, but it differs in being apparently quite smooth, to the unassisted eye, it is however striated; there are a few broadish concentric lines of a light brown colour on the shell, which is otherwise almost white; it is rather a gibbous shell. The pair figured were found exposed on a darkish brown marly piece of Septarium from the Highgate Clay stratum.

TAB. XIV.—*Right hand middle figure*

much resembles the last, but is smoother on the most prominent part of the shell, and does not shine so brightly: it is rather flatter, and nearly of an uniform light brown colour. This is in a more sandy Septarium from Highgate.

TAB. XIV.—*Left hand lower figure.*

The only material difference between this and the three foregoing, is its more rhomboidal appearance, though it is proportionally rather longer. It is rather paler in colour than the last. Also from Highgate.

The four specimens last described are probably only varieties of each other; I have, however, met with some who consider them as distinct species.

TEREBRATULA.

ANOMIA Linn.

GEN. CHAR. Shell an equal sided inequivalved bivalve; beak of the largest valve prominent, perforated; a pair of curved surfaces on each side the beak, and two shelly elongated appendages form the hinge.

TEREBRATULA subrotunda.

TAB. XV.—*F. 1 and 2.*

SPEC. CHAR. Circular, depressed, smooth; valves regularly and equally convex; beak short.

LENGTH three-fourths of an inch, rather wider than long; slightly angular on each side the beak; the larger valve in some specimens a little deeper than the other.

Found in the hardish Chalk about Hornisham in Wiltshire, where they are often preserved of a beautifully silky lustre. The shells are scaly, and seem but little altered. My friend Mr. Meade has sent me specimens an inch and a quarter long from Cornbrach, inclining to a reddish colour, seemingly but very little altered, which may be a variety of this, but the perforated beak is more protruded, and the contour rather inclining to squarish. They were found in a soil partaking of Limestone with Ochraceous Iron. Dr. Sutton has sent me specimens from Suffolk: Lady Aylesford kindly forwarded some to me from a Limestone quarry near Warwick, with curious crystals of pellucid Carbonate of Lime covering the horn-like appendages of the hinge, and lining the shell, see f. 2. It is abundant in many places.

TEREBRATULA ovata.

TAB. XV.—F. 3.

SPEC. CHAR. Ovate or oblong-ovate, depressed, smooth; small valve flattish, slightly pentagonal.

SAME size as the last, but longer than wide; the beak being protruded gives it an ovate form.

Chute, near Heytesbury, in Wiltshire, to which place I was conducted by the family of my late worthy friend, Mr. Cunnington, affords a most curious variety of extraneous fossils, mostly agatized, among which this shell is found. Some parts of the shell are whiter than others, owing to a little Carbonate of Lime. The rings of Vermicular shells are conspicuous, as is frequent with agatized or siliceous shells found in green sand. The spot where these shells are found is not above half an acre square, and after plowing, it is astonishing what an abundance of organic remains appear, as if some great Cabinet had been thrown away there, with some perfect, some mutilated, and some obscure subjects. I was so engaged an hour there, that I used all the time I had to find what I could, promising to notice the surrounding country another time.

TEREBRATULA punctata.

TAB. XV.—F. 4.

SPEC. CHAR. Oblong, depressed; valves equally convex, edge straightened at the front: the whole surface finely punctated.

LENGTH one inch and a quarter; width one inch. The very minute punctums are arranged in undulating lines, these, although to be found in most of the smoother species under the usual coat, are most conspicuous on the surface in this.

Abundant in the same dark Limestone, sent me by Lady Aylesford, with No. 2, at a place called Hornton stone quarry; they are sometimes sattiny, and white externally, and sometimes of a dusky brown, enclosed in Limestone of

the same colour ; within the shell is white pellucid Carbonate of Lime, beautifully crystallized in primitive rhombs, and several varieties with truncations, bevillings, &c. and sometimes of a pretty pink colour, sometimes yellowish with spots of Oxide of Iron and Manganese ; some rounding, not unlike B. M. Tab. 436 & 437, and these line the shell and cover the corneous processes, very elegantly pointing them out. Some Sulphuret of Zinc or Blende was in the Limestone with them.

TEREBRATULA carnea.

TAB. XV.—F. 5 and 6.

SPEC. CHAR. Depressed, smooth, obtusely five sided, front edge short, valves equally convex, slightly flattened along the middle.

AN inch or more in length, and the same in width ; often of a dull red colour, the margin is not undulated as in the next species.

The soft Chalk of Trowse, near Norwich, affords the most perfect specimens of this species, which seem so little altered, that they look almost as if some one had contrived to gather them fresh, and after taking out the animal, had buried them in the soft Chalk, which had afterwards hardened a little. They are remarkable for being of a fleshy red colour. Being enabled to empty the shell, I have an opportunity of showing the inside with the curious hinge and appendages, f. 6. I have received similar shells from the softish Chalk near Warminster, as well as from Devizes, by favour of Mr. Salmon. Darker varieties were found about Coteswold, Gloucestershire, by Mr. Richard Taylor, jun.

TEREBRATULA subundata.

TAB. XV.—F. 7.

SPEC. CHAR. Nearly circular, depressed, smooth, valves equally gibbous, front margin straight or slightly depressed in the middle, with one undulation on each side of it.

LENGTH about one inch, rather longer than wide, front margin but slightly undulated ; the surface more uniformly convex than in the last.

These are found in the softish Chalk at Warminster, and are sometimes of a fleshy red colour, like those found near St. Giles's Gates, Norwich, but differ in the roundness and undulations; perhaps among a great many specimens they might be found passing into each other. I could not get any one to show the inside.

TEREBRATULA *intermedia*.

TAB. XV.—*F. 8.*

SPEC. CHAR. Obscurely five sided, rather depressed smooth, larger valve most convex, front margin undulated; three depressions in the smaller valve, and two in the larger.

AN inch and half in diameter, the moderately deep undulations extend half way along the shells, the remainder of the valves are regularly convex.

This species, from Cornbrach, was sent me by Thos. Meade, Esq. The circles of growth indicate a nearly straight truncation in the front, when very young, but it is distinctly undulated when full grown. It is commonly of a reddish brown colour.

I have the same from Felmersham near Bedford, through the kindness of the Rev. T. O. Marsh.

TEREBRATULA *semiglobosa*.

TAB. XV.—*F. 9.*

SPEC. CHAR. Nearly circular, gibbous, smooth; largest valve deepest and uniformly gibbous, front margin undulated, with two risings in the smaller valve.

ABOUT one inch long, width nearly as much. It is so gibbous as to be sometimes as deep as long. The undulation is remarkably conspicuous in a side or front view, though scarcely perceptible if viewed from the top or under-side, which the outline explains.

These shells are from the harder Chalk near Warminster. They are generally filled or lined with very clear Quartz, and sometimes the outer part or shell is partly Quartz, and partly Chalk. Mr. Cunningham is the friend to whom I am indebted for them.

SCALARIA.

GEN. CHAR. An univalve turreted shell, with sharp longitudinal raised ribs. Aperture nearly circular, with an uninterrupted bordered and reflected margin.

SCALARIA similis.

TAB. XVI.—*Two upper figures.*

SPEC. CHAR. Whorles contiguous, spire with five or six rounded transverse elevations, close to each other, and somewhat decussated, the lowest most prominent. Ribs distant, circular.

LENGTH an inch and an half, greatest width about half an inch. Volutions about seven.

I received the first specimen of this shell from Bramerton, near Norwich, a few years since; in 1812, Mrs. Cobbold favoured me with the same species found by herself at Holywells, near Ipswich. I do not know that more than one or two, nearly perfect specimens, have been found, neither have I learnt that it has been met with elsewhere. It is so like the Turbo clathrus of Linnæus (now Scalaria of Lamarck), that we have but one strong character to distinguish it by, the round transverse elevations. The specimens are generally so brittle, that they are apt to fall to pieces by being moved from a moderate temperature into an hand a little warmer, when they usually separate at one of the ribs, so neatly as not to spoil the contour of the shell, as they only appear smaller in proportion to the number of ribs separated. I call it similis from its resemblance to the Linnæan species, and one figured in the Annales du museum, which is there called Scalaria decussata, the mouth of which is, however, drawn much smaller, though this may possibly be some mistake of the draughtsman or engraver.

SCALARIA semicostata.

TAB. XVI.—*Middle figure.*

SPEC. CHAR. Volutions contiguous, spire transversely striated, ribs numerous, but slightly raised, lower part of each volution smooth, naked.

LENGTH half an inch, greatest width three-sixteenths. The ribs scarcely cover two-thirds of each volution. Volutions about seven.

This pretty specimen was among some of the earth accompanying other shells from Barton Cliff, kindly sent me by the Rev. W. Bingley. I have hitherto seen only this one specimen. The transverse ribs terminate rather abruptly a little above the mouth, nearly where there generally is a prominent line in some of the species, especially in the next.

SCALARIA acuta.

TAB. XVI.—*Two lower figures.*

SPEC. CHAR. Volutions rather distant; spire with three slight transverse risings, and a fourth very prominent one, near the lower part of each turn. Ribs recurved, expanded, and acutely angular at their upper ends.

LENGTH eight-tenths of an inch, width four-tenths. Volutions about seven. The reflected margin of the mouth is extended at the upper part into a kind of short flat spine; the ribs unite the volutions to each other, and form a flattish space on their upper part. I am glad to present another extraordinary novelty and rarity, by favour of Miss E. Bennet, whom I have before mentioned. It is quite a new *Scalaria* from Barton Cliff. That Nature is ever treating us with variety and beauty is admirably exemplified in this production. The ribs and lowest transverse risings particularly distinguish it by their forms, giving a new contour to the whole.

I have observed another larger specimen of this beautiful and singular shell in Mr. Bullock's Museum, and there is a smaller one in Miss Bennet's collection.

AMMONITES acutus.

TAB. XVII.—*Fig. 1.*

SPEC. CHAR. Involute, rather depressed, inner turns half exposed, surface with straight projecting radii extending over the interior half of each whorle; margin crenated. Aperture triangularly cordate, two-fifths of the diameter of the shell in length. Volutions three or four.

SHELL about one inch in diameter, and one-third of an inch thick, slightly carinated, flattish at the edge, with about three crenatures to each of the radii.

This is from the cliff near Minster on the Isle of Sheepy, it is a cast in blackish Pyrites, but after some years has luckily not begun to decompose, and still looks neat and elegant. On some parts the calcareous shell remains of a dull brown colour. The mouth is filled with little tuberosc accretions of Pyrites, giving it the appearance of the mouth of a cornucopia.

AMMONITES cordatus.

TAB. XVII.—*Figures 2 and 4.*

SPEC. CHAR. Involute, rather depressed, carinated, inner turns half exposed; surface with angular, projecting, undulating radii, extending over the inner half of each whorle, the remaining half covered by diverging undulations terminating in a crenated margin. Aperture cordate, two-fifths of the diameter of the shell long. Volutions four or five.

FROM one to two inches in diameter, and about one-third of its diameter in thickness; generally about five external undulations to two radii; no depression upon the edge.

The specimen, figure 2, shows the exterior surface of the

shell; on it the radii are nearly equal in their thickness throughout, the external undulations are very prominent at their commencement, and the keel projects but little, hence the whole has a flatter aspect than No. 4. I gathered it myself in the better light coloured Limestone of Shotover in Oxfordshire, about the year 1805. It is often found larger, but seldom so perfect.

No. 4 represents a cast of the interior, the radii terminate with an acute prominence, from which they sometimes branch into the external undulations, these are not so prominent as in No. 2. The margin or keel is also broader and thinner than that of No. 2, its general contour is more uneven, and its sides appear more concave. I am much inclined to consider it as a distinct species. The specimen is a fine and instructive one, showing at the broad end the construction of the septa in an handsome manner, with the undulating and branching articulations which often give elegance to a specimen. This specimen is covered on the external part by an ochraceous Iron: the inside is light coloured Carbonate of Lime crystallized. It was sent me from Somersetshire by the late Mr. Cunnington.

AMMONITES quadratus.

TAB. XVII.—*Fig. 3.*

SPEC. CHAR. Involute, rather depressed, carinated, inner whorles half concealed; surface with projecting furcate undulating radii extending into a crenated margin. Aperture obtusely square, in length about one-third the diameter of the shell. Volutions four or five.

AN inch and an half in diameter, and less than half an inch thick, the radiating undulations are nearly regular in their thickness, they are forked about the middle of the whorle, where some short intermediate undulations commence without any regularity: the margin is not flattened.

Robert Sparrow, Esq. of Worlingham Hall, Suffolk, kindly lent me this specimen; it is an hollow chambered cast in semitransparent Calcedony. It was found in a gravel pit at Brandestone, near Framlingham, Suffolk, in 1781.

SCAPHITES.

GEN. CHAR. A concamerated shell, commencing with a depressed volution, the last turn of which, after being enlarged and elongated, is diminished and reflected inwards.

SCAPHITES *equalis*.

TAB. XVIII.—*Figures 1, 2, and 3.*

SPEC. CHAR. Involute, umbilicated, inner whorles concealed, surface with projecting distant radii extending all round the whorle; outer part rounded with about two projecting striæ between and equal to each of the radii; outer whorle ventricose, the radii upon it much enlarged, and abruptly terminated before they reach the edge.

THIS is an even shell, a little more than an inch long. On account of the imperfection of the specimen, I am not sure that the mouth is incurved.

I received this specimen some years ago, by favour of the indefatigable and highly intelligent Dr. W. E. Leach, from Yeovil. I place it under Mr. Parkinson's new genus *Scaphites*, not with the strictest propriety, but in the present infant state of our knowledge, it may be convenient, as it agrees so nearly with the next. Figure 1, is a side view. Figure 2, shews the front with the volution central and a flinty grain or two of sand. Figure 3, is a section through one of the concamerations, exposing part of the undulations, not always to be seen in such marly stone casts. The coat or remaining part of the shell has a little of the pearly lustre. It is from the green sand formation.

SCAPHITES obliquus.

TAB. XVIII.—*Figures 4, 5, 6, and 7.*

SPEC. CHAR. Obliquely involute, umbilicated, inner whorles concealed, covered by transverse striæ, dividing into two or three near the outer half of the whorle, which is rather flattish and broad, and uniting again on the other side.

THE obliquity of the curve of this shell, and the smallness of those striæ or radii that cover the last whorle, are the characters that distinguish this from the last. The last whorle is much incurved. Length nearly an inch, width about three-fourths of an inch, greatest thickness half as much. A specimen, or rather a cast, found in the hard chalk near Warminster, in possession of Miss Bennet, measures an inch and a quarter in length.

The specimens here figured are from Hamsey Marl pit near Lewes, in Sussex. I was favoured with them by G. A. Mantell, Esq. and I am happy to show that this rarity is found in the marley stratum, as well as in the chalk, in the neighbourhood of Brighton. I have given two views, the one a profile, the other a more dorsal one, to show that the transverse striæ are narrower at the smaller spire, and wider as they approach the returning spire, where they are about twice as distant. The left hand lower figure shows a front view and the obliquity of the spire. The segment on the right hand was broken off to show the concamerations, but very little of them are preserved.

The contour of the shell should have been shown more swelled in the middle of the figure.

LINGULA.

GEN. CHAR. An equivalved equal-sided bivalve shell, hinge none, the base or beak of the valves pointed, and united into a tendinous tube, serving for a ligament of attachment, and which extends over the valves in a membranous form, open at the front.

LINGULA mytilloides.

TAB. XIX.—*Figures 1 and 2.*

SPEC. CHAR. Ovate, anterior end slightly truncated; beak indistinct.

NEARLY an inch long, and three-fifths wide, the older shells are flatted towards the front, with rather a straightish edge. Shining and of a greyish blue colour.

These are mostly found in pairs at Wolsingham in the county of Durham, in a dark coloured Limestone. I am told they are sometimes larger than the figure. They are preserved so well that they have the appearance of a recent muscle.

LINGULA tenuis.

TAB. XIX.—*Fig. 3.*

SPEC. CHAR. Elongated, lanceolate, anterior end truncated.

ABOUT three-eighths of an inch long, and not more than one-third in width; flattish, with a bright shining surface, the anterior edge short and straight: colour reddish brown.

This, although not unfrequent in the sandy stones which are so commonly found at Bognor, with the *Arca barbata* (now *Pectunculus* of Lam.) which is also found at the Isle of Dogs (see tab. 15, B. M.) has, I believe, generally been

overlooked, from its smallness. It is nevertheless very distinct and pretty when examined. I have only seen single valves, they are accompanied by some *Anomia*, &c.

LINGULA ovalis.

TAB. XIX.—*Fig. 4.*

SPEC. CHAR. Depressed, oblong-oval, anterior edge circular, beak very short.

HALF an inch long, a quarter of an inch wide. The young shells of *L. mytilloides*, although they scarcely show the truncated edge, are to be distinguished by their being more elevated in the middle, and more acute at the posterior edge.

I have only seen a cast of this species, it was found in a lump of a hard white marley stone, among the sand, above the Clay stratum near Pakefield in Suffolk, by Mr. John Thurtell, who has favoured me with some curious shells from that county, it is accompanied by some striated *Ammonites*, *Tellinæ*, &c.

This genus of shells does not appear to have been noticed as fossil. It is very rare in the recent state, and I believe but one species is known, which Linnæus, having seen only one valve, very naturally called *Patellaunguis*.* The specimen from which Cuvier's figure in the *Annales du Museum* is taken, is one of those which were originally Seba's. Cuvier dissected it, and has given figures of all the parts of the animal, from which it appears that the shell is covered with a membrane, by the action of which alone it is enabled to open its valves. The animal has two tentacula or arms, with which it procures its food and conveys it to its mouth. He found that it has two hearts.

* Mr. Sowerby has published a plate containing figures of the recent species of this genus from good specimens in Mrs. Mawe's collection; it may be had separate.

VENUS lineolata.

TAB. XX.—*Upper Figure.*

SPEC. CHAR. Rather gibbous, ovato-subcordate; four-fifths of the surface covered with obscure zigzag striæ; anterior side smooth; edge entire.

SYN. *Venus castrensis* of Linn. *Parkinson Org. Rem.* 3. p. 187.

LENGTH about one inch and three quarters, width about two inches and an half; the beak is rather prominent, and the thickness of the shell not remarkable; the cicatrix is cordate, but not well defined.

This is the *Venus* from Blackdown, near Collumpton in Devonshire, spoken of by Mr. Parkinson, and which I had much wished to see, and my wishes were soon gratified, for almost the same day a parcel arrived from Miss Hill, with this extraordinary specimen, which, notwithstanding the great change that has taken place in its substance which is now siliceous approaching to Agate or Calcedony, has the elegant zigzag lines yet distinct. It adheres by its inside to agglutinated sand so strongly, that I could not attempt to get at the hinge without danger of spoiling it; I therefore have placed with it a shell which shows the hinge, and from the outward contour appears to be of the same genus. The numerous greenish black particles of Chlorite in this sand characterize the stratum.

This shell does not agree with Linnæus's description of *Venus castrensis*.

VENUS planus.

TAB. XX.—*Lower Figures.*

SPEC. CHAR. Rather depressed, subcordate, slightly angular towards the anterior side; surface smooth; edge entire.

ABOUT two inches and an eighth in length, and two inches and three-eighths in width; a strong but not thick shell; the cicatrix is lanceolate.

A dull corneus appearance, with a semitransparency and plainness of form, have given rise to the name; it is also from Blackdown, by favour of the same Lady as the above. The black particles of sand seem to have decomposed into a kind of ochre.

VENUS equalis.

TAB. XXI.

SPEC. CHAR. Uniformly convex, obcordate or nearly circular, covered with numerous transverse concentric striæ; thick, particularly in the middle; margin acute, extended, entire. Cicatrix obscure.

LENGTH and breadth nearly equal; a shell of three or four inches in diameter, is about half an inch thick; the anterior side rather rugged; striæ projecting, sharp. I received specimens of these some years since, by favour of the Rev. P. Lathbury, from Woodbridge in Suffolk; gathered in the cragg-pits. Dawson Turner and William Hooker, Esqs. have also favoured me with fragments. The two upper figures are from one specimen from Elmset, by favour of the first Gentleman; it is the most perfect I have seen. The fragment below is part of a larger shell, and shows the opposite hinge, and at the same time a wearing at the cavity where the cartilage probably was fixed, by which it is remarkably enlarged near the beak of the shell; besides some wearing about the rest of the hinge part, almost enough to make some think it another species. I have received a fragment of this and another species of similar proportions, much resembling *Venus Islandica* of Linn. from Holywell near Ipswich, found in a cragg pit on Mr. Cobbold's estate. These shells are mostly the Carbonate of Lime remaining from the recent shell, more or less coloured by ochraceous oxide of Iron; they are generally thick, particularly in the middle, and are of a thickly plated

structure. The hinge teeth, which are very thick and conspicuous, may be traced with attention to fit the other shell very conveniently, showing how they lock one into another.

These shells seem nearly allied, if they are not the same species as one figured in tab. 250 of British Mineralogy, which is in flint from Teignmouth, Devonshire. They at first sight resemble *Venus Islandica*, but they do not appear to be the same as Mr. Parkinson mentions at p. 188 of the third volume of Organic Remains, with which he was favoured by Capt. Gardner. I have a more similar one in sand, it is calcedonic, somewhat translucent with an opaque coating, and was sent me by Miss Hill from Blackdown. The hinge and contour are sufficiently preserved to show that it is not *V. Islandica*, corresponding with the idea that fossil shells do not accord with recent species.

MUREX.

GEN. CHAR. Univalve, spiral, ovate-oblong; base channelled, varicosely tumid; with rough, spinous or fringed, longitudinal and projecting sutures.

MUREX striatus.

TAB. XXII.

SPEC. CHAR. Shell ventricose, with many transverse rounded projections, and from three to five parallel striæ between each, crossed by other striæ or sutures. Volutions from three to six. Beak nearly straight. Mouth oval.

THE last whorle is much above half the length of the shell, and not very suddenly contracted into the beak. The longitudinal sutures or lines of growth are scarcely rough: the beak is rather wide. Grows to three or more inches in length.

This species, at first sight, much resembles *Buccinum undatum* of Linn.; the projecting of the canula in our species seems to be its distinguishing character. Some varieties very nearly accord also with the recent *Murex antiquus* of Linn. in shape, and their resemblance is greater or less as they are more or less worn; both agree in having the mouth on the right hand side. I have figured a full-sized

specimen, though not the largest, of a dark ochre colour, as found in the Essex and Suffolk craig pits, and peculiar to them. The next figure in proportion is of a lighter colour, and is from among many choice specimens with which I was favoured by Mrs. Cobbold, from the pit on the Holywell estate near Ipswich. The small smooth shell at the bottom of the plate is from the same place, and much resembles the young recent shells in the irregular swellings of the spire. This shell sometimes so nearly resembles *Murex contrarius*, that it has frequently been considered as a variety of that, having the mouth on the right, instead of the left hand side, and is thought very rare. I have them from the smallest to the largest size, selected in pairs, which often renders it really doubtful. It is rather remarkable that the mouths of the shells have a white almost chalky lining.

MUREX contrarius.

TAB. XXIII.

SPEC. CHAR. Spire reversed, volutions five or six, slightly expanded at the upper part, and contracted towards the beak: surface with many rounded projections or smooth. Mouth irregularly ovate; beak rather short.

Gmel. Syst. Nat. Tome 1. p. 3564.

THE last whorle is half the length of the shell, which is often very smooth, and three or four inches long. The spire is longer than in the last, and the volutions more equal.

This has always a more striking resemblance to the recent *Murex antiquus* of Linn. than the last, but the spire winds the contrary way. It is very rare to meet with a reversed recent shell of that species. The small specimen at the bottom of the plate appears to be a young shell, but the small shell figured in the upper part of the plate differs a little, it is rather longer in proportion, and has alternating larger and smaller striæ; the mouth is reversed also, but broader towards the top, and the canula is lengthened a little. May it not be specifically distinct? if so, it might perhaps be distinguished by its neatness, and called *Murex pulcher*.

AMMONITES serratus.

TAB. XXIV.

SPEC. CHAR. Involute, depressed, carinated, inner whorles two-thirds concealed; surface radiated and undulated near the circumference; keel distinct, sharply crenated, containing the siphunculus; aperture narrow, five-angled, half the diameter of the shell in length. Volutions five.

DIAMETER four inches, thickness one inch. The sides of the whorles are rather concave near the keel, which is nearly cylindrical, and from the sharpness of its crenatures, may almost be called serrated or jointed. The septa are close, with many deep undulations on their margins.

I do not know that this species has ever been found perfect. The upper specimen retains some of the shell in one part very perfectly; we see in it also part of one of the divisions of the shell prettily spreading into the small external sutures, and exposing the passage or hole of the siphunculus belonging to the turn within it; where the shell is lost, the various undulating ramifications, which have a kind of foliage-form, more or less perfect, are explained.

The under figure shows the frequent divisions, and that there are about five rather distinct principal undulations, which divide alternately, and lock into smaller sutures.

The centre whorles are very thin, and frequently lost, as in this specimen.

The middle figure exhibits a cast of one of the chambers formerly distinguished by the name of Spondylithes; it shows the shape and principal undulations of the margin of the septum, with the hole of the siphunculus through it, and the protuberating undulations outside.

When we have learned by some experience, that better are not to be obtained, imperfect specimens of organic remains must be used; they serve well to instruct us, and exhibit the internal organization, &c.

The specimens were a little larger than the figure, and are filled with a brown stony marle; the shell being somewhat like hardened chalk and yellowish, some are more decomposed, softer, and whiter or stained with ochre. They are found in the parish of Worlingham near Beccles, and are lent me by my friend, R. Sparrow, Esq. I have inferior specimens from other parts of Suffolk.

CHAMA.

GEN. CHAR. An attached unequal bivalve with unequal incurved beaks; hinge with one thick oblique and sometimes crenated tooth; two muscular impressions. Often crenated around a great part of the inner margin of the shell.

CHAMA haliotoidea.

TAB. XXV.

SPEC. CHAR. Flattish, oval, uneven, with one longitudinal curved line outside, and a deep curving hollow within the deepest valve, extending from the beak around one side; the remainder very shallow, margin thin, broad, slightly fringed, crenate within. Muscular impression large.

ABOUT an inch and an half long, and an inch broad; beaks subinvolute; anterior side of the upper valve marked with a long curved suture, and not fringed, whence it much resembles an *Haliotis*. Under valve attached by nearly its whole surface.

Figs. 1 and 3 represent the under valve; 2 and 4 the upper valve; and fig. 5 the cast of the inside, showing the crenated edge.

Miss E. Benett of Norton House favoured me with this specimen from the green sand formation in the parish of St. Mary Donhead, Wiltshire. Miss B. remarks that the upper valves are seldom found, although from Dinton, near Salisbury, to Stourhead, the deeper or lower shells of various *Chamae* are predominant.

The shells are siliceous casts, and belong to the green sand formation.

CHAMA canaliculata.

TAB. XXVI.—*Fig. 1.*

SPEC. CHAR. Oblong-oval, flattish, plated; deeper valve with a lateral canaliculated projection, or wing.

LENGTH an inch and a quarter; breadth, exclusive of the beak, one inch. The beak of the deeper valve is much curved towards the wing, but partly obliterated by the surface of adhesion. The beak of the other valve is very short, it has scarcely any wing; the margins of the different stages of growth cover the shells like deep folds of drapery. The surface of adhesion is between the wing and the beak of the deeper valve.

I could not separate the valves, so I judge from the outside appearance alone, that this belongs to the Genus *Chama*. It is siliceous, and accompanied by the green sand; found in a field at Chute, Wiltshire.

CHAMA recurvata.

TAB. XXVI.—*Fig. 1.*

SPEC. CHAR. Deep valve conical, curved; beak subinvolute.

THE hollow valve is a roundish deep shell, the surface is smooth, and the beak turned to one side. Hinge indistinct. I have not met with the other valve, but I suppose it to be flatter.

This also is composed of Silix, and is impregnated with a coarse ochraceous oxide of Iron. It is from Halldown, near Exeter, by favour of T. J. L. Baker, Esq.

CHAMA conica.

TAB. XXVI.—*Fig. 3.*

SPEC. CHAR. Oblong, curved; larger valve deep, with a blunt conical beak, and a small wing; lesser valve oval, flat, with a crenated margin and wing.

DEEP valve much larger than the other, about an inch long, and three-fourths wide. The hinge is peculiar, somewhat resembling a ball and socket.

I found this siliceous shell at Chute: its valves easily separated from the cast of the inside, which is composed of sandy marle, mixed with the green granular Talc which characterizes the stratum in which it abounds, and gives it the name of green sand.

CHAMA plicata.

TAB. XXVI.—*Fig. 4.*

SPEC. CHAR. Transversely ovate; beak short; deeper valve with a narrow channelled wing.

HALF an inch long, three-fourths wide; wing small, ear-shaped, deeply folded at its commencement, flatter and obtuse at its termination; hinge-tooth obscure or none: margin of the shell crenated within the edge. Surface of adhesion small. I have not seen the flatter valve of this. T. J. L. Baker, Esq. presented me with this specimen from Halldown: it is Silex coloured by oxide of Iron.

PECTUNCULUS, *Lamarck.**Arca, Linn.*

GEN. CHAR. A bivalve subequilateral shell, hinge with many alternately inserted teeth placed in a single arched row. Cartilage of the hinge partly internal, attached to a flat triangular striated surface.

PECTUNCULUS *decussatus.*TAB. XXVII.—*Fig. 1.*

SPEC. CHAR. Transversely obovate; sides rather straight; surface covered with numerous longitudinal striæ. Hinge teeth twenty-five to thirty. Margin thick, plain.

GENERALLY about half an inch wide, slightly depressed; besides the lines of growth, and distinct longitudinal striæ, which give the shell a beautiful appearance, there are many very close fine transverse striæ, which can hardly be seen without a lense.

Extremely common among the looser earth from the upper part of the clay stratum, thrown out from the excavation at Highgate, as also in the more dense pyritaceous depressed nodules or septaria, often surrounding the edges in multitudes. The middle figure is from an extraordinary specimen presented to me by the indefatigable friend to science, B. G. Snow, Esq. It was apparently a ball of Pyrites covered with these shells, lying in many directions, some filled with coloured Pyrites; but when broken at one end, it was found to be a rather irregular crust, containing within it a quantity of the new resinous substance in a state approaching decomposition, as it had lost its transparency, and is of an earthy aspect, looking like light brown dry cracked clay, but is readily inflamed. I am glad I had made a memorandum of it, as the Pyrites was in so forward a state of decomposition, that its falling to pieces could not be prevented, even under water.

PECTUNCULUS *costatus*.TAB. XXVII.—*Fig. 2.*

SPEC. CHAR. Orbicular, depressed, with twenty-five longitudinal sharp ridges, and a few transverse striæ; hinge of fourteen teeth; margin serrated within.

SHELL thin, somewhat variable in form: some specimens are rather oblique and angular; the ribs are not quite regular, being in some more distant than in others, with here and there a small intermediate one. The beak is not prominent. A few specimens are found an inch or more in diameter, the one figured is of a middling size.

Mrs. Tylee and the Rev. Mr. Bingley, have favoured me with variety of this from Hordwell Cliff. I wonder that Brander has not figured it, as it does not appear to be rare.

PECTUNCULUS *plumstediensis*.TAB. XXVII.—*Fig. 3.*

SPEC. CHAR. Transversely obovate, slightly oblique, with longitudinal obscure furrows and minute transverse striæ; margin serrated within.

BEAK rather prominent, obtuse; shell thin, nearly an inch wide.

Found in the alluvial sandy gravel of a small hill which contains many good shells, at Plumstead, near Woolwich. I believe it is seldom found whole, being very brittle. I have fragments larger than the one figured, and some minute whole shells; this may occasionally be worth noticing, as it may lead us to improvement in geological science, and probably serve to shew in what cases the shells remain in their original beds.

PENTAMERUS.

GEN. CHAR. An equal-sided inequivalved bivalve, one valve divided by a longitudinal internal septum into two parts, the other by two septa into three parts or valves. Beaks incurved, imperforate.

PENTAMERUS Knightii.

TAB. XXVIII.—*Upper Figure.*

SPEC. CHAR. Circular, with many longitudinal furrows; tripartite valve much depressed, with a short slightly-incurved beak; bipartite valve conical, gradually produced into a long incurved beak.

THE septa in the flat valve extend to its edge, they are near each other and parallel. The septum in the other valve divides the beak; the divisions extending to the edge of the shell, form a kind of double beak, much resembling the horny part of the toes of a pig's foot, and leave an angular hollow within the curve; the stone that fills this hollow commonly separates easily, and may at first sight be taken for a third valve of a triangular carinated form. The edge of the deep valve appears to extend over that of the flatter one: the length of the curve from the apex to the edge is often six inches.

About half a mile up the river Teme, near Downton castle, the dell is bounded by two steep rocks approaching

to each other, and the parts of the land above are level and alluvial, as if a lake had been there before the present chasm in the rock. On the southern rock (a dark grey limestone) these extraordinary split shells are found, and are situate about twenty feet above the level of the river. I am greatly obliged to T. A. Knight Esq., of Downton, for the first specimen of this shell in 1809; I have since received specimens from A. Carlisle, Esq., which have much assisted in illustrating its curious structure, collected by him when on a visit to the gentleman abovementioned.

Arthur Aikin, Esq., had observed this formation and the dividing of the under shells, and mentioned them to me at a meeting of the Geological Society in February, 1812, and Mr. Farey was so kind as to send me several specimens with the following interesting observations: "The divided shells which I sent to you were brought from Croft-Ambrey Park Limeworks, Herefordshire, about eight miles S.S.W. of Ludlow: the quarries are in a sudden valley $\frac{1}{4}$ m. N. of Croft Castle, where thirty feet thick of the rock is opened, a dun grey shattery Limestone with blue cores. A great many of the thin beds in this quarry abound with the divided shells in a very perfect state; and, with others, I also saw appearances of *Entrochi* and *Coralloids* in this rock, which here dips to the S.E. at the rate of about one in eight or ten, and it appeared to me to be the upper of the three Limestone rocks that I was hastily tracing in this neighbourhood in July, 1812, and to underlie a local patch of Clearhills coal measures, extending hence southward; and though belonging to the same limestone rock as Tinker's, Cairbarn, &c. hills to the N.E. and beyond the Teme, and in Hopton-Wafers, I do not find that they now join, but are separated by the wide excavated vale of the Teme, in the red marle and other under measures to this rock."

PENTAMERUS Aylesfordii.

TAB. XXIX.

SPEC. CHAR. Nearly circular, with longitudinal furrows; tripartite valve convex, with a prominent incurved beak; bipartite valve gibbous, incurved, conical, with a much incurved beak.

NEARLY resembles the last, differing only in the form of the smaller valve, which is more hemispherical, and has a more curved beak; the edges of the two valves meet in this, which I suspect is not the case with *P. Knightii*.

I think it possible that this may be another species, and may accord with some of Mr. Aikin's specimens from Yeo Edge. The largest is in the possession of Lady Aylesford, and is the finest I have seen. It is almost necessary to break these specimens in order to see their strongest characters, nor would Lady Aylesford's have been recognized but for the fracture at the apex, which displays the division at the beak. The left hand outline of Tab. 28. is the sketch of a section exhibited by a specimen from Amestry, in a coarse grey Limestone, among others in the possession of G. B. Greenough, Esq., it is of a pink hue, prettily relieved by the dark stone; it is filled with a crystallized mass of a light colour. Mr. Farey has specimens from Croft-Ambrey Park.

I cannot learn where Lady Aylesford's specimen was found; the one of which I have given two views below, and which is rather a wider shell, though scarcely different enough to be considered a distinct species, was picked up by Mr. Ryan at Colebrook Dale. It is from analogy that

I consider it to be of the same genus, for I do not consider it right to run the risk of spoiling the only one I have seen in search of internal evidence. I hope other specimens will soon be found, now that notice is taken of the peculiar structure of the genus, which will clear all doubts.

PENTAMERUS lævis.

TAB. XXVIII.—*Right hand Figure.*

SPEC. CHAR. Smooth, triangular, front rounding, beaks incurved.

MUCH less gibbous than either of the last; free from furrows, but having slight depressions over the septa; length generally less than an inch.

Not having found this in a perfect state, although I have had stones including hundreds of specimens, I have been doubtful whether I ought to admit it. The Rev. Dr. Abbot, of Bedford, in May, 1812, was so kind as to bring me pieces of rolled Limestone, with these small dividing shells, from near Hopton Court, where he thought they appeared to be left by the swell of the river Teme, and formed a bank three feet or more high.

Sometimes I think there are two species in the stone, a smooth and a furrowed one, but better chance than I have had must determine this; at the same time the formation is distinctly characterized.

The same stones contain the remains of Madreporæ. The specimen figured is from Bildwas, Shropshire, collected by A. Aikin, Esq. In some of his specimens I perceived the imperfect remains of small Entrochi.

SERPULA, *Linn.*

GEN. CHAR. Univalve, adherent, tubular, variously curved. Aperture round.

SERPULA *crassa*.

TAB. XXX.

SPEC. CHAR. Shell acutely conical, round within, three-sided externally, about four times as long as the diameter of the end at the aperture.

ABOUT an inch long, and one-fifth diameter at the mouth, the edges slightly waved, two of them attached to the substance the tube adheres to. Animal with a stellated bony termination to the proboscis.

This Highgate specimen is peculiarly interesting and important, inasmuch as it appears to be the first specimen of the kind noticed or perhaps found, and as it leads to the more attentive investigation of the recent species, the stellated organ that terminates the proboscis being preserved, and apparently serving as an occasional cover or operculum. I had not seen this stellated organ in the recent or living species till about half a year after I possessed this specimen, when upon a visit to Dr. Leach* (to whom the world is likely to be greatly indebted for the learning and assiduity he bestows upon particular departments of Natural History)

* Although this was the only specimen yet known to him or me, Dr. Leach was so generous as to insist on my acceptance of it to elucidate my Highgate specimen.

he showed me an *Eschara* from Plymouth with a partly upright more cylindrical *Serpula* with a rounded aperture, with the edge of which the operculum is placed immediately in contact. This organ may perhaps in future serve for distinguishing the genus or species. The *Serpula* which I have figured for *S. triquetra* in *British Miscellany*, tab. 31, has a bell-shaped proboscis, with the addition of a peculiar tongue-like appendage, which gives some idea of a difference in these organs, but my figure is not properly triquetrous, but rather five-angled; and I conceive by the specimens I possess and have seen, that the *Serpulæ* may be divided much more than they have been. Ellis has a very distinct figure of this instrument, tab. 38, fig. 2.

I have since found in dry specimens of the recent *Serpulæ* these parts preserved, when the specimens appear not to have been washed; and it may be recommended to those who collect these extraordinary productions, to preserve the animal in spirits, or if, when they protrude from the shell, a piece of paper be put under them, they will often remain very perfect. I preserved those figured in *British Miscellany* in this manner, and they may be kept thus many years.

The *Serpulæ* figured in this plate are attached to a fragment of the *Strombus amplus* of Brander, tab. 6, which is a rare Hampshire shell, and not before known in any other part of Great Britain.

VIVIPARA*, *De Montfort.*

GEN. CHAR. Univalve, ovate or oblong, with a regularly elevated rounded spire. Aperture entire, oblong, longitudinal, the two lips united angularly above.

THE term *Helix* being by late Authors confined to those shells only which resemble *Helix promatia* of Linn., we are willing to adopt the generic name *Vivipara* of Montfort, for such as are like *Helix Vivipara* of Linn., although it may imply a character that perhaps will not be found in every shell otherwise not generically different. The recent prototype of this genus, being a fresh water shell, analogy would lead us to suppose the fossil shells nearly resembling it to have been inhabitants of fresh water also, which have long been supposed not to have been preserved, but under such circumstances as may be explained, as Mr. Parkinson says, "on the supposition of their having been involved in the gradually accreting tufaceous matter which is deposited by streams and rivers, or in the stalactitical concretions forming the cavities of Limestone rocks of comparatively modern formation." *Org. Rem. v. 3, p. 86.* Those in the tufaceous substance might happen to be the remains of dead shells, even of the current year, and are often of the same species as those living in the rivers or lakes where the deposit has taken place. At

* We believe the shells here described belong to Lamarck's genus *Bulimus*, but they do not exactly agree in several characters, and moreover the exact prototype of this genus is undoubtedly a fresh water, and not a land shell, as Lamarck's *Bulimi* are.

the bottoms of the lakes of Kinnairdy in Scotland, when they were drained, there were found beds of a kind of shelly tufa, varying in thickness from two to six feet, covered by sulphureous peat from two to ten feet deep; below this is sand, then clay, and frequently beneath the clay is another thin layer of the shells. Specimens of these were sent me by my good friend Charles Lyell, Esq. in 1808. I found the shells to be the same species as those which at present frequent such lakes. The masses are three or four inches square, very friable, light and delicately white, except here and there a brownish or reddish stain; the shells are delicately preserved in a similar way to those found near Paris, and which so much resemble the *Helix planorbis*, Linn. The Isle of Wight shells, which are somewhat similar, but as I shall hereafter show, distinct, come next in the order of preservation; in 1807, the Rev. G. R. Leathes brought me specimens from the Isle of Wight, in which, besides the *Helices* resembling *planorbis*, are casts of shells of the present genus in a clayey marl. In the Sussex marl also there are often casts of the same genus, and the late General Davies, in 1806, brought me similar ones, found two feet under clay, on the road from Rathersden to Ashford in Kent. Mr. Smith informs me that the clay there is beneath the chalk. From these different localities of shells, apparently of the same genus, we must conclude, either that analogy is not sufficient to prove that these fossils are of fresh water origin, or else that there are more fresh water formations than are generally supposed.

VIVIPARA fluviorum.

TAB. XXXI.—*Fig. 1.*

SPEC. CHAR. Volutions four to six, convex. Shell about twice the length of the aperture. Lines of growth rather sharply conspicuous, giving the shell a finely striated appearance.

SHELL not quite twice as long as broad. When full grown, about an inch and an half long, and seven-eighths wide.

Of the three central figures above the slab, the upper two are filled with a loose kind of marle, the shell being replaced by a dark coloured imperfectly crystallized Carbonate of Lime, in part bleached externally, so as to look like the sun dried remains of the recent *Vivipara fluviorum*; the lower figure is from a recent specimen, for comparison, from the centre of a pond that has been dried up. The figures on either side of these differ in the length of the spire, but I can only consider them as varieties, for there are several intermediate ones among the specimens from which the figures are selected; the recent shells are subject to the same variations, the larger and longer ones being generally found in the deepest water, as in the Thames and some deep ponds at Hackney. These were presented to me, some by Mr. R. Weeks, and others by the Rev. Mr. Fearon; they are brought from Sussex*.

* I saw a large mass full of shells like these in the Bishop of Winchester's Park at Farnham; it had been picked up in the neighbourhood. Wapping Docks also afforded this shell while digging.

The square figure is from a piece of the Sussex marble taken from the ruins of Lewes Priory, and given me by G. A. Mantell, Esq.; it shows the more or less perfect section or distorted outline of the dark coloured shelly remains, filled with whiter confusedly crystallized Carbonate of Lime: in the grey or brown ground are an immense number of minute bivalve shells, resembling those of bivalve *Monoculi*,* but now very properly distinguished from the genus *Monoculus* by Lamarck, under the name *Cypris*; the form of the shell is much like that of *Mya ovalis*: in another specimen I received some years ago from Mr. Weeks, there are also many small *Viviparæ*, probably the young progeny of the larger shells suddenly arrested by fate. The four figures by the sides of the slab exhibit fragments detached from less compact pieces of the marble. The group below is from near Ashford, as before mentioned, the specimens are commonly only casts of the interior of the shell somewhat distorted; on either side are detached varieties. I have never seen the operculum of any fossil specimen.

VIVIPARA *extensa*.

TAB. XXXI.—*Fig. 2.*

SPEC. CHAR. Volutions four or five, subconvex, lower part rather angular, inner lip swelling a little at the umbilical side, outer lip extended outwards. Shell about twice the length of the aperture.

SMOOTH, three-eighths of an inch long, rather thin.

This little white specimen so much resembles *Helix tentaculata* of Linn. that I can hardly pronounce it to be a

* So common in stagnant water at the present day.

distinct species, but the extended outer lip appears to be a distinguishing character. It is a siliceous cast which not being quite smooth, seems unfinished; it was sent me from Blackdown by Miss Hill, where it occurred among shells hitherto supposed to be of marine origin. It has however somewhat the appearance of *Turbo canalis* of *Montagu*, and may therefore possibly be a marine shell.

VIVIPARA *lenta*.

TAB. XXXI.—*Fig. 3.*

Helix lenta. Brand. f. 60.

SPEC. CHAR. Smooth, volutions five or six, scarcely angular. Lines of growth occasionally conspicuous. Aperture nearly round, entire.

SPIRE rather long: shell thickish, an inch long, not half an inch wide.

This shell is found at Hordwell and Barton Cliffs; I am indebted to the Rev. W. Bingley for the specimen figured. The figure in Brander is from a specimen with a broken mouth, the mouth is also engraved rather too round, giving it too much the air of a Turbo, otherwise the engraving is excellent.

VIVIPARA concinna.

TAB. XXXI.—*Figs. 4 and 5.*

SPEC. CHAR. Shell rather conical; volutions four or five; slightly convex; lower part rather angular.

LINES of growth indistinct, surface smooth; length three-fourths of an inch.

This has the convex contour of the spire less distinct than the last, and is rather angular in the lower part of the whorles. The spire is also rather shorter and pointed, consisting generally of about four whorles. I am favoured with it from a somewhat sandy part of the strata of Barton Cliff, by Mrs. Tylee.

VIVIPARA suboperta.

TAB. XXXI.—*Fig. 6.*

SPEC. CHAR. Volutions five, convex, with a depressed line along the upper part; a little wrinkled, outer lip folding partly over the upper part of the aperture. Shell about twice the length of the aperture.

SPIRE acute, surface flattish, smooth, three quarters of an inch long.

This specimen ought perhaps to have been reserved for another plate, as we are rather doubtful whether it belongs to the genus Vivipara; it was sent me by Mrs. Cobbold, from the estate called Holywells, near Ipswich.

ELLIPSOLITHES.

GEN. CHAR. Shell univalve, elliptical, involute, chambered, all the volutions apparent. Aperture lunulate on account of receiving in its inner part the return of the volution.

ELLIPSOLITHES funatus.

TAB. XXXII.

SPEC. CHAR. Shell with numerous transverse simple rounded risings, relieved by rather wider grooves, at intervals a kind of constriction distinguished by a small protuberance on the inner part of the rising immediately beyond it.

SHELL smooth; whorles three or four, half concealed; long diameter, three inches; short diameter two and a quarter; thickness, one and an half.

The general appearance of this curious production would bespeak it a multilocular shell, and De Montfort describes it as such; our specimen however does not expose such a character so distinctly as might be desired, yet I believe sufficiently in one part. Although in this respect hardly satisfactory, I could not avoid treating my friends with a knowledge of this curious rarity belonging to the Blackrock range, S. E. of Cork, as discovered by my friend Samuel Wright, Esq. in 1812. It is a fairly elliptical species, and although the specimen is somewhat distorted, the curve is sufficiently apparent to decide upon; besides which there is at intervals a sort of constriction,

distinguished by a small protuberance that perhaps makes it more perfect and certain than any before seen, if it be not a specific difference. They are said to be found along with the Turrilites, at Mount St. Catherine, near Rouen. It is not a little remarkable that it is not found in Sussex or Wiltshire with our Turrilites, for the shell figured by Mr. Parkinson, plate 9, f. 6, which at first sight a little resembles it, and which is found in the same stratum with the Turrilites, is certainly oval or elliptical by distortion, and is of a different species; when most perfect the specimens have a round contour. I have specimens variously distorted. I do not know that any Turrilites have yet been discovered in Ireland: there are however two or more truly elliptical shells.

Those found at St. Catherine are said to be argillaceous-calcareous, ours are a very foetid Limestone, which is very apparent when scraped.

UNIO, Lamarck.

Mya, Linn.

GEN. CHAR. A transverse shell, having three muscular impressions, two very distinct and the third nearly united to the posterior one; an irregular callous hinge tooth, prolonging itself on the anterior side beneath the ligamental slope, and articulating with that of the opposite valve.

SEVERAL species of this genus abound in the Iron-stone stratum of Derbyshire, called the Muscle Band, and elsewhere, in the nodules found in what they call the Bluebind, or in Bituminous Shale above the Coal, as on Lord Middleton's estate at Woolaston in Nottinghamshire, 75 yards below the surface; they are sometimes partially covered with Coaly matter, and often indicate Coal measures. They are occasionally called Dog's-tooth marble.

UNIO subconstrictus.

TAB. XXXIII.—*Figs. 1, 2, and 3.*

SPEC. CHAR. About twice as broad as long, with a constriction running from the front of the shell towards the beak on the anterior side, the end of which is subtruncated.

RATHER shallow, generally rather more than an inch broad, and half an inch long.

Not a rare species, it was sent me from Derbyshire by Mr. Jonathan Salt; it is impressed upon a nodule of argillaceous Iron-stone that has become ochraceous upon the exposed surface. Such Iron-stone is found to contain from 25 to 30 per cent of Iron. There is a perforation in the shell, seemingly made by some species of worm.

UNIO uniformis.

TAB. XXXIII.—*Fig. 4.**Mya ovalis*, Martyn Petref. *Derb. tab. 27. 28?*

SPEC. CHAR. Subovate, beak near the middle of the shell, anterior and posterior ends elliptical.

WIDTH nearly twice as much as the length; rather deeper than the last, and differs also in having the beak nearer the

middle of the shell, and in wanting the constriction and the subtruncated anterior end

Martyn's figures, tab 27 and 28, appear to be the same species as this; they were then understood to be the same species as *Mya ovata* of Linn. Trans. which was not distinguished from *Mya ovalis*, but it differs from that in the outline, which is a regular uniform curve, without any angles at the end, as in recent shells. Those specimens that have angles, are evidently distorted ones, and most of them appear to have slipped from the hinge a little. This was found in marle at Felmersham in Bedfordshire, by my very kind old friend the Rev. T. O. Marsh. The specimens sometimes bear so much resemblance to the Derbyshire ones, that they are taken for the same even when found in the alluvial soil near Bedford. Tab. 99, British Mineralogy, exhibits the inside of a pyritaceous cast resembling it, from Bath.

UNIO acutus.

TAB. XXXIII.—*Figs. 5, 6, and 7.*

SPEC. CHAR. Anterior side acute, twice as wide as the other which is blunt or rounded. Width two and an half times its length.

POSTERIOR side deeper than the anterior, beak rather angular, size the same as the two last.

Plentiful among argillaceous Iron-stone in the neighbourhood of Bradford in Yorkshire. I am favoured with the shorter variety by Samuel Hailstone, Esq. The other was sent me by Mr. Jonathan Salt; I believe it is from Derbyshire. The lowest figure is taken from one which I suppose to be a cast of the inside.

In order to prove the identity of these shells with the Genus *Unio* of Lamarck, which their external characters led us to suspect, we have made a cast of the inside of a recent species, upon a comparison of which with several fossil casts we are enabled to give it as our decided opinion, that these shells are undoubtedly of the same genus, consequently we have several species of *fresh water shells* in one of our Coal formations, and we have great reason to believe that the *Mytillus crassus* figured in Brit. Min. tab. 386, may also be considered as a fresh water shell, as it appears to be an *Anodonta* of Lamarck.

EMARGINULA, *Lamarck*.

GEN. CHAR. Univalve, obliquely conical, vertex inclined; anterior or posterior margin with a single deep notch or fissure.

EMARGINULA *crassa*.TAB. XXXIII.—*Upper figures.*

SPEC. CHAR. Oval, obtusely conical, furrowed; with four or five striæ between each furrow; fissure wide.

THIS shell is remarkably thick, and the lines of growth are marked across the striæ. The fissure is filled up for half its length by a thinner continuation of the shell.

I conceive this to be a species hitherto undescribed; it was found in the Crag near Ipswich, by Mrs. Cobbold, whose zeal for science prompted her to send me the fine specimen from which this figure is taken. I have not seen another specimen, but consider this a full grown shell, for towards the margin the lines of growth become very strong and irregular, which from analogy may be supposed to point out the usual size. There is besides an additional piece round the edge, produced as it were by an extra effort of growth, similar to that in many old shells. The substance of the shell is about as hard as plaister of paris cast, without any appearance of crystallization, but remains of a glossy smoothness in some of the interior parts; the outside looks like that of a dead, decaying, bleached shell; it is a little stained by oxidized Iron. Some animals have formed holes in it, and there are the zigzag grooves of some kind of *Serpula* remaining in it.

EMARGINULA reticulata.

TAB. XXXIII.—*Lower figures.*

SPEC. CHAR. Shell oval, reticulato-striated, vertex rather acute, principal radii 24 or more.

SYN. Patella fissura. *Linn. &c.*

IT is remarkable that this shell is so strictly concordant in every character with the recent *Patella fissura* of Linn. that it cannot be separated as a distinct species, a circumstance that may be adduced to strengthen the idea of a learned gentleman and friend of mine, that many recent shells may be the same species as the deeper or older fossils, but are more or less degenerated, or have from various causes even assumed such new characters as not to be identified, being more different than mules. The little we know of this subject at present, makes it difficult to comprehend the wisdom displayed on the globe, but as the field is open, and the enquiry began, I hope it will be improved, as I have no doubt of Almighty indulgence, since these relicts are so miraculously preserved, not only for our times, but for ages yet to come, especially as improvement in this science has of late years been very rapid.

These specimens seem but little changed; they were sent from Holywell field with the former, by Mrs. Cobbold in 1812.

MUREX rugosus

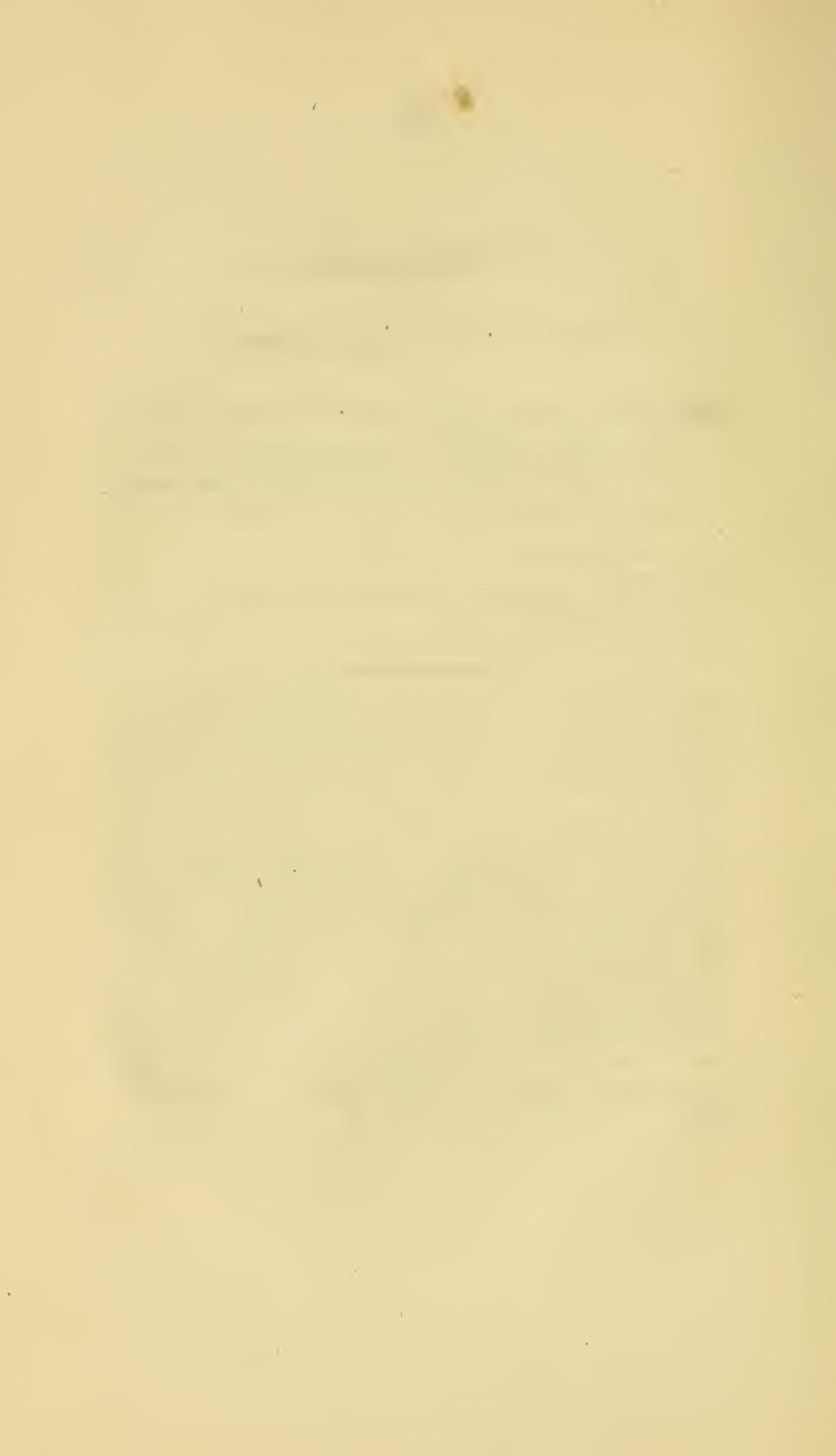
TAB. XXXIV.—*Upper figures.*

SPEC. CHAR. Spire acute, of about six whorls, rather gibbose, with about ten longitudinal undulations that intersect many deepish transverse striæ. Beak nearly straight, lip thick; canal rather broad.

SYN. Murex rugosus. *Parkins. Org. Rem.* 3. p. 64. t. 5. f. 16.

THE mouth and beak together are about half the length of the shell; the surface is smooth between the striæ; it is a thick rugged looking shell, about two inches long and nearly one inch wide.

This shell is said to be one of the rarer productions of the Essex cliff; it is also found in the Crag of Suffolk. My assiduous friend Mrs. Cobbold sent me two specimens from near Ipswich last year, and as they differ a little from each other I figure them both: one is broader and shorter than the other, and wants the left hand lip which in the other spreads over the columella. They are both tender specimens, nearly white, with rather less of the ochry stain than usual to most of the shelly remains of Suffolk and Essex.



MUREX Bartonensis.

TAB. XXXIV.—*Lower figures.*

SPEC. CHAR. Shell oval, contracted close to the beak, strongly reticulated, whorls about four or five, the last about two-thirds the length of the shell. Mouth elongated, curved, acute at both ends; right hand lip expanded, undulated, toothed within; left hand lip smooth at the edge, toothed within.

LESS than half an inch long; the mouth is twice as long as wide, elegantly curved into a small beak; the outer lip has a furrow at about the fourth tooth from the beak, almost as much extended as the beak itself. The reticulation upon the surface is very square and sharply projecting; it is extended over the back of the lip, and forms its undulated edge.

Two specimens given me some years ago by the Rev. Mr. Bingley differ a little in the undulations of the mouth; I have given two magnified figures of one of them at the bottom of the plate. The small figure in the middle of the plate is the natural size; it is from a specimen sent me by the discerning Miss Bennett; the furrows of the lip are not so distant in this. Barton Cliff is the only place in which we know this shell to have been found.

Murex Rana of Linn. a New Holland species, seems most nearly related to this. I suppose it would be placed under the genus *Bufo* by De Montfort.

MUREX corneus.

TAB. XXXV.—*Three upper figures.*

SPEC. CHAR. Spire elongated, whorls rounded, rather smooth, with numerous nearly obsolete striæ; aperture angular behind.

SYN. Murex corneus. *Linn. Trans. v. 8, &c.*

THIS is an elegantly formed rather slender shell, $2\frac{1}{2}$ inches long, and about one-third as wide; the beak is often slightly curved. Some of the transverse striæ are more prominent than the intermediate ones, but in old shells, and in fossil specimens, they are generally worn away. The mouth and beak together are equal to half the length of the shell, and are smooth within.

I have various recent specimens of this shell, with and without the epidermis, the former are rather rare. Excepting those with the epidermis, the dredged and what are commonly called good specimens, are scarcely better than the fossil ones. I therefore need now only speak of these of which I have figured three varieties. The middle fine one is by favour of Mrs. Cobbold from Holywells. No. 2 is from Walton; and No. 3 from Aldborough in Suffolk. The first has eight whorls, also the pillar lip, which sometimes does and sometimes does not exist in the recent shells, (it can scarcely be made out in my most perfect recent specimen, but in a bleached one it is so conspicuous as to be almost detached at each end,) it therefore affords no distinction. The right hand figure has no left lip, it is rather a broader shell, and has seven volutions. The left hand figure is nearly destitute of striæ, and the canal is more reflected than usual. It is remarkable that recent specimens of this shell are occasionally found on our coast, much distorted in the lip, widened and covered with the resemblance of an epidermis, the work of a parasite.

MUREX trilineatus.

TAB. XXXV.—*Fig. 4, 5.*

SPEC. CHAR. Shell elongated, with many transverse projecting narrow bands, each obscurely divided into three threads. Volutions five or six. Beak straight, pointed. Aperture elongated; several folds within the outer lip.

THIS shell is sometimes $1\frac{1}{2}$ inch long, the aperture being about half the length. Its form is nearly the same as the last, but it is more rugose, the transverse projections are equal, and often very neat, they are each divided by two obscure lines into three threads. The outer or right lip has nine or ten elongated plaits or teeth placed a little way from its edge.

I am indebted to the Rev. Dr. Sutton for the group figured, it was with pyritous wood imbedded in an argillaceous-marl Septarium, from Brentford. The same species is found in the Clay and attached to the Septaria at Highgate. The figure below is from an Highgate specimen. I have fragments of shells from thence, which, if perfect, would be two inches or more in length.

MUREX latus.

TAB. XXXV.—*Left hand lower figure.*

SPEC. CHAR. Shell slightly ventricose, smooth, covered with alternately large and small transverse linear projections. Spire of five volutions, upper part of each volution undulated; mouth strongly striated within. Beak straight, expanded, truncated.

THE apex of this shell seems to be rather acute, the mouth is oval, elongated into a wide and short canal: the internal striæ terminate at some distance from the edge of the outer lip, which is entire. Length about three-fourths of an inch.

The Rev. H. Steinbauer brought me this new shell from Plumsted, in August, 1812; I had found mutilated specimens in 1807.

TURRILITES.

GEN. CHAR. Shell spiral, turreted, chambered; the turns contiguous, all visible. Chambers divided by sinuous septa, pierced in their disks. Aperture round.

TURRILITES costatus.

TAB. XXXVI.

SPEC. CHAR. Whorls of the spire beset with short ribs, beneath which are two rows of small tubercles.

Turrilites costatus. *De Montfort Journ. de Phys.*
an 7. p. 1. t. 1. f. 1.

Parkinson Org. Rem. v. 3. t. 10. f. 12.

SOMETIMES six inches or more in length, and one and an half inches or more wide.

I am much pleased that Great Britain contains even the cast of this rare and beautiful shell. The larger figures are from specimens found in Hamsey marl pit by my valuable correspondent, G. A. Mantell, Esq. The other which shows part of the septa, is from the green sand at Horningsham in Wiltshire. I am favoured with it by the intelligent Mr. William Smith. Time and attention to the subject may discover finer specimens; but were I to wait for such, I might be disappointed, or the subject might be forgotten. I have never seen any more than casts of what I suppose to be the inside of the shell, and these are generally pressed into a more or less oval form.

ELLIPSOLITES *ovatus*.

TAB. XXXVII.

SPEC. CHAR. Gibbose, umbilicated, edges rounded, inner volutions nearly concealed by the outer; surface smooth; aperture obtusely saggittate.

At first sight this has scarcely the appearance of an involute shell, the general form is so round, the inner volutions so nearly concealed, and the aperture, from the narrowness of its sides, so obscure; both sides of the shell are alike, and the umbilicus equally deep in both. The greatest diameter is about twice the thickness of the shell, and one-third longer than the shortest diameter. I have not been able to trace the septa. It is usually obliquely pressed.

I do not know that this has been described in any shape. It is sufficiently remarkable to attract notice, especially as it is one of the various productions of the Black-rock near Cork; which, reasoning from the fossils it contains, Geologists will hereafter distinguish as a particular formation; it is a very foetid Limestone. My thanks are due to Samuel Wright, Esq. and Dr. Wood, for the only two specimens I have seen.

ELLIPSOLITES compressus.

TAB. XXXVIII.

SPEC. CHAR. Shell flat, smooth; margin broad, flat, perpendicular to the sides; volutions four or five, almost wholly exposed; aperture oblong, rectangular.

BOTH sides are alike, the greater diameter is about one-fourth longer than the lesser; the thickness about one-fourth of the shorter diameter.

This singular production is from the Black-rock range, discovered nearly at the same time by the two gentlemen who discovered that of tab. 32. The upper specimen is partly composed of crystallized Carbonate of Lime, commonly called Iceland Spar, see tab. 2, Brit. Min. with the diagonal striæ mentioned at tab. 260, Brit. Min. The regularity and order of the volutions are very apparent, but the crystallization seems to have helped to obliterate the chambers, if ever there were any: or rather the solution of such parts has proceeded far before the mould was filled. Some parts are rather rough, and a little ochraceous.

The under shell appears to be the same species, although it is rather more elliptic. Both seem to have been included in a very solid part of the rock, as appears from the fragments which adhere to them.

MELANIA, *Lamarcke.*

GEN. CHAR. Univalve, turreted, aperture entire, ovate or oblong; inner lip spread over the base of the columella, which is smooth.

MELANIA *sulcata.*TAB. XXXIX.—*Middle figure.*

SPEC. CHAR. Spire more than five times the length of its diameter, with spiral striæ; a concave sulcus or furrow between each whorl. Whorls fourteen or more.

A RATHER strong shell, about eight inches long; the surface of each whorl regularly convex, with a margin along the upper part; each one is separated from the next by a narrow groove.

I am favoured with this shell by Mr. John Holloway of Portsmouth, whose zeal in these researches has been useful in many discoveries which he has enabled me to point out from time to time. He found it at Stubbington Cliffs, between Stokes Bay and Southampton water. This Cliff is about twenty or thirty feet high, and is composed of sand and gravel, more or less mixed with blue mud and frequent irregular patches of sand, at the base of this is a stratum, not more than two feet thick, of blue clay or mud, in which the shells are found. He has a specimen five inches long; but the figure is taken, the upper part from one specimen, and the lower part from another: it is remarkable that these specimens seldom have either end perfect; whereas some specimens of Turbines, &c. of Linn. are remarkable for having one end perfect and the other not.

MELANIA Heddingtonensis.

TAB. XXXIX.—*Right and left hand figures.*

SPEC. CHAR. About three times as long as the diameter; whorls eight or more; surface of each whorl concave near the middle, with an obtuse angled rising near the upper part.

A THICK rugged shell, four or five inches long; the lines of growth are deep. The upper part of the whorl is angular.

I have received this from Heddington, near Calne in Wiltshire, and have found specimens about Shotover hill in Oxfordshire, where I have also found the inside cast. Casts of these and other spiral shells are commonly called screws, and are often found with little or no remains of the shells in solid masses of stone, and sometimes have the impression so perfect around them, that the outer pattern of the shells is very distinct, and may therefore often be convenient in a geological point of view to assist us to recognize these casts, for in some places we very seldom find any thing else. I think it desirable here to figure the cast of this shell, as likely to be instructive; besides it makes us acquainted with the particulars of the inside of the shell, and is an assurance of its not being chambered as a Turrilites; see Tab. 36.

NAUTILUS undulatus.

TAB. XL.

SPEC. CHAR. Gibbose; surface largely undulated, sides rather conical, edge flat; aperture obcordate, inner whorls concealed.

THE septa are somewhat numerous, each one is crossed obliquely by an undulation of the surface. The thickness is half of the diameter, and the length of the mouth rather more, with the siphunculus near the centre. A single line runs along the middle of the flat part of the edge or back.*

This species is found in a marly sandstone, a little above the fullers earth at Nutfield in Surrey, it varies in size, being sometimes twelve inches in diameter, forming a very heavy mass, being generally a mixture of Irony marle or clay with sand. It would appear from some that the outer chamber is very large, and therefore the older or larger shells seem to have less of the undulations. I have not seen any specimen resembling this from any other place, wherefore I might have named it Nutfieldiensis, but although it is characteristic of the place, I shall find that trivial name better suited to some other shell which is also characteristic.

* We must be cautious of looking upon this as an indistinct siphunculus, as in some cases it might seem to be.

NAUTILUS *inequalis*.TAB. XL.—*Lower figures.*

SPEC. CHAR. Sphæroidal umbilicate; aperture nearly round; septa distant in the inner whorls, and approaching near together in the outer whorls; siphunculus near the inner margin of the septum.

THE aperture is obscurely three-lobed from its partly embracing the volution: it is about half the diameter of the shell long, and the same in width. It is remarkable for the septa being more distant as they approach the interior or first formed whorls, where their distance from each other is equal to their own length. The septa are but slightly curved.

The specimen is from Folkstone, by favour of Mr. Gibbs; its chambers are filled with an Irony clay, the remains of the shell being Carbonate of Lime.

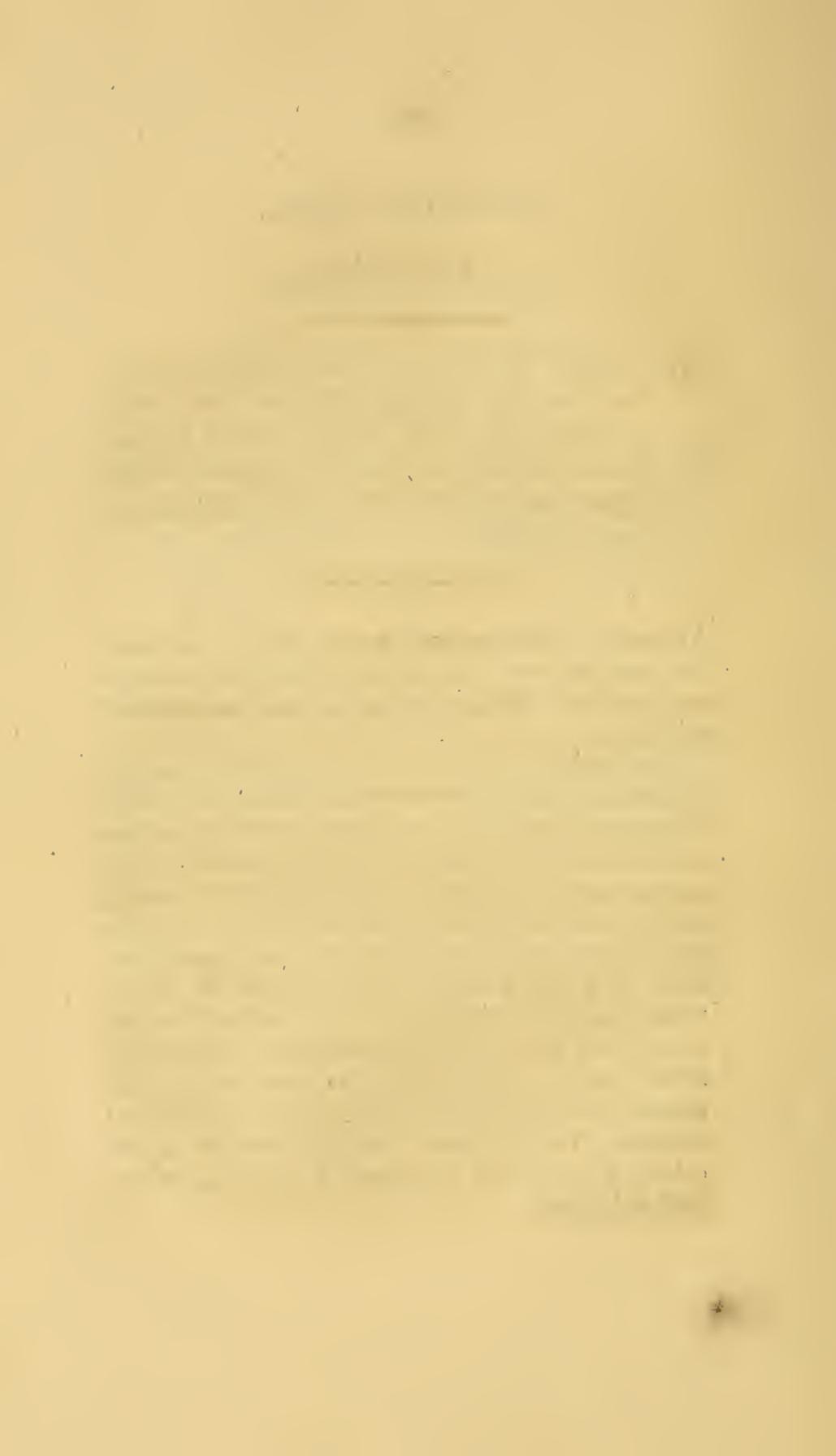
.NAUTILUS lineatus.

TAB. XLI.

SPEC. CHAR. Flatted sphaeroidal, umbilicate, surface obscurely striated, back flat, broad, with a concave line in the interior (which appears convex around the cast). Aperture rather square, deeply indented by the preceding whorl; septa numerous.

DIAMETER about one-third longer than the thickness. The septa are very concave, with three slight waves in their margins. The siphunculus is near the middle of each septa.

This specimen is from Comb-down near Bath, and is in the possession of my kind friend Thomas Meade, Esq. whose collection of Fossils is very valuable. I have it also from the Bristol road. I have seen but few specimens of this species, which is so similar to others, that the line passing around the interior of the shell, shown on the surface of the cast, becomes an important distinction, and appears constant. It is said to belong to what is called the inferior Oolite; and from the division of the chambers, has, like others which have been thus divided, been compared to a lobster's tail. I believe it is often much larger. The substance is not always favourable to the perfect division of the septa. The lower figure is added to show the siphunculus; 'tis taken from a specimen I picked up between Bath and Bristol.



LUTRARIA, *Lamarcke.*MACTRA, *Linn.*

GEN. CHAR. A transverse, inequilateral bivalve, gaping at the extremities; two oblique and diverging hinge teeth, one on each side of a large pit for the cartilage. No lateral teeth.

MACTRA *gibbosa.*

TAB. XLII.

SPEC. CHAR. Gibbose, anterior side much wider than the posterior, recurved, truncated, gaping.

LENGTH and depth about equal; breadth equal to twice the length: the posterior side is rounding and about one-third the breadth of the other; beaks much incurved and pointed.

This fine specimen is from the great Oolite Limestone stratum, near Bath. I am favoured with it by the Rev. H. Steinhäuer. The external characters when compared with those of *Mactra hians* agree in every particular, but that it has more gibbosity and a boldness of feature in the curve and beak, conveying the idea of an extravagant variety, yet too strongly marked to allow a doubt of its being specifically different. This analogy gives a full sanction to its being considered as an undoubted *Mactra* of

Linn. which I have ventured to consider it, though I have not seen the hinge. Should any of our friends get possession of a specimen showing that part, I shall be glad of such information as will be decisive, and will give notice accordingly. I have only seen casts. I believe there are several species of this Genus found in a fossil state in this country.

MYA, *Linn. Lamarcke.*

GEN. CHAR. A transverse bivalve, gaping at both extremities; ligament internal: the left valve with a compressed rounded hinge tooth, perpendicular to the valve, to which the cartilage is attached.

MYA mandibula.

TAB. XLIII.

SPEC. CHAR. Gibbose, flattish in the middle, transversely undulated; anterior side square, gaping, aperture oblong; posterior side straightish.

THE depth is about two-thirds the length; breadth half as much again as the length; the undulations are about twenty-five, following the margin; the beaks are incurved and pointed.

In cutting the Canal at Devizes in Wiltshire, a variety of Micaceous Sandstone and Sand was found, in which many species of shells and shelly remains were concealed, and often only the forms of shells cast in the sand, cemented strongly enough, by compression, as it were, to hold together, as here figured, the cast being distinct, and apparently very accurate. The species here figured is very like the recent *Mya truncata* of Linn. but it gapes at

one end more extravagantly, so as to give the front view of the opening end nearly a circular contour. The lower figure shows the beaks.

The Micaceous sand, besides having these and other casts, has siliceous and calcedonic ones. That the Silix should replace the Lime of the shells is both curious and beautiful, and the filling a mold, as it were, with almost loose sand, and in looser sand, is not less curious and admirable. Whether we shall ever see these shells so as to identify the hinge we cannot tell. The prominence and appearance of the beak and parts around over the hinge of the shell, looking something like the mandibulæ of a bird, has caused its name.

ARCA.

GEN. CHAR. A transverse inequilateral bivalve, the beaks distant, hinge with many teeth, disposed in a straight line; the teeth lamellated, close, and alternately inserted between each other: a subrhomboidal smooth area between the beaks, on which the cartilage is disposed.

ARCA subacuta.

TAB. XLIV.—*Upper figure.*

SPEC. CHAR. Gibbose, margin an obtuse scalene triangle deeply plaited; breadth greater than the length, surface longitudinally striated.

THE hinge extends nearly the whole width of the shell, forming the longest side of the triangular margin; the teeth are sharp and numerous; the marginal plaits are rounded and very deep, particularly at the anterior side, they are elongated over the surface of the shell, at least I presume so from the impression of the inside, which is all I have to examine.

This happens to show the nature of the hinge teeth externally, else it might have been considered as a *Cucullæa*, a division or genus of Lamarck's taken out of the *Arca* of Linn. and on which the teeth are on a line parallel with the hinge, and which I shall have an opportunity to show hereafter. It is little else than the chalky remains of the shell covering a hardish Limestone Marble. From Sussex, by favour of Mr. Mantell.

ARCA carinata.

TAB. XLIV.—*Lower figures.*

SPEC. CHAR. Very convex, parallellipedal, anterior side flattish, separated by an acute angle, truncated at nearly a right angle; posterior side rounded; surface longitudinally ribbed.

ABOVE twice as wide as long; hinge straight; beaks slightly incurved. The ribs or striæ are chiefly alternately one rather more prominent than the other; sometimes on the sloping sides there are two faint rising striæ intervening. The angles, of the usual form of those of *Arca Noce Linn.* are very sharp, and the shell not so wide.

These are from the micaceous sand of the Devizes Canal. They are remarkably neat impressions, shewing the direction of the hinge teeth, if I am not misled by the roughness of the sand. Mrs. Gent was so obliging as to favour me with these, and Thomas Meade, Esq. has assisted me with fine specimens, from his cabinet.

EUOMPHALUS*.

GEN. CHAR. An involute compressed univalve, spire depressed on the upper part; beneath concave or largely umbilicate. Aperture mostly angular.

EUOMPHALUS pentangulatus.

TAB. XLV.—*Fig. 1 and 2.*

SPEC. CHAR. A prominent central ridge or rising angle on the upper side, the other side obtusely angulated. Striæ of growth hair-like. Volutions almost wholly exposed. Aperture obscurely pentangular, rounded on the outer side.

THIS is apparently a thin shell; the under and umbilicated side is much deeper than the upper, which approaches to flat; there are about six whorls; the aperture is about one-seventh of the diameter of the shell. The striæ of growth are fine and rising. The greatest diameter is from half an inch to two inches.

From the Black Limestone near Dublin, by favour of Mr. T. W. Moore. It is apparently one of the characteristic shells of that rock, of which I shall have more to say hereafter. The specimen figured is curiously waved with a darker and lighter tinted Limestone; it emits a foetid odour on being scraped with a knife. The aperture is not quite filled up; rhomboidal crystals of nearly transparent and whitish Carbonate of Lime form the innermost lining, next is the darker Limestone, and then the shell seemingly replaced by a mixture of the lighter and darker stone. Sometimes the upper side of the shell is very black. I have not seen a perfect mouth among a number of specimens, although some are otherwise very neatly and finely preserved. There may possibly be much larger specimens; I have some very small, about half an inch in diameter. The left hand upper figure shows the upper side is flatter than the opposite side, which is represented in the right hand figure. Sometimes the specimens have a more oval form, apparently from accident.

* From *ευ bene*, and *ομφαλος umbilicus*. I conceive myself justified in giving this Generic appellation, as the shells of which the Genus consists do not agree with any Generic character before published.

EUOMPHALUS catillus.

TAB. XLV.—*Fig. 3 and 4.**Helix catillus**. *Martin Petrif. Derb.*

SPEC. CHAR. One prominent ridge upon each side: Volutions almost wholly exposed: Aperture a triangle, two sides of which are much longer than the third: umbilicate side an hollow cone.

PROBABLY as thin a shell as the last; its proportions are about the same; the principal difference lies in the prominent ridge on the under side, which gives the aperture a triangular form.

It is now ten or twelve years since I received specimens of this shell from Mr. Martin, the late intelligent Author of "Petrificata Derbiensia;" it is found at Tideswell, Winster, Buxton, &c. in Derbyshire. He observes that the specimens are very much compressed in the shale which interposes between the Limestone and Gritstone strata. Mr. Parkinson has figured a similar, but perhaps plainer species of this Genus as approaching the *Delphinula*, and rather unfortunately quotes Brander's *Fossilia Hantoniensia*, Tab. 10. F. 7 and 8 (*which is a Solarium of Lam.*) as an example. Walcot has also a specimen, probably of this Genus, as a Bath Petrification, Fig. 56, Both are probably different species. I have not yet seen such from Bath.

Judging from a fragment I received from my kind friends Mr. Winsor and Mr. Duckett, in Nov. 1810, I should guess that a very similar species is found at Scalaber near Settle in Yorkshire, which is four or five inches in diameter.

* *Catillus* signifying a little dish or porringer, which it may be considered as resembling when placed with the upper side downwards. The next species might, however, with as much propriety, be designated by the specific name *Catinus*, a large porringer.

EUOMPHALUS nodosus.

TAB. XLVI.

SPEC. CHAR. Upper side having a nearly central ridge, under side a row of rather large nodular projections: Aperture nearly round.

A MUCH larger shell than the last, with the same number of whorls, and an aperture above one-third the diameter of the shell. There are about ten projections to each whorl; those of the inner whorls being half concealed.

The late Mr. Martin also favoured me with this specimen as a Derbyshire one; he has neither figured nor mentioned it further as I know of, nor is it noticed by any other author. It is sometimes a large shell, as, besides the specimen of which I have here figured the upper and under side, I have a fragment with four nodular projections that fits on this at about the fifth projection beyond the end, which would make it much larger, at least twice as big, and give the cavity a remarkable depth. The nodular or under side of the shell is placed uppermost in the plate because most characteristic. The lower figure or upper side of the shell much resembles that of *E. catillus*, the ridge however is nearer the middle. The whole is Limestone, the shell rather thin and mostly crystallized or decomposing and chalky.

THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST

By JOHN BURNET, BISHOP OF SALISBURY.

Printed by J. Sturges, at the University Press, Oxford, 1734.

MELANIA striata.

TAB. XLVII.

SPEC. CHAR. Length about $2\frac{1}{2}$ times as long as the greatest diameter. Whorls six or more, with about sixteen rounded or spreading carinæ, nearly equal on the outer part of the whorls, but widened in the concealed parts.

THIS shell appears sometimes to exceed eight inches in length; the surface is smooth, with sixteen sharpish longitudinal striæ, and as many rounding projections.

The upper part of this figure is taken from a specimen found at Lymington, Somersetshire, and sent me some years since by my late Friend Mr. W. Cunnington; the lower part from one found in what is called the Coral rag stratum at Goat-acre, Wiltshire, by favour of the Rev. H. Steinhauer in 1813. I have placed the two pieces together to show the appearance and size of a more perfect whole; they accord so well that one might seem to have been broken from the other, and the wearing of the specimens also accords, for the upper part of the under specimen has almost lost the appearance of striæ, while the upper specimen is so worn that it would have hardly been recognizable as the same species, were it not for the agreement in the proportions and the striæ on the under side. Geologists will know whether they are

from strata of the same age, and perhaps where to find larger and more perfect specimens, now that the age is so much enlightened in these researches that we are continually gaining more knowledge, and individuals do not so slightly notice these things which promise so much instruction and usefulness.

OSTREA.

GEN. CHAR. A rugged inequivalved bivalve; hinge without teeth; pit of the hinge transversely striated*, increasing with age (or commonly broader inwards); cartilage half internal. One muscular impression in each valve.

OSTREA Marshii.

TAB. XLVIII.

SPEC. CHAR. Oblique, both valves deeply plaited in seven or eight angular diverging undulations; edge thick, flatted.

THIS is a strong depressed shell very variable in form, though generally longer than wide, and often furnished with an obscure ear upon the posterior side. There is such variety among the recent individuals of the Oyster tribe, that it is one of the most difficult tasks in Conchology to distinguish the species, much more so when we add the fossil and otherwise antient remains, which, however, are seldom replaced but by a siliceous infiltration between the laminæ becoming, Calcedony, &c.

The present species, nevertheless, from its first appearance, seems to claim a place as perfectly distinct from the

* Tripartite, central division generally broadest, to which the cartilage is attached.

conspicuous plaited or sharp zigzag undulations, but this might be traced by an attentive selection of specimens by degrees to the common oysters. This being the case, I may perhaps err when I make this shell distinct from *O. diluviana* *Linn.* Our shell does not very clearly show the erect acutangular teeth, but is rather more irregular, and the many specimens I have examined, have as many various figures, being rather oblique chiefly to the right, but often to the left; wider than long; roundish, semi-lunate or ovate; more or less imbricated, sometimes very deeply; the inside varying in depth, and the cicatrix or muscular impression very variable. They are gregarious, parasitical, or independent.

The upper specimen is bleached and weathered, as it were, by exposure, differing but little probably in its substance from a recent dead oyster shell, that has been exposed some time on the sea shore. The lower specimen is less altered; the inside of one valve is shown to expose the muscular impression, the other shows a concave furrow of adhesion near the hinge, which is scarcely perceptible in our specimens.

I name this after an assiduous investigator, the Rev. T. O. Marsh of Felmersham, in whose neighbourhood it is found abundantly in all its varieties, and to whom I am obliged for specimens.

CARDIUM Parkinsoni.

TAB. XLIX.

SPEC. CHAR. Gibbose, rather oblique, posterior side straightish; surface slightly rugose, with nearly forty longitudinal ribs, having slight transverse risings on each.

THIS elegant shell is larger and more delicately formed than our *Cardium edule*, or any of its varieties; it is also less angular or acute at the posterior side; the number of striæ is generally about thirty-six, with some differences in their relief. The transverse rugæ, which are most prominent near the margin, are less numerous than in the common Cockle. The inner marginal teeth are distinctly incurved. I do not know of a similar Cockle in a recent state, although it has but few distinguishing characters: it much resembles *Cardium maculatum*, *Lister* 328, No. 165; from the bay of Campechy, which has thirty-one ribs.

This very neat and perfect specimen was presented to me by Mr. Parkinson, who, as a sort of Volunteer in the Natural History of Organic Remains, has been so deserving of remembrance, that I felt it a kind of duty to give it his so respectable name.

The Craigs afford some other species, but I have only received this from Mr. Parkinson, besides somewhat smaller

specimens from Mr. D. Turner and Mr. Hooker, found in Norfolk. Mrs. Cobbold has sent me a fragment of a larger still from Holywell, but it seems to be a thicker shell, and promises, from so much as I possess, to be another species. So good a specimen as this may therefore prove rather rare: it is from the Essex cliff at Harwich. The shell is probably Carbonate of Lime, little changed except by being stained by Iron ochre.

VENERICARDIA.

GEN. CHAR. An equivalved lateral bivalve, ribbed longitudinally outside, with two thick hinge teeth disposed obliquely and in the same direction; two strong muscular impressions.

VENERICARDIA planicosta.

TAB. L.

SPEC. CHAR. Subcordate, very thick, smooth, ribs broad and flat, about twenty, expanding into each other towards the margin; a few large teeth within the posterior edge.

SYN. *Venericardia planicosta*. *Lamarcke, Ann. du Mus.* VII. p. 55. IX. Tab. 31, Fig. 10.

THE thickness of this shell is such as to leave but little space for the animal; it is particularly heavy about the hinge, which is large and very broad; the posterior margin is deeply indented towards the incurved beaks, but without a cordate mark. The length and breadth are nearly equal, often reaching four or five inches.

I was some time since favoured with a fine small specimen from the Geological Society to make a drawing of for this work, but having since received this larger, although not quite so perfect a specimen, from the same place, viz. Bricklesom Bay in Hampshire, by favour of Mr. J. Holloway, I have preferred it for representation. The species is

sometimes larger, when the hinge does not seem to occupy so large a proportion of the shell as in the smaller ones.

Although I do not understand that there are any recent shells of this species, yet the habitat might not be thought very antient, as the shell is apparently but little changed from its original substance or structure. The specimens are said to be very small in the neighbourhood of Paris, and large at Piedmont and Florence. My figure is a little diminished from one about four inches and an half wide. The old and larger shells seem worn on part of the hinge, and the teeth at the edge are almost obliterated, their form is short and broad; the ribs extend most on the shorter side of the shell, and do not reach to the margin as in the smaller ones: the laminated structure of the older shells admits of the outer coat breaking off, so as to show the space between the ribs nearly equal to the ribs and flat, while the furrows in the upper coating are much contracted, ending acutely, when they meet the more prominent transverse striæ of growth near the margin. The whole is nearly smooth and greyish, stained with darker or lighter ochraceous Iron, &c.

TURRITELLA, *Lam.*

GEN. CHAR. Shell univalve, turreted. Aperture entire, rounded, and having the two lips separated above. A sinus in the right lip.

TURRITELLA *conoidea.*TAB. LI.—*Figs. 1 and 4.*

SPEC. CHAR. Lower part of the whorl angular, slightly projecting, longitudinal striæ equally distant, seven or more, with intermediate smaller ones, all acutely crenulated.

WHORLS about eighteen; the sides of the spire are nearly straight with an angular spiral groove; the right side of the mouth squarish.

This is from Barton Cliff, Hampshire, and very nearly accords with Brander's Tab. 3, F. 47, *Turbo terebra*, which is probably intended for the same shell, the striæ varying somewhat, and the aperture, being mostly broken, giving a sufficiently rounded appearance for the *Turbo* of Linnæus, in which Genus the modern division may be useful in many respects to prevent difficulties in distinguishing species. I would not consider Brander, F. 49, as the same species, it has too many differences; the volutions being more oblique, &c. in which I believe it will accord with a species hereafter to be considered.

Fig. 4 represents a specimen from Stubbington, where such are found abundantly; it appears to be a worn specimen of this shell, it bears some resemblance to a screw; whence the Generic name *Haustator* is taken, by some authors, but perhaps unnecessarily. I have a very neatly marked specimen from Highgate. I believe it was very rarely found there.

Fig. 5 is a piece from the Craig at Holywell, with which I am favoured by Mrs. Cobbold, showing the many coned structure when worn away distinctly.

1814. 10.

TURRITELLA elongata.

TAB. LI.—*Fig. 2.*

SPEC. CHAR. Whorls flattened in the middle, lower parts projecting, striæ more distant near the middle of the whorls, inconspicuously crenulated, with some finer intervening striæ.

THIS is longer in proportion to its width than the last, it is also smoother and more irregularly striated. The whorl may be divided into three parts, viz. the upper part rounding, the middle part flat, and the lower part rather angular and overhanging, as it were, the upper part of the whorl below it. Whorls about fifteen; length nearly two inches.

Turbo vagans of Brander, T. 3, f. 50, much resembles this, but it can scarcely be determined by his fore-shortened figure. My specimens are from near Christchurch, Barton Cliff, &c. in Hampshire.

TURRITELLA brevis.
TAB. LI.—*Fig. 3.*

SPEC. CHAR. Spire rather short, upper and lower part of the whorls equally rounded, striæ ten or twelve, finely crenulated.

A CONSIDERABLY shorter shell than the last, with scarcely any appearance of the whorls overhanging each other, whorls twelve; length an inch.

This is from a clay stratum at Barton, it was sent me by my friend the Rev. F. Iremonger, it is a more delicate species than the preceding, and the substance seems but little altered; it resembles ivory.

TURRITELLA *incrassata*.

TAB. LI.—*Fig. 6.*

SPEC. CHAR. Whorls flattish, with the lower part angular and three smooth longitudinal threads; outer lip thickened in the middle.

LENGTH two inches, whorls about fourteen; two of the spiral threads are much more prominent than the third, particularly the central one, opposite to which, in full grown shells, there is an internal projection that gives thickness to the outer lip; besides this it is altogether a strong shell: the inner lip spreads over an umbilicus.

This is also from Holywell, it has a plain appearance, perhaps from being worn.

TURRITELLA *edita*.

TAB. LI.—*Fig. 7.*

SPEC. CHAR. Whorls rounded, slightly depressed in the middle, lower parts rather prominent with many obscure longitudinal striæ.

Turbo editus. *Brander, Tab. 3. Fig. 48.*

A LONG slender formed shell with about twenty whorls; length three inches.

This varies a little, and is very often like Brander's excellent figure. It is generally very chalky, and seems as if it had all the ornaments obliterated or worn, but is not so much so as might be supposed, for my specimen had some fine Flustra that appeared to be cotemporaneous with it, which in a great measure indicates that although somewhat worn, it never was very full of ornament, but always nearly as represented.

Most of the species of this Genus are very abundant wherever they occur, and every one is liable to vary, which makes it difficult to distinguish the species; how far I have divided them right can hardly be determined till more figures, specimens, and experience gives the necessary aid.

Fig. 7 may possibly be an older shell of the same species as fig. 2.

EUOMPHALUS.

TAB. LII.

I have placed the following under this new Genus, as rather agreeing with it than with *Delphinula*, where the penetrating Mr. Parkinson has doubted the propriety of placing them.

EUOMPHALUS *discors*.TAB. LII.—*Fig. 1.*

SPEC. CHAR. Above subimbricated with four spiral projections, beneath nearly smooth.

RATHER conical, with three or four volutions, the imbrications are most prominent over the spiral projections, one of which forms the margin of the whorl; the diameter is about two inches, the length little more than three quarters: aperture nearly circular.

The specimen was presented to me by Richard Duppa, Esq. in 1810, it is a beautiful one from Colebrook Dale. The lower figure shows the under side, which differs so much from the upper as to constitute a peculiar character. I have therefore called it *discors*.

EUOMPHALUS *rugosus*.TAB. LII.—*Fig. 2.*

SPEC. CHAR. Above subimbricated, with four spiral projections; beneath plaited, margin rather acute.

THE general shape of this shell is much like the last; the form of the mouth, which has two sharpish angles, and the undulating plaits beneath, distinguish it well. In this species one of the spiral projections forms the margin, and the other the inner edge of the whorl.

I am favoured with this from Colebrook Dale by Mr. Ryan.

EUOMPHALUS angulosus.

TAB. LII.—*Fig. 3.*

SPEC. CHAR. Above subimbricated, with three spiral projections, beneath striated, with five obscurely plaited spiral projections. Aperture obscurely octangular.

THE upper surface is nearly as in the last. On the under side the transverse plaits are partly obsolete in four longitudinal ranges, between the five ridges, forming three sharpish angles to the upper, and five to the lower half of the aperture. Diameter less than an inch. The ridges do not always interrupt the inner contour of the aperture.

The specimen from which this drawing is taken, is in the valuable collection of the great friend to this branch of Natural History, Thomas Meade, Esq. It is altogether a little disturbed, as if it had been in a soft state when it became petrified, and is thus irregularly round.

These three species all partake of an appearance as if from a similar Limestone stratum. I have seen one from Benthall edge that looked as if it were from the same, but not well enough preserved to enable me to determine to which species it belongs; Mr. Parkinson's Pl. 6, f. 7 and 8, is nearly in the same predicament: is it not my Fig. 2, from the appearance of the under side?

AMMONITES striatus.

TAB. LIII.—*Fig. 1.*

SPEC. CHAR. Discoid, gibbose, inner whorls concealed, obscurely undulated, finely striated longitudinally; septa rather distant, with four large angular folds.

THICKNESS rather more than half the diameter; striæ extremely numerous and very regular, the aperture is semicircular with nearly parallel edges; siphunculus at the outer margin of the septum, where it is slightly notched. The shell is very thin.

This resembles the species in Sir Edward Hulse's collection, that was Lethiculier's, and is figured in three views in Tab. 19 of his M.S. in that Gentleman's valuable Library, it is said to be found in Pools-hole in the Peak, Derbyshire. It seems to be the less globular variety mentioned by Mr. Martin in his description of *Nautilus sphaericus*, our next figure. I suppose our specimen to be from near Buxton or Castleton in Derbyshire. I believe the shelly remains are very seldom so perfect as in this specimen; and it is somewhat convenient that they did not quite cover it, as the zigzag septa would then have been entirely hid. The shell must have been beautifully delicate when in a recent state, as the elegant transverse undulations pass in very fine semicircular curvatures, with the sharp ends meeting in points upwards (only to be seen with a magnifier), passing into straighter lines by degrees to the sides. The zigzag separations are very distinct without passing into the foliated sutures that characterize most of the Ammonites.

AMMONITES sphæricus.

TAB. LIII.—*Fig. 2.*

SPEC. CHAR. Orbicular, inner whorls concealed; septa with four broad angular folds. Aperture narrow.

Martin Petrif. Derb. Tab. 7, Figs. 3, 4, and 5.

THE diameter and thickness are nearly equal; in other respects the interior of this shell resembles the last.

I could not discover the shell of this, although I had it in the stone, and the specimen within was a loose part that was enveloped by the remainder, which seemed as large altogether as Fig. 1, but united by degrees with the dark Limestone and lost its form. It is from Derbyshire.

AMMONITES minutus.

TAB. LIII.—*Fig. 3.*

SPEC. CHAR. Orbicular, inner whorls concealed with many distant longitudinal striæ. Aperture lunate.

THICKNESS and diameter nearly equal. Striæ about twenty-four. Aperture rounded at the sides. It has a small umbilicus. Diameter two or three lines.

Apparently a minute species of this Genus, but being a cast in Pyrites it only exposes the pattern of the external part of the shell and the aperture. From Folkstone in Kent, by favour of Mr. Gibbs. The right hand figure is the natural size, the other magnified. It looks at first sight like a very young specimen of *Ammonites sublævis*, tab. 54: that, however, was far from being so orbicular when in a young state.

AMMONITES sublævis.

TAB. LIV.

SPEC. CHAR. Orbicular (rather depressed when young), inner whorls exposed within the umbilicus which is deep, undulated, and has an angular edge. Septa numerous, with five principal undulations which are repeatedly divided into many lesser rounded ones.

Orbulites lævis? *Lamarcke, Anim. sans vertebr.* 54.
Nautilites, &c. *Luidii Lithoph. Brit. Tab. 6, F. 292.*

WHEN full grown about five inches in diameter with a very deep conical umbilicus about one inch and a quarter wide. The shell is smooth on the surface and free from undulations, except within the umbilicus and on the young shell. The margins of the septa traced upon the stone resemble some pinnate leaves, such as those of curled parsley. Aperture very wide, semicircular, truncated at the sides. Siphunculus close to the outer margin.

From Christian Malford, it is undoubtedly the same as the Kellaways rock Lyas shell, and is a fine example of difference in proportion arising from age, getting rounder as it has grown larger. The inner or younger part of this specimen at about a quarter of an inch long is only half as wide as long, and has very conspicuous rising transverse ribs, although so small: these become less sharp or more rounded as the shell advances in growth, being alternately long and short, and some furcate, at about two and an half inches or three inches long these striæ begin to be indistinct,

and they are scarcely if at all to be seen at four or five inches, the external measure of the original. I must observe that some other shells become the reverse or narrower and longer as they grow bigger, of which I shall hereafter show good examples, that may guard us against mistakes in future. A section through the middle is a curious geometrical object, and expresses this part of the subject clearly, for take any part of it as the younger shell it will show that it is longer than wide in proportion as it is smaller*, see the left hand figure. I have got a piece out of the inner part of the large one agreeing with it. The sections in this way often present beautiful specimens, of which I have one three inches in diameter; besides showing the different form of the infant shell, it shows the chambers becoming deeper and squarer, giving a new contour. The middle figure shows a front view of the septa in the young state, when they are broader in the middle. The right hand figure shows that the sides are become broader in the adult state, while it shows also the inner undulations and spreading ramifications of the sutures, and the place of the siphunculus, which is often difficult to discover. I have, however, a specimen from Kellaways by favour of Mr. Salmon, where it is rendered conspicuous by a stain of oxide of Iron. I have marked the spot in the middle figure. The specimens are sometimes very beautifully filled in a variety of ways with crystallized Carbonate of Lime of various colours, and sometimes with granular grey or other coloured Limestone. The divisions of the chambers are sometimes distinct, and sometimes quite obliterated for two or three turns. I have called this species *sublævis*, as it is wrinkled with transverse furcate costa when young, but otherwise smooth and shining. Colonel Hardwicke has a fine specimen, said to be found in a bed of sand in digging a well at Wisbech.

* More so than is generally the case with a volute.

AMMONITES Mantelli.

TAB. LV.

SPEC. CHAR. Depressed, edge three-sided, broad, and flattish; sides flattish; volutions undulated, about two-thirds concealed, undulations alternately reaching across the whorl.

THE aperture equals about two-fifths of the diameter, which is often four inches, and the thickness about one. The outer edges of the septa have five principal folds. The shorter undulations of the surface reach about two-thirds over the whorl. Aperture obscurely six-sided, one side embracing the next whorl. Whorls three or four.

I am favoured by the indefatigable G. A. Mantell, Esq. with numerous specimens of this species from Ringmer, east of Lewes in Sussex. Good specimens seem to be scarce, and as I had not seen such distinct ones before, I indulge myself in laying before the public the older and younger shell. I have also commemorated my friend in the specific name. The substance is a coarse buff-coloured marly limestone with a few ochraceous stains. I presume the species may sometimes be much larger, and then perhaps the characters may be more obliterated, as appears to be the case in the larger of these. I believe it sometimes varies a little, and has more prominent or knotted joints to the costa and somewhat diversified*. I suppose the siphunculus to be in the outer edge of the septa.

* Of this variety I have lately received a very large specimen from Hamsey near Lewes, by favour of the same Gentleman.

PECTEN.

GEN. CHAR. A regular, eared, inequivalved bivalve, with contiguous beaks. The hinge toothless; pit trigonal, receiving the internal ligament. One muscular impression.

PECTEN quadricostata.

TAB. LVI.—*Figs. 1 and 2.*

SPEC. CHAR. Triangular, nearly even, front semi-circular, margin notched. Convex valve ribbed, larger costa six*, three smaller between each. Posterior auricle large.

THE length is somewhat greater than the width; surface nearly smooth. There are regularly three small costa between each of the larger, making five sets of four ribs each: near the sides the costæ are less regular and smaller.

This is by favour of T. J. L. Baker, Esq. from Halldown near Exeter, out of the green sand. No. 2 is a fragment, perhaps of the same species, from the green sand at Chufe Farm, in the parish of Horningsham, near Longleat, Wilts. They are both siliceous, the latter is much worn, as if rolled. This is perhaps the same as the fine large shell from near Stourhead, represented in British Mineralogy, tab. 183, in which the shell itself is Carbonate of Lime, not siliceous. The Rev. Thomas Rackett has found the same species at Aynswell hill in Dorsetshire, in which the shell is siliceous.

* By some unaccountable accident, five only happen to be represented, which somewhat disguises the figure, but may be understood as now mentioned.

PECTEN *quinquecostata*.TAB. LVI.—*Figs. 4, 5, 6, 7, and 8.*

SPEC. CHAR. Subtriangular, rather oblique, front semicircular, toothed; convex valves gibbous, ribbed, principal costa six, with four lesser ones between each: surface finely transversely striated. Upper valve flat-toothed.

THE obliquity of this shell is slight, the length not much greater than the width; the lines of growth frequently being deep and crossed by the ribs give the shell a fringed or furbellowed aspect: the flat valve has diverging striæ and notches corresponding in number with the costa upon the hollow valve. The whole surface is covered with minute transverse striæ, which in the chalk specimens are often nearly obliterated. Figs. 4 and 5 are from the Sussex Chalk near Lewes, by favour of G. A. Mantell, Esq. they very much accord with those of the green sand from Wiltshire, figured below, but appear to be longer, and to have the transverse striæ of growth very remarkable. The shell represented at Fig. 5 is a curiosity, showing the inner side of the flat valve, which is slightly convex within. I gathered the small shell, Fig. 6, at Chute Farm, it is a young deep undervalue, with the transverse striæ of growth neatly arching between the larger six costæ. Figs. 7 and 8 show the upper and under valves of different specimens, they are from the green sand at Chute, and are chiefly siliceous; for the use of one I am indebted to Thomas Meade, Esq.

Such are said also to be found at Devizes and Blackdown, with the upper valve. It is possible that these are different species from those in the Chalk, the costæ are less prominent, and the striæ more distinct; at present, however, I can consider them only as varieties.

Tab. 56, Fig. 3 represents a specimen in ferruginous Sandstone from Chute, which may possibly prove to be a distinct species. Its length exceeds its breadth by one-fifth, and on the sides of the larger costæ are two lesser ones, which are partly blended with them; the surface is nearly smooth. I have only seen this specimen.

The following is a list of the names of the persons who
 have been appointed to the various offices of the
 Board of Education for the year 1898-99.
 The names are given in alphabetical order.
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 to the various offices of the Board of Education
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 order.

VERMICULARIA, *De Lamarcke.**Serpula, Linn.**Vermiculum, Mont. Test. Brit. 2. 517.*

GEN. CHAR. Shell a free tube gradually enlarging towards the mouth; spiral or involute at the smaller end; aperture round, entire.

THE Generic Character of *Serpula* given by Linnæus, including only such shells as adhere laterally to other bodies, and *Vermiculum* of Montague, (univalve, shape various, not attached to other bodies) not being sufficiently defined, I adopt De Lamarcke's Genus *Vermicularia* for such shells of the Linnæan Genus *Serpula* as are not fixed to other bodies*.

VERMICULARIA *concava.*TAB. LVII.—*Figs. 1, 2, 3, 4, and 5.*

SPEC. CHAR. Discoid, involute, concave on one side; the last whorl but slightly attached.

THIS is almost wholly involute with but a small portion of straight tube: the surface is nearly smooth and even; the involute part is concave on one side only, the other being flat. It seldom exceeds three-fourths of an inch in diameter, with about four turns.

I should suppose the inhabitants of these shells to be gregarious from the number included in the sand, but we cannot determine such things with certainty in fossils, which may, after they have passed from the living state, have been variously disposed, yet there is some room for presumption on this head when we find but little admixture. As the specific character will not include the varieties of this shell, I must observe that the younger shell probably has no appearance of the latter whorl separating from the

* The *Serpulæ* of *Linn.* are arranged as *Vermes* by De Lamarcke, to distinguish them from Mollusca or Shelly animals, but their having shelly coverings we may probably include them as better completing the arrangement of shells.

others, while the older shells have it more and more prominent as they advance in age, besides some contortions, such as becoming elliptical, &c. Fig. 1 is a congeries from the green sand at Dilton, near Westbury, by favour of Lord Compton, who possesses the specimen. Fig. 2 shows the upper flat side of the shell. Fig. 3 the lower or concave side. Fig. 4 a vermicular appearance which some of the brown calcedonic parts put on in spots as if the Silix had been dropped in, which spots often accompany shells found in the green sand. Fig. 5 is a mass of hardened marle with Chlorite sand, the same as Brit. Min. tab. 324. which seems to include the same shell, as far as I can conjecture, in it the chain-like section appears. It is probable that this shell belongs to the green sand formation particularly.

VERMICULARIA umbonata.

TAB. LVII.—*Figs. 6 and 7.*

SPEC. CHAR. Discoid, involute, umbonated above, concave beneath, the smallest whorl concealed in the umbo.

THE concavity of this shell is but trifling, the last whorl, at least in my specimens, is not separated from the others; the central obtuse knob is peculiar. About three-fourths of an inch in diameter, and the whorls two or three.

From the Hamsey marle pit near Lewes, by favour of G. A. Mantell, Esq. Fig. 6 the convex or umbonated side; Fig. 7 the concave side. It is composed of Carbonate of Lime.

VERMICULARIA ovata.

TAB. LVII.—*Fig. 8.*

SPEC. CHAR. Discoid, involute, rudely ovate, rather the most concave beneath.

THERE are about two or three whorls to this wormshell; the longest diameter is about half an inch.

I gathered it out of Limestone at Shotover hill near Oxford, and figure it as adding but little to the plate, and yet useful for comparison. I may hereafter meet with it in some variety.

ORTHOcera.

GEN. CHAR. Shell straight or slightly bent, fusiform; chambered, siphunculed; margins of the septa even or with one or two gentle wavings.

IN what manner the shells of this Genus terminate at either end, is at present not well ascertained. The jointed alveoli of some Belemnites, particularly in such specimens as exhibit them continued beyond the more solid parts, very nearly resemble some of the specimens of Orthocera, but as yet I have seen none with a central siphunculus. I have very lately been permitted by the kindness of Sir Joseph Banks to sketch a large specimen, in which the chambered part or Alveolus extends about seven inches beyond the Belemnite, properly so called, and so nearly resembles my Orthocera conica, that I suspect it to be the same species larger*.

We know of many species of Orthocera to which we have seen no Belemnite attached, and the proportions of which will match no Belemnite we are acquainted with. May it not be that the shell of some Orthocerae is so thin to the very point, as not to be recognized as a Belemnite, and that there is a series from these to such as have the shell so thick and large as to be arranged as Belemnites alone? The discovery of an Orthocera with a thin shell perfect to the end, would go far towards answering this query.

* I hope to receive more information upon this head, when I shall be happy in presenting the figure to my readers.

The following interesting Letter upon this subject I am indebted to Mr. Farey for permission to insert.

“HAVING collected out and arranged my Notes and references to Authors, as to British *Belemnites*, with or without the *Alveoli* or series of cups belonging to their conical cavities, which *Alveoli*, when hitherto found separate, have been generally called *Orthoceratites*, by various Authors, (and are said by some recent Writers to characterize the *Transition Rocks of Werner*?) I find them referable to 20 different places in the British series of Strata; extending from (1st) the *London Clay* above the Chalk, to (20th) the Limestone resting on Slate.

“It is the 13th of these Eras, in which *Belemnites* existed during the deposition (and probably during the Creation also) of the Strata that now rise to the surface or basset in the British Islands, that the very fine and perfect specimen lately found in Leicestershire and Northamptonshire, by Mr. *Benj. Bevan*, the Engineer to the *Grand Union Canal*, of which specimens you lately shewed me drawings, are referable.

“The Stratum to which I allude, is one of *Blue Clay*, situated in the upper part of what I have called the “*Lias Clay*,” in my Derbyshire Report, vol. I, p. 114, or between the *Northampton Freestone* and the *Blue Lias Limestone*; in the range of which Clay stratum across England, I have noted 9 localities of *Belemnites*, all probably of one species; the two first and most northern of these localities were known to Dr. Woodward, in the early part of the last century, as appears from his “*Catalogue of the Fossils of England*,” vol. I, p. 108 and 110, and his specimens are yet preserved at Cambridge, I believe.

“The 1st, from Ashby, E. N. E. of Market Harborough, Northamptonshire, is described as having two of the cups or chambers within the conic cavity of the *Belemnite*; the 2nd, from Great Bowden, N. E. of Market Harborough in Leicestershire, is mentioned as having six cups within the *Belemnite*; 3rd, Mr. Bevan’s specimen, sent to Sir Joseph Banks in Dec. 1813, from Husband Bosworth Tunnel, N. W. of the village, in Leicestershire, at 12 feet deep in the 5th shaft; several middling sized ones, in a layer in a lump of Clay, some of them crushed, and a large broken one containing six or seven cups; 4th, his fine specimen sent to Sir Joseph Banks in Feb. last, from 90 feet deep in Crick Tunnel, S. of the village, in Northamptonshire, (5½ m. N. of Daventry), which you have examined and drawn, and which is perhaps one of the most perfect specimens of the *Belemnite* and its *Alveoli*, that is known.

“My 5th note relates to *Belemnites* found in this stratum near Cheltenham Town, Gloucestershire, which were in the possession of the late Fletcher Bullivant, Esq. of Stanton Ward in Derbyshire; the 6th, at Frocester Hill, W. of Stroud in Gloucestershire, of which Mr. W. Smith has specimens; the 7th, near Lansdown, half a mile S. of Tog-Hill, N. of Bath in Gloucestershire, described in Mr. Walcott’s “*Petrifactions found near Bath*,” p. 35, tab. 45, fig. B; but possibly this may belong to my 12th situation in the series? the 8th, E. of the town of Bath, according to Mr. Smith; and the 9th, at Tucking-mill in Monkton-Comb, S. E. of Bath in Somersetshire; large with their *Alveoli*, Mr. Smith.

“I would beg to recommend it to the Readers of the “*Mineral Conchology*,” and your Correspondents in general, to assist in increasing our list of these important Extraneous Fossils, by sending you as many perfect specimens as they can, *out of Strata*, whose exact situation and nature they can describe, along with them.

JOHN FAREY, SEN.

ORTHOCERA striata.

TAB. LVIII.

SPEC. CHAR. Shell tapering very gradually, longitudinally striated, thin; aperture oval, about one-third broader than wide; septa numerous, deep.

THE stone filling the last chamber of this specimen, if separated would form a cup about three inches and an half in the longest diameter, and a little more than two in the other, an inch deep, and about three-eighths thick in the middle, with a very thin edge. The septa are extremely thin, blending almost imperceptibly with the outer shell. The siphunculus is about a quarter of an inch wide, and the whole of the specimen I possess is eleven inches long.

This species is in a lightish coloured Limestone found in the Black rock near Cork, and was sent me by Dr. Wood and Mr. Wright, in 1812, who observe that there are much larger in other parts of Ireland. I have two cupped Limestone divisions of a species much related to it from the Kendal Limestone, with Encrini and a small Trilobite imbedded in them, with the siphuncle central, but thicker in proportion to the diameter; they are five inches by four in diameter, and taper so little that a series would be fourteen or sixteen feet long ere they would form a pointed end. We hope this will inspire the curious in these researches to trace these subjects in the rocks ere they detach pieces.

ORTHOCCERA undulata.

TAB. LIX.

SPEC. CHAR. Shell oval, thin, smooth; septa numerous, oblique, their edges rising, oval, with a wave on each side. Siphuncle near the upper edge.

THE septa are nearly parallel, and but slightly concave, there are five or six to an inch, all equally distant: the siphunculus, placed near the broad side at about one-sixth part from the edge, is about one-tenth of an inch in diameter, the shell diminishes about one inch in a foot. My fragment is six inches long, and one inch three-fourths by one inch and an half wide at the broadest end.

When the shelly part (which is replaced by Limestone as well as the rest of the specimen), is separated, the divisions of the chambers are shown by distinct transverse striae. Fig. 1 shows the undulation opposite to the Siphuncle; Fig. 2, the side view, shows the obliquity of the septa; Fig. 3 one of the solid casts of the chambers, a little concave and with an undulating margin interrupting the more regular oval which it would have on looking directly into it. The upper part of Figs. 1 and 2 was possibly the terminal chamber, as the transverse septa are not to be seen; or it may be that the stone is more incorporated with it. This is from near the water-force on Scaleber near Settle, by favour of Mr. Ducket.

ORTHOCERA conica.

TAB. LX.—*Figs. 1, 2, and 3.*

SPEC. CHAR. Shell long-conical, aperture oval, a little wider one way than the other, smooth, chambers numerous, increasing in depth by age; siphuncle nearly touching one of the sides, small.

THE septa have even margins and regularly concave surfaces, they are very thin and twice as distant from each other at the broadest end of the shell; the siphuncle is oval, about half a line wide.

These figures exhibit specimens from the Alum Clay at Whitby, presented to me by the Marchioness of Bath. Fig. 1 is a dark Iron clay stone, the shell chiefly Carbonate of Iron. The edges of the septa have something like a double margin, or a little sulcus, which is occasionally apparent within the shell. Fig. 2 has the shell of a lighter tint with some signs of Pyrites and the remains of the pearly lustre in the division; it is also less conical, and I should consider it as the narrow continuance of the same species. Fig. 3 shows the convex side of one of the septa with the siphuncle near the edge.

ORTHOCERA Steinhaueri.

TAB. LX.—*Fig. 4.*

SPEC. CHAR. Shell transversely striated, very gradually tapering; chambers very deep; septa distant, even-edged, circular; siphuncle close to one side.

THE depth of the chambers, the distance of the septa, and the width of the shell, are equal to each other; the siphuncle is large in proportion to the shell, being half a line where the shell is half an inch. The striae on the surface are very regular and even.

This neat specimen was found accompanying the Ammonites Listeri, Brit. Min. t. 455, about two miles and an half north of Halifax, on the road to Bradford, in lumps of Limestone mixed with much Pyrites, by the Rev. H. Steinhauer, whose merit in research deserves esteem and remembrance.

ORTHOCERA Breynii? *Mart. Pet. Derb.*
T. 39. F. 2.

TAB. LX.—*Fig. 5.*

SPEC. CHAR. Shell plain, oval, gradually elongated septa oblique, slightly concave, ovate, numerous; siphuncle near the middle, small.

THE siphuncle is placed in the focus of the broader end of the oblique septa; the outer shell is very thin, plain, and much incorporated with the stone.

I have possessed this specimen some years, it is Limestone from Derbyshire; it agrees in many respects with Mr. Martin's description; his is more rapidly acuminate or conical, in his "the dissepiments are approximate, concave, oblique, almost entire;" but in this the slight wave in the front which he speaks of is scarcely discernible, the oblique divisions of the sides are like the line fig. 5*, allowing it but little undulation. The siphuncle placed between the centre and the edge agrees with ours. This species is said to vary considerably in size; we hope this figure will give occasion to enquiry whether they are the same species or not, and as there is a furrowed species, *O. Gesneri*, it would be advisable also to look for that with the outer shell, Mr. Martin's specimen being destitute of it. His figure of *O. Breynii* is destitute of the outer shell also.

ORTHOCERA circularis.

TAB. LX.—*Figs. 6 and 7.*

SPEC. CHAR. Shell smooth? gradually tapering, round; septa approximate, slightly concave with even edges; siphuncle placed about half way between the edge and the centre.

SEPTA about three-sixteenths of an inch distant from each other. Diameter of the largest end in my specimen about an inch.

A rude piece of Limestone from Dudley encloses this fragment; it is without the external shell, but the position of the siphunculus distinguishes it from all others that I have seen. I should not have figured this imperfect shell, had I not thought it convenient to particularize the difference of character in the shells belonging to certain rocks, for the sake of Geology, and even the more or less perfect preservation of the different subjects becomes of some consequence in such enquiries. In some instances we are pleased to find that such small remains have a specific difference.

HAMITES, *Parkinson*.
Baculites, Faujas de St. Fond.

GEN. CHAR. Fusiform; hooked or bent into two parallel limbs, chambered; septa undulated at their margins with a siphuncle at their outer edge.

THE surface has commonly annular undulations, and the siphuncle is at the outer edge of the septum. The septa have six large waves with plated margins, as in Ammonites.

The Genus *Baculites* appears to have been formerly made from straight fragments of chambered shells; the bent or hooked parts of which, having been since found, have been termed *Hamites* by *Parkinson*. The siphuncle seems to have been passed over by *Faujas de St. Fond*, who describes the septa as imperforate; it is, however, visible in several of my specimens, and particularly so in one from *Maestricht*, the chambers of which are cast in sandstone and detached from each other, which was lent me by *Mr. Parkinson*. Some Authors, as *De Montfort*, speak of and figure a central siphuncle, but we conceive that none of the chambered shells of the same construction as those of the present Genus ever have the siphuncle in the centre.

As far as I know, no whole shells of this peculiar Genus have been found, or even either of the terminations; from hence it is, I presume, that many mistakes have arisen and continually will arise in the division of the species. I have taken up the subject as a means of drawing the attention of Collectors to it, hoping they may do something to improve our knowledge; besides it had become necessary to make figures, as some of the subjects are liable to decompose and be lost, while most of them are considerably lessened in beauty by the decay of their tender pearly shell. The form and position of the undulations upon the surface, and

perhaps even the form of the tube itself, are liable to variation; these are still further difficulties.

Hamites have been found in the Clay at Folkstone, as most of the species here figured; in the Chalk at Hamsey in Sussex, resembling *H. intermedius*; and also by Miss Benett, in the Chalk at Horton.

HAMITES tenuis.

TAB. LXI.—*Fig. 1.*

SPEC. CHAR. Slender, depressed, undulations obtuse, slightly waved, disappearing on the back of the limbs.

THE compressed shape of this would give the aperture an oval form about half as long again as wide. The undulations are irregular, some reaching nearly to the back, others only half way. The fragment I have figured is straight, and tapers more rapidly than others of the Genus.

I am indebted to the indefatigable James Gibbs for this and most of the specimens figured in this and the following plate. They were picked up by him in the Clay of the neighbourhood of Folkstone, among Ammonites and various other Fossils.

HAMITES rotundus.

TAB. LXI.—*Figs. 2 and 3.*

SPEC. CHAR. Aperture round, undulations obtuse, annular, numerous; the curve of the shell very gradual.

THE regularity of the undulations and roundness of the shell, are the distinguishing marks of this species. *Fig. 2*

exhibits two specimens, the largest appears to be distorted laterally, for the septa at the lower end are turned to one side. It is composed chiefly of Iron Pyrites covered with the pearly remains of the shell; its small weight, and the cavity at the upper end, lead me to think that the chambers are left hollow; the other is quite regular. By an attentive examination of the specimen the siphunculus may be traced. Fig. 3 shows a compressed cast in Oxyde of Iron (probably this was Pyrites once). I add it for the purpose of exhibiting the gradual curvature, but with some hesitation, as the specimen is too bad to ascertain with certainty that it belongs to this species.

HAMITES attenuatus.

TAB. LXI.—*Figs. 4 and 5.*

SPEC. CHAR. Slightly compressed, suddenly attenuated just below the curve; undulations obtuse, numerous.

THE larger limb is suddenly contracted near where it turns into the smaller, which consequently is more slender in proportion, and is round; the undulations are obscure at the back. The specimens here represented are excellent for exhibiting the Generic character, in consequence of the length of the lesser limbs, which are rarely found.

Fig. 4 is cast in dark Iron Pyrites, with the pearly septa remaining. In the engraving the undulations are not quite near enough, particularly on the lesser limb. Fig. 5 is an impression in Clay of a larger shell, perhaps of the same species; it appears to have been Pyrites, and dissolved.

HAMITES compressus.

TAB. LXI.—*Figs. 7 and 8.*

SPEC. CHAR. Depressed, curved at right angles? undulations sharp, slightly waved, most prominent at the back.

OF the oval end the shorter diameter is two-thirds the length of the longer; the undulations are very regular, bending towards the curve.

The lightest coloured of these specimens is marle, the other Iron-stone; the septa are obliterated in both.

HAMITES maximus.

TAB. LXII.—*Fig. 1.*

SPEC. CHAR. Slightly depressed; undulations even, rounding, disappearing at the back; curvature gradual.

SYN. *Parkinson Org. Rem. III. Tab. 10. F. 4.*

As the curved part of a shell of this nature, cannot be increased by age, I conceive this to be a very large species. Except the size, I do not know any very strong character by which to distinguish it.

This specimen is exceedingly handsome; the beautiful pearly shell covers a mixture of Pyrites and indurated marle, which serve to relieve it. Mr. Gibbs brought it with those of the last plate from near Folkstone.

HAMITES intermedius.

TAB. LXII.—*Figs. 2, 3, and 4, except the right hand figure.*

SPEC. CHAR. Depressed, undulations obtuse, annular, waved, curvature rounding.

SYN. *Parkinson Org. Rem. III. Tab. 10. F. 1. 2. narrow end uppermost.*

THE undulations continue all around, but in some specimens are obscure at the back; in size it is intermediate between *H. maximus* and *H. rotundus* or *H. attenuatus*; in form between *H. maximus* and *H. gibbosus*.

The three specimens at Fig. 2, and two at Fig. 4, are indurated marle; the smallest of these two last is harder and darker coloured, it approaches Argillaceous Iron stone. The Figs. 3 are Pyrites with a bright brassy surface, the straightest of these shows the pearly septa and siphuncle very distinctly. The undulations descend towards the front when near the curve, as in three of the smaller fragments, while further from it they are direct, and higher still they ascend as in the larger representations; all these directions are seen together in the longest piece of *H. rotundus*.

HAMITES gibbosus.

TAB. LXII.—*Fig. 4, right hand figure.*

SPEC. CHAR. Gibbous, undulations acute, prominent at the front, rather distant.

VERY flat at the back, where the undulations rise but little: the front is rounded, so that the end is an oval with the shortest diagonal from back to front, and just the reverse of all the others.

Indurated marle is the substance upon which the pearly coat of this is preserved; the septa are so much blended as to be nearly obliterated.

HAMITES adpressus.

TAB. LXI.—*Fig. 6.*

SPEC. CHAR. Aperture round, lesser limb acute, pressed close to the larger; no undulations; septa? distant, not waved.

UPON the surface, which is smooth and even, are circles that I suppose to be the edges of the septa, they are equally distant, notwithstanding the gradual diminution of the shell.

I can scarcely admit this as an Hamite, since it appears to want one or two of the characters, but am unwilling to make a new Genus without seeing more specimens with similar characters. The only one I have seen is composed of ochraceous Iron.

FUSUS, *De Lamarcke.*MUREX, *Linn.*

GEN. CHAR. Univalve spiral fusiform. Varicose sutures none. Mouth oval, with a long channelled beak and entire outer lip.

FUSUS longævus.

TAB. LXIII.

SPEC. CHAR. Ventricose, smooth, spire turretted with a few large knobs upon the upper part of the latter whorls; beak as long as the spire, slightly curved near the end.

SYN. *Murex longævus.* *Brander Foss. Hant. p. 22. f. 40. 70. and 93.*

WHEN young the knobs upon the latter whorls are scarcely discernable; when full grown they are about half an inch long, and about the same distance from each other; the length of the shell is eight inches, or even sometimes more; the young shells show transverse striæ upon the upper whorls.

This is one of the handsomest shells found at Barton or Hordwell Cliffs in Hampshire. I have figured an uncommonly perfect specimen from the cabinet of Miss Benett. Most of the specimens found are only fragments, and those approaching to perfection seldom have the beaks entire.

An *Ostrea* adheres to it, which, although pretty perfect, does not show its characters sufficiently to be figured otherwise than as a companion to the *Fusus*.

Miss Codrington has a fine specimen from Muddiford, in which the knobs are numerous and large; while I have fragments of various sizes in which there are scarcely any protuberances, thus constituting two varieties, which might lead to error, did not some specimens exhibit both in one shell.

There are shells from France, which often find a place in English Cabinets, and are perhaps this species; they are very delicately preserved, and show the striæ of growth in thready appearances, which are more or less decussated by transverse rising ridges from the first even to the last whorl. I do not know that this species, so frequent in Hampshire, has been found in the Highgate Clay.

OSTREA gigantea.

TAB. LXIV.

SPEC. CHAR. Depressed, longer than wide, pit of the hinge large, tripartite, placed upon a straight perpendicular eminence, its sides flat striated; sides near the edge obscurely crenulated; muscular impressions deep.

SYN. *Ostrea gigantea*. *Brander, Foss. Hant. f. 88.*

THE chief distinguishing mark of this oyster is the internal end of the hinge, which is perpendicular to the surface of the shell and straight not curved gradually into the sides of the shell, as in other species. The shell is thick and irregular in form.

I was favoured with this rare specimen by Miss Benett, who procured it from Hordwell or Barton Cliffs in 1813. It is the finest specimen, I believe, yet known, and appears to be the deeper valve. At the British Museum there is a fragment which I think seems to be the shallow valve of a size that may fit this, having about the same area and the hinge being similar: pieces more or less perfect are not unfrequent.

There are much larger oysters, recent and otherwise, but I am unwilling to alter the name. I picked up one brought to mend the road at Lambeth which weighed three pounds and an half, possibly from Malta, where there are oyster shells weighing much more; and I have an elongated one resembling *Ostrea virginiana*, *Lister, Tab. 200, 201. Fig. 34 and 35*, about one foot long.

It is worthy remark in this specimen that the colour of the cicatrix is so conspicuous.

VENUS angulata.

TAB. LXV.

SPEC. CHAR. Obtusely cordate, broader than long, beak short, an angular rising on the anterior side, which is slightly truncated, smooth; margin entire; larger hinge-teeth placed at an angle of about 60° .

Two inches and three-quarters long, three and a quarter wide, rather slender. The two prominent teeth of the hinge are placed at a curved* angle of about 60° . In the posterior side of the hinge of the shell is a rather roundish hollow to receive a tooth on the opposite valve.

This shell very much resembles the recent Venus Islandica, but the hinge-teeth are much narrower, and the angle at the ridge is rather undulated and less conspicuous, and spreads more externally, but is better seen internally. It has some resemblance to Venus mercenaria, but that has a serrated edge. It may be proper to observe that in Mr. Pennant's British shells† this latter is mistaken for the former.

Desirous of determining this Blackdown siliceous Fossil, Mr. Parkinson kindly lent me a specimen much larger than the figure, by which, with a smaller one by favor of Miss

* Tab. 20. V. planus, angle not so curved.

† Edition 4.

Hill, I am gratified in settling it, as I had figured what had, by some, been considered the same species.

I find, upon comparison, that there are two or three more that have a general resemblance to each other, found at Blackdown, which may be distinguished by the hinge, and I shall pay attention to them, that when I have sufficient specimens, they may not be forgotten.

PERNA, *De Lamarcke, &c.*

GEN. CHAR. Subequivalved oblique winged bivalve, hinge formed of many parallel linear teeth, not articulating, and ranged upon a straight, transverse, or oblique line. Ligament attached between the teeth on each valve.

THE Genus *Crenatula* (Parkins. Org. Rem.) is somewhat related in respect to the crenulated hinge, but is otherwise very distinct. These will require further attention.

PERNA *aviculoides.*

TAB. LXVI.

SPEC. CHAR. Depressed, very oblique, ovato-lanceolate, wings small, beak straight; lines of growth fine, prominent, sharp.

LENGTH equal to thrice its breadth, the posterior wing is sharp; the hinge straight; anterior wing very obtuse, and the front round; sometimes six inches long.

This species has been found frequently in various imperfect states of preservation, in which it has been difficult to gain proper instruction as to where to place it systematically, and although in its general construction it is sufficiently distinct, and its peculiarities convenient, as far as we know them, yet its generic and essential characters are concealed.

Dr. Lister, tab. 519, fig. 74, seems to have figured this shell in a mutilated state as a *Solenites*, and better specimens at tab. 522, and 523, fig. 77 and 78, as *Pinnites*, and many have called them in common *Muscles*. I do not know that tab. 521, Lister, belongs to this Genus; there is a peculiar accuracy in his figure from which I should doubt it, but tab. 522 being in all probability a *Perna*, I have an idea that they might have been placed on the same page as somewhat related to each other. In some places I understand a similar, if not the same species, has been termed the *Laurel-leaf Muscle*: in Oxfordshire, about Shotover Hill, I have picked up a curved inside cast which I expect may be of this Genus, and I feel an hope that it may be found with sufficient of the shell to determine it; we shall then know more accurately the form of the muscular impressions, which are very large and apparently one in each valve, besides a row of little lateral risings within the shell, near the front, that seem peculiar to it. Such are found in some of the Bedford Clay strata, but I have not seen very perfect ones.

Until Miss Benett brought me specimens, I had not much noticed the Genus, not having found any before sufficiently fit for attention, but on discovering the rudely crenated hinge, it shortly settled a distinction to search for, and soon after the learned Woodwardian Professor my very kind friend the Rev. John Hailstone, brought for my inspection some of the strata of Filey promontory, White-nab, near Scarborough, with similar shells, one of which had the inner part of the hinge exposed, which was enough to show to what it belonged, and the general outline of the rest led me to Lister as above, tab. 519, fig. 74, from the inscription upon which plate, as Mr. Hailstone observes, "e rupibus juxta Philo, agri Eboracensis," we may suppose they came from the same place.

Figs. 1 and 2 are from Osmington near Weymouth, they were found in a mixed stratum with a muddy debris, and the shells seem as if they had suffered but little change by their general aspect, as if indeed they had only lain in mud and dirt so as to begin to lose a fresh appearance, such as might be expected in a few months, but as they are found upon examination to be changed into crystallized Carbonate of Iron? they are certainly preserved under other circumstances.

Fig. 3 shows part of an hinge from Whitenab. Fig. 4 is a specimen from the same place.

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CUCULLÆA, *De Lamarcke.*

GEN. CHAR. Bivalve equivalved, inequilateral, subtransverse, ventricose. Hinge rectilinear furnished with a series of transverse interlocking teeth, and terminated by two or three parallel transverse plates. Cartilage external.

THIS is another Genus separated from the Linnæan Genus *Arca*, and of which I presume we shall find many species.

CUCULLÆA *glabra.*

TAB. LXVII.

SPEC. CHAR. Rhomboidal, anterior angle obtuse, posterior edge of the front rounded; surface covered by fine longitudinal lines decussated by the lines of growth: teeth of the hinge deeply striated.

SYN. *Cucullæa glabra?* *Park. Org. Rem.* 171.

BUT slightly ventricose, and without any very prominent angle; about one-fourth wider than long; beaks rather incurved; the surface to which the cartilage of the hinge is attached is marked with four diverging cuts, and the line of the hinge finely reticulated.

These Blackdown specimens, so much externally resembling some *Arca* of Linnæus, help to caution us against

forming a judgment from external appearances only. There are I find many species that might be taken for varieties, as they gradually pass through different degrees of obliquity. This appears to be the species Mr. Parkinson thinks might, if not otherwise designated, be called *glabra*; I am afraid however that there are still more glabrous ones to obtain the title. The line of the hinge is, as he observes, finely crenulated, as well as three transverse teeth which terminate the hinge at each end: so are some of the other species of this Genus, and possibly it ought to form part of the Generic Character, but may often be imperceptible from being worn, as I have it tolerably distinct in that Mr. P. thinks might be denominated *C. decussata*.

PRODUCTUS.

GEN. CHAR. An equilateral unequal-valved bivalve with a reflexed, more or less cylindrical, margin; hinge transverse, linear: beak imperforate*; one valve convex, the other flat or concave externally.

No one not usually conversant with the subject, would conceive the shells I have collected for this Genus could be in any way related to the Genus *Anomia* of Linnæus, but as yet there seemed no other place for them in the system, nor do they agree with any of the Genera established by later Authors. Martin has pointed out several divisions of the Genus *Anomia*; one of them which he defines to be "imperforate, with one valve gibbous, the other flat or concave, hinge on a straight line," includes these shells and I expect several others, as he considers the reflected margin to be accidental. His *Conch. Anomites productus* is a good type of the Genus, therefore, as the name *Anomites* must be laid aside, I have adopted his specific name as the Generic one, the character it expresses being also peculiar. It is highly gratifying to me that I have the means of showing so many new Species of such a curious Genus as this from Scotland, by the help of the indefatigable, ingenious, and zealous Friend to science, the Rev. John Fleming of Flisk; every one must feel pleased at his generous desire to facilitate knowledge by trusting such delicate specimens so far, and further at his desire to commemorate the late Mr. Martin, by naming this Genus after him, for his superior talent in showing the divisions in the old Genus *Anomia*, but as the name *Productus* appeared so applicable, I was loth not to use it, so have been content to apply his name to the species I have robbed of the Generic one.

* This term is used because it was formerly placed among *Anomiæ*, which included perforate and imperforate.

PRODUCTUS longispinus.

TAB. LXVIII.—*Fig. 1.*

SPEC. CHAR. Eared; convex valve indented in the middle, broader than long, the other concave; hinge long, one very long and several smaller spines near each side of the concave valve.

THE ears are triangular, gradually extended from the sides of the shell, and bounded at the back by the straight linear hinge, which is about half as long again as the shell, and equal to its width. All the spines are tubular, the two principal ones are nearly straight and cylindrical, attached to the sides of the convex valve, and extending in a line parallel to the hinge, the other spines are placed between these and the beak; in the only specimen I have examined there are two small holes near the front edge, probably the remains of spines which have been broken off. The reflexed margin is entirely lost, but the great curve of the concave valve and the blunt edge indicate it. Length half an inch.

I name this from its remarkable spines, of the extent of which when perfect I am not certain; they diminish but little in half an inch, so that to come to a point they would be perhaps an inch and an half long; they are apparently broken, which shows their tubular construction, and from what I have seen in other species, I should guess that they open into the shell for some purpose suited to the nature of its inhabitant. "It is from the great Limestone stratum which traverses in a northerly direction the county of Linlithgow, and constitutes a part of the independent Coal formation of the Lothians, Scotland;" Rev. J. Fleming.

PRODUCTUS Flemingii.

TAB. LXVIII.—*Fig. 2.*

SPEC. CHAR. Ears small; shell nearly twice as broad as long; the sides of the convex valve gibbous; the front indented, longitudinally furrowed; a few short spines on the sides.

HINGE straight, in length about two-thirds the width of the shell; there are several concentric wrinkles extending over the ears, which are not very prominent; no lines of growth visible. The spines are tubular, as in others of the Genus, some are closed at their extremities, others open, perhaps broken. Length half an inch.

From the same place and by the same favour as the last; a specimen of the deep valve only, with some ferruginous earth in it, but which allows the inside of the shell to show the perforations. I believe that the deep shell may be enough to distinguish species by, but experience may hereafter determine it better. I take upon me to honour it with the name of the discoverer, whose merits and kindness I shall be glad to hand down to posterity.

PRODUCTUS spinulosus.

TAB. LXVIII.—*Fig. 3.*

SPEC. CHAR. Semicircular, flattish; hinge long and straight; convex valve gibbous towards the beak, with many small spines spread over it; ears obscure; the other valve also spinous and very concave.

THE spines are short, numerous, and arranged in quincunx order; besides these the surface is covered with longitudinal

striæ; the line of the hinge is as long as the shell is wide, forming the diameter of its semicircular edge.

From the same place and person as the last: this and the two former are extremely brittle; they are little else than the earthy part of the shell remaining, coloured by Iron Oxide.

PRODUCTUS aculeatus.

TAB. LXVIII.—*Fig. 4.*

Conchiliolithus (Anomites) aculeatus. *Mart.*
Petrif. Derb. T. 37. F. 9 and 10.

SPEC. CHAR. Roundish, concave valve smooth; the other with adressed reflected spines; gibbous; front slightly indented; hinge half the breadth of the shell.

THE spines are so adressed to the convex valve, that they appear as if they were forcing their way through it and raising its surface, with their points towards the beak or backwards, chiefly on the sides, about ten on each, in nearly regular alternate order. Length rather less than the breadth, which is seldom three-quarters of an inch. On the convex valve are several obscure concentric undulations.

I had this from Mr. Martin; it is rather smaller than his figure, and is a cast in a light coloured Limestone with the shelly remains very thin. He says it is found near Bake-well and Buxton. The beaks, he observes, are often broken, giving them the appearance of being perforated. Mine is broken off, but I have represented it as if whole; the allowance is easily made.

PRODUCTUS scabriculus.

TAB. LXIX.—*Fig. 1.*

Conchiliolithus (Anomites) scabriculus. *Mart.*
Petrif. Derb. Tab. 36. F. 5.

SPEC. CHAR. Nearly round, flat valve obscurely punctato-striated, the other gibbous, marked with longitudinal striæ and prominent tubercles ranged nearly in quincunx order; hinge straight, equal to the breadth of the shell.

THE sides are straightish, giving the shell a rectangular form, rather wider than long: the tubercles on the convex valve are placed on the striæ, elongated, and each has a fine point at the end most distant from the beak. The flat valve has indentations like the impressions of the imperfect spines on the other valve, giving a concentrating reticulated appearance.

Mr. Martin sent me this shell many years ago from Buxton. It has much the character of his Conch. (Anom.) productus, and presuming on this general appearance, I expect most of the Genus, although not always found with the produced margin any more than his, have it when perfect.

PRODUCTUS spinosus.

TAB. LXIX.—*Fig. 2.*

SPEC. CHAR. Roundish, very gibbous, convex valve with many long spines, longitudinally striated; hinge small.

THE back of this shell is rounder than the front, which is slightly indented in the middle; the striæ are pretty numerous; the spines long, cylindrical, bent towards the front; hinge apparently much shorter than the shell is wide; length rather less than the width, which is not quite an inch. The concave valve is destitute of spines.

This being a rarity in Scotland, the same part from whence the Rev. J. Fleming sent me the former, I was glad to gain for the science the information such a specimen affords. Of its being a *Productus* I believe there can be no doubt, and its similarity to *Conch. (Anom.) productus* of Martin, Tab. 22. F. 1. upper part, which I wish to call *Productus Martini*, makes me almost suspect it to be a variety of it; the spines, however, being more prominent and the hinge shorter, may prove it distinct; we must avail ourselves of these characters until our knowledge is ripened by experience, and we may hereafter show more perfect specimens.

PRODUCTUS Scoticus.

TAB. LXIX.—*Fig. 3.*

SPEC. CHAR. Semicircular, with fine longitudinal striæ and a few obsolete spines, gibbous towards the beak; sides expanded into the line of the hinge; hinge nearly twice the length of the shell.

THE shallow valve has diverging striæ, similar to those in the other, but without spinous punctures; it is concave, deepest in the two spaces between the middle and sides; the sides wrinkled towards the hinge. The striæ on the convex valve are a little interrupted by obsolete spines or punctums, and short intervening striæ. The lines of growth are fine and partial, causing irregular undulations, especially towards the sides; the middle slightly depressed. Nearly two inches wide.

I know this species from Scotland only, it was sent me by the Rev. J. Fleming. It is in dark coloured foetid Limestone, like most of the Derbyshire species, and it has crystallized Carbonate of Lime of a lightish colour within it.

DENTALIUM, *Linn.*

GEN. CHAR. Shell univalve, tubular, tapering, slightly bowed, open at both ends.

DENTALIUM *nitens.*

TAB. LXX.—*Figs. 1 and 2.*

SPEC. CHAR. Nearly straight; surface even and shining; aperture circular; mouth expanded.

VERY gently tapering to the smaller end, at which the shell is thickest. From half an inch to one inch and an half long.

Found in the Clay at Highgate in 1811, chiefly in broken pieces, with some smaller ones, apparently young of the same; they were mostly filled with the Clay, and thin, brittle, tender, remarkably smooth and shining. I do not know that such have been found elsewhere in England. I have received a species resembling it, but rather larger, from Avignon, under the title *Dentalium cylindricum*, by favour of my kind friend Mr. Gerville; it is highly polished, but is distinguished by little oblong punctures.

DENTALIUM *entalis?*

TAB. LXX.—*Fig. 3.*

SPEC. CHAR. Slightly arched, surface waved, nearly smooth; edge of the mouth acute; apertures smooth.

SYN. *Dentalium entalis?* *Linn. Syst. nat. ed. 13. Tom. 1. p. 3736.*

ALTHOUGH this shell is tolerably smooth, the striæ of growth are here and there more or less conspicuous.

I have received specimens of this among shells from the Hordwell Cliffs; they do not vary much in size, and seem but little changed, which makes me rather doubt whether they really be fossil.

DENTALIUM striatum.

TAB. LXX.—*Fig. 4.*

SPEC. CHAR. Surface marked with ten or eleven longitudinal acute prominent striæ, and several obsolete intervening ones; lines of growth fine, numerous; aperture circular.

THE longitudinal striæ are very regular and prominent at the smaller end of the shell, making it about ten-angled, but they disappear towards the mouth; there are from one to four intervening minute striæ, which are most apparent near the middle of the shell. The thickness is nearly equal throughout, and the inside smooth; length about two inches.

I am rather doubtful whether this species, from its being sometimes nearly covered with longitudinal striæ, and sometimes nearly destitute of them, has not been made into two species, entalis and Elephantinus, by Brander; or it may otherwise have been deceiving, as the outer ornamented part is sometimes separated in a thin coat, leaving the other inner part nearly smooth; the figure shows the outer coat whiter, and the inner part smooth and not shining, otherwise it might have been considered as the Highgate species, from which it is however sufficiently distinct in other respects. I have received these by favour of Mrs. Tylec and the Rev. Mr. Bingley, from Hordwell and Barton Cliffs.

DENTALIUM decussatum.

TAB. LXX.—*Fig. 5.*

SPEC. CHAR. Surface marked with twenty or more longitudinal striæ and several intervening obscure ones; lines of growth numerous, distinct, oblique; mouth elliptical.

THE longitudinal striæ are much more numerous in this than in the last, but not much more prominent, although the shell is nearly twice the diameter; they are decussated by the lines of growth, the obliquity of which seem to indicate an elliptic mouth.

I received this specimen from the great Friend to Botany and science, William Borrer, Esq. from Sussex.

DENTALIUM ellipticum.

TAB. LXX.—*Figs. 6 and 7.*

SPEC. CHAR. Nearly straight, quickly tapering, rather compressed, surface uneven, aperture circular; external edge elliptical.

THE shell being thicker along two sides, gives the tube a depressed form, and makes the outer margin of the mouth elliptic; the lines of growth give the surface a rugged aspect; internally it is beautifully polished: the diameter of the mouth is sometimes nearly half an inch.

This is a large species, apparently not before noticed, for want of better specimens; it is however the more deserving

of notice as it gives rise to beautifully polished oblong cones, which frequently remain after the shell is decomposed, and which have often puzzled Collectors, from the difficulty of ascertaining what they belong to. They are from Folkstone in Kent, by favour of Mr. Gibbs.

DENTALIUM costatum,

TAB. LXX.—*Fig. 8.*

SPEC. CHAR. Surface marked with twelve or more closely set ribs; lines of growth obscure; aperture circular.

THE ribs and sulci between them are nearly equal and rounded.

I am greatly indebted to Mrs. Cobbold for sending me this rarity from the Holywell Craig, which place has afforded to ingenuity of enquiry and research such fine and instructive specimens, of which many are yet to come. It is but little changed, and seems like those shells that have been softened by exposure to the weather, then rolled a little, and afterwards preserved in Ochraceous Gravel. It does not agree with any recent species I know of.

TURBO.

GEN. CHAR. Shell conoidal or slightly turreted; aperture round, not toothed; margins disjoined in the upper part; columella smooth at the base.

TURBO littoreus.

TAB. LXXI.—*Fig. 1.*

SPEC. CHAR. Shell suboval, acute, striated; columnar margin flat.

SYN. Turbo littoreus. *Linn. Trans.* VIII. p. 158.

WHORLS about five, with their upper part rather flat, making the sides of the cone nearly straight; in the Fossil specimens the striae are often worn away.

Bramerton Hill, near Norwich, affords these shells in plenty, and remarkably well preserved, sometimes even so as to vie with the recent ones in colour; there is some variety in shape, number of coloured stripes, &c. The upper figures are from a lengthened rather distorted specimen, such as I have often seen recent; the others are the more usual form of the recent specimens, which are often larger and vary much, as nice discrimination will discover.

TURBO rudis.

TAB. LXXI.—*Fig. 2.*

SPEC. CHAR. Shell suboval, rather obtuse; whorls ventricose.

SYN. Turbo rudis. *Linn. Trans.* VIII. p. 159.

WHORLS four or five, rather swelled in their upper parts, undulating the sides of the cone; the lip generally thick; there are often a few longitudinal furrows besides the striæ, which, with the irregular lines of growth, give the shell a rugged appearance.

From near Aldborough, by favour of my kind friend the Rev. J. Lambert, of Trinity College, Cambridge.

Whether I am right in considering these shells as the same species with the two recent ones I have named them from, must be determined by experience. I cannot discover any character to distinguish them by; the *littoreus* has the same markings, and the *rudis* seems to be as destitute of colour as the recent shells, a resemblance that is very remarkable, and seems to indicate that these fossils, together with others that accompany them, are not of very ancient date, compared with those that are in more solid rocks, and which also lie deeper in the strata.

AMPLEXUS.

GEN. CHAR. Shell nearly cylindrical, divided into chambers by numerous transverse septa; septa embracing each other with their reflexed margins.

AMPLEXUS coralloides.

TAB. LXXII.

SPEC. CHAR. Tube irregularly bent, longitudinally striated; margins of the septa deeply reflexed and regularly plaited.

THE folds on the margin of the septa correspond in width to the longitudinal striæ of the tube, and are so deep as to form elongated cells opening into the chambers; the lines of growth are close and rather unequal in depth. The diameter and curvature of the tube are both irregular; the septa are a fourth or a fifth part the diameter, distant from each other, with the margins reflexed to the next septum. The diameter is from half an inch to one inch and an half.

This extraordinary production, an example of the curious structure of organic antediluvian remains, is from the Black rock at Limerick. I have been favoured with specimens by my ingenious friends Mr. Wright of Cork, and Mr. Moore of Dublin. They seem a type of a peculiar formation or æra in that Limestone, which requires some penetrating research. Its resemblance to a Coral or Madrepore has probably caused it to be less noticed, as looking like ordinary specimens of branches of some of that tribe. Upon examining it, however, its uncommon structure is developed, and we are enabled to add another Genus to the multilocular shells.

Fig. 1 shows the half of a cylinder with the divisions, which are filled almost homogeneously, so as to appear a mere piece of grey marble, the upper end exposing the embracing margin of a division in oblong convexities, between the angles of which are small remains of the corresponding folds of the next joints; at the bottom are the concave sides of the folded margin, the lower corners of which are generally left in the angles of the plaits below. Fig. 2 is turned the other way upwards, and shows its irregular cylinder, striæ, &c. Fig. 3 a single joint of a larger specimen, with part of the shelly covering left; Fig. 4 two joints of a smaller specimen broken from No. 5, which exposes crystallized Carbonate of Lime in some of the chambers.

AMMONITES planicosta.

TAB. LXXIII.

SPEC. CHAR. Depressed, volutions six or more, not concealed; (diverging costæ) or radii numerous, obtuse, flattened at the front; mouth circular, slightly indented at the back by the preceding whorl.

BETWEEN the rising striæ of this shell are rounded furrows; the costæ are prominent on the sides and straight, as they go round the front they widen, are flattened, and incline towards the mouth. The siphunculus is only now and then preserved so as to be discernible.

I have long desired to acknowledge the kindness of John Rogers, Esq. of Yarlinton in favouring me with two beautiful drawings of this fossil, commonly known by the name of Marston Stone. It is found at Marston magna near Ilchester; at Evershot in Somersetshire; in digging a well in Lord Digby's park at Sherborne; and also near Yeovil in Somersetshire in moderate masses, occasionally big enough to form tolerable sized sideboards; Dr. Lettsom has a very fine one. It is formed of a dark marly Limestone, including shells laying in great disorder, and much variety is produced by the sections when cut and polished, the white shelly remains passing into a buff colour, and sometimes finely iridescent both inside and out. The divisions of the chambers lined or filled up with fine brown

crystallized Carbonate of Iron or Carbonate of Lime, adds to its variety and beauty. The same species of shell is discovered at other places under different circumstances. My good friend, James Brodie, Esq. brought me specimens from Craymouth in a more granular marly Limestone, in which nearly the whole of the shelly part is more or less replaced by a brown sparry crystallization exactly forming the contour of the shell. They are also found loose and very perfect, and sometimes in small masses or separate, cast in Pyrites, as at Exmouth. There are seldom other shells in this congeries besides the one now described, and a keeled Ammonite generally of a larger size and sufficiently characterized to form another Genus perhaps, hereafter to be noticed.

TURRILITES tuberculata.

TAB. LXXIV.

SPEC. CHAR. Whorls of the spire beset with one row of large obtusely-conical projections or tubercles, and three rows of smaller tubercles below them.

THE upper row of tubercles extends along the middle part of each whorl; they are in number about eight or ten to each whorl, and placed at distances nearly equal to their diameter. The siphuncle (mention of which is omitted in the Generic Character on page 81, on account of uncertainty) is placed near the upper part of the whorls.

Who would have imagined, but a short time since, that Great Britain could possibly have been favoured with such a variety of natural productions as are now continually discovered. The present specimen among others, in this work only, is a proof of an increasing activity of research. We have been able to pourtray this magnificent shell through the kindness of the assiduous G. A. Mantell, Esq. F. L. S. accompanied with the observations of locality at the end of this description; it is not only valuable as a shell of rare occurrence, but from its extraordinary size, for if perfect it must have measured more than two feet in length, according in proportion with the gigantic species of Ammonites, a Genus to which it is analogous in its chambered structure.

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This specimen is decisive of the situation of the siphunculus in the Turrilites, which before was in a similar predicament with some of the Ammonites and the Hamites, see p. 135. It is perhaps wonderful that the replacing of the different parts of the construction should be so partial, that the siphuncle can be discovered only in a very few instances: there are among Fossils many other examples of the same nature. The probable construction of the septæ with the siphuncle is similar to that of Hamites, and from my experience in this subject, I think Montfort's figure with a central siphuncle is incorrect, both in Turrilites and Baculites. The specimen here figured is a little compressed, being narrower one way than the other; it was found in July, 1814, in the marle stratum at Middlesham, in the Parish of Ringmer in Sussex, situated about two feet below the surface; the Turrilites occurring in general at the depth of six or seven feet.

It is worthy of remark that this is the only species found at Ringmer and Stoneham, while at Hamsey, where the costata, figured at Tab. 36, and the undulata, Tab. 75, are met with, the tuberculata entirely disappears.

TURRILITES undulata.

TAB. LXXV.—*Figs. 1, 2, and 3.*

SPEC. CHAR. Whorls decorated with many gently undulated costæ, mostly continuing from the upper to the lower part of each.

THERE are sometimes indications of a row of tubercles below the costæ, and sometimes the costæ themselves are somewhat depressed near the middle, as if they were dividing into knobs. Some persons doubt whether this be not a variety of *Turrilites costatus*, Tab. 36, I, however, consider it deserving of a distinct figure, and I have received, since this plate was engraved, some specimens which serve in some measure to confirm me in my opinion of these being distinct species, as they agree on the whole with the larger outline, Fig. 1, which shows they are sometimes of a considerable size, and the more finished representation, Fig. 2, with very little depression in the costæ. Fig. 3 shows a variety somewhat approaching the *costata*, but even in this there is but one row of tubercles, and that would be concealed by the next whorl.

This species is found at Hamsey with the *T. costata*, while *T. tuberculata* seems only to belong to Ringmer. As it requires some time to be assured whether one I have received from Stoneham is not another distinct species, having one row of larger and two of smaller tubercles, while *T. tuberculata* has one row of larger and *three* of

smaller tubercles (besides other differences), I have reserved it for a future period, when other species may have been discovered. These figures are from specimens with which I am favoured by Mr. Mantell, who has examined the Genus much.

TURRILITES obliqua.

TAB. LXXV.—*Fig. 4.*

SPEC. CHAR. Upper part of the whorls contracted; below the middle is placed a row of large oblique tubercles.

THE spire of this turns to the right, whereas the other Turrilites are reversed shells: the tubercles being placed upon the more prominent part of the whorls give them an angular aspect.

The morsel I have here figured is from the micaceous Sandstone near Devizes: it was found in digging the Canal, and presented to me by Mrs. Gent. It may hereafter prove not to be a Turrilite: I figure it not knowing that better can be got, and wishing to draw the attention of Collectors to it. Its not being a reversed shell is peculiar, if it be a Turrilite, as I believe other Turrilites always are so, a circumstance which Mr. Parkinson's Engraver has overlooked, and which I forgot to mention in my former description, though my figures are right.

MYA intermedia

TAB. LXXVI.—*Fig. 1.*

SPEC. CHAR. Depressed, smooth, twice as wide as long, sides rounded, anterior side expanded, gaping a little; posterior side small; front nearly straight.

The opening of the gaping side is less extravagant than in most *Mya*; the general flatness of the shell, but particularly of the anterior side, distinguish this in its external appearance from several fresh-water shells of the Genus *Mya* of *Linn.* or *Unio* of *De Lamarcke* and others. The specimens in general are about two inches and an half wide. I was favoured with some by Lady Wilson, as well as by Mr. Borrer from Bognor. I venture to consider it a *Mya*, but I could not see the hinge with so much certainty as I could wish, although I had many specimens, as the valves are generally closed and held strongly together by the tough sandy marle.

The shell is a little chalky, but breaks in some parts with a brittle and angular fracture.

MYA plana.
TAB. LXXVI.—*Fig. 2.*

SPEC. CHAR. Rather depressed, smooth, wider than long, ovate, nearly equilateral; anterior side rather elongated; front rounded.

THIS is a very delicate, slender shell; the anterior side scarcely gapes, but is slightly truncated only; about three-fourths of an inch wide.

I found this abundantly at Plumsted, near Woolwich in Kent, in 1808, yet very rarely a moderate specimen, and seldom in pairs; they are placed in a stratum of shelly earthy matter seldom more than a foot thick, betwixt sand and flint pebbles, varying very much in size, and stratified above and below them. The shells are more or less stained, a little chalky, partly retaining their polish within, and separating easily from the earthy substance about them.

MYA subangulata.

TAB. LXXVI.—*Fig. 3.*

SPEC. CHAR. Rather depressed, smooth, wider than long, nearly equilateral, oblong-ovate; anterior side angular above, acuminate; front slightly emarginate.

THE greater width in proportion to the length; the straighter and slightly indented front, and angular appearance of the anterior side, distinguish this shell from the last.

From Barton, by favour of Miss Tylee. I believe it is very rarely found, yet the specimens are tolerably perfect, being cleaner and whiter than the last, and retaining the inside polish. I suspect this species gapes but little or not at all, yet the hinge does not allow of its being separated from the Mya, else the general construction might warrant it, as in external character it differs from fig. 1, which is the more common appearance of Mya.

PLAGIOSTOMA.

PECTEN, *Luid.*

GEN. CHAR. An oblique eared bivalve, hinge destitute of teeth or internal pit; line of the hinge straight in one valve, in the other deeply cut by an angular sinus.

THE beak and parts about the beak of all the individuals of this Genus I have met with, are very thin; the sinus at the back forms when the valves are together a large triangular aperture, probably for the passage for the attachment of the animal to rocks, &c. There does not appear to be any true hinge. The type of this Genus has been well known from Luid's time to the present day, and has had many Generic titles, such as Pectinites, Venus, Cocklestones, &c. it is figured among the Trigonæ in the Natural History part of the French Encyclopædia; and Parkinson, after he had taken much pains, thought he had found a tooth in the hinge, and figured it as a *Donax*, *Org. Rem.* 3. t. 13. f. 3.

It often happens that certain species of a Genus are preserved in hard stone, or under circumstances that prevent our getting at those parts which are required to establish Generic characters, while others are as easily examined: this is exemplified in the shells of this Genus, the *P. gigantea*, although too tender to resist the changes which the thick valves of several of the Trigonæ will withstand, is nevertheless generally well preserved, but so firmly attached internally to hard stone that the inside is not to be got at; whereas the *P. spinosa* often occurs in soft chalk which can be picked out

easily; in this, however, the thinness of the beak is such, that it is not often preserved entire. *Plagiostoma* (from *πλαγιος*, oblique, and *δωμα*, mouth) is the trivial name given by Luid to my *gigantea*, from which it should appear that he had not overlooked the external form of the back, with the triangular opening for the cartilage of attachment. The species of this Genus being apparently but little understood, I have taken some pains to examine them, and the tenderness of the beak or hinge end, which is extremely thin and brittle, and commonly imperfect, rendering this difficult, I am the more pleased that I have thus succeeded.

PLAGIOSTOMA *gigantea*.

TAB. LXXVII.

SPEC. CHAR. Smooth, depressed, deltoid with the posterior side rounded into the front; ears small, anterior one longest, placed in a large broad and straight furrow; beaks pointed; surface obscurely marked with diverging striæ.

ALTHOUGH this shell is marked with lines of growth and diverging striæ, yet its general aspect is smooth; often the lines are very obscure, as if worn away, and the surface appears polished: it is deepest towards the straight anterior side; its width is about four-fifths of its length, and its greatest depth about one-fifth.

This species is found in great variety in the Bath Lyas or Foetid Limestone, both the blue and white, the specimens partake of the colour of the stone in which they are imbedded. They are often of large dimensions: I have one nine inches in diameter, and another very large one

from Avignon, where they are said to be sometimes larger, even ten inches or more. Probably they are as large in England in places from whence I have received only smaller specimens, as Cardiff Castle, and Pickeridge Hill, in South Wales, from which latter place I have received abundance and variety by favour of Miss E. Hill, who first noticed those interesting quarries, being conducted there by an observing mind, upon seeing the stony fragments brought to the road side from Boston House, and finding upon enquiry that it was built of stone brought from that place about 250 years since. Several new and curious productions are found these deserving the attention of the Geologist, as to the strata, &c. Among them are a variety of Gryphites and flattened Ammonites, in what the workmen called Blue and Grey Lyas; there are even fragments of Pentacrini, Echinus spines, &c. and it may be worthy of remark that the striated Limestone, Brit. Min. tab. 345, is found there much as at Shotover.

PLAGIOSTOMA spinosa.

TAB. LXXVIII.

SPEC. CHAR. Obovate, longitudinally furrowed; sides nearly equal, straightish; one valve spinous, spines half the length of the shell.

ONE valve is more convex than the other, the flatter one being spinous; both are deeply and regularly furrowed both outside and within, the projections of the inside terminate in angular teeth near the edge. The spines, in

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number about twenty-five, are largest near the front of the shell; at the sides they are smaller and lie closer together: each spine has a dorsal ridge and a distinct furrow beneath. Beaks projecting. The whole surface of the shell is covered with very fine transverse projecting striæ; the lines of growth sometimes interrupt the regularity of the furrows, and the spines are sometimes very short and adpressed, at others they are irregularly bent, but their general position is at an angle of about 45° with the shell. The breadth is rather above two-thirds of the length. I can discover no muscular impression within the shell, although I have specimens perfectly cleared from the chalk.

This species is common both in the soft and hard Chalk, and is often attached to Flints. I have received it in hard Chalk from Mr. Mantell, found near Lewes; from Norton Bevant, Heytesbury, &c. from Miss Benett. Inside casts are common in gravel flints, these, of course, do not expose the spines. Mrs. Morris sent me a specimen picked up at Rickmansworth, and I have a cast in Calcedony, found near Sidmouth, for the possession of which I am indebted to the kindness of my friend Mr. Thomas. Its varieties are almost, nay sometimes quite, destitute of spines; Mr. Mantell sent me a specimen from Lewes, in which some of the spines are almost at right angles to the shell, and the others laying in bas-relief, curving in elegant turns, as if too weak to rise.

Fig. 1 represents the spinous side of a specimen said to be from Brighton, the Chalk is cut from it as far as might be to leave support to the spines; the beak of the plain side is just visible. Fig. 2 gives the dorsal view of a specimen from Northfleet, showing the triangular aperture: this specimen had the remains of a Flustra on some parts of it. Fig. 3 the inside of a detached spinous valve, having no appearance of a muscular impression, as in Pecten.

DENTALIUM planum.

TAB. LXXIX.—*Fig. 1.*

SPEC. CHAR. Gently tapering and curving, smooth; aperture round; lip a little thickened, sharp edged.

NEARLY an inch long, sharp at the smaller end.

Gregarious, found in moderate quantities in a greenish sandy Limestone at Bognor, in masses of considerable size. I have a piece about four inches broad, and uniformly filled with them as the piece represented, by favour of Mr. Boys.

DENTALIUM cylindricum.

TAB. LXXIX.—*Fig. 2.*

SPEC. CHAR. Cylindrical or scarcely tapering, nearly straight, smooth; aperture round.

ABOUT three-fourths of an inch long, and almost a line in diameter; the smaller end nearly as large as the other.

The ochraceous sandy Iron-stone stratum near Exmouth, affords these in tolerable plenty, being casts of both the outsides and insides of the shells, leaving the empty spaces where the shells had been. The casts of the inside look

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like perfect *Dentalia*, more especially when separated or having fallen out, and may often be taken for the shells themselves. I received these long since by favour of the late Mr. Cunnington, and lately by the friendship of Mr. Holloway.

Dr. Thompson, in his *Annals of Philosophy*, asks how the Fluor was dissolved from the Quartz in some Mineral veins; and may I not here ask what has become of the Carbonate of Lime or shelly matter? What solvent would take away the Lime and leave the cavities where the shells were, so perfectly clean, and apparently having no avenue for its escape? I have still more curious facts of this kind; they serve to enliven the imagination, and heighten our admiration of Nature.

DENTALIUM *incrassatum*.

TAB. LXXIX.—*Figs. 3 and 4.*

SPEC. CHAR. Very taper, curved, smooth, swelled near the aperture; aperture round; lip sharp.

SIMILAR in its proportions to *D. planum*, but much more swelled near the lip, and more curved.

Found in single specimens, or in numbers clustered together, as fig. 3, in hardened Clay at Highgate. Fig. 4 is a specimen of the same species with part of a small one at the small end, giving it the character of a jointed species: found in the dark Clay at Richmond, where the specimens were generally scattered.

DENTALIUM medium.

TAB. LXXIX.—*Fig. 5.*

SPEC. CHAR. Shell tapering; mouth round; lip sharp; tube somewhat trumpet-formed within, or broad at the mouth, and becoming suddenly small; external transverse striæ or lines of growth conspicuous.

THIS shell is rather thicker than most of the species, it is gradually thinner near the mouth, the edge of which is sharp, giving the inside a trumpet form, while the outside is not expanded.

I am obliged to the indefatigable Miss E. Hill for this, among other curiosities peculiar to the green sand from Blackdown; and as I believe it to be rare, I have placed it here that it may be an hint to those who have opportunity to search for better specimens; it is part of a cast in sand, which is united together by a siliceous cement. Fig. 5 shows the cast of the inside; fig. 6 the cast of half the outside broken from the other.

DIANCHORA.

GEN. CHAR. An attached inequivalved bivalve, the attached valve having an opening in place of a beak, the other beaked and eared; hinge without teeth.

ALTHOUGH I expect there are but few shells with these characters, I think the attached valve of importance enough to separate them as a distinct Genus from Plagiostoma, which in other respects they closely resemble. This character is the more remarkable, as it is united with an angular aperture at the back of the shell, seemingly formed for the passage of a ligament, by which the animal could fix itself to rocks, &c. as in Plagiostoma. The beak and parts around it are mostly very thin, the ears small, and the general contour of the shell oblique.

DIANCHORA striata.

TAB. LXXX.—*Fig. 1.*

SPEC. CHAR. Oblique, ovate-triangular, beak prominent, free valve obscurely ribbed.

LENGTH and breadth nearly equal, and the form would be ovate, were it not for the projecting beak, from which the free valve is gradually flattened to a sharp edge, and which

gives it a triangular aspect. The ears are small and continued along the sides.

I found this some years since at Chute Farm near Warminster, in the green sand, a place that afforded me an extraordinary variety on a small piece of land. The specimens vary a little, and have more or less Carbonate of Lime in them, filling up betwixt the calcedonic infiltration, which looks like a little worm shell or *Serpula*, but on inspection discovers a sort of stalagmitical form of the calcedony in circles, rings, or drops.

DIANCHORA lata.

TAB. LXXX.—*Fig. 2.*

SPEC. CHAR. Semicircular, beak rising; free valve plain.

THE obliquity of this species is scarcely to be observed; the lines of growth being slightly marked, and the gentle convexity of its form, added to the indistinctness of the few striæ upon its surface, and the sharpness of its edge, give it a peculiar plainness of character.

This is from the Chalk near Lewes, by favour of Mr. Mantell; it is but little known, I believe, at present in Chalk, and it differs from any I have hitherto seen in other strata or formations.

MYA lata.

TAB. LXXXI.

SPEC. CHAR. Ovate, depressed; anterior side acuminated and truncated, slightly gaping.

LENGTH about two-thirds the width; the beak is sharp, but not very prominent; the hinge-tooth large.

This is a great curiosity at present, and is highly satisfactory as determining the species to be different from the recent *Mya arenaria* of Linnæus, which is readily seen by comparison, at least from that understood to be *Mya arenaria* in England. The craig shells of Norfolk and Suffolk are remarkable for the little change they have undergone, as well as their near resemblance to some of our recent species; and although a few are not easily to be distinguished from them, and others are mutilated, and until seen in perfection cannot be distinguished, yet many are not at all related to any recent species known or observed in any other stratum. Thus it is pleasant to meet with sufficient specimens. If the present be the same as those from Bramerton near Norwich (of which we have only seen small pieces which were generally considered as *Mya arenaria*) they must be different species; *Mya arenaria* is not truncated, and they differ sufficiently from *Mya truncata* not to be that species, and as it is a broad shell, I have called it *lata*. It seems to be between *Mya arenaria* and *truncata*; but there are other truncated species among the Fossils, and others might come between the same two, else intermedia might have been a good name.

CARDIUM hibernicum.

TAB. LXXXII.—*Figs. 1 and 2.*

SPEC. CHAR. Very broad and deep, longitudinally striated; posterior side deeply truncated, bounded by a large circular ridge, concave, with a nearly central umbo; anterior side elongated. Beaks incurved, small.

THE length of this is nearly equal to the width, and the depth but little less than the length. The size and sharpness of the longitudinal ridge that bounds the concave posterior side, is such as to give the shell a carinated form; it arises from the beaks; the umbo in the centre of this side is a kind of wing. The striæ on the surface are rather distant, and the spaces between them convex, but not enough so to be called ribs.

The Genus Cardium is so constant in its characters that it can seldom be mistaken; its species may generally be known by analogy, although the internal parts cannot be seen; the present one, however, without a knowledge or comparison with a recent species as unlike others of the Genus as itself, might have remained unintelligible, but with such an help we are enabled to be bold, and undoubting: the Venus's heart Cockle, *Cardium cardissa*, has the internal characters very decisive, and the remarkably curious external form is nearly the same as that of the stony cast, except that the sides or wings, if I may be allowed to call them so, are not so much elongated. It is with much pleasure I thank my Friends, Dr. Wood and S. Wright, Esq. of Cork, for specimens from the black marble rock in that vicinity. Mr. J. Humphreys has materially assisted me with specimens, and I have had one from Mr. W. Moore of Cork, who considered it as the heart Cockle. They are provincially called *Asses' hoofs*, and I am told they are sometimes so large as to answer to the appellation in respect of their size. The *Cardium* found in the neighbourhood of Paris, by Lamarcke, is quite distinct, and more like *C. cardissa*, ours not having the denticulated edges: may their

existence depend on the neat preservation of the specimens, being chiefly in a stratum of little else than clean fragments and minute shells of their own texture, which preserve them by defending them from the ruder fragments and change of weather?

As the sides are usually broken off, I have had recourse to several specimens to produce the upper figure, which I hope exhibits the character tolerably correct. The shell is so incorporated with the stone, that it is not possible to detach it and expose the hinge: it is often partially filled with foliated Carbonate of Lime, exhibiting the diagonal fracture. Fig. 2 gives two views of a specimen that appears to have been distorted when the rock was in such a soft state as to assimilate with the shell, and both were compressed or bent together, a circumstance characteristic of the Irish Black Rock.

CARDIUM elongatum.

TAB. LXXXII.—*Fig. 3.*

SPEC. CHAR. Ovate, ventricose, longitudinally and obtusely plaited; anterior side elongated, plain; posterior side produced.

SYN. *Arcites rostratus.* *Mart. Petr. Derb. pl. 44.*

INCLUDING the elongated sides, this shell is twice as wide as long; the longer side is nearly cylindrical and free from striæ; the beaks are rounded.

This is from Derbyshire, and is the same species as figured by our late friend Mr. Martyn as an *Arca*, which it was generally thought to resemble. Its relation to the Genus *Cardium* will not, however, now be doubted, having seen the *Cardium hibernicum*. How near the rock containing this in Derbyshire is related to the black rock of Ireland, will by degrees be ascertained. Some of the *Terebratulæ* which accompany them are very similar, if not exactly alike in both rocks, agreeing with *Anomia striata* of Martyn. This specimen was among others presented to me by Mr. Martyn before he begun his work, and I presume it is from the place where his specimen was found.

TEREBRATULÆ of the plaited sort seem to form a division, but in the great variety of species the passage from the smooth to the plaited ones will be so gradual, that it will be hardly possible to draw a line. I have put a few plaited ones together here, and once thought they might be named numerically from the ridges, but I now expect that will be equally difficult. I have taken such means as were most convenient for the present, hereafter perhaps we may improve. The species here represented and those figured in tab. 15, agree in many particulars: the perforation in both is at the end of the beak of the shallow valve, and occasionally they have both two oblique sulci or narrow furrows, that would if imperfect imply a triangular foramen, see fig. 8; the sides of the hinge are not straight in either. Fig. 2* shows the cast of the triangular organization; I shall explain this further when I figure species in which I have seen the internal structure.

TEREBRATULA *lateralis*.

TAB. LXXXIII.—*Fig. 1.*

SPEC. CHAR. Oval, broader than long, gibbous; middle of the front much elevated with three deep but short plaits; sides with two plaits each, much below the middle.

THE three plaits in the middle of the imperforated valve, though not continued far into the shell, produce three very

deep angular notches, which are filled by as many sharp teeth on the edge of the other valve, which is not so much plaited and is altogether flatter. The length of the edge between the central plaits and the lateral ones is remarkable.

This is found in the Limestone rock near Dublin, and in the Black rock near Cork. The stone is generally a compact darkish marble, fœtid when scraped. I have had specimens from Messrs. Moore of Dublin, and Dr. Wood and Mr. Wright of Cork. A similar species is found at Aynhoe, Northamptonshire, in a marly stratum.

TEREBRATULA crumena.

TAB. LXXXIII.—*Figs. 2, 2*, and 3.*

SPEC. CHAR. Deltoid, gibbous, plaited; middle of the front elevated with three long plaits; sides with four or more plaits below the middle; beak prominent.

SYN. Anomites crumena. *Martyn Petr. Derb. Tab. 13. f. 4.*

THIS species is distinguished from the last by its deltoid form, and the plaits extending nearly to the beak.

Mr. Martyn long since sent me this from Winsten, it is composed of grey Limestone. I have also casts in ferruginous Sandstone, of what I suppose to be the same species, from the banks of the Tees, by favour of the Rev. Mr. Harrinan; they are represented, *fig. 2 and 2**. Pickering has afforded Miss E. Hill the same species.

TEREBRATULA tetrædra.

TAB. LXXXIII.—*Fig. 4.*

SPEC. CHAR. Obtusely deltoid, gibbous, plaited; front elevated in the middle with four or five sharp plaits; four or more sharp plaits on each side; beak rather incurved.

THE general form of this shell is a regular tetrædron, the edges of which are rounded, the plaits are very neat and continue to the beak. The distance between the central and lateral plaits is about three-fourths the length of the shell.

This species is plentiful at Aynhoe and in some other places, the shell remaining with a silky lustre and somewhat fibrous texture, like many of its congeners. It is also abundant at Banbury in Oxfordshire.

 TEREBRATULA media.
TAB. LXXXIII.—*Fig. 5.*

SPEC. CHAR. Very obtusely deltoid, gibbous, plaited; front rounded, with a rising in the middle composed of six sharp plaits approaching those in the middle; beak a little incurved.

MAY be distinguished from the last species by its more rounded form, the greater number of its plaits, and the less sudden elevation of the middle.

Also from Aynhoe, and the neighbourhood of Bath.

TEREBRATULA *concinna*.TAB. LXXXIII.—*Fig. 6.*

SPEC. CHAR. Nearly globose, acutely plaited, middle elevated by seven plaits; twelve or more plaits on each side; beak projecting.

A VERY elegant shell, the plaits are very uniform and neat, and continue sharp to the very beak: it is rather wider than long; the length and depth are about equal.

The peculiar neatness of this shell has given it a name. It is from Aynhoe.

TEREBRATULA *obsoleta*.TAB. LXXXIII.—*Fig. 7.*

SPEC. CHAR. Nearly round, gibbous, plaited; middle of the front a little elevated by seven plaits; sides having from seven to eleven plaits: beak projecting.

A FLATTER and less neat shell than the last, and the middle of the front is less elevated. Depth about two-thirds the length.

This species was sent from Felmersham near Bedford, by the Rev. T. O. Marsh, in 1813, it does not appear to be common. I believe the same species is found in Wiltshire, but the specimens are larger, and the seven ridges are not always so perfectly distinguished from the seven lateral plaits. I have received it also from Gunton near Yarmouth; by favor of Mr. Downs.

BALANUS.

GEN. CHAR. Conical, composed of four or six valves laterally articulated and fixed by a base. Mouth at the top, having within two or four valves like an operculum.

THE operculum is seldom found in extraneous Fossils, because in the recent specimens it is united only by a membrane. Many of the species are gregarious, when the form becomes prismatic instead of conical: the lateral valves are generally composed of tubes.

BALANUS tessellatus.

TAB. LXXXIV.—*Fig. 1.*

SPEC. CHAR. Obliquely conical, thin; valves six, obscurely ribbed, smooth; interstices finely tessellated; aperture oval.

HEIGHT rather less than the diameter of the base, the longest diameter of the aperture about half as much.

This species, from Bramerton in Norfolk, has some resemblance to recent species, yet I do not know that it can be referred to any known one. It is thinner for its size than most reliquia.

BALANUS crassus.

TAB. LXXXIV.—*Fig. 2.*

SPEC. CHAR. Oblique, thick; valves six, obscurely ribbed, smooth; aperture triangular.

NOT so conical, thicker, and more irregular than the last; the aperture is four-sided, but three of its angles are more acute than the fourth: its height equals the diameter of the base.

This specimen, from Holywell near Ipswich, by favour of the kind friend to science, Mrs. Cobbold, is the best I have seen. At the same place are found separate valves and fragments, perhaps of the same species. Fig. 4 is rather more ribbed. Fig. 3 is smooth and destitute of ribs; apparently from being worn. The inside projections and pores at the narrowish base are exposed in the lower figures 3 and 4; in one of them which is very thick, the bottom pores are elongated. Perhaps it will become of use to notice these parts as the progress of the yet infant knowledge of organic remains will point out.

TRIGONIA.

GEN. CHAR. An equal-valved inequilateral trigonal bivalve, hinge with two diverging elongated compressed teeth, transversely grooved on each side, and fitting into grooved cavities in the opposite valve.

THE trigonal form, although admitted as a Generic Character, is often very obscure. The anterior side of the shells of this Genus is generally separated from the rest by a prominent ridge, and the whole surface is more or less ornamented. In *Trigonia margaritacea*, of Lamarck, a recent shell which led to the discovery of the nature of the hinge of this Genus, it is said that there are two muscular impressions, but in the fossil species I have not been able to trace more than one: ought they not therefore to be considered as distinct Genera? The difference is of consequence to those who doubt the identity of recent with fossil organization.

 TRIGONIA costata.

TAB. LXXXV.

SPEC. CHAR. Triangular, with transverse smooth ribs; anterior side marked with many small and three large prominent longitudinal crenulated ridges.

SYN. *Curvirostra non rugosa*, &c. *Luid. Lithoph.* p. 36. T. 9. F. 714.

Trigonia costata. *Park. Org. Rem.* 3. T. 12. F. 4.

THE posterior angle is very obtuse; the anterior side large, with an obtusely three-angled margin, corresponding to the three larger longitudinal ribs, before the first of which the

transverse ribs that cover the other part of the shell abruptly terminate. Length and breadth nearly equal.

A frequent shell in Great Britain, particularly in the inferior Oolite, as at Little Sudbury Wilts, and at Oxford. I have received specimens from the Rev. H. Steinhauer and Mr. Sheffield. Neither is it rare on the Continent. The specimen figured shows the hinge very distinctly, and also the single muscular impression. It is nearly a solid gray Carbonate of Lime, and being found in an ochraceous matrix, is more or less colored with ochre. Little parasites have formed holes, &c. in most of these shells; sometimes they have vermiculi about them.

TRIGONIA spinosa.

TAB. LXXXVI.

SPEC. CHAR. Roundish, depressed, many-ribbed; anterior side truncated; ribs oblique, diverging both ways from the ridge that separates the anterior side; set with short spines.

SYN. *Park. Org. Rem. 3. T. 12. F. 7.*

THE ribs of this shell are composed of tiled plates, the edges of which are twisted up into a sort of flat spines; they are small at their commencement, but increase in thickness as they descend obliquely from the ridge towards the front; they are curved, and terminate very suddenly at the edge. The disposition of these ribs, and the regularity of their asperities, produces a considerable degree of novelty and elegance of feature.

This very curious species is from Blackdown: the casts are siliceous; it conveys, even when magnified, a sort of deception to the sight, and it has its name from that look, which when thoroughly understood, does not appear accurate, and may be the rather unfortunate, as it is likely better to suit some other species hereafter, but the original name must be retained. I am glad to show the hinge, by favor of the Rev. H. Steinhauer. This shell has been penetrated by some curious parasites.

TRIGONIA clavellata.

TAB. LXXXVII.—*Upper figure.*

SPEC. CHAR. Triangular, rather wider than long, with ten or more oblique rows of tubercles; anterior side straight, with three longitudinal knotted ridges.

SYN. *Curvirostra rugosa clavellata major.* *Luid. Lithoph. p. 36. T. 9. F. 700.*

Trigonia clavellata. *Park. Org. Rem. 3. T. 12. F. 3.*

THE posterior side and angle are rounded; anterior side straight, slightly gaping near the hinge, and forming an acute angle with the front: there are about ten rounded tubercles perfectly distinct in each row.

I have figured this from a specimen sent me by the Rev. S. Rackett from Radipole near Weymouth; such is also found at Portland. The shell is preserved of much the same texture as a recent oyster shell which has laid in a blackening mud. The same species has been found in Oxfordshire by Mr. W. Walter, and I have a cast in Sandstone, from Gunton in Suffolk, that appears to be the same species, but its length and breadth are more equal, and it is larger. I have also received, by favor of Alexander M'Leay, Esq. numerous specimens of a species much resembling this from Boulogne; they are from one to five inches wide, much wider than long, and can hardly be called triangular, the anterior side is drawn out to a greater length, and the depth is also greater: they are much worn, with oyster-shells sometimes adhering to them: the earth about them is a marly clay.

The lower figures represent a shell which so nearly resembles the larger one, that I can only consider it as a variety: in it a few of the tubercles in each row are united, so as to form interrupted ridges. I thought it a convenient addition to the plate, although the specimen was not very perfect, as it shows the hinge, which the compactness of the stone in the upper specimen prevents the display of. This is from the inferior Oölite at Little Sudbury, by favor of the Rev. H. Steinhauer.

TRIGONIA *dædalea*.

TAB. LXXXVIII.

SPEC. CHAR. Obtusely rhomboidal, with many oblique rows of tubercles; anterior side angular, with many scattered tubercles, and one longitudinal row, bounded by a longitudinal ridge, on which is another row of large tubercles.

SYN. *Trigonia dædalea*. *Park.* 3. *T.* 12. *F.* 6. with smaller tubercles.

NEARLY half the surface is occupied by the flatter part, which I call the anterior side; from the tuberculated ridge which bounds it, the oblique rows of tubercles which cover the rest of the shell descend towards the front, except near the beak, towards which three or four rows incline; they are gently recurved. The scattered tubercles upon the flatter part are smaller than the others, and are arranged in quincunx order; the length is rather greater than the width. There is a variety with smaller and more numerous tubercles referred to above.

I feel much pleasure in presenting so complete a specimen of this singular and rare species, through the kindness of my friend T. J. L. Baker, Esq. Few specimens have good hinges, but here happen to be the two opposite valves showing the hinge, which Mr. Baker with much pains cleared from the earthy agglutinated particles which adhered to it, so that it is likely to be the most perfect specimen of the species known. It is siliceous or agatized, and semitransparent. I find, by comparing the opposite valves and imperfect specimens, that the series of stud-like protuberances is sometimes more or less interrupted in regularity. On the broader side, however, a peculiar arrangement is very constant; this may be plainly observed on the left hand side of the valve I have pictured. It is that two of the rows a little below the apex diverge from each other, and form an angle, the space within which is filled up by angular sets of tubercles, each like a letter V, placed one within another. The irregular size of the tubercles upon the other half, and their sometimes passing into each other, make the order appear confused. A few single shells have been found orderly and distinct, but there will be no doubt as to the species. It will be seen that the form of the hinge in this Genus is necessarily connected with a thick shell, very unlike the Genus *Plagiostoma*, with which only (I believe) it has been confounded.

CARDITA.

GEN. CHAR. An inequilateral equalvalved bivalve, with recurved beaks; hinge teeth two, unequal, the shortest beneath the beaks; the lateral one longitudinal, beneath the insertion of the cartilage.

CARDITA striata.

TAB. LXXXIX.—*Fig. 1.*

SPEC. CHAR. Quadrangular, gibbous; the beaks placed at one of the angles; obliquely striated from the beaks to the edge.

NEARLY right-angled; the anterior side rounded; the length greater than the width: the striæ are curvilinear.

This is from Swanswick in Somersetshire, by favor of the Rev. H. Steinhauer; it is in ochraceous Limestone with a sandy aspect. It appears to be the cast from the mould of the outside of the shells. Walcot's (*Bath Fossils*) Fig. 11, probably belongs to this species; he observes, "at one of the angles are the beaks which are hooked, their points curved outwards; striated from the beaks to the margin. *Free stone.*"

CARDITA abrupta.

TAB. LXXXIX.—*Fig. 2.*

SPEC. CHAR. Triangular, gibbous; beaks projecting near one angle; obliquely striated, anterior side longitudinally striated; five or six transverse reflected ridges along the front.

SOME of the oblique striæ meet the longitudinal upon the anterior side at an acute angle, the remainder abruptly terminate at the first transverse ridge. The anterior side is nearly straight, forming the shortest side of the triangle: the striæ are curvilinear.

From the same place and by the same favor as the last. The thin shelly remains cover the greater part of the specimen.

Not having seen the hinge of either of these, I cannot pronounce with certainty that I have placed them under the right Genus. I am desirous of seeing more specimens, therefore I make these public, that by thus recommending research, we may learn whether these are mere varieties, and perhaps make further discoveries. There are, probably, many species which may agree with them in Generic character, and which at present want places in the system.

TEREBRATULA biplicata.

TAB. XC.

SPEC. CHAR. Oblong, gibbous; beak prominent; sides rounded; front straightish, when full grown, elevated with two distant large plaits. Fig. 1.

β . sides rather angular, straightish towards the front, smaller and broader than α . Figs. 2, 3, 4, and 5.

OF the two varieties of this shell, the larger one is longer in proportion to its width, and more gibbous: the younger shells of either seem scarcely to be plaited, and are rather flat.

I was favored with some of the shells, &c. found in digging in the Castle Hill, Cambridge, by Dr. Clarke and H. Warburton, Esq. about ten years since; among the parcel from the latter gentleman was the middle specimen here figured; it was among the marly gault with the green and iron sand, &c. see Brit. Min. tab. 184. Its resemblance to those surrounding it made me place it here, as I think they ought to be identified. It is, however, larger, and the shell not much more altered than recent shells sometimes are. I possess the same variety from Limerick, but more mutilated, the shell not more changed, but having become a shelter for small worms: also another specimen not infected with worms: they appear to be of the same age and size. Hunstanton Cliff in Norfolk affords the

same in a red ferruginous stone, with specimens of which G. B. Greenough, Esq. has kindly supplied me.

Figures 2, 3, 4, and 5, show the growth of the smaller variety, of which the youngest is not at all plaited: as they advance they also become more gibbous. They are found in immense numbers in the green sand of Warminster, and the neighborhood of Longleat, Chute Farm, &c.: they have lost more of the recent shell-like appearance than the above, and are occasionally silicified, the green sand sticking about them.

These seem to join the *T. intermedia*, which is found in the same neighborhood; see Tab. 15, Fig. 8.

ROSTELLARIA, *De Lamarck.**Strombus, Linn, &c.*

GEN. CHAR. A fusiform or subturretted univalve, with the base drawn out into a sharp canaliculated beak; the lip expanded by age, either entire or toothed, with a sinus close to the beak, and an elongation upon the spire.

ALTHOUGH there are many recent species of this Genus, we are acquainted with but few fossil ones. It is one of the Genera made by De Lamarck out of the Linnean Genus *Strombus*, its principal character being the indentation of the lip close to the beak. In some species the upper edge of the lip is extended in a canal nearly the whole length of the spire.

ROSTELLARIA? *lucida.*TAB. XCI.—*Figs. 1, 2, and 3.*

SPEC. CHAR. Fusiform, longitudinally ribbed, transversely striated; lip thick with an obscure sinus at the inferior edge, and a very short channel at the superior; beak straight, short?

THE surface of this species is glossy and covered equally with fine rising obtuse striæ, the ribs numerous and rounded, the whorls about eight, in the young shell the lip is not thickened; when the last whorl is about half-formed its growth is stopped, and the edge of the lip is inflected; it afterwards grows to its full size, and the lip thickens, leaving the inflected part of the former lip in the form of a large rib about half a whorl from the end. The beak is not

perfect in any of the specimens I have seen that appear full grown.

Highgate Hill is the only part of the London Clay stratum that has furnished me with this new shell*, which was found in the attempt to form a Tunnel through it. The shell is usually of a yellowish brown color with a shining fresh appearance, but generally mutilated and rather brittle. The form of the spire so much resembles the young shells of Brander's *Murex rimosus*, figured in this plate, that without comparison it has often been confounded with it; when compared they are readily distinguished by the obtuseness of the costæ, the gloss of the surface, and the flatness of each whorl in the Highgate shell. The *R. rimosa* has never been found at Highgate, although many of the other Hampshire shells have, nor does it appear that *R. lucida* has been found in Hampshire.

ROSTELLARIA rimosa.

TAB. XCI.—*Figs. 4, 5, and 6.*

SPEC. CHAR. Fusiform, whorls slightly convex, longitudinally ribbed, transversely striated; lip reflected, with a sinus at the inferior edge below an expansion of the margin, and a canal at the superior edge extending nearly the length of the spire; beak straight.

SYN. *Murex rimosus.* *Brander Fossil. Hant. F. 29.*

IN general the surface is glaucous, the striæ upon it are more distant and stronger near the beak; the ribs are

* Mutilated specimens have been since found, though rarely, in sinking the shaft near White Conduit House, Islington, accompanied by subjects not found at Highgate.

numerous and rather sharp. Whorls about eight. The extension of the lip upon the spire is wanting in very young specimens, but even in them the lip is often thickened; when about half grown the extension reaches across one or two whorls, and when full grown it approaches almost to the apex finishing with a curve. The back is straight with the axis of the spire.

I do not know that this species is found any where but in the Clay at Barton Cliff, where it is abundant. There is a French fossil very nearly resembling this, called *Strombus fissurella* by Linn. and *Rostellaria fissurella* by De Lamarck, but in that the ribs are less numerous, the striæ only at the base, and the axis arched, the whole giving a peculiar character immediately perceptible upon comparison. The French shells are found abundantly at Grignon near Paris; they are more delicately preserved, of a whiter color, and are very brittle. The English shell has a more recent appearance, with an horn-like transparency, and darker color. Brander's figure is from a larger specimen than I have been lucky enough to meet with.

Linneus's recent *Strombus fissurella* should be carefully compared with these fossil species, it may possibly prove distinct. I was favored with some as if gathered before they had been exposed to bleach or change, consequently more like recent ones than usual, by the attention of Miss Pratt.

AMMONITES jugosus.

TAB. XCII.—*Fig. 1.*

SPEC. CHAR. Involute, depressed, keeled; inner whorls half concealed; radii large, obtuse; straight, equal to the space between them, disappearing on the front; keel small, distinct; aperture ovate, narrowest at the front.

THE radii have much the form of undulations, but they are straight and very regular, like some kinds of furrows in a Gardener's ground: the keel which is sharp on the outside of the shell is almost lost in the cast. The septa are not very numerous; their margins are moderately plaited. Volutions four or more. Aperture two-fifths the diameter of the shell, and one-fifth wide. The shell thin and tender.

This pretty specimen is from Mr. Strangeways, a warm enquirer after the information the study of Fossils affords; it was broken out of Limestone at White Lackington Park near Ilminster, and shows the distant septæ, as well as the crystals of Carbonate of Lime lining the chambers; the shell itself is attached to the stone, it is very thin.

AMMONITES triplicatus.

TAB. XCII.—*Fig. 2.*

SPEC. CHAR. Involute, inner whorls exposed; radii twice curved, alternately one long and three short; a smooth line along the front; aperture obovate.

I COULD only describe a cast of this, the shorter radii extend rather more than half-way from the front towards the centre, there are commonly three, but sometimes only two between a pair of long ones; the long ones are rarely forked. Volutions about four. Aperture about half the diameter long, and one-third wide; septa rather distant.

This came from Portland Island, it is a cast in pyrites with Carbonate of Lime in the chambers. I was favored with it by the late Mr. Bryer of Weymouth.

AMMONITES binus.

TAB. XCII.—*Fig. 3.*

SPEC. CHAR. Involute, depressed, keeled; inner turns two-thirds exposed; radii diverging in pairs from round tubercles, swelling and then turned up towards the front and disappearing; keel small, entire; aperture oblong rectangular, angles rounded.

VOLUTIONS about four; aperture one-third the diameter long, and rather more than one-sixth wide; there are some-

times single radii between the pairs; the tubercles are placed near the inner part of each whorl.

A pyritaceous cast from Bramerton in Norfolk.

AMMONITES ellipticus.

TAB. XCII.—*Fig. 4.*

SPEC. CHAR. Involute, depressed, carinated; inner volutions two-thirds exposed; radii broad, slightly curved, few, obscure near the margin; aperture acutely elliptical; keel sharp.

THE regular elliptical form of the aperture is a strong character of this shell; the obtuse radii are distant and correspond with the septa in number.

My esteemed Friend, James Brodie, Esq. brought me this pyritaceous cast of an Ammonite, with other curiosities, from Charmouth: It was found among the marley clay of that place, so celebrated for various and numerous productions; I myself saw an imperfect impression of an Ammonite there, some years since, which was above a yard in diameter in a stone on the shore, but I do not remember the species. The remains of Crocodiles (as they have been commonly thought) consisting of teeth, jaws, vertebra, &c. show the place to have been an extraordinary deposit continually discovered by becoming again a prey to the sea, which seems once to have formed it, although no such things are now found in a recent state.

AMMONITES nodosus.

TAB. XCII.—*Fig. 5.*

SPEC. CHAR. Involute, depressed, keeled; volutions but little concealed; radii straight for two-thirds of their length, then rising into a small knob, from which they extend towards the keel, curving upwards, rather distant, with a gentle concave between them; keel broad, obscure.

THE aperture is oblong, broadest towards the front, which is rounded; it is one-third the diameter long, and rather more than one-sixth wide: the keel, which is plain externally, is crenulated internally or on the cast.

From Scarborough, by favor of Mr. Strangeways; it is in a dark brown clay. I think it undoubtedly belongs to the keeled division of Ammonites, as it agrees with them in general character, although the front is broad, and the keel obtuse.

AMMONITES stellaris.

TAB. XCIII.

SPEC. CHAR. Involute, rather depressed with a rounded sulcus on each side of an obtuse keel; inner turns about two-thirds exposed; volutions about four with their sides flattish; radii numerous, straight; aperture quadrangular, with the interior angles rounded.

THE sinuous margin of each septum is crossed by two radii, the septa are placed at each fourth radius. The siphuncle is contained in the keel, as in most of the carinated species. The aperture is rather longer than wide; its length is two-fifths the diameter of the shell. Surface of the shell marked with obscure rather distant decussating striae.

Found rather abundantly at Lyme in Dorsetshire; Mr. Strangeways has forwarded it to me. I broke one specimen to find the siphuncle, and thus separated three or four joints by the septa, so as to hold together like a chain, being moveable like the dissepiments of some other species, without falling apart, the sutures fitting in a sort of dovetail manner. This specimen is remarkable for the more central volutions having a pentagonal figure. When the shell covers the cast the sutures of course are covered, and in some species the external form is different from the internal, but a part of the shell which remains towards the front at the bottom shows that in this they do not probably differ.

AMMONITES elegans.

TAB. XCIV.—*Upper Figure.*

CHAR. Involute, much depressed, acutely keeled; volutions about three, inner ones about two-thirds concealed; radii twice curved, numerous, equal; keel distinct, entire; aperture acutely triangular; internal angles truncate.

A DELICATE species with a thin shell; thickness about one-sixth of the largest diameter; it gradually lessens towards the edge, which is rather obtuse with a sharp keel placed upon it. The septa are tolerably close with their sinuous margins much plaited; the siphuncle slender within the keel.

This species was gathered between Ilminster and Yeovil by Mr. Strangeways, who possesses this beautiful specimen; I have a fragment of a larger one which was given me as British. The plaited margins of the septa are sometimes beautifully conspicuous; a few of the chambers being occasionally filled, as it is partially here, by spar of a darker tint; at other times it is more regular all over, pointing out the septa conspicuously, where otherwise they would not be discernible, as is particularly the case with some other species.

AMMONITES *concavus*.TAB. XCIV.—*Lower figure.*

SPEC. CHAR. Involute depressed, keeled, umbilicate; umbilicus a large hemispherical depression; volutions four, concave near the centre; radii numerous, curved, unequal in length, obsolete near the centre; keel sharp, entire; aperture acutely triangular; external angle rounded; internal angles obliquely truncate.

APERTURE half the diameter of the shell, with the sides rounded, approaching to parallel; the radii, which are very conspicuous over half the whorl, are alternately long and short, the longer ones often continue, but obscurely, to the centre, the others sometimes join into them. The thickness is one-sixth of the diameter. The shell not very thin.

This general form and undulating character of the costa is not very rare, but the peculiarity of a regularly concave centre is a convenient distinction at present. This is not a rare species in the neighborhood of Ilminster, and I have had some larger ones long since by favor of the Rev. Dr. Sutton of Norwich. Specimens generally consist of nearly transparent Carbonate of Lime, more or less covered with an ochraceous marle; the one I have figured is filled with granular Limestone.

AMMONITES armatus.

TAB. XCV.

SPEC. CHAR. Involute, volutions exposed, with many annular undulations armed with two rows of large short furrowed spines.

VOLUTIONS six or seven, pressed against each other, the undulations continue upon the spines, and after meeting on the point pass on to the other side: there are about five undulations upon each spine, and one between each. The aperture is obscurely four-sided, the inner side being smallest and concave. When the shell is broken off the cast the spines are succeeded by an ovate flat disk, over which the margins of the septa are beautifully delineated. The siphuncle is visible, as in most of the Genus, near the front. The young shell is plain and without the spines.

Numerous varieties of this species are found in the great Alum-clay formation at Whitby, where this large-sized specimen was gathered by Mr. Strangeways, by whose favor I have thus been enabled to draw a larger specimen than I possessed. We have here also the advantage of many specimens, the middle being a small plain one of which many are occasionally found, which indeed might have been considered a different species; the next circle might by the same rule form a second species with larger radii, and again the third with the flat disks and fewer striæ than the outer circles. I have separate specimens of most of these different sizes; they are liable to be destitute of the inner volutions. It is worthy of

remark that the spines have the appearance of having been stuck on, probably owing to their being attached to part of the outer shell which is worn away at their bases, the spines sometimes being gone also. These shells or casts being chiefly pyrites decompose easily, exuding the flowers of Sulphur if in a dry place, or Sulphate of Iron if wet, when they have the sulphurous odour and occasionally fall to pieces, which may be the case with this large shell, the odour and sulphur exuding from its sides being signs of it. In such when the subjects are sufficiently desirable they may be kept under water in stopped bottles. The little outline at the bottom shows the contour of one of the septa and the siphuncle.

TEREBRATULA digona.

TAB. XCVI.

SPEC. CHAR. Triangular, oblong, gibbous; beak prominent; sides rounded; front either convex or concave; when old, bounded by two prominent angles alike in each valve.

THIS shell is very variable in its form, being sometimes almost globose, at others acutely triangular and rather depressed, the two angles of the front are continued a little way along each valve, and look as if they were produced by pinching the edges between the fingers; the front between the angles is in some shells concave, in others straight or of different degrees of convexity. The surface when magnified is found to be minutely punctured.

This is very common in the neighborhood of Bath; it is mentioned by Woodward, Walcot, &c. but we cannot be certain of synonyms at present, as there are so many varieties, and it may hereafter be found that in some soils they are more constantly of one particular form and color than of another. Walcot's fig. 26 seems related to it, and he quotes Woodward, vol. 1, part 2, page 46, fig. 215, 216, and says specimens are "scarce; Woodward found them at Toghill, and he met with one or two nearer Bath." I have expressed, figs. 1, 2, and 3, three varieties from among a parcel found in Clay above the great Oolite at Bradford and Pickwick,

by favor of the Rev. H. Steinhauer; they resemble some sent me by Thomas Meade, Esq. from the Cornbrash stratum near Chatley, of which they are said to be characteristic; they are mostly rounder, but with the same kind of points. The Rev. T. O. Marsh has sent me specimens from Felmersham, one of which I have given two views at fig. 4 and 5. These are more gibbous than those from Bradford, but less so than the Chatley ones, some of which are almost globose.

INFUNDIBULUM, *De Montfort*, 2. 166.

Part of the Genus CALYPTRÆA, Delamarck,
Syst. des animaux sans vertèbres, 1. 70.
Environs de Paris, 16.

GEN. CHAR. Univalve, obconical, hollow beneath, spirally twisted; with a central spiral columella and a spirally decurrent plate or valve within: mouth round, expanded; lip entire, sharp.

THE edge of the internal plate generally diverges obliquely from the centre towards the edge, near which it bends so as to enter it at a very sharp angle; the lines of growth are nearly circular, but placed obliquely.

If we consider this shell, with *De Montfort*, as regularly spiral, it will be found to consist of a triangular involute tube, the inner side of which is wanted to make it complete, the outer lip of the aperture forming the whole of the concave base; the inner lip extending only to the centre in one direction, and not always to the margin in the other. It appears most natural to view it as *Delamarck* and others have done, in its relation to *Patella* and *Crepidula*, in conformity with which I have formed the Generic Character. Although, in many instances, *De Montfort* has multiplied Genera beyond their natural limits, in separating this from *Delamarck's Calyptræa*, he has done an acceptable service to the student in Conchology, but he has surely gone too far on the same road with older authors in removing it to a place so near the *Trochus*.

INFUNDIBULUM rectum.

TAB. XCVII.—*Fig. 3.*

SPEC. CHAR. Conical, concentrically striated; apex central, acute, turns of the spire obsolete; valve rectangular; columella slender.

THE valve within this takes scarcely more than one turn; in the place at which it approaches the edge that forms the columella, it is expanded so as to have an angular form, and it has no part reflected, as in other species, like an umbilicus. The striæ of growth are very conspicuous.

This has more the external character of *Patella* than most of the species of this Genus. It is from Holywells, near Ipswich, by favour of the scientific Mrs. Cobbold.

INFUNDIBULUM obliquum.

TAB. XCVII.—*Fig. 1.*

SPEC. CHAR. Flattish, smooth; apex curved, adpressed, oblique; internal plate two thirds the diameter of the mouth.

THE edge of the internal valve is reflected near the columella, so as to resemble in some measure an umbilicus, as is the case also in several other species; the upper surface is regularly conical and very smooth, but the apex is bent towards one side.

A perfect but small specimen from Brakenhurst, in Sussex, is represented; the species is found much larger in the Cliff, at Barton, from which place the Rev. W. Bingley has kindly sent me specimens.

INFUNDIBULUM tuberculatum.

TAB. XCVII.—*Figs. 4, and 5.*

SPEC. CHAR. Gibbous, conical, oblique, rugosely tuberculate.

SYN. Trochus apertus. *Brand. Foss. Hanton. Tab. 1. figs. 1 and 2.*

TURNS of the spire three or four; the latter one inflated, covered by rows of rugged projections.

Brander's name, apertus, is applicable to all the species of Infundibulum, and is therefore objectionable, but while the shell was considered a Trochus, is exhibited a remarkable character. Brander has been wrongly quoted by Delamarck, who makes Brander's *T. apertus* and opercularis the same as his *Calyptræa trochiformis* and my *Infundibulum spinulosum*.

INFUNDIBULUM echinulatum.

TAB. XCVII.—*Fig. 2.*

SPEC. CHAR. Gibbous, depressed, conical, oblique; apex acute, smooth, last turn obscurely echinulated.

SPIRAL turns three or four, the last being much the largest, the others are well defined, and often rather ventricose. The short spines are most prominent near the edge, but even there they are in many specimens worn away, as in the one figured. The internal plate resembles that of the last in form. Diameter sometimes three-fourths of an inch.

Found with *Cardium plumstedense*, and numerous others, in a bed of shells, mostly in fragments, which lies between two beds of rounded pebbles, at Plumsted. In the upper bed the pebbles are much larger than in the lower, and stratified with a little Clay and Carbonate of Lime.

INFUNDIBULUM spinulosum.

TAB. XCVII.—*Fig. 6.*

SPEC. CHAR. Conical, apex acute, nearly central; whorls obscure, surface covered with numerous short hollow spines or small tubercles.

SYN. *Calyptrea trochiformis* α ? *Delamarck, Foss. des env. de Paris, 17. excl. Syn. Brand.*

WHORLS three or four, those about the apex a little inflated, but obscure. The spines are extremely short, and rather reflected. Nearly an inch and half in diameter. The indistinctness of the turns, and their want of gibbosity at once distinguish this from *I. echinulatum*. The want of specimens from France makes me uncertain respecting *Delamarck's* synonym, as his description will suit either, although it will not include the two rugose species of *Brander's* work.

The size and rarity of this specimen render it a desirable addition to our catalogue. Although a fine specimen, we have reason to wish it were less crushed, which must plead for our imperfect figure. It was found at Barton, and is in possession of the indefatigable collector, Miss Benett, whose desire to assist science and give information, will ever be respected.

TROCHUS, *Linn. &c.*

GEN. CHAR. Univalve, spiral, conical; base flat or concave; aperture transversely depressed, subquadrangular; axis oblique.

WHORLS more or less carinated, the keel of the last forming the margin of the base. Some species are umbilicate when young, the umbilicus being covered in old shells; in other species the umbilicus is permanent, and some have a solid columella. The Phorus of Montfort may, perhaps, hereafter prove a good Genus, but the variable umbilicus and the agglutinating practice of the animal are too uncertain for generic distinctions. The other characters are found to be gradually shaded off when we examine many species.

TROCHUS agglutinans?

TAB. XCVIII.—*Smaller figures.*

SPEC. CHAR. Depressed, conical, smooth; base expanded, with a broad waved margin; whorls externally deformed; umbilicus plicate; aperture oblong.

SYN. Trochus agglutinans? *Dclamarck, Foss. des environs de Paris*, p. 102.

T. umbilicaris. *Brander, Foss. Hant. figs. 4 & 5.*

Phorus agglutinans. *De Montfort*, 2. 158.

MUCH irregularity in the upper surface and margin of this is produced by the shells and fragments of other substances that become attached to it, which has procured it from some the appellation of “the Conchologist,” from others, that of “the Builder,” “the Carrier,” &c. The smooth, uninterrupted part of the surface is only marked by striæ of

growth, which are particularly strong over the base, running into the large umbilicus in plaits. External lip obtuse, internal sharp, about half extended over the base of the spire. The undulated margin seems the part mostly designed for collecting shells, &c.

This is one of those few fossils which agree so well with analogous recent shells, that they can with difficulty be distinguished as varieties. The American shell commonly styled "the Carrier," is so nearly allied, that Delamarek says he could not distinguish it. Our specimens are from Barton.

TROCHUS Benettiae.

TAB. XCVIII.—*Larger figures.*

SPEC. CHAR. Depressed, conical; upper surface obliquely wrinkled; base expanded with a broad waved margin; whorls externally irregular; umbilicus plicate, partly covered; aperture narrow.

THE obliquely striated or wrinkled surface, which bears some resemblance to the rippling of shallow water, marks this as decidedly distinct from the last; in other respects, what has been said of that will apply correctly to this. The umbilicus being partly covered by the lip is the effect of age. The spire is less irregular than usual.

This elegant specimen is in possession of Miss Benett, who has been so fortunate in meeting with many rarities. It would have been a great satisfaction to have met with it without the aperture being crushed in, which makes it more difficult to comprehend. This is, however, sufficiently distinct to be recognized as a species, and perhaps we may never see such another: I have therefore named it in honour of its possessor.

ANCILLA, *Delamarck.**Voluta, Linn.*

GEN. CHAR. Univalve, spiral, oblong, subcylindrical; spire short, without a canal; aperture longitudinal, expanded, slightly emarginate at the base; a tumid appendage, or varix, round the base of the columella.

THE last whorl is much larger than the others, whence the aperture is often equal in length to half the shell. The varix is frequently plaited, and the inner lip is, in several species, continued farther over the spire than the outer; in some it even reaches over the line of separation of the whorl before it.

After the Genus *Oliva* had been defined to have a canal between the whorl on the spire, it became necessary to separate such analogous shells as were destitute of that mark, into another Genus, but I fear there are intermediate ones, which will render that character ambiguous, such as my *Ancilla turritella*, which, although it has no canal, has a concave space approaching one.

ANCILLA *aveniformis.*

TAB. XCIX.—*Middle figures.*

SPEC. CHAR. Oval, elongated, smooth; spire long, acute, varix with two plaits; extension of the inner lip short. Aperture little more than half the length of the shell; inner lip extended over about one-third of the exposed part of each whorl; surface shining.

ONE of the few shells from Barton not figured by Brander; it differs from *Delamarck's A. buccinoides*, in having a

longer spire, a less expanded base, and smaller extension of the inner lip. It may be *Voluta anglica* of Pilkington in Linn. Trans. 7. 116, t. 11, f. 1, but that is described as "*obliquè striata*."

ANCILLA turritella.

TAB. XCIX.—*Larger figures.*

SPEC. CHAR. Subcylindrical, with an acute sub-turreted spire, minutely and transversely striated; upper part of each whorl shining, middle minutely decussated; an obscure spiral sulcus near the varix; columella with three plaits, and one deep sulcus.

LAST whorl nearly cylindrical, with a large sinus at the base; the aperture is above two-thirds the length of the shell, expanded, and having a small tooth at the edge; the sulcus in the varix of the collumella is nearly longitudinal, commencing near the base. The interior lip extends over two-thirds of each of the volutions.

Two fine specimens of this species, found in the Cliff at Barton, which had escaped the keen eye of Brander, have come into Miss Benett's collection.

TEREBRATULA ovoides.

TAB. C.—*Upper figure.*

SPEC. CHAR. Ovate, elongated; beak prominent; larger valve gibbous subcarinated; lesser valve convex.

THE sides have an obtuse angle or shoulder at about one-third the length from the beak; more or less prominent in different specimens. Length almost twice the width; the front rounded, undefined.

Found in blocks of Sandstone containing green Sand, in alluvial deposits of Gravel, fragments of Chalk, &c. in some parts of Suffolk, by my friend, Charles Wilkinson, Esq.

TEREBRATULA lata.

TAB. C.—*Lower figure.*

SPEC. CHAR. Orbicular, depressed; beak prominent; larger valve subcarinated at the back.

THE length and breadth of the smaller valve are equal. There is no perceptible difference between this and ovoides, excepting in the length.

Found in blocks of Sandstone in the same situation as the last, at Gisleham, near Lowestoft, in Suffolk, by Mr. John Thurtell: the stone often contains grains of an argillaceous Iron ore.

TEREBRATULA ornithocephala.

TAB. CI.—*Figs. 1, 2, and 4.*

SPEC. CHAR. Ovato-rhomboidal; depressed when young; elongated and gibbous when old; front straight, bounded by two obtuse lateral depressions, similar in each valve.

THE aperture in the elongated beak is large. Breadth of the shell equal to four-fifths of its length; the sides being rather

depressed, produce an obtuse angular projection on the front.

I have specimens of this from the Cornbrash Limestone, at Chatley, from Thomas Meade, Esq. and others picked out of the Blue Lias (Marle), at Pickeridge, by favour of Miss Hill. The left-hand upper figure is from a Cornbrash Limestone specimen, and figure 4 is a young depressed shell, from Pickeridge.

TEREBRATULA lampas.

TAB. CI.—*Fig. 3.*

SPEC. CHAR. Ovato-rhomboidal gibbous; front straight, produced, lesser valve depressed.

CLOSELY resembling the last, but the sides are not concave, the sides of the larger valve being only slightly so; the flatness of the other valve gives the whole much of the contour of an antique earthen lamp.

My figure is from a cast in ferruginous Sandstone, from near Lyme, Dorsetshire, where I believe they are common in this state.

TEREBRATULA obovata.

TAB. CI.—*Fig. 5.*

SPEC. CHAR. Obovate, transverse, gibbous, flattish; beak prominent; front straightish, bounded by two obsolete plaits.

A VERY short shell, with rounded sides and a flattish margin; the length, excluding the beaks, is rather less than the width; the plaits which bound the front are sharp, but small, and only marginal.

A specimen from Mr. Meade's garden, at Chatley. It differs from the Chatley variety of *Terebratula digona*, tab. 96. in being much shorter, and in the points or plaits at the front being very obscure.

TEREDO, *Linn. &c.*

GEN. CHAR. Bivalve, gaping; back and posterior side closed by membrane or shelly valves terminating an accessory shelly tube. Hinge with one tooth in the right valve. A long free process arising from the beaks contained in each valve.

THE principal valves are longer than broad, striated, gaping at both sides and at the back; in the posterior side of each is a deep rectangular sinus; in the anterior side is a corresponding small rounded sinus; the front is lanceolate, with an internal tubercle at the extremity; one of the accessory valves lies over the beaks and is lobed; another is trapezoidal, covering the sinus at the posterior side, it has a line down the middle where there may possibly be an opening, or it may indicate two valves. The membrane which covers the shell is extended over the anterior side, forming a taper tube many times longer than the proper shell, and strongly impregnated at a little distance from the valves with shelly matter; in the extremity of this lie two spatulate valves, attached by muscles to the animal, and capable of closing the aperture, in which is placed a longitudinal septum; this tube is slightly attached to a tortuous passage bored in wood by the animal, and is elongated and gradually increased in diameter as the animal recedes further into the wood.

The resemblance between this Genus and several species of *Pholas* is remarkably strong; the species of *Pholas* nearest related to it are those which have one lobed accessory valve covering the beaks; these have also a tooth in the hinge close to the beak, so that there remains nothing except the greater proportional breadth (which makes the

Pholas a transverse shell) and the want of the shelly tube, to distinguish them. The form of the animal is very different, that of the *Teredo* extending far beyond its proper shell, and having at its extremity two spatulate valves; whereas the animal of the *Pholas* is confined to its shell, and has not these additional valves. They both bore into wood, and apparently by a similar process; that is, by repeated semi-circular turns backwards and forwards while the valves are partly opened, cutting the wood with the striated or rough posterior part of their margins, which as they wear blunt, are succeeded by fresh additions at their edges; the cutting part may be compared to a series of files, bent so as exactly to fit the size of the holes they are required to make; now, as the animal grows older, he requires a larger hole to live in, and the files being renewed along the edge of the shell, are increased exactly in the same proportion as he grows, and the degree of their asperity is proportioned to the substance they are to bore, so that each one may cut a sufficient space for itself to turn round in before it is worn away: consequently, in the *Teredo*, which only bores wood, the striæ on the posterior part of the shell are very fine, and cut into minute teeth; while in those species of *Pholas* which bore into stone, there are rows of prominent angular reflected teeth, presenting strong sharp points to the surface they are to act upon. The motion of the *Teredo* is probably confined to a smaller part of a circle than that of the *Pholas*, in consequence of the shelly part of its tube being fixed.

These observations are made upon examining the only two species of the Genus *Teredo* with which I am acquainted, *T. navalis*, *Linn.* and the fossil one. Among the specimens of the first that have fallen under my inspection, I have met with none which show any of the accessory valves, except the tube and the two spatulate valves attached to the animal, nor even the membrane that is preserved in

the fossil one covering the proper shells, and attaching them to the outside of the tube. I hope persons resident near the sea will make search to ascertain whether they exist, and whether the posterior side is guarded only by a membrane. Hitherto naturalists appear to be as much in the dark respecting these animals as the animals themselves are in their obscure retreats; and it is only the fortunate circumstance of a specimen of petrified wood, in which many of them had been trapped, decaying away from them and leaving their outer surfaces perfect, that has permitted me to see so much of their nature.

TEREDO antenautæ.

TAB. CII.

SPEC. CHAR. Valves transversely striated; striæ on the anterior side numerous, smooth; dorsal and posterior accessory valves shelly.

SYN. *Fistulana personata*, *Delamarck, Foss. des env. de Paris*, 160. *Park. Org. Rem.* 3 p. 200. t. 14. f. 8. 10.

THE striæ follow the zigzag edge of the shell, those over the posterior side are very fine and regular, and under a lens appear minutely toothed; on the other side they are stronger but less regular and smooth. The dorsal accessory valve, called by Delamarck and Parkinson, *the rotula*, is thick, four-lobed, with rounded edges, the two posterior lobes are the smallest. The valve that closes the posterior sinus is marked with lines of growth parallel to the edges of the shell and is very thin; the tube near the valves retains, in the large specimens, a wrinkled form, and some of the smaller ones are inflated in parts, showing their original membranous texture. *See figs. 4 and 5.* At a dis-

tance from the valves the tube is of a firm, shelly texture, smooth and shining. The animal seems to have been capable of separating itself from this tube, which is not attached to any sensible part of it, and of returning towards the place where it first entered; in this case it forms a septum behind it across the tube, contracting its dwelling to a size experience has taught it is sufficient.

The *Teredo navalis* may be distinguished by the following—

SPEC. CHAR. Valves transversely striated on the posterior side; anterior side smooth, with only a few lines of growth.

The dreadful ravages committed upon timber by this destructive borer, seems to have commenced as soon as timber was immersed in sea-water, and long before ships were invented; whence I have named the Fossil species, *antennautæ*, and would retain Linné's name for the common recent one that has been so formidable ever since the Europeans visited India. Whether it penetrates the wood for food or only for shelter, is doubtful; if it work for shelter only, why does it penetrate to such a distance from the surface? and if it feeds upon the wood, would not its mouth first enter, instead of its boring with its posterior part? The position of its mouth and the analogy of other testaceous animals, rather show that it feeds upon such small molusca as may chance to enter the narrow porch of its winding habitation, and be surprized by a gigantic enemy lurking in secret.*

Delamarck must have had a very imperfect specimen, or he would not have hesitated to have placed this as a *Teredo* (for he has observed its resemblance to that Genus and to *Pholas*), instead of confounding it with several other boring shells, which (independent of a calcareous covering attached to their external surfaces, and which, in a few

* The *Pholas*, &c. appear often to recede to a distance from the external parts of their holes.

instances, they seem to form for themselves), have all the characters of *Modiola*: even with respect to these, he is sometimes mistaken, for in several of the Fossil species he has described, what he calls the tube is no more than a solid mass of marley Stone, filling the hole in which the shell lies, enveloping it and preserving its form, while the Coral or substance the shell has bored into, has decayed away. I have specimens in several stages of decay, both foreign and English, with the impressions of the Coral upon their surfaces. Parkinson has figured similar ones, *Vol. II. t. 12. f. 1* and *2*, and in *Vol. III. t. 14. f. 6* and *12*, and I have figured others in *British Mineralogy*, tab. 323, under the name *Mytilus tunicatus*. Delamareck seems to have had a right conception of the recent ones, such as *Modiola curvirostra*, *Brit. Min. Vol. 3. p. 182*, *Mytilus lithophagus* var. *Linn. Trans. VIII. p. 270, t. 6, f. 2*, and would perhaps have left them with the *Modiola*, had he not been misled by the Fossils.

Figs. 1, 2, and 4, are from specimens selected from a large decaying mass of fossil wood, the hollows of which were filled with Marle; masses of wood thus preserved were found in great abundance in the Highgate Clay, towards the part on the southern side of the hill, where the Sand commenced, and on exposure the wood became powdery, while the shells became more or less chalky, and were easily separated. Some few specimens in the medium state were obtained: the wood formed a sort of cylinder, and the animal's broader ends were all around its centre, pushing, as it were, for the greatest share, the largest forwardest, and so on in succession, to those not so big as a barley-corn filling the interstices, the intervening ones often having two or three protuberances, like rollers or cushions of defence, (fig. 4) to keep them from the larger ones, and sometimes the larger ones seemed to have impressions in their sides corresponding with them, as if obliged to give way; the

tube commences from a very small point outwards at the bottom or sides of the wood; the embryos were deposited in abundance externally very near each other, they all started to pursue their way into the wood in courses more or less parallel, and when any one got before another, it seemed to have roamed across the grain, its competitor being interrupted and apparently stunted by that manœuvre. They sometimes curve and even double and have partitions (see fig. 8), but are more frequently without any partitions. I have not detected the spatulate valves. The connection of the valves with the tube is curious; the dorsal valve is more independent and is rather rare, as it is easily detached, and then the beaks of the hinge seem perfect, so that it might not be expected by those who had not by chance seen it. Fig. 3 is taken from a specimen of an uncommon size, the dorsal valve is broken in a way to make it irregularly five-lobed, which is too strongly expressed in the figure. I have tubes that appear to correspond with it from Highgate, they may, perhaps, have been two feet long. I have also some parts of tubes from Southend, in Essex, and Sheppey, in Kent, full as large in diameter. Figs. 5 and 6 show tubes as they appear in the more solid masses of Marle when broken. Fig. 6 presents a series of undulations not unfrequent and often more extensive. Fig. 7 exhibits the septum or the lodgments of the two spatulate valves at the aperture of the tube, a part very rarely found fossil. Fig. 8 has a transverse septum in the wide part of the tube. See *Park. Org. Rem. Vol. III. p. 205.*

The whole extent of the London Clay stratum and the other Clay strata above the Chalk, furnish masses of rotten wood perforated by Teredines and impregnated with argillaceous Marle, and Pyrites. The tubes of the Teredines are mostly lined with brown and resin-like Carbonate of Iron in spicula, &c.

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CORRIGENDA.

- Page 42, line 22, for "they" read *the shells*.
 42, l. 1, for "plumstedianum" read *plumstediense*.
 43, l. 7, ditto.
 58, l. 1, for "planus" read *plana*.
 69, l. 2, for "fig. 1" read *fig. 2*.
 176, l. 3, for "δομα" read *σομα*.
 177, l. 12, for "these" read *there*.
 187, l. 2, for "Figs. 1 and 2" read *Figs. 1 and 3*.
 188, l. 18, for "Fig. 3" read *Fig. 2*.
 191, l. 6 from the bottom, after "plaits" read *lateral plaits*.

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Any information or specimens illustrative of any of these subjects will be truly acceptable.

A SUPPLEMENTARY INDEX TO VOL. I.

Arranging the Shells described therein according to the several Strata in which they are found imbedded, from the newest towards the oldest in the British Series.

THE completion of my first volume of MINERAL CONCHOLOGY, the publication of Mr. *William Smith's* very long expected *Map of the Strata of England, Wales, &c.* and its accompanying Memoir, and the publication of Mr. *Aaron Arrowsmith's* very large and minutely detailed *Map of England and Wales*, having all happened about the same time, have given the means and increased the facility of arranging the 212 species of Shells contained in the preceding Index, according to their respective places in the Series of strata; that is, according to the eras in which these shell-fish respectively lived, beginning with the most recent.

For this Supplementary Index I am indebted to my indefatigable friend, Mr. *John Farey sen.* author of the *Mineral Report on Derbyshire*, and many geological papers in the *Philosophical Magazine*, &c., who desires it may not be received as a perfectly correct arrangement, for which the *localities* mentioned were not always sufficiently minute and particular, nor is the order of the strata in every instance settled beyond controversy, but is submitted for the revisal and free correction of my readers and correspondents, either in their letters to me, or to Mr. *Tilloch*, the Editor of the *Philosophical Magazine*; in which useful work Mr. *F.* proposes to publish an Alphabetical List of all the *places* herein mentioned, with their *situations* and *strata*, and a List of the genera and species of *Shells* found in each place; referring to the tab. and fig. in my plates wherein they have been delineated.

I will take this opportunity of requesting the increased attention of all the kind correspondents and contributors of Shells for this Work, to the giving of the name and precise situation of the place (by bearings and distances from one or more adjacent towns) whence their specimens were taken, that have already, or may hereafter be sent to me, and the kind of stratum in which they were imbedded: and from such as are possessed of Mr. *Smith's* Map, I should be glad to receive the mention of the name of the stratum to which each Shell belongs, that I may be enabled to publish the same with its description, and to mention its cotemporary Shells in my future numbers.

SUPPLEMENTARY INDEX TO VOL. I.

An arranged List of Strata, Shells, and Places, by Mr. Farey.

- GRAVEL and alluvial Clay, Sand, &c.; which extraneous rubbish is peculiar to no particular substrata.
- Ammonites quadratus, tab. 17, f. 3, Brandestone
Terebratula lata, tab. 100, lo. Gisleham
 ovoides, tab. 100, u. ditto
Unio uniformis? tab. 33, f. 4, Felmersham
Vivipara fluviurum? tab. 31, f. 1, Wapping (London Dock)
- Bagshot-Heath Sand, supposed to be the highest of the regular British strata. Perhaps the Crag-marle may be in this situation. (None of its Shells yet described herein).
- London Clay, upper part, blue, with imbedded Septaria, &c. (*duu blue*. in Mr. Smith's map.) (See some account of the limits of this stratum in p. 11).
- Ammonites acutus, tab. 17, f. 1, Minster Cliff
Ancilla aveniformis, tab. 99, m, Barton Cliff
 turritella, tab. 99, la. ditto
Avicula media, tab. 2, Highgate Archway
Cardium nitens, tab. 14, lo r. le. r. lo le. ditto
Cassis carinata, tab. 6, u. ditto
 striata, tab. 6, lo. ditto
Cyprea oviformis, tab. 4, ditto
Dentalium entalis, tab. 70, f. 3, Hordle Cliff
 incrassatum, tab. 79, f. 3 and 4, Highgate A. Richmond
 nitens, tab. 70, f. 1 and 2, Highgate Archway
 planum, tab. 79, f. 1, Bognor
 striatum, tab. 70, f. 4, Barton Cliff; Hordle Cliff
Fusus longævus, tab. 63, ditto, ditto, Muddyford
Infundibulum obliquum, tab. 97, f. 1, ditto, Brockenhurst
 spinulosum, tab. 97, f. 6, ditto
 tuberculatum, tab. 97, f. 4 and 5, ditto
Lingula tenuis, tab. 19, f. 3, Bognor
Melania sulcata, tab. 39, m. Stubbington Cliff
Modiola depressa, tab. 8, u. Highgate Archway
 elegans, tab. 9. le. u. m. lo. Bognor, Highgate Arch-
 [way, Richmond-Park Well
Murex Bartonensis, tab. 31, lo. Barton Cliff
 trilineatus, tab. 35, f. 4 and 5, Brentford, Highgate A.
Mya intermedia, tab. 76, f. 1, Bognor
 subangulata, tab. 76, f. 3, Barton Cliff
Natica glaucinoides, tab. 5, u. Highgate Archway
 similis, tab. 5, m. Bognor, Highgate Archway
Nautilus centralis, tab. 1, lo. Richmond-Park Well
 imperialis, tab. 1, u. Brentford, Highgate A. Minster C.
 ziczac, tab. 1. lo. Highgate Archway
Ostrea gigantea, tab. 64, Barton Cliff, or Hordle Cliff
Pectunculus costatus, tab. 27, f. 2, Hordle Cliff
 decussatus, tab. 27, f. 1, Highgate Archway
Rostellaria lucida, tab. 91, f. 1, 2, and 3, ditto, Islington Tunnel
 rimosa, tab. 91, f. 4, 5, and 6, Barton Cliff
Scalaria acuta, tab. 16, lo. ditto
 semicostata, tab. 16, m. ditto
Serpula crassa, tab. 30, Barton Cliff, Highgate Archway
Solarium discoideum, tab. 11, u. r. Barton Cliff
 patulum, tab. 11, lo. r. le. Highgate Archway

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London Clay, &c.

- Solen affinis, tab. 3, Highgate Archway
 Strombus amplus, tab. 30, Barton Cliff, Highgate Archway
 Terebra antenautæ, tab. 102, Highgate A. Minster C. Southend
 Trochus agglutinans, tab. 98, sm. Barton Cliff
 Benettiae, tab. 98, la. ditto
 Turritella brevis, tab. 51, f. 3, ditto
 conoidea, tab. 51, f. 1 and 4, Barton Cliff, Highgate
 [Archway, Stubbington Cliff
 edita, tab. 51, f. 7, Barton Cliff
 elongata, tab. 51, f. 2, Barton Cliff, Christchurch
 Venericardia planicosta, tab. 50, Bracklesham Bay
 Vivipara coneinna, tab. 31, f. 4 and 5, Barton Cliff
 lenta, tab. 31, f. 3, ditto, Hordle Cliff

Crag Marl, or soft Limestone, sometimes mixed with *Gravel* on the surface.

- Ammonites binus, tab. 92, f. 3, Bramerton. *Qu.* London Clay
 [or Alluvial?
 serratus, tab. 24, Worlingham
 Balanus crassus, tab. 84, f. 2, Holywell
 tesselatus, tab. 84, f. 1, Bramerton
 Cardium Parkinsoni, tab. 49, Harwich, Norfolk
 Dentalium costatum, tab. 70, f. 8, Holywell
 Emarginula crassa, tab. 33, u. ditto
 reticulata, tab. 33, l, ditto
 Infundibulum rectum, tab. 97, f. 3, ditto
 Lingula ovalis, tab. 19, f. 4, Pakefield
 Murex contrarius, tab. 23, Holywell
 corneus, tab. 35, u. Aldborough, Holywell, Walton-Nase
 rugosus, tab. 34, Harwich, Holywell, Walton-Nase
 striatus, tab. 22, Holywell
 Mya lata, tab. 81, Bramerton
 Natica depressa, tab. 5, Woodbridge
 Scalaria similis, tab. 16, u. Bramerton, Holywell
 Terebratula obsoleta? tab. 83, f. 7, Gunton
 Trigonina clavellata? tab. 87, ditto
 Turbo littoreus, tab. 71, f. 1, Bramerton
 rudis, tab. 71, f. 2, Aldborough
 Turritella conoidea? tab. 51, f. 5, Holywell
 incrassata, tab. 51, f. 6, ditto
 Venus equalis, tab. 21, Elmsett, Holywell, Woodbridge
 Vivipara suboperta, tab. 31, f. 6, Holywell

London Clay, lower part, red, red and white, mottled and white,—Potter's
 and Pipe Clay, and *Brick Earth* (*brown*).

Woolwich Loam and green Sand, &c., with layers of chert nodules.

- Cardium Plumstedense, tab. 14, r. and l. Plumstead
 ? tab. 14, m. Bury St. Edmunds
 Infundibulum echinulatum, tab. 97, f. 2, Plumstead
 Murex latus, tab. 35, le. lo. ditto
 Mya plana, tab. 76, f. 2, ditto
 Pectunculus Plumstedense, tab. 27, f. 3, ditto
 Serpula, tab. 14, m. Bury St. Edmunds

Black-Heath Sand, white, yellow (*light brown*).

Chalk, upper, soft, with layers of Flints (No. 1, *green*).

- Plagiostoma spinosa, tab. 78, f. 1 and 2, Brighton, Northfleet, Rick-
 [mansworth

SUPPLEMENTARY INDEX TO VOL. I.

Chalk, &c.

- Terebratula carnea*, tab. 15, f. 5 and 6, N. E. of Devizes, Trowse,
[N. E. of Warminster
subundata, tab. 15, f. 1 and 2, N. E. of Warminster

Chalk, lower, hard, without Flints, (No. 1, *deep green*).

- Dianchona lata*, tab. 8, f. 2, Lewes
Pecten quinquecostata? tab. 56, f. 3 to 8, ditto
Plagiostoma spinosa? tab. 78, Heytesbury, Lewes, N. E. of Norton-
[Bavant, E. of Sidmouth
Scaphites obliquus? tab. 18, f. 4 to 7, E. of Brighton, E. of War-
[minster
Terebratula semiglobosa, tab. 15, f. 9, E. of Warminster
subrotunda, tab. 15, f. 1 and 2, S. E. of Horningsham,
[N. W. part of Suffolk

Fire-Stone of Riegate, Totternhoe, Reche, &c.

Chalk-Marle, with layers of Clunch or whitish Chalk-like Stone, red Cawk, &c.

- Ammonites Mantelli*, tab. 55, Hamsey, Ringmer
minutus, tab. 53, f. 3, Folkstone
planicosta? tab. 73, Evershot
Arca subacuta, tab. 44, u. Hamsey
Dentalium decussatum, tab. 70, f. 5, Sussex
ellipticum, tab. 70, f. 6 and 7, Folkstone
Hamites adpressus, tab. 61, f. 6, ditto
attenuatus, tab. 61, f. 4 and 5, ditto
compressus, tab. 61, f. 7 and 8 ditto
gibbosus, tab. 62, f. 4, r. ditto
intermedius, tab. 62, f. 2, 3, and 4, Hamsey, Folkstone,
[South Horton
maximus, tab. 62, f. 1, Folkstone
rotundus, tab. 61, f. 2 and 3, ditto
tenuis, tab. 61, f. 1, ditto
Nautilus inequalis, tab. 40, lo. ditto
Scaphites obliquus, tab. 18, f. 4 to 7, Hamsey
Terebratula biplicata? tab. 90, Cambridge (Castle-hill), Hunstanton
[Cliff
Turrilites costata, tab. 36, Hamsey, St. Catherine's Mount, near
[Rouen
tuberculata, tab. 74, Middlesham, Ringmer, Stoneham, ditto
undulata, tab. 75, f. 1, 2, and 3, Hamsey
Vermicularia umbonata, tab. 57, f. 6 and 7. ditto

Green Sand, chloritic and micaceous Sand, yellow, brown, or red, in some places (No. 2, *white*), including the Surry Fuller's Earth.

- Arca carinata*, tab. 44, lo. Devizes Canal
Cardium Hillanum, tab. 14, u. Black-Down (Whetstone-Pits)
Chama canaliculata, tab. 26, f. 1. Chute Farm
conica, tab. 26, f. 3. Chute Farm
haliotoidea, tab. 25. Dinton, Donhead St. Mary, Stourhead
plicata, tab. 26, f. 4. Haldon-Hill
recurvata, tab. 26, f. 2. ditto
Cucullæa glabra, t. 67. Black-down
Dentalium medium, tab. 79, f. 5. ditto
Dianchona striata, tab. 80, f. 1. Chute Farm
Modiola pallida, tab. 8, r. lc. Fonthill
Mya mandibula, tab. 43. Devizes Canal
Nautilus undulatus, tab. 40. Nutfield

SUPPLEMENTARY INDEX TO VOL. I.

- Bedford Limestone**, the rubble on its surface called *Cornbrash soil* (*yellow brown*).
- Ammonites discus, tab. 12. N. E. of Bedford
 - Ostrea Marshii, tab. 48. Felmersham
 - Terebratula digona, tab. 96. Chatley, Felmersham
 - intermedia, tab. 15. f. 8. Chatley, Felmersham
 - obovata, tab. 101, f. 5. Chatley
 - obsoleta, tab. 83, f. 7. Felmersham, Wiltshire
 - ornithocephala, tab. 101, f. 1, 2, and 4. Chatley
 - subrotunda? tab. 15, f. 1 and 2. Ditto
- Clay under the Cornbrash of the Bedford Limestone (No. 5, *white*).
- Terebratula digona? tab. 96, f. 1, 2, and 3. Bradford Lo. Pickwick
- Barnach**, or **Coral Rag**, durable free Limestone, numerous small and broken Shells.
- Collyweston Limestone and Grey Slate**, or **Whichwood Forrest Marble**, with Bones, &c. (No. 6, *light blue*).
- Sand.**
- White free Limestone.**
- Great Oolite Limestone**, or **Bath Freestone** (No. 7, *yellow*).
- Ammonites concavus, tab. 94, l. Ilminster
 - elegans, tab. 94, u. E. of ditto
 - jugosus, tab. 92, f. 1. White Lackington
 - Cardita abrupta, tab. 89, f. 2. Swanswick
 - striata, tab. 89, f. 1. Ditto
 - Mactra gibbosa, tab. 42. Near Bath
 - Mytilus amplus, tab. 7. Midford.
 - Terebratula carnea? tab. 15. Cotswould-Hills
- Coral-rag**, under the Bath Oolite.
- Melania striata? tab. 47, l. Goatsacre
- Clay**, Fuller's-earth, and Marl, lead-colour and purple, in some places; (No. 8, 9, and 10, *white*).
- Terebratula concinna, tab. 83, f. 6. Aynhoe
 - lateralis? tab. 83, f. 1. Ditto
 - media, tab. 83, f. 5. Ditto, and near Bath
 - tetrædra, tab. 83, f. 4. Aynhoe, Banbury
- Under Oolite**, lower or inferior Oolite, yellow and brown Freestone. (No. 12. *orange*).
- Nautilus lineatus, tab. 41. W. of Bath, Comb-Down
 - Terebratula digona? tab. 96. Near Bath, Tog-Hill
 - Trigonia clavellata? tab. 87. Little Sodbury
 - costata, tab. 85. Ditto, and N. W. of Oxford
- Northampton yellow and brown Sandstone and Sand** (No. 13, *orange*).
- Blue Marl**, whitish upper Lias Clay, producing Mineral Springs, Bones, (No. 14, *faint blue*). Nine places of Belemnites herein are mentioned, p. 128.
- Ammonites ellipticus, tab. 92, f. 4. Charmouth Cliff
 - planicosta? tab. 73. Craymouth, Exmouth
 - stellaris, tab. 93. Lyme-Regis
 - Dentalium cylindricum, tab. 79, f. 2. Exmouth
 - Terebratula ornithocephala? tab. 101, f. 4. Pickeridge-Hill
- Marston or Melbury Marble**, and ferruginous Marble, Green Sand, &c. (No. 14, *faint blue*).
- Ammonites planicosta, tab. 73. Marston-Magna, Sherborn-Park [Well, and N. E. of Yeovil
 - Scaphites equalis, tab. 18. f. 1, 2, and 3. N. E. of Yeovil
 - Terebratula crumena? tab. 83, f. 2 and 3. Pickeridge-Hill
 - lampas, tab. 101, f. 3. Near Lyme Regis

SUPPLEMENTARY INDEX TO VOL. I.

Green Sand, &c.

- Pecten quadricostata*, tab. 56, f. 1 and 2 Armswell-Hill, Chute
 [Farm, Haldon-Hill, Stourhead
quinquecostata, tab. 56, f. 3 to 8. Black-Down, Chute
 [Farm, Devizes
Terebratula biplicata, tab. 90, Chute Farm, Longleat, Warminster
intermedia? tab. 15, f. 5. ditto, ditto, ditto
ovata, tab. 15, f. 3. ditto
Trigonia dædalea, tab. 88. Haldon-Hill
spinosa, tab. 86. Black-Down
Turrilites costata? tab. 36. Horningsham
obliqua, tab. 75, f. 4. Devizes Canal
Venus angulata, tab. 65. Black-Down
equalis? tab. 31. Ditto, N. W. of Little Teignmouth (east)
lineolata, tab. 20, u. Black-Down
plana, tab. 20, l. Ditto
Vermicularia concava, tab. 57, f. 1 to 5. Dilton
Vivipara extensa, tab. 31, f. 2. Black-Down

Blue-Marl, or Oak-tree Clay (No. 3, *blue green*).

- Perna aviculoides*, tab. 66. Filley-Bridge, Osmington, Shotover-
 [Hill, White-Nab

Aylesbury, Purbeck, &c. Limestone, superior or upper Oolite, Kentish
 Rag, &c. (*bright blue*).

- Ammonites cordatus*, tab. 17, f. 2 and 4. Shotover-Hill
triplicatus, tab. 92, f. 2. Portland Isle
Melania Heddingtonensis, tab. 39, r. le. Heddington, Shotover-H.
Modiola parallella, tab. 9, u. r. Maidstone
Solarium conoideum, tab. 11, m. Portland
Trigonia clavellata, tab. 87, u. Boulogne, E. of Oxford, Portland
 [Isle, Radipole
Vermicularia ovata, tab. 57, f. 8. Shotover-Hill

Blue Clay of Thame, &c., under the upper Oolite.

- Ammonites nodosus*, tab. 92, f. 5. Scarborough

Clay, imbedding the Sussex Marble.

- Vivipara fluviolarum*, tab. 31 f. 1. Bethersden, Farnham, S. E.

Woburn Sand, upper stratum, sometimes loamy Brick-Earth (No. 4,
dun brown).

Clay.

Woburn middle Sand, or ferruginous Car-Stone.

Fuller's-Earth near Woburn, &c.

Woburn lower Sand, with petrified wood, green in some places (No. 4, *dun
 brown*).

Clunch Clay, containing beds of Clunch Stone near its top (*dun purple*).

Alum Shale, of Whitby, imbedding Cement-balls, Jet, &c.

- Ammonites armatus*, tab. 95. Whithy
Modiola depressa? tab. 8, m. Ditto
Orthocera conica, tab. 60, f. 1 and 2. Ditto
Perna aviculoides? tab. 66. S. E. of Bedford

Kellaway Limestone, Straiths? York, North Riding, &c.

- Ammonites sublævis*, tab. 54, Christian Malford, Kellaway-Bridge,
 [Wisbeach Wch]

Brick Clay, with Bituminated Wood; perforated by numerous swallow
 holes.

SUPPLEMENTARY INDEX TO VOL. I.

- Blue Lias Limestone, water-setting, with blue Clay intervening, Bones, Fish, &c. (No. 15, *dun blue*).
Helicina compressa, tab. 10, m. Leicestershire
Melania striata, tab. 47, u. Lymington
Modiola lævis, tab. 8, l. l. Barry Isle and near Caerphilly Castle
Plagiostoma gigantea, tab. 77. Near Bath, Cardiff Castle, Pick-
[eridge-Hill
Terebratulæ erumena? tab. 83, f. 2 and 3. Pickeridge-Hill
punctata, tab. 15, f. 4. Hornton Quarry
subrotunda? tab. 15, f. 1 and 2. Ditto
- White Lias Limestone and Marl, (No. 16, *dun blue*).
Plagiostoma gigantea? tab. 77. Near Bath
- Sand, or soft Sandstone, of Balderton.
- Red Marl, upper or marly red, with greenish blue streaks, blue Marlstone, white Sand, soft red Sandstone, or Sand, Gypsum, Salt, &c. (No. 18, *rose colour*). Without organic remains?
- Upper Yellow or Magnesian Limestone, light straw-coloured Freestone, deep yellow in some places (*deep blue*).
- Middle red Marl, with Gypsum, sulphate of Strontian, tufaceous or conglomerate Limestone, coarse or Millstone grit, &c. (No. 19).
- Lower yellow, or buff, Magnesian Limestone, with blue (mild) Limestone beds near its bottom (*deep blue*).
- Sand, or soft Sandstone, brown or salmon-coloured.
- The strata below this, are found in many parts of the middle and west of England, to lie *unconformably*, having their *edges* covered by the strata last mentioned. See the Phil. Mag. Vol. XLV. p. 167. Of these more ancient strata only such will be mentioned as contain Shells described in this Volume.
- 12th Coal-shale? of the Derbyshire Series. See Report, Vol. I. p. 161. (No. 20 to 23, *Indian ink*).
Unio subconstrictus, tab. 33, f. 1, 2, and 3. Derbyshire, Wollaton
- 9th Coal-shale, with muscle-band or dog-tooth Ironstone.
Lingula mytilloides, tab. 19, f. 1 and 2. Wal-ingham
Mytilus crassus, p. 84, Brit. Min. tab. 386. Wigan
Unio acutus, tab. 33, f. 5, 6, and 7. E. of Bradford Lo. and in Der-
[byshire
uniformis, tab. 33, f. 4. W. of Bath, Stavely, Tupton
- 3rd Coal-shale, with Crowstone and Fire-clay, Limestone and Pyritic Balls, &c.
Ammonites Listeri (p. 132, Brit. Min. tab. 455). Alton, N. of Halifax, (Cathrine-slack?)
Orthocera Steinhaueri, tab. 60, f. 4. N. of Halifax, (Cathrine-slack)
- 1st Coal-shale, containing beds of Gritstone and of Limestone in some places
Terebratulæ crumena? tab. 82, f. 2 and 3. Tees River, upper part
- Limestone-shale, or great Shale, imbedding micaceous Gritstone, and blue and black Limestone, or Marble, in some places.
Euomphalus catillus? tab. 45, f. 3 and 4. N. of Buxton
Orthocera Breynii, tab. 60, f. 5. Ashford

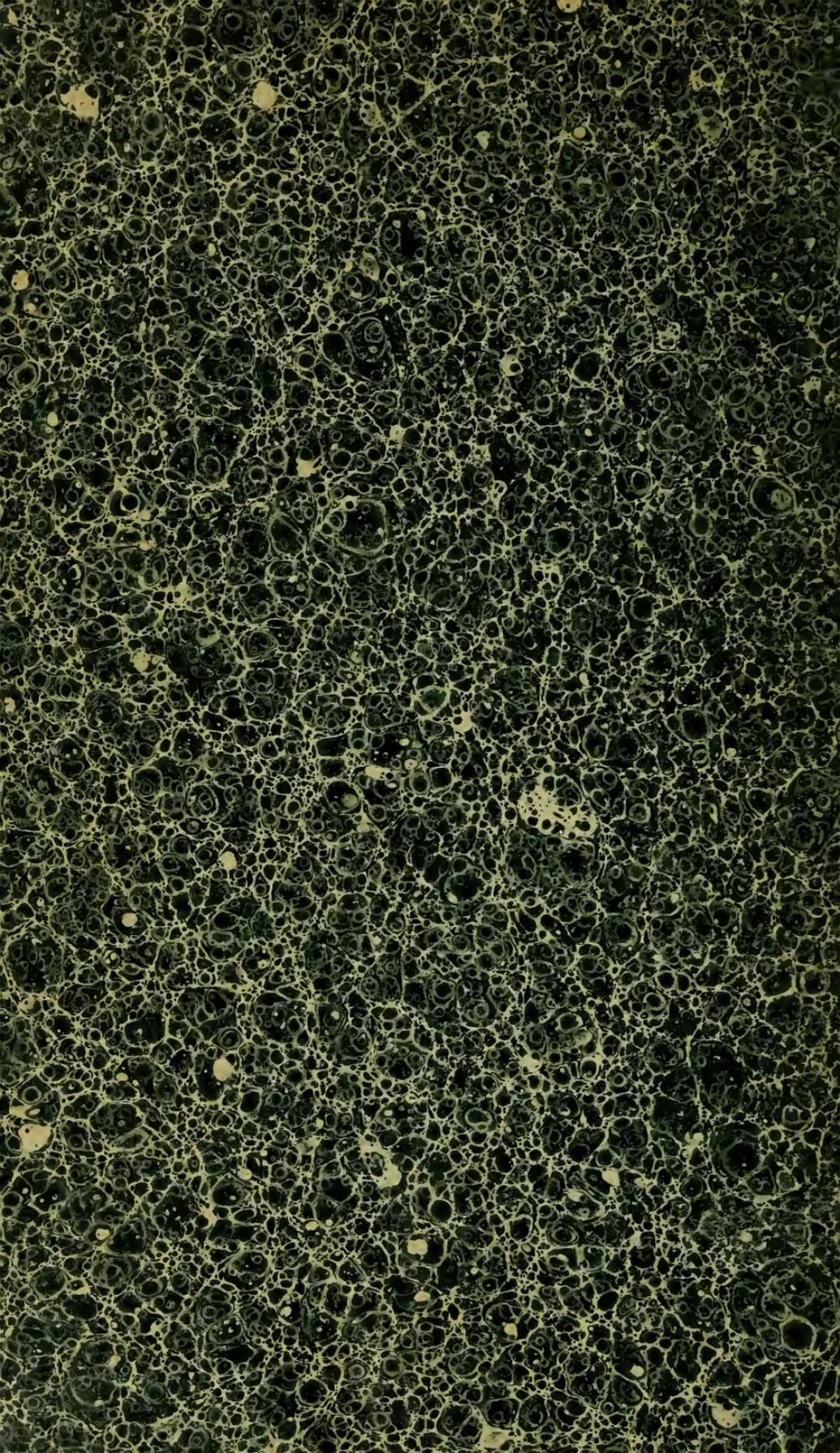
Supplementary Index to Vol. I.

- 1st or upper grey Limestone Rock, of the Derbyshire series (*purple blue*).
Cardium elongatum, tab. 82, f. 2. Bakewell
Euomphalus catillus, tab. 45, f. 3 and 4. Scalebar, N. E. of Tideswell, Winsters
- Helix carinatus*, tab. 10, u. 10. N. of Settle
Orthocera undulata, tab. 59. Scalebar
Productus aculeatus, tab. 68, f. 4. Bakewell
Terebratula crumena, tab. 83, f. 2 and 3. Winsters
- 3rd Limestone Rock, black and white in different places.
Ammonites sphæricus, tab. 53, f. 2. Mill-Dale, S. W. of Castleton, [S. E. of Buxton]
- Productus aculeatus?* tab. 68, f. 4. Ditto
scabriculus, tab. 69, f. 1. Ditto, W. of Tideswell
- 4th, or lowest thick Limestone Rock.
Ammonites striatus, tab. 53, f. 1. Pool's-Hole, Buxton, Castleton
- Derbyshire-Peak, or Mountain Limestone Rocks (not distinguished as above), under lying *coal-measures*, and upon coarse *Slate*; very variable in entire thickness, and the nature of its intervening beds, grey, black, red, &c. in different places (*purple blue*).
- Amplexus coralloides*, tab. 72. (Black-rock), Limerick
Cardium Hibernicum, tab. 82, f. 1 and 3. (Ditto), S. E. of Cork
Ellipsolithes compressus, tab. 38. Ditto
funatus, tab. 32. Ditto
ovatus, tab. 37. Ditto
- Euomphalus angulosus*, tab. 52, f. 3. Benthall-edge
discors, tab. 52, f. 1. Colebrook-Dale
nodosus, tab. 46. Derbyshire
pentangulatus, tab. 45, f. 1 and 2. Near Dublin
rugosus, tab. 52. Colebrook-Dale
- Nautilus discus*, tab. 13. Near Kendal
Orthocera circularis, tab. 60, f. 6 and 7. N. of Dudley
striata, tab. 58. Black-Rock, S. E. of Cork
- Pentamerus*, *Aylesfordii*, tab. 29. Amestry. Colebrook-Dale, Croft- [Ambery Park, Yeo-Edge]
Knightsii, tab. 28, u. Croft-Ambery Park, Downton
lævis, tab. 28, r. Buildwas, Hopton-Wafers Court
- Productus Flemingii*, tab. 68, f. 2. (Livingstone?), Linlithgowshire
longispinus, tab. 63, f. 1. Ditto, Kilbride
Scoticus, tab. 69, f. 3. Ditto
spinosus, tab. 69, f. 2. Ditto
spinulosus, tab. 68, f. 3. Ditto
- Terebratula biplicata?* tab. 90. (Black-Rock?) Limerick
lateralis, tab. 83, f. 1. Near Dublin, (Black-Rock) [S. E. of Cork]

Some *errata* having escaped correction in the former Index to this volume, the same will be found corrected herein, viz. *Solarium discoideum*, *Turbo littoreus* and *rudis*, *Chama conica* (omitted in the Index), *Pecten quinquecostata*, and *Euomphalus angulosus*; my readers are requested to correct these with the pen. And in No. VII. pages 73 to 84, two stars (73**, 74**, &c.) should be added, to distinguish the unfortunate repetition of pages, which there occur.

When figures of references have been omitted, in several of the plates of this volume, the letters referring to the place in the plate are added in this Supplementary Index; and several *localities* of Shells, before omitted, are here supplied.

The colours of strata herein mentioned refer to Smith's Map.









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THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN;
OR
COLOURED FIGURES AND DESCRIPTIONS
OF THOSE
REMAINS OF TESTACEOUS ANIMALS
OR
Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

By **JAMES SOWERBY, F.L.S. G.S. W.S.**
HONORARY MEMBER OF THE PHYSICAL SOCIETY OF GÖTTINGEN, OF
THE SOCIETY OF JENA, &c.
AUTHOR OF BRITISH MINERALOGY, EXOTIC MINERALOGY, BRITISH
MISCELLANY, ENGLISH FUNGI, AND A BOTANICAL
DRAWING BOOK;
DESIGNER OF ENGLISH BOTANY, &c.

Many, O Lord my God, are thy wonderful works which thou hast done; they cannot be reckoned up in order to thee: if I would declare and speak of them, they are more than can be numbered.

PSALM xl. 5.

VOL. II.

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MDCCCXVIII.

1818

AMMONITES splendens.

TAB. CIII.

SPEC. CHAR. Involute, depressed, front flat with crenulated edges; inner whorls three parts concealed, few; sides flat; radii alternately one long and two short; aperture long.

Corne d' Ammon fort plate, unié ét ornée de fleurs. *Bourguet Traité des Petrifications.* pl. 48. f. 312.

THE whorls are in number about three, quickly diminishing, the aperture being half the diameter of the shell long at the back, one fourth wide; the front narrower. The long radii are very prominent near the centre of the shell, and obscure towards the middle of the whorls; near the front they are again prominent, and together with the short ones form the crenulated margin; they all curve a little towards the mouth. The middle of the front is nearly plane. The cast is ornamented in the same way as the external surface.

This beautiful species is found in a pyritaceous marle at Folkstone in Kent. I received specimens from Mr. Dillwyn, and also from the indefatigable Mr. Gibbs. I do not yet know of their being found elsewhere, although some other of the Folkstone species are found in Sussex. The shell often remains: it is extremely thin, and of a cream colour, except where it has become partly decomposed, when it often exhibits the most splendid iridescent lustre, equal to those Ammonites, &c. enveloped in the Carinthian

VOL. II.

marble, and I think superior to the Broad Marston Ammonites mentioned by Dr. Maton in his Tour, II. p. 21. (*Ammonites planicosta* figured in my plate 73.) Fig. 2. shows a good specimen; imagination must supply the figure with lustre, which when the surface is made pellucid with wet is most perfect, yet if gummed is nearly obliterated. Fig. 1 is a small specimen which is less angular but contains the centre (which is commonly lost in larger or older specimens) whole: at the top, near the figure, is a small vestige of the siphuncle, nearly black, which in some specimens is preserved very distinctly, while it appears, from others which are far more perfect, impossible for a siphuncle to exist: it is in the front as is most common. Figure 3 is a pyritaceous cast, and exhibits the foliated sutures which are more or less conspicuous and a little peculiar in the continuous structure below the higher risings of the radii, which are rather blunter than in the upper figure. A species nearly resembling this is, I believe, found at Westbrook in Wilts.

AMMONITES *Calloviensis*.

TAB. CIV.

SPEC. CHAR. Involute, subumbilicate, rather depressed; volutions about five, three-fourths concealed; front flat; radii small, very numerous, alternately one long and from two to five short, obscure in the latter whorls of old shells; aperture orbicular when young, deltoid with the angles truncated when old.

AGE makes a great difference in the form of the whorls of this shell, the young ones being roundish, and having numerous sharp radii in sets, composed of one long one very prominent at the commencement, and from two to five about two-thirds the length, and all passing over the front. The outer whorls of full grown shells are triangular, the two inner angles being truncated, so as to give the shell an umbilicate appearance; the surface is largely undulated, wrinkled near the back, and has many irregular striæ in the place of radii: the inner surface differs from the outer only in the larger whorls being free from striæ and losing the radii sooner.

Found in a more or less mutilated state very abundantly in the shelly Limestone at Calloways or Kellaways Bridge. I have received specimens from many kind friends. Fig. 1 in the plate was sent me by my friend Mr. Salmon of Devizes, and I picked up the specimen from which Fig. 2 is

drawn enveloped in a rough piece of Limestone on the road near Chatley; it is much stained with rust of Iron, but was said to have been brought from Kellaways Bridge. Much of the shell is sometimes preserved of a dirty or ochraceously-stained white; it is rather thick, and does not seem much altered: in the older shells it is generally broken away, especially in the latter whorl, where perhaps the chambers have not been formed, as well as lower down, where the divisions are perhaps not so strong, on account of the breadth of their construction: the cast in this case exhibits something of swollen large undulations, but rarely the costæ, and would not, if detached, be known as part of the same shell. It is composed of sandy Limestone; the chambers contain crystallized Carbonate of Lime: in some cases no vestige of the siphuncle could be perceived, but Fig. 1 shows it near the upper edge.

Fig. 3 exhibits a specimen given me by the Rev. H. Steinhauer: it seems to be a much rarer variety than the other, and is seldom found so perfect; it has similar bivalves, &c. about its matrix as the other has, denoting a similar locality. This was taken out of a piece about two inches in diameter; it distinctly shows the siphuncle which is coloured black, whereas the rest of the shell is nearly white Carbonate of Lime. Possibly good specimens might prove this beautiful little shell to be a distinct species: it differs in having a rather rounded front, the edges of which are defined by sharpish tubercles just on the bend of the radii; the radii also are more prominent near the centre, and the aperture rather lunulate.

AMMONITES excavatus.

TAB. CV.

SPEC. CHAR. Involute, lenticular, subumbilicate; keel sharpish, crenulated; whorls about six, those of the young shell exposed; inner margin nearly right-angled; radii curved, obscure in full grown shells; aperture in adult shells sagittate; inner angles truncated.

A SLIGHT concavity separates the keel from the remaining uniformly convex sides; the radii, which in the last-formed whorls of full-grown shells are little more than irregular striæ, are in the first whorls very prominent over the inner angles; these angles in the young shell are rounded, and have not the flat space which in the old shells forms a partial umbilicus. The length of the aperture is about half that of the diameter of the shell, and the width at the back about one-third. The chambers are rather distinct.

I had the pleasure of picking this up a few years ago on the productive hill of Shotover near Oxford, and as I saw no more specimens it may possibly be rare. The shell which is replaced by Carbonate of Lime is moderately thick, and appears very exact in most parts. The chambers are commonly hollow, and crystallized within; the thin septa are also distinctly replaced by Carbonate of Lime. The finishing chamber, which would add a fourth to the size of the whole, and which I have separate, is filled with

a granular Limestone, similar to that in which it was found, and which is quarried there for paving, building, &c. The perpendicular inner margin of the whorls is three-eighths of an inch on the biggest part; thus the umbilicus is deep, although commencing rather suddenly at the fourth whorl, the bottom is consequently nearly flat, composed of four or five whorls, and very perfect, to the minutest. I was glad to discover the proper place for the siphuncle, expressed on the upper edge, by breaking the shell in looking for the contour of the chambers.

This somewhat resembles *Amaltheus margaritatus* of De Montfort, t. 23, p. 91. The place of the siphuncle is of much consequence in distinguishing them, as his is in the middle of the inner margin.

AMMONITES *Walcotii*.

TAB. CVI.

SPEC. CHAR. Involute, depressed; volutions four, three-fourths exposed, with a concentrate furrow; lunate undulations over half the sides; front with a carina between two furrows.

APERTURE oblong, its length equal to one-third of the diameter of the shell; the sides are flatted; each whorl is divided into two parts by an obtuse furrow; the inner half is nearly smooth, the other marked by semi-lunar depressions.

This species is much spread about; I have it in ferruginous marly Limestone from near Bath—from Llantrissant near Cardiff by favour of Miss Hill—and from White Lackington Park. I have specimens marked Devonshire and River Trent. It is abundant in clayey Ironstone or black marle at Colebrook dale, with blend or black Sulphuret of Zinc, and included in balls in the dark pyritaceous or Alum Clay at Whitby.

The species generally runs from two to four inches in diameter; the shell is laminated and scaly, composed of two, three or more coats, and rather deep, yet the sutures of the septa continue to near the outside, and the form is the same throughout the cast, differing from the outside ornament or pattern only in the greater depth of the furrow. The insides are divided by various crystallizations of Carbonate of Lime or Iron, or more solid or earthy, and more

or less distinct in the divisions or chambers, agreeably to the nature of the stratum in which the specimens are found. The section figured is from a Bath specimen, and shows several varieties of compact earthy marle, dendritical, &c. and the divisions more or less perfect, or obliterated, as it was cut rather irregularly, and the double line of the siphunculus is in some places very unintelligible; it is, however, very conspicuous in many specimens just under the thin shell of the keel, and appears to be nearly continuous. Walcot's figure (Bath Petrifications, fig. 41, p. 32) appears a worn specimen, the inner whorls being destitute of transverse costæ. Its foliated sutures are sometimes more distinct.

AMMONITES *angulatus*.TAB. CVII.—*Fig. 1.*

SPEC. CHAR. Involute; volutions six or more, exposed, angular at the back within; radii prominent, split over the front, commencing in the cast from a narrow concave space.

THE aperture is rather longer than wide, its width equals one-fifth the diameter of the shell; around the concentric angle at the inner part of the whorl is a narrow concave space, from the outer part of which commence the radii: this angle and the concave space are indistinct on the outside of the shell.

I received this, I think, rare and curious specimen from the Whitby Alum Clay, by favour of Mr. J. M. Sowerby, among various other specimens. The line at the inner part is apparently only in the cast, the small shelly part remaining on the specimen being destitute of it. The shell appears to be replaced by a mixture of pyrites, Carbonate of Iron, and Limey marle, but more stony within. The sinuated margins of the septa are rather close, but not particular or very distinct; if any thing they are more acute than in the *A. communis*. I have not seen the siphuncle or plains of the septa, but I presume they bear a close resemblance to the following. Indeed the resemblance between this species and *communis* is so general, that if the internal angle were not observed, it would, from its external appearance, be considered as the same, yet I expect it is always more ovate in the opening, with an approach to a flattish front. The shell seems somewhat laminated. The forked divisions in the front of the shell turn upwards in both.

AMMONITES communis.

TAB. CVII.—*Figs. 2, and 3.*

SPEC. CHAR. Involute; volutions six or more, exposed; radii annular, prominent, split over the front; aperture circular.

SYN. Corne d' Ammon a raies doublées vers le haut du dos. *Bourguet, &c. pl. 42. f. 276.*

THE aperture about one-fifth the diameter of the shell. The radii, which in the cast commence quite at the inside of each whorl, are continued nearly straight to the round front, over which they are sometimes forked and sometimes divided and united again on the opposite side.

This species, varying a little, is very common in the Alum Clay at Whitby; it is mostly dark coloured calcareous marle, shining with pyrites. The Ammonites are called in common Snake-stones, and superstition has accounted for their having been found constantly without heads, saying, the curse of St. Cuthbert was the cause of it; but as some of the dealers felt it a possible inconvenience, they were determined to be less barbarous, and compassionately supplied some with heads. I was so curious as to desire to see what sort of heads might be substituted, and Lady Wilson kindly procured me a specimen when at Whitby. I have figured that specimen for the information of others; see fig. 2. The beautiful Keynsham Ammonites are also called Snake-stones, having been changed into stone by some devotee for the benefit of his brethren. Fig. 3 is a small specimen, showing something of the section and septum, which is nearly round, exclusive of the space occupied by the inner whorl.

This species is perhaps among the fossil Ophiopomorphites of Plott.

AMMONITES Nutfieldiensis.

TAB. CVIII.

SPEC. CHAR. Involute, volutions four or more, nearly concealed; radii numerous, prominent, with shorter intermediate ones over the rounding front. Aperture obcordate.

SEPTA rather numerous, elegantly lobed and sinuated in the usual way; the intermediate shorter *radii*, or rather *undulations*, are often in pairs; they extend nearly half way over the sides: the longer radii are most prominent near the centre. The mouth is two-fifths of the diameter in length, and about the same in width; the front rounded.

Plentiful in the green Sandstone, above the greater beds of Fullers Earth in which the fine-coloured Sulphate of Barytes, Brit. Min. tab. 237, is imbedded. It is found from three inches to a foot in diameter, if I may include some specimens which vary a little in the radii. The present species has two or three short ones in a set, but some appear to have radii regularly the whole length all round. Some also appear to be more compressed, others rounder. The specimens are chiefly casts in dark Irony clay, ochraceous externally, and have sandy Quartz and Chlorite about them.

A specimen which I have lately received from Hythe in green sand is the same species.

MUREX striatus.

TAB. CIX.

VAR. *a* (*carinatus*) having three or four of the transverse projections more prominent than the rest, especially the upper ones.

THERE have been found recent shells very similar to this, and bearing the same relation to *M. antiquus*, *Linn.* (*M. despectus*, *Penn.*) as this does to my *M. striatus*, tab. 22, such appears to be the *M. carinatus*, *Penn.* I have a recent specimen somewhat carinated, and among a number of Fossil ones a complete series is easily selected. These Fossils have often been taken for the same species as the recent *M. carinatus*, but an attentive view of the proportions of the spire and the last whorl will readily distinguish all the varieties: the recent one having a longer spire, more like *M. contrarius*, tab. 23. which also is liable to the same carinated variation of form, but in a less degree and more rarely. I have endeavoured to show some variety with the younger shell, selected by Mrs. Cobbold from the same pit as *M. striatus* and *M. contrarius*, formerly figured, and with which the least carinated ones had been arranged in pairs. I have also had great variety from the Rev. G. R. Leathes and other Suffolk friends.

Fig. 1 is a moderate sized specimen; fig. 2 shows almost all the projections rather broad; in fig. 3 they are more regular; and in fig. 4 they are monstrous, and the beak is elongated: fig. 5 is a young shell.

1816. T. 2. XX.

BUCCINUM, *Linn. &c.*

GEN. CHAR. Univalve; spiral; oval, or elongated; aperture nearly longitudinal, oblong, with a reflected sinus at the base of the columella. Columella plain, tumid.

BUCCINUM elongatum.

TAB. CX.—*Fig. 1.*

SPEC. CHAR. Shell ovate-elongated, transversely striated; whorls seven, rather convex, longitudinally undulated; outer lip obscurely crenulated within; mouth oval with a short recurved sinus.

TWICE as long as wide, the aperture is rather less than half the length; the undulations upon the lesser whorls are tolerably regular and straight; upon the last whorl they are less uniform and more curved; the inner lip is smooth, thicker at the base.

Some doubts may be entertained, of this being a trifling variety of *B. undatum* of *Linn.* with greater regularity in the undulations, since we know how much the *B. undatum* varies in that respect: indeed it is with much uncertainty I give it here as another species. The length of the spire may perhaps distinguish it, wherefore I have called it *elongatum*. Mr. Herbert brought this shell from Walton le Soken Crag-pits, Essex, in 1810. I do not at present know of another specimen, but would recommend further search to be made after fossils so nearly related to recent shells. It is

a curious circumstance, that not long since, my kind friend, the Rev. W. Bingley, presented me with a remarkably distorted recent specimen (perhaps I should call it a monstrosity) of *Buccinum undatum* with a very elongated spire, twice as long as the lower whorl, and with a single spiral rounded ridge embossed on the upper part of it.

BUCCINUM rugosum.

TAB. CX.—*Fig. 3.*

SPEC. CHAR. Shell ovate-elongated, obtuse, transversely striated; spire with twelve or fourteen angles; whorls five, prominent; aperture obovate, latter whorl rugged.

APERTURE about one-third the length of the shell, rather broadest at the lower part, the sinus in the beak scarcely recurved; the angles on the spire are large undulations, something like those on *B. undatum*, but more elevated and regular. The apex of the spire is truncated and thick, showing that the egg must have been rather large.

Received from Holywell, by favour of Mrs. Cobbold: specimens are found of various sizes, sometimes quite white, and often stained with ochre, especially in the hollow parts, prettily relieving the projections. Its general form bears a great resemblance to *Murex rugosus*, tab. 34, but it wants the canal in the beak.

BUCCINUM reticosum.

TAB. CX.—*Fig. 2.*

SPEC. CHAR. Shell oblong-ovate, acute, reticulated; whorls six, with the upper and lower parts rounded and sides flattish: outer lip toothed within.

THE reticulated surface of this shell very much resembles the impression of some coarse cloth; it is prominent, formed by strong transverse striæ, crossing numerous longitudinal, rather acute undulations; the transverse striæ approach in pairs, and are twice as numerous as the undulations: the mouth is an oval, pointed at the upper end, and with a recurved sinus at the lower. The greatest width of the shell is less than half the length, and equal to the length of the aperture: the outer lip is toothed and striated within; inner lip plane, covering the columella.

Mrs. Cobbold favoured me with this well-preserved specimen from Holywell; it is an handsome-formed shell.

BUCCINUM granulatum.

TAB. CX.—*Fig. 4.*

SPEC. CHAR. Shell ovate, pointed, transversely striated, and with twenty longitudinal rows of tubercles; outer lip thickened, many-toothed within.

THIS has about four rather swelling whorls; between the striæ are many little tubercles arranged in longitudinal ridges, sometimes larger on the upper edge of the whorl; at the upper part of the inner lip is a tooth so placed opposite to one in the outer lip, as to form with it an apparent sinus, corresponding, but smaller, with that at the base of the columella. The aperture is obovate; edge of the outer lip rather straightened in the middle; the sinus at the base is a little curved.

A pretty little shell, which varies from less than a quarter to nearly three quarters of an inch in length. I have been favoured with very perfect specimens by my Ipswich friend. It closely resembles *B. macula*, but may be distinguished, by the longitudinal rows of tubercles or granules.

OSTREA gregarea.

TAB. CXI.—*Figs. 1 and 3.*

SPEC. CHAR. Clustered, oblong, curved, plaited; plaits many, rugged, diverging from a longitudinal plait or sulcus; valves unequally convex, beaks produced and curved.

THE lower valve is usually more concave than the other, and more or less carinated; the general form of the shell is very variable, nevertheless it constantly curves towards that side in which lies the muscular impression. The plaits are often branched near their commencement; they vary in length, several not reaching the central line; those in the hollow side are smallest. There are no vestiges of ears by the sides of the hinge, the pit of which has a central concavity in the lower valve, and a corresponding convexity in the other, characters which distinguish this from the plaited Oyster found in the green Sand. The shell is rather slender, especially towards the edges.

Immense masses of these shells have been found near Devizes: they are of a greyish colour, and so much attached to each other, that it is difficult to distinguish the valves, and pairs nearly detached are rare. Mr. Sheffield has fine specimens, which he was so good as to lend me; for others I am indebted to Mrs. Gent. A greyish Limestone often fills the insides, and sometimes partially covers the outsides.

The large upper valve, of which two figures are given at fig. 3, is filled with a similar stone superficially stained with Iron: it seems to correspond in some respects with Delamarck's description of *O. pectinata*: it was sent me by the Rev. Mr. Steinhauer, from the upper Coral rag, at Westbrook, near Melksham, Wilts.

All the species of Oysters are so variable in their contour, that it is difficult from description to determine them.

OSTREA palmetta.

TAB. CXI.—*Fig. 2.*

SPEC. CHAR. Ovate-roundish, obscurely one-eared, depressed, with a plaited margin; plaits diverging from a longitudinal space; beaks straight.

THIS shell is but slightly curved, it is flatter and the plaits are few and more irregular than in *O. gregarea*, but it may prove to be a variety in a young state.

Found in Marston field, near Oxford, by Mr. Baker, in a somewhat redder soil than the preceding. The upper valve easily separated, and allowed the inside of the other to be properly seen; there was but a small piece of earth in it.

GRYPHÆA, *Delamarck.*

GEN. CHAR. A free (except when very young) unequal-valved, inequilateral bivalve; larger valve involutely curved, concave, lesser valve flattish, beakless. Hinge a transversely striated pit, containing an internal ligament, without teeth or crenatures.

THE lamellar structure of the Gryphites and their texture is much the same as that of the Ostracites, the hinge is also of the same nature; but the general form has afforded Delamarck a distinguishing character; how far this is sufficient, I leave others to judge. The general perpendicularity of the hinge, the restriction on the right side, and the concavity of the smaller valve may assist.

The length of most of the species is greater than the width; the larger and lower valve is very concave, gradually curved into a large, more or less involute beak, along which runs one side of the pit holding the hinge cartilage: this side is consequently curved. The lesser valve is flat or convex within, and forms a kind of lid; the part to which the hinge cartilage is attached in this valve, is flat and perpendicular. The very young shells are nearly flat and attached to other bodies, of which they take the impression, through both valves; when they are full grown they lose their attachment, and the impression remains upon the beak of one valve and upon that part of

the other valve which met it when it was young, although now far removed. I have a specimen, upon the beak of which is the concave impression of a Cardium, and a convex impression upon the lid;* their correspondence appears at first difficult to understand, but they prove, that Gryphææ are no more free shells than Ostrea. The otherwise independent appearance of full grown shells, deceived the great and discerning Delamarck. The right side is often distinguished by an obscure lobe or sulcus.

These shells seem generally more changed than most petrified Oysters, and the lamina are less tender and less divided. Fragments, however, are often with difficulty distinguished from those of Oysters. I do not quite know at present that I have received Ostrea from the same stratum as the Gryphææ, yet the former are abundant in many places. We conceive, that a knowledge of the different species of Gryphæa will be of some importance in identifying formations, as they appear to occur in many places. I have them in the blue and white Lias; in the great Oolite, particularly in the Clay which intersects its beds; in the Clunch Clay, the Kellaway Limestone, &c. and from the following places; Weston, near Bath; Purton Passage-ferry, in the mud; Frethern; Weymouth; Radipole; Kellaway; Elveston, near Bedford; Norton-Disney, in Lincolnshire; Kettering, in Northamptonshire; Birdbrook, in Essex; Strontian, in Argylehire; and Belfast.

* I have a recent Oyster adhering to a Pecten, which has the impression of the ribs of the Pecten through both valves in a similar way, although a quarter of an inch or more in depth: also some specimens of Anomia ephippium of *Linnaeus*, which are larger, (being always an adherent shell, and when on the common Oyster not appearing particular) but the ribs or striæ being thus formed, gives them a sort of specific difference. I had this long since, through the generosity of Miss Pocock, gathered near Marazion.

GRYPHÆA incurva.

TAB. CXII.—*Figs. 1 and 2.*

SPEC. CHAR. Elongated, very involute, right side an obscure lobe, lesser valve oblong, externally concave.

SYN. *Parkinson, Org. Rem.* vol. III. p. 209, t. XV. f. 3. *Walcot's Bath Fossils*, f. 34, p. 51 N.

So great is the curve of this that the point of the beak is often concealed; when visible it is generally sharp, seldom showing any impression. The curvature is very regular, extending about one turn and an half. The surface is much laminated and rather rugose. The sides are straight, widening gently towards the round front. The lid is oblong, widened towards the front and truncated at the hinge, where it is very thick. The curvature of the beak is sometimes, but rarely, oblique at the apex. The upper specimen, fig. 1, is from the Lias near Frethern, in Gloucestershire, by favour of Thomas Meade, Esq. Its incurvation seems to hide the mark of attachment, which, however, will be found distinct in many of the genus. My kind friend, Thomas Walford, Esq. long since favoured me with the curious gregareous specimen, fig. 2. from Birdbrook, Essex; it resembles some I have from the Cornbrash at Chatley, &c.

GRYPHÆA obliquata.

TAB. CXII.—*Fig. 3.*

SPEC. CHAR. Oblong, slightly involute, oblique; right side an obscure lobe; lesser valve irregularly ovate, externally concave.

THE curvature of this shell rarely forms one whole circle, the beak turns to the right side; it is seldom sharp, but often truncated by the surface of adhesion to other bodies when it was young: it is a broader shell than the last, with rounded sides.

This species does not seem to mix with the preceding, and by a little use will always be discriminated; it either belongs to another rock formation or another part of the same stratum; information relative to the places they are found at, and other circumstances, may ripen our knowledge as to these particulars.

Most of my specimens of this species are out of blue Lias; one of them has minute young ones attached to it, these are very flat, nearly circular, a quarter of an inch or less in length, without the least appearance of curvature, although they show more beak than young Oysters in general do. Part of the shell of this is replaced by Silix, with those concentric marks so frequent on the green Sand Fossils; it is in blue Lias, from St. Donat's Castle, Glamorganshire, by the Rev. W. Traherne.

PLAGIOSTOMA punctata.

TAB. CXIII.—*Figs. 1 and 2.*

SPEC. CHAR. Depressed, obliquely obovate; with numerous diverging striæ; anterior side long, straight; ears nearly equal; diverging striæ transversely marked with other very fine striæ, or punctums.

WHEN young the margin is rather a greater segment of a circle than half, but older shells approach to an oval, the greatest length of which is placed obliquely parallel to the cavity on the anterior side, in which lies one of the ears; the diverging striæ are fine, becoming obscure in the older shells; the transverse ones are hardly to be seen, except in the hollows of the others, where they appear as minute punctums; in the young shells they undulate, and seem like rows of minute punctums across each of the diverging striæ. The length and breadth, taken at right angles to each other, are nearly equal; the depth of one valve near the beak is about one sixth of the length.

Having given some of the *Plagiostomæ* in tab. 77 and 78, I now add a few more species of this tribe, which it may be proper to distinguish, and save some inconvenience to the inexperienced: different species having their respective localities, they will be better understood. The present species has a distinct character in the punctums, as pointed out by Miss E. Hill. This is from a quarry, at Pickeridge Hill, of hardish light and dark grey Limestone, called grey and blue Lias, provincially: it is a little foetid when scraped; has faint impressions of shells much pressed, or flattened volutions of *Ammonites*, which being rather on the face of the stone, form a natural resemblance which

the men call "Clocks*." I have another specimen from St. Donat's Castle, Glamorganshire, by favour of the Rev. W. Traherne. Fig. 2 is a young specimen from the ruins of the keep of Cardiff Castle, which was built by Robert Fitzhammon. A. D. 1110. Such were found also at Barry Island, in 1792, by Miss Hill. The stone is very like the other.

PLAGIOSTOMA cardiiformis.

TAB. CXIII.—*Fig^s. 3.*

SPEC. CHAR. Gibbous, nearly circular, longitudinally furrowed, smooth; anterior side short, straight; wings equal.

So fine are the transverse striæ in this shell, that they are nearly lost, except at the bottoms of the furrows, where they look like rows of very minute dots; this is a direct shell, with nearly equal sides, a little longer than wide; the margin is toothed within: it is nearly related to *P. spinosa*, tab. 78, having in common with that, much of the general form of a *Cardium*. Depth of a single valve about one-third of the length.

The great Oolite stratum contains also, larger and lighter or darker coloured specimens of this *Plagiostoma*, than the one I have figured. I am indebted to the Rev. H. Steinhauer for several specimens from Petty France, in Gloucestershire.

* In a quarry near is the cone-coral Limestone mentioned in British Mineralogy, vol. 2, tab. 149, passing into striated Limestone or striated Spar, the local term for which is "Charrow-bed." Pickeridge Hill, mentioned before at pp. 177, 190, and 223, is in the parish of Corffe, four miles S. of Taunton, Somersetshire.

PLAGIOSTOMA rigida.

TAB. CXIV.—*Fig. 1.*

SPEC. CHAR. Gibbous, obliquely obovate, with many diverging sharp thread-like ribs, and very minute intervening transverse striæ; anterior side long, straight, very concave; ears nearly equal.

THE ribs are sharp, irregularly waved, a little zigzag, about three or four times their thickness distant from each other; the beaks are rather prominent, the shell entire at the edge, thin and rigid to the touch, in consequence of the sharpness of the ribs; except the greater depth, its proportions are the same as in *P. punctata*. The striæ upon the space between the ribs are too fine to be seen without a lense.

I picked this up in one of the quarries at Shotover, otherwise I have only met with it once, when my friend, Mr. Sheffield, lent me a specimen marked Oxford. *P. ovalis* is like it, except in being a narrower formed shell, and from the striæ of growth the present does not appear to have been narrower when younger.

PLAGIOSTOMA ovalis.

TAB. CXIV.—*Fig. 3.*

SPEC. CHAR. Rather gibbous, oblique, elongated, oval, with many small ribs and minute intervening transverse striæ; anterior side concave, slightly recurved.

VERY nearly resembling *P. rigida*, so that at first sight it might be taken for the young of it, but it is of a narrower oval shape, the ribs are rounded, and at a distance from each other only equal to once their thickness; the length exceeds the width, taken at right angles to it.

My specimen is a very neat one from the Fuller's-earth Rock at Small-Cossall, near Bath. The Rev. H. Steinhauer sent it to me in 1813.

PLAGIOSTOMA obscura.

TAB. CXIV.—*Fig. 2.*

SPEC. CHAR. Rather gibbous, oblique, ovate, smooth, externally ribbed? with twenty-five internal sulci: anterior side flattish; beaks prominent.

THE width of this shell is greater than the length; it is elegant in form, the anterior side not being so straight as in most *Plagiostomæ*, and the beaks more elevated. I am not certain, but suppose the margin to be toothed. This specimen from Kellaway was obligingly presented to me by Mr. Salmon.

PLAGIOSTOMA pectinoides.

TAB. CXIV.—*Fig. 4.*

SPEC. CHAR. Depressed, a little oblique, obovate, rather angular at the back; beak pointed; surface with twenty or more carinated ribs, transversely striated; internally plane; margin toothed.

BETWEEN each of the ribs the space is very narrow, a little elevated and terminated at the margin by a tooth; the transverse striæ are little else than lines of growth, but they are very numerous and sharp. Both sides are straight, the anterior one twice the length of the other; the ears are prominent and the general contour is that of a *Pecten*.

From a clayey part of the soil at Pickeridge Hill, by favour of Miss Hill.

VOLUTA, *Linn. Delam.*

GEN. CHAR. Univalve, ovate, subventricose; apex papillary; base emarginate; columella plicated, inferior plicæ largest and longest.

VOLUTA luctator.

TAB. CXV.---*Fig. 1.*

SPEC. CHAR. Shell ovate-acute, crowned with tubercular spines, terminating longitudinal ribs, transversely striated or sulcated; whorls concave above, with a rugged edge; outer lip plain within; mouth oblong.

SYN. Strombus luctator. *Brand. Hant. 64.*

Voluta musicalis. Lamarck. Env. de Paris 26.

THE spire is a short cone with rather concave sides; one row of short thick spines winds up it, diminishing rapidly towards the apex; from the bases of these spines proceed undulations or ribs which extend to the beak, and are crossed by numerous linear sulci or plaits, deepest about the lower part; the whole surface above and a small space below the spines is free from transverse striæ, but the whole is longitudinally striated. The last whorl is about three times the length of the spire, angular above and but slightly ventricose; its upper edge is rugged with obscure tubercles, and sometimes an angular depression. Aperture oblong, lips nearly parallel and smooth: on the columella are three or four plaits.

The shell here figured agrees with Brander's from Barton above quoted. It has generally a coarser appearance than its congeners and is often larger, sometimes, perhaps, four or more inches long. The spire varies at the apex, being sometimes very blunt. It is very doubtful whether Branders fig. 65, ought to have been retained under the same name by him.

From Barton Cliff, I have also the fragment of a young one in the blue clay, from a well dug in Richmond Park some years ago.

VOLUTA spinosa.

TAB. CXV. *Figs. 2 and 4, Var. β fig. 3.*

SPEC. CHAR. Ovate-acute, ventricose, crowned with large spines extending into the longitudinal ribs, and a row of smaller spines near the upper edge of the whorl; whorls concave above, transversely striated below. Mouth ovate-elongated; outer lip plain within.

SYN. Strombus luctator. *Brand. Hant. fig. 65.*

Voluta spinosa. Lamarck. Env. de Paris 26.

SIMILAR to the last in general form, but the last whorl is ventricose; the edge of the whorls above the concave upper part is generally rectangular, with a row of sharp spines upon its angle. The transverse striæ are often obscure over the upper half or more of the whorl. The mouth has a very obtuse angle at the upper part. Var. β has a greater number of ribs and is less ventricose, fig. 3.

This is *fig. 65* of *Brander*, and resembles, or is perhaps the same as *Lamarek's V. spinosa*, although in the French specimens I possess, the whorls are blended into each other, and the lesser row of spines is more irregular; it is besides shorter in proportion to the width. The neatest, whitest, and best preserved specimens at *Barton Cliff* are generally of this species, but the French specimens are frequently more perfect still, having the yellow lines of colour preserved. The variety β is more distant from the French shell; my figure of it shows the plaited columella, characteristic of the Genus, but which is mostly hid by the position of the shells in *Brander's* beautiful figures. *Fig. 4.* is intermediate in form between *fig. 2* and *3.* My specimens of this species, and also of *V. luctator*, have all the outer lip so broken as not to show whether it be striated within or not, I therefore take that character from *Brander's* descriptions.

VOLUTA ambigua var. monstrosa.

TAB. CXV.---*Fig. 5.*

SPEC. CHAR. Shell elongated ovate, acute, with longitudinal undulations and sharp transverse striæ; spire crowned with two rows of obsolete spines. Aperture acute at the top, expanded at the base; outer lip dentato-striated within.

SYN. *Voluta ambigua.* *Brand. Hant. 69.*

A much narrower shell than either of the last; that part of the whorl above the undulations, or ribs, instead of being concave as in them, is rounded, and has a trans-

verse ridge along its middle: the spines are very small, and only worthy the name on the lesser whorls. The variety here figured is curious, on account of a deep groove along the upper part of the whorls around the whole of the spire; the species may, however, be distinguished, by the constantly rounding upper part of the whorls, and the spines being less prominent. I am favoured with this curiosity from Barton Cliff, by the Rev. W. Bingley.

NAUTILUS elegans.

TAB. CXVI.

SPEC. CHAR. Gibbose, umbilicate, with numerous linear, reflexed, radiating sulci.

ABOUT two thirds as thick as wide; the septa are rather numerous, gently waved; the aperture is obtusely sagittate, with the posterior angles truncated; umbilicus small, perhaps closed.

This fine specimen was found in the chalk marle, at Ringmer, in Sussex, in 1814, by Mr. Mantell, and from the remains over the umbilicus it must have been as wide again. I have had numerous portions; one of the last chamber, which not having the siphuncle (in general perceptible) is often less intelligible than when broken so as to show its place, as in this specimen. I suspect that this species is not uncommon near Heytesbury and in some other parts of Wiltshire. I remember Mr. Cunningham had a fine specimen, which, I think, was the same species, but as it was purchased among other things by Dr. Parry that Gentleman only can decide it. It is often found very much distorted, in Sussex, and other places, having the curved lines, its particular character, very much worn or lost, as in the greater part of this specimen.

Mr. Cunningham's, if I remember right, was very perfect in this respect.

AMONITES monile.

TAB. CXVII.

SPEC. CHAR. Sub-umbilicate, with tubercular radii; inner whorls exposed; tubercles hollow, in the interior deep, externally obsolete on the margin; external surface divergingly striated; aperture transversely ovate.

IN the cast the radii are composed of tubercles gradually rising higher and becoming elongated towards the front, where the last one is bifid; this and several others are not to be seen on the outside, because the shell is so thick between them as to make the surface level. The inner surface is smooth; the front rather concave, finely striated externally. Aperture about one-third the diameter of the shell in length, and nearly twice as wide. Occasionally we see the siphuncle just within the front.

I am favoured with this, and other curious productions of the green sand at Sandgate, near Folkstone, by a discerning friend, whose zeal for scientific research could not resist attention, even to the often refused rejectamenta of former animation, preserved, I am apt to think, as monuments of the most highly instructive nature, regarding the lapse of ages; while they often afford splendid examples of beauty increased by premature decay.

This Ammonite in many ways baffles description, in being so various according to its state of preservation; the shell is thick originally, and rather laminated; its surface decaying may give much variety as to the protuberances, while it occasionally becomes nacreous with an indescribable lustre; and often most so when the last

remains of the inner shelly lamina exposes the cast, and when the moniliform appearance is most prominent, elegantly forming semicircles, like so many necklaces one above another, not unaptly reminding us of those in fashion about a century ago.

TEREBRATULA plicatilis.

TAB. CXVIII.---*Fig. 1.*

SPEC. CHAR. Gibbose, transversely obovate, finely and obtusely plaited; middle elevated by twelve plaits; fifteen or more plaits on each side; beak slightly projecting.

LENGTH rather greater than the depth; width about one third greater than the length. The plaits continue to near the beak. The beaked valve is rather less gibbose than the other.

I have this species most perfect from the upper Chalk at Northfleet near Gravesend, and also filled with flint from Margate: it is sometimes in such a state as to separate from the chalk, and show something of the interior construction, which is very desirable in this division of shells, as it is often very remarkable. The two upper figures are the upper and lower valve separated from the chalk, and showing the construction of the hinge. The next figure shows both valves closed together.

 TEREBRATULA octo-plicata.
TAB. CXVIII.---*Fig. 2.*

SPEC. CHAR. Gibbose, transversely obovate, obtusely plaited; middle elevated by eight plaits; twelve or fourteen plaits on each side; beak projecting.

THIS differs from the last in the number of plaits, having at most but 9 at the sinus, it is also a rather longer shell.

From the Chalk at Lewes; the two specimens here figured differ from each other in the number of plaits, and slightly in shape, but we do not know how to consider them as distinct species: this and the last are nearly related to *T. concinna* t. 83. fig. 6.

TEREBRATULA Wilsoni.

TAB. CXVIII.---Fig. 3.

SPEC. CHAR. Circular, plaited; front cylindrical, margin acutely dentated, elevated in the middle with seven plaits; nine or ten plaits on each side; valves compressed towards the beaks.

THE front of this shell is placed at a right angle to the beaked valve, and is nearly of the same length: the remaining parts of both valves are slightly convex: the form of the shell is therefore a cylinder cut off obliquely at one end, and rounded: the sinus at the front, although very deep, does not alter the evenness of the surface.

This is from Mordiford, E.S.E. of Hereford, by favour of Lady Wilson: the structure is curiously different from any I have otherwise seen. I have the honour of naming it after her Ladyship, in commemoration of her zeal for research in this science. The specimens have some of the shell remaining; and are filled with a darkish limestone.

MAGAS.

GEN. CHAR. An equilateral unequalvalved bivalve ; one valve with an angular sinus along an incurved beak ; line of the hinge and back of the other valve straight, with two projections near the middle.

A partial longitudinal septum with appendages attached to the hinge within.

THIS new Genus has the general contour of the plain *Terebratulæ* figured in tab. 15; but attention to the parts about the hinge soon distinguishes it. The beak has no circular perforation as in them; but there is a large quadrangular foramen, two sides of which are formed by two projections from the straight back of the flatter valve, and the other two run along to the point where they meet; on each side of it is a flat space extending from the line of the hinge, which is much longer than the foramen, to the apex: if the valves be separated the foramen is divided into two angular sinus's, that in the beaked valve being much the largest. In the middle of the shell rises a thin longitudinal septum reaching from one valve to the other; the upper part of it arches over to the hinge, the front of it is perpendicular, on each side are two shelf-like appendages, one over the other, the upper ones united by slender processes to the hinge. I know of but one species, some variation in these particulars may be expected in others, but the general structure is sufficiently remarkable to warrant the establishment of the Genus.* Most

* It is not unlikely that Martin's *Anomites glaber* and others resembling it, the internal structure of which I have not been able to examine, may belong to this Genus. It were much to be wished that some person would publish an account of the curious internal appendages of these shells.

of the *Terebratula* have lines along the beak, in the same direction as the sinus in this, but the back of the flatter valve is arched, never straight; this also wants the perforation in the beak. The resemblance of the arched septum to the bridge of a violin has suggested the generic name: to which valve this septum is attached I have not been able to ascertain, because I could not open the shell without breaking it.

MAGAS pumilus.

TAB. CXIX.

SPEC. CHAR.....

THE beaked valve is hemispherical, smooth, with a circular edge, and small incurved beak; the other valve nearly flat, with a long transverse straight back.

Mr. Richard Taylor, jun. favoured me with specimens of this singular shell, found in the Chalk near Maudesley, Norwich. The construction being new to me I was glad to exhibit it, especially as it appears to be newly discovered in the chalk; the specimens, he observes, are sometimes smaller than No. 1, but seldom larger than No. 2, 3, and 4. The extraordinary interior construction I have only been able to give an imperfect idea of, not having an opportunity to examine sufficient specimens. When magnified the shell is found to be curiously punctured in a minute quincunx order, which appears to depend on the construction of it, as in most of the tribe related to the *Terebratula*; it is generally most apparent within the substance.

SPIRIFER.

GEN. CHAR. An equilateral unequalvalved bivalve ; valves beaked ; one valve with a large angular sinus along the inside of the beak ; hinge transverse, long and straight. Two spirally coiled linear appendages to the hinge nearly filling the shell.

THE shells of this Genus are in general wider than long, with a large sinus or fold elevating the front ; unarmed ; many of them longitudinally furrowed. The sinus in the beak being met at its open end by the back of the lesser valve, forms a triangular foramen, with inflected edges.* The surface of the beak on each side of this foramen is flatted and often widely extended, having numerous parallel longitudinal striæ upon it, which gives it much the appearance of the outside of the hinge of *Arca*. I think this Genus will comprehend nearly all the shells, retained as *Terebratula* by Lamarck, which have a triangular foramen and not a perforation at the apex of the beak as the character of that Genus requires. The several individuals in which I have discovered the spiral appendages, bear a considerable natural affinity to each other, † from which circumstance we may venture to place many analogous species in the Genus, although their interior has not been ex-

* In some species I have traced these edges quite across the beak, forming septa, somewhat like those in the flatter valve of the *Pentamerus*, but confined to the beak.

† I gave a paper some time since to the Linnean Society, on the construction of this spiral tubular cartilage, which almost fills the shells, and which I have seen full proof of in Derbyshire and Irish specimens ; and Mr. Brown has some curious specimens from Van Diemens land.

posed. I conceive that all those in Martin's division of *Anomitæ d. d.* (Martins's outlines, &c. p. 243.) which he describes as having both valves convex, and a large trigonal foramen belong to this Genus, and also, perhaps, those of his next section with a small foramen, but we are not sufficiently acquainted with their internal structure, to decide whether another Genus may not be necessary to render the divisions of the Linnæan Genus *Anomia* quite natural.

SPIRIFER cuspidatus.

SPEC. CHAR. Inversely pyramidal, longitudinally sulcated; back flat, triangular, equilateral; front elevated by a semicircular sinus, corresponding to a large longitudinal rising in the upper, and depression in the lower valve.

SYN. *Anomia cuspidata.* *W. Martin in Trans. of Linn. Soc. IV. p. 45. t. 3. and t. 4. fig. 5. Petrif. Verb. t. 46. & 47. fig. 3. 4. and 5.*

Terebratula. *Parkinson Org. Rem. III. 234. t. 16. fig. 17.*

DEEPER valve nearly flat at the back, because its beak is but slightly incurved, or is straight, and sometimes even it is recurved; its depth is equal to its greatest width, which is occupied by the line of the hinge; the other valve is about one third the depth: the length is equal to about one half the width; the edge semicircular; there

are about fifteen sulci on each side of the smooth central wave. A few lines of growth are marked on its surface, continuing over the back, which is finely striated longitudinally. The edges of the foramen are inflected. I have not discovered the spiral appendages to the hinge, but as they may be seen in *Anomia trigonalis* of Martin, t. 29. f. 36. it is probable they might be found in this, if the specimens were fortunately preserved.

We were obliged to the late Mr. W. Martin for the first account of this species in 1798, and it had not been a second time discovered by him or mentioned by any other author until very lately: he observes it is very rare at Castleton, and that its structure is truly remarkable, &c. As species of shells are said to determine the precise age of the rock they are found in, by degrees we shall gain much useful instruction.

A few years since my good friend, and friend to science, W. Danby, Esq. gave me a specimen, gathered below St. Vincent's rock, near Bristol, and in May, 1815, the Rev. J. M. Trahernes sent it to me as he observes, "from the Mountain Lime with *Entrochi*, near St. Hilary, Glamorganshire." I have also a specimen from near Cork, by favour of Dr. T. Wood, in 1812. The two first have a few scaly remains of the shell; they are somewhat distorted, with incurved beaks; that from Bristol has some signs of *Entrochi*, in a dark reddish Limestone; in the other they are very distinct and abundant, the stone is darker with red stains. The specimen from Ireland has less of the shell, and is remarkably distorted, see fig. 5; this distortion appears to imply some difference in the age, as if a further change had taken place, which effected a total reduction or more total loss of the shell, softening the whole mass, the shell previously

interrupting and imposing the distinction and separation of the rocky matter sufficient to keep its form visible.

The other four figures are from the same specimen as Martin figured: I cut a piece from it in search of the spiral cartilage, but it was obliterated: we may still hope to see it in perfection in some other. The Irish and Derbyshire specimens are in a much lighter coloured stone than the others.

NAUTILUS Comptoni.

TAB. CXXI.

SPEC. CHAR. Lenticular, carinated; center covered; surface smooth; keel obtuse; aperture acutely triangular.

THE last whorl covers all the others, and has about ten septa. The centers are covered by a convex crust, more opaque than the rest of the shell. The mouth is formed of two arched lips. Siphuncle probably in the keel. Diameter less than one line.

This is, perhaps, so small a Nautilus, that it is likely to be overlooked in England. I received it from Lord Compton (in the same stone with the *Turrilites costata*, tab. 36.) who found it at Earl-stoke, seven miles N. E. of Warminster, Wilts. I beg to record his Lordship's penetration, as an honour to himself, and as likely to prove ultimately useful to society; for, as the language of a country (says Lord Moira) may be enriched by a knowledge of other languages, so a knowledge even of the minutiae of Natural History must facilitate other branches of science in any country, for every atom has its use to infinity. The minuteness and rarity of this specimen made me rather anxious to give it publicity, lest it should be lost.

It agrees in some respects with the genus *Patrocles* of Montfort, but from the imperfection of some of his figures I do not know how to confide in this, and I think it is a fault to be hasty in making Genera, before we are acquainted with individuals. Now every observer would

consider this as somewhat belonging to the *Nautilus*, I therefore retain it in that genus at present, rather than go farther, beyond the limits of general knowledge. *Nautilus calcar* of Fichtel is quoted by Montfort, but it appears certainly to differ from either. I am sorry not to be able to find the siphuncle, but I suspect it is at the outer extremity. In all my specimens, which is seldomer the case in *Nautili* than in *Ammonites*, it was obscure: one had a little break where I expected it, but I could not say it was there :---it must therefore be left for further research.

NAUTILUS simplex.

TAB. CXXII.

SPEC. CHAR. Depressed, sphæroidal, umbilicate, plain; mouth lunate, with the angles truncate, embracing the preceding whorl; siphuncle nearest to the inner edge of the septum.

THICKNESS about four-fifths of the greatest diameter, septa numerous, rather flatter than in *Nautilus imperialis*, tab. 1. and narrow in the middle.

This is found rather abundantly in the vicinity of Boreham, one mile E. S. E. of Warminster, but often so loosely aggregated in parts as to fall to pieces as a mere marley green sand, as it is commonly called; at the same time some parts are become more or less solid, and compact flinty hornstone, or partially filled with carbonate of lime in crystals. Under these circumstances it is seldom that a good specimen is found, and they vary in shape and size, being compressed or rounded, and from an inch or two to a foot or more in length. The present specimen, from Miss Benett, shewing the place of the siphuncle, helps to distinguish it from species which might otherwise be confounded with it. It bears a great resemblance to *Nautilus imperialis*, (tab. 1.) but is, however, generally rounder in the curvature, and narrower. In one massy specimen I found what is deemed an Aleyonite imbedded; it is a sort of organic remains, that has repeatedly forked branches, and bearing many clubbed, pearshaped, nearly cuplike or folded, apparent termina-

tions or heads,* some nearly the shape and size of a moderate lemon; the branches about half an inch thick, with five or more calcedonic tubes filled up with flint, &c. the rest being chiefly horny looking flint, which with some difficulty separates from the green sandy and flinty marly mixture. *Pectens*, &c. are frequently included with them.

The green sand in which this is found owes its name to particles of Chlorite, or earthy Talc, coloured green by Iron mixed with it,† a colour seldom found in Mica, and never imparted by it to the sandstone, of which it may form a part.

* Since my paper on this was read to the Linnean Society, more specimens have been found in the Warminster green sand, by Miss Benett, indicating many swelling terminations or heads, hydra-like.

† The Fullers' Earth, near Woburn, is often accompanied by a bright green sand, whose colour is occasioned by Iron, it is said.

NAUTILUS truncatus.

TAB. CXXIII.

SPEC. CHAR. Thick, flattened, plain, umbilicate ;
back flat, mouth elongated, four-angled : si-
phuncle nearest to the inner margin of the
septum.

SYN. *Lister*, 1048.

THICKNESS rather less than half the diameter ; the sides are rather conical and even. Mouth above half the diameter of the shell, long, narrowest towards the back, siphuncle oval. Septa very numerous, not recurved towards the umbilicus.

A fine specimen of this species is figured by *Lister*, measuring ten inches in the longest diameter ; no doubt, when perfect it is sometimes much larger : mine is eight inches, I figure a part of it, as sufficient ; the remainder is a broken continuation of it. I have never seen the last chamber. This is composed of a mixture of dark lias limestone and pyrites, found at Keynsham, S. E. of Bristol. It is also said to be found in the blue lias of Bath, &c. *Lister* does not say where his specimen was found ; his figure shows about three whorls, mine did not expose them ; possibly when the shell is removed the whorls may be uncovered. Mine has fragments of the shell of considerable thickness about it, indicating that it was smooth when perfect.

NAUTILUS obesus.

TAB. CXXIV.

SPEC. CHAR. Gibbose, umbilicate, plain; back broad, flat; mouth large, squarish; septa very numerous, not recurved; siphuncle nearly central.

THICKNESS about three-fourths the diameter. The mouth is large, being two-thirds the diameter long. The septa are very numerous; their angles not being recurved gives a very open form to the umbilicus. The siphuncle is transversely oval.

My kind and discerning friend Mr. Strangeways sent me this from the coarse or rather ferruginous limestone, at Norton-under-ham; it is often of a large size (a foot or more long) and clumsy make, but seldom perfect. It is readily distinguished at first sight by the flat broad back, and afterwards by the siphuncle being nearly in the middle of the septa, inclining inwards: both these characters being taken together will distinguish many species, yet I expect more may be occasionally necessary. The shell must have been very thin and without peculiar markings, as there is no sign betwixt the curve and the mouth that betrays any. The divisions are sometimes irregular, but that happens in the most perfect in many other species.

NAUTILUS intermedius.

TAB. CXXV.

SPEC. CHAR. Gibbose, umbilicate, concentrically striated; back broad, flattened; mouth squarish; siphuncle nearest the external edge.

NOT so thick as *N. obesus*, with flatter sides and a narrower back; the septa are also less numerous; it approaches *N. truncatus*, (tab. 123.) but is thicker, with a broader back; its surface being finely striated, distinguishes it from both.

From Keynsham.—This and the last might easily be confounded with each other; the siphuncle, however, in this, is nearest to the outer part of the shell. From the inner part of the front of a whorl that became exposed in separating, we find it was longitudinally and finely striated. Had not this been discovered, we must have depended more upon the siphuncle, which is round and not transversely oval. The stone in which this and the last figured specimen were imbedded, does not seem to differ much. The shells of either appear to have been very thin, and are so worn that the numerous and thin septa are seen conspicuously exposed.

How admirable is it that Nature allows us so much distinction in specimens that have undergone such vicissitudes, while we are often puzzled with very perfect recent ones! It is truly useful, as we the better discriminate their places in the rock and system; and thus will the recent species become more easy to our exercised faculties.

Thomas Walford, Esq. has nearly similar remains of shells on his estate at Birdbrook, N. W. of Castle Hed-
ingham, Essex, of which he kindly sent me a specimen,
in the light chalky marl, perhaps alluvial on the London
clay; but I expect, from what I have, that the siphuncle
is placed about one-third of the length of the mouth from
the last whorl; and although the flatness and width of the
shell nearly corresponds, it is not so angular as in the
Keynsham specimen. It was part of a septarium, which
included the shell, indiscriminately, as a mass of earth.
Such light earthy septaria are found under gravel, near
the Marquis of Cornwallis's, Culford Hall, near Bury
St. Edmund's, Suffolk.

AMONITES giganteus.

TAB. CXXVI.

Simplegades. Montfort, p. 92.

SPEC. CHAR. Depressed, with many radiating, sometimes furcate undulations; inner whorls exposed; sides straitish; mouth obovate.

VAR. β . Mouth nearly circular, sides rounded.

SYN. ——— *Lister, pl. 1046.*

THERE are about 5 distinct whorls in most specimens, the interior ones being almost wholly exposed; the septa are rather numerous with their margins much sinuated. Thickness of var. α equal to about one fourth of the diameter, and rather more in var. β .

I was at a loss how to represent this, which in magnitude and beauty is preserved so many ways for our wonder, instruction, and gratification. It is sometimes filled with small grained Limestone: sometimes the chambers are lined or filled with crystallized Carbonate of Lime; the crystals being commonly equiaxed or inverse rhombs (see British Mineralogy tab. 12.) Such are found, I believe, near Keynsham, and cut and polished, thus shewing the chambers within, and the sinuated margins of the septa, at various depths externally; they are often cut so thin as to be transparent in parts; my late esteemed friend, Dr. Lettsom, presented me with some specimens of this kind, which surpass description. The flint that occurs in the Limestone where these shells abound, occasionally envelopes some of them, the cham-

bers are then generally filled or lined with quartz crystals. I have several large fragments of nearly such from the neighbourhood of Fonthill, Wilts. A specimen from the last place in flint I have figured in *British Mineralogy*, tab. 310.; it is composed of calcedony, which has formed a thin coat over the shell, septa and all, when the shell decaying has left the calcedony with its exact form. It has been said, somewhere, that Mr. Beckford, of Fonthill, was in possession of one, holding Feldspar; upon enquiry I have every reason to think this to have been a mistake; if such a one was at Fonthill, Mr. Beckford was so kind as to order it to be sent to me, but no such thing existed. The half of one, however, the smaller chambers of which are lined with inverse rhombs of Carbonate of Lime supporting short prismatic crystals of the same substance, was added to my collection; it is from Chicksgrove quarry, one mile and a quarter E. N. E. of Tisbury, near Hindon, Wilts, and measures two feet three inches in diameter. When I was at that place some years ago, the quarry men told me, that they had broken within that week, one as large as the hinder wheel of a coach! Lister says his was two feet, and there is in the museum at Paris, a shell of the same genus four feet in diameter; knowing this, Montfort seems ready to give credit to the assertion, that they are sometimes eight feet. The Chicksgrove one just mentioned is the largest I have met with; it is the var. α and in a compact sandy Limestone; there is part of a curiously formed crab's claw in the stone, and a number of plain serpulæ about the mouth of the shell; there is a specimen of this variety α , brought from Purbeck Isle, as it is called, in Dorsetshire, measuring 21 inches in diameter, to be seen in the basement, in front of one of the warehouses in the London Docks.'

Of the variety β I have several calcareous specimens from the Chicksgrove quarry, one of them lined with equiaxed rhombs of calcareous spar, for which I am indebted to A. B. Lambert, Esq. of botanical celebrity; in the stone imbedding this shell there was a large congeries of *Serpulae*, of a different species from those in the other specimen var. α , an Oyster shell, impregnated with *Silex*, *Trigoniae*, various small Shells, small *Vertebra*, and imperfect Crab's claws. Most of the siliceous specimens are also of the variety β . I am indebted to Mr. Salmon for some masses of Flint, having hollows almost filled with calcedony, which appear to be nearly obliterated chambers of such a shell, of a very large size: they were found in Marlborough Downs.

Some years ago I saw on the shore at the foot of the Cliffs, between Dover and Walmer castle, an impression in Chalk, of an *Ammonite*, which measured about three feet in diameter.

Chicksgrove quarry produces many *Ammonites*, they occur in a Limestone, into the composition of which a small quantity of fine sand enters, and as there are dispersed through it many portions of crystallized Carbonate of Lime, that break into laminae, it has, I am told, been erroneously called sandstone with mica: the quarry men term the particular bed which produced my largest specimen var. α , the spangle bed, (the specimen var. β appears to be from the same bed) from the appearance of these crystals. Miss Benett who has paid indefatigable attention to Chicksgrove quarry, and indeed to Geology in general, has kindly remitted to me the following account of the section, with the nomenclature of the people who work the stone, and a series of specimens which enable me to mark the mineralogical differences of the stones.

A corrected Section of Chicks Grove Quarry, S. of the Village and of the River, in the Parish of Tisbury, in Wiltshire.

1. Top of the Quarry.—Rubble, fourteen feet.—No shells in this bed. (Impure chalk.)

2. Stone not good, two feet.—The lower part of this bed contains the same shells as the chalk below it.

3. Chalk, two feet.—Trigonias three species, Pectens like those of Thame, Oxfordshire, Ostrea several species, a thick equivalve, bivalve which is common in the rubble beds of freestone, a small bivalve, perhaps Unio, two other small bivalves and a Trochus like those of the flinty chalk. (Hard chalk.)

4. Flint, four inches, (approaching chert.)

5. Chalk, eleven feet.—A rubbly Chalk without shells. (Hard chalk.)

6. Spangle bed, five feet six inches.—Contains Ammonites, Oysters, and various other shells changed into spar. (Limestone, containing some white, but no green sand.)

7. Walling Rag, two feet six inches.—Fragments of shells changed into spar. (Like No. 6, only coarser and harder.)

8. Devil's bed, two feet.—Fragments of shell changed into spar, smaller shells than the Walling Rag. (Like No. 6.)

9. Great Rag, three feet.—No shells, or only small fragments. (A compact sandy Limestone, with minute grains of green sand.)

10. Brown bed, three feet.—Contains Ammonites. (Less compact than the last, with more green sand, some parts of a loose texture.)

11. Trough stone, three feet four inches.—Trigonias, the shell changed into spar, and Ammonites. (Similar to some parts of the last.)

12. White bed, two feet eight inches.—Contains Ammonites. (Between 10 and 13.)

13. Hard bed, three feet six inches.—Trigonias, the shell changed into spar and Ammonites. This bed is very like No. 11. (Rather less green sand than No. 10.)

14. Fretting stone, two feet.—A soft stone and no shells. (A loose sandy Limestone with green sand.)

15. Under bed, two feet.—Fragments of shells changed into spar. (More compact and finer grained than the last, and holding less green sand.)

16. Under bed, two feet six inches.—Contains Trigonias, the cast of the outside of the shell a soft stone. (Like the last, except that it contains no spar.)

The whole depth of Chicksgrove Quarry to the bottom of the stone is 61 feet 4 inches, measured by John Moun-
tague, foreman of the quarry.

The scales of fish, erroneously supposed to have been found in this quarry, were from a tile-stone quarry on Lady-Down, in the parish of Tisbury, and about one mile N. W. from Chicksgrove Quarry.

The above are the names by which the different beds are known by the people who work the quarry.

Most of the stone contains calcareous spar, in the place of the fragments of shells dispersed through it, but No. 14 and 16 are without it; the Spangle bed contains most.

The rare stratum called by Geologists "White Free-stone" and here called chalk, but from which it differs in its situation, occurs also at Brill, in Buckinghamshire, and at Upway, in Dorsetshire.

CERITHIUM, *Bruguiere*.

GEN. CHAR. Shell univalve, spiral, terminated at the base by a short truncated or recurved canal; aperture oblique, with an obscure canal at the upper part.

THE shells of this Genus are generally seven times the width of the aperture long, and beautifully ornamented by tubercles, transverse striæ or carinæ and longitudinal costæ, variously combined and proportioned. It seems to be a very natural Genus, containing many species; but the canal at the upper part of the mouth is often very obscure, and sometimes, even entirely wanting. The size of individuals varies from a quarter of an inch to two feet in length, limits which are exceeded by very few Genera of spiral shells. This Genus has been divided into three by Montfort; how far this division may be found necessary by those who are conversant with foreign shells, I will not pretend to say, but at present I feel satisfied with Lamarck's distinctions and would wish to go no further.

 CERITHIUM *pyramidalis*.

TAB. CXXVII.—*Fig. 1.*

SPEC. CHAR. Pyramidal, with six projecting tuberculated angles; whorls 10 or 11, transversely tri-carinated, carinæ tuberculated; six compressed tubercles on the upper part of the last whorl; outer lip expanded.

- SYN. *Cerithium hexagonum.* *Lamarck Env. de Paris, p. 79.*
Murex hexagonus. *Chemnitz Conch. X. p. 261. t. 162. f. 1554. 1555.*
Murex angulatus. *Brander, p. 24. f. 46.*

ALTHOUGH the general form of this is pyramidal with six sides the spaces between the angles or rather costæ are not flat; the costæ are slightly arched, obtuse, with about three tubercles on each, corresponding to the number of obtuse carinæ that cross them, and which have three or four tubercles between each costa: the last whorl shows seven or eight carinæ, and wants the costæ on its lower part, while they are enlarged on the upper part by an equal number of prominent transversely flattened tubercles: the whole surface is minutely and transversely striated. Brander describes seven angles to his *Murex angulatus*, but I conceive there is no doubt of this being the same species, the number of angles constituting it only a variety. I have two specimens, both with six angles.

From Hordle or Barton Cliffs, by favour of my kind friend, the Rev. Mr. Iremonger; not having the mouth quite perfect in the authentic specimen, a dotted line is added from a specimen the same in every respect, except that its ornaments are sharper, and that it has so recent an appearance, that I cannot answer for its being a fossilized remains, nor do I know where it was found, although shells, almost as recent in appearance, are found at Hordle Cliff.

Lamarck's *Cerithium hexagonum* comes the nearest in description to this shell, but is distinguished by the flatness of its sides and spinose tubercles. See *Env. de Paris, p. 79.*

CERITHIUM geminatum.

TAB. CXXVII.—*Fig. 2.*

SPEC. CHAR. Conical, elongated, smooth, with seven or eight longitudinally disposed pairs of acute tubercles on each whorl; whorls about twelve; lip even.



THERE are two obsolete transverse carinæ, extending from one pair of tubercles to the next; the upper tubercle of each pair is the largest, particularly upon the last whorl, where it is often bifid; on this whorl are also two other rows of small tubercles, visible; the aperture is nearly round, with a very slightly recurved beak.

I believe this is a rare shell, even at Barton Cliff, from whence I am favoured with it by the Rev. Mr. Iremonger, who has generously allowed me to take many of the most rare and perfect of his specimens, for public information—this is the best specimen I have seen; but I possess a smaller one from the same place, by favour of the Rev. W. Bingley.

CERITHIUM funatum.

TAB. CXXVIII.

SPEC. CHAR. Conical, elongated, with two obtuse crenulated transverse ridges upon each whorl ; upper part of each whorl thickened and tuberculated ; mouth squarish ; base smooth.

THE tubercles upon the upper part of the whorl form, in some specimens, a kind of corona : the last whorl only differs from the others, in exposing two more transverse ridges ; the mouth has a small canal at the upper edge ; the beak is rather short. Whorls ten or eleven.

This elegant species seems to have been common at Hordle Cliff, when Mr. Iremonger procured it ; the individuals are sometimes neat and white, with a mixture of sand and marle, or stained with ochre ; sometimes they are less sharply preserved with a grey or greenish sandy mixture about them, and occasionally the ornament and striæ are obliterated to so plain an appearance, that the species can scarcely be recognized without very careful comparison, the ridges, &c. varying more or less according as they are worn, but commonly having the most distinct appearance about half way from the apex. I have named it from the resemblance of the costa to small cords.

Fig. 1 from a bed of blue clay on the indurated marle, Castle-hill, near Newhaven, Sussex, by favour of G. A. Mantell, Esq. collected in 1802 or 1803. Fig. 2 found at Hordle Cliff some years since, and presented to me by the Rev. Mr. Iremonger.

VOLUTA Lamberti.

TAB. CXXIX.

SPEC. CHAR. Fuciform, short, smooth; base elongated, obscurely truncated; columella with 3 or 4 plaits; aperture acute above; outer lip sharp, not expanded towards the base.

SYN. *Voluta* of Harwich. *Park. Org. Rem. V. III. p. 26. t. 5. f. 13.*

A Cast. *Hist. Lap. Fig. p. 112. t. 33. f. 3. App. to Dale's Hist. of Harwich, pl. 10. f. 14. p. 289. (See Parkinson).*

THE whole surface is smooth; the aperture occupies about two-thirds of the length of the shell, it is nearly of the same form with it, but is acute at the upper part, whereas the apex of the shell is subglobose; the width is considerably less than one-third of the length; the outer lip has a slight sinus where it approaches the spire and is rather expanded in the middle: the base is equally elongated with the spire, and so slightly and obliquely truncated, as to render the beak but obscurely emarginate. The lowest plait of the columella is sometimes confounded with the base of it, when there remain only three plaits.

I retain this as a *Voluta*,* although the base is, perhaps, scarcely emarginate, and is more taper than usual. It is rather curious that about five specimens have been found in a recent state, much resembling this, which are in the hands of different cognoscenti; Mr.

* It has some affinity to *Murex tulipa*, *Linn.* or *Fasciolaria*, *Lam.*

Hall is said to have two, Mr. Jennings one, of which I have seen drawings, some of which indicate an emarginate base : the shape in other respects is so near that it might be considered the same : the colour also corresponds ; the recent one, is, however, finely marked with zigzag or lightening-like stripes, of the colour of the warmest or darkest line of our figure, and is altogether to be admired, so that it has got the appellation *elegans*. It is said to be a native of the Fejee islands in the south seas. I have seen a recent specimen approaching it, with a broad expansion of the outer lip, and emarginate base, without coloured markings.

Fig. 1 is from a young shell by favour of Mrs. Cobbold, from Crag-marle at Holywell ; fig. 2 from the Rev. Mr. Lambert's specimen ; it is, perhaps, the most perfect known, and was found in the Cliff at Bawdsey, Suffolk, where the Crag lies upon blue Clay. Fig. 3 is the outline of a cast, by favour of that gentleman, from Aldborough, Suffolk, full twenty miles distant from Bawdsey where the other specimen came from.

I have the pleasure of naming it after the Rev. Mr. Lambert, that his ardour and zeal may be remembered with gratitude.

Mr. Parkinson's figure seems to have been taken from a good specimen, but differs from ours in the contour of the adherent upper part of the lip.

Having been favoured with a sketch of the general nature of that part of Suffolk where the Crag-marle, more or less supplies these, and numerous other vestiges of beings, formerly organized ; I am glad to lay the instructive detail before the public :—" It is that part of the county of Suffolk which, from the comparative lightness of the soil, is expressly called the Sands—it abounds so much in that species of fossil shell, called Crag shells,

that it is much more difficult to say where they are not, than where they are to be found. The Crag at Bawdsey Cliff, near the mouth of the Deben or Delen River, is particularly deserving attention, not only for the variety of shells which it produces, but because you may discover in various parts of it, particularly the southern extremity, the base on which it rests, and which appears to be blue Clay, and such is the Anchorage ground in Hollesley Bay, N. E. of it, visible at ebb tide. On elevated ground, to the west of Melton, N. N. E. of Woodbridge, is a Crag pit, just on the confines of the deep soil of High Suffolk, its produce mixes with the fossils of the blue Clay. At Shottisham, S. E. of Woodbridge, I found the *Murex despectus*; near Brightwell and Foxall, S. W. of Woodbridge, the reverse *Murices* and *Chamæ* abound; near Woodbridge is a vein of imperfect specimens of *Venus Islandica*, but I never could extract an entire specimen. At Sudbourn, N. of Orford, the Crag is of a much paler colour, and of so concrete a texture, that some walls at Orford are built with it; and in sinking wells through it at Sudbourn no other support is wanted for the sides. The Crag near Aldborough is very loose.* I believe that the soil of the country between the rivers Orwell and Stour, S. and S. W. of Ipswich, is similar to that of the Sands, and equally abundant in Crag; but I have never examined any part of it except the neighbourhood of Wherstead and Belstead. To the westward of Ipswich, Crag was formerly seen on high ground, which is now concealed by plantations; and about half way down, be-

* It consists of fragments mixed with entire shells of *Pectens* and some others, corals, &c. adhering together around the spaces formerly occupied by other shells, such as *Voluta Lamberti*, *Venus Islandica*, &c. that have left behind them here nothing but their impressions, while in other places they are found entire.

tween this and the river, a tooth and several bones of an elephant were found in sinking a well, ten or twelve years ago. Near Harwich, S. S. E. is the Cliff originally quoted by Lister as the habitat of the inverted Murex, and copied from him by succeeding Conchologists, "Prope Harwich."

AMMONITES Bucklandi.

TAB. CXXX.

SPEC. CHAR. Depressed, inner volutions exposed, with large obtuse radii; back carinated, and a furrow on each side of the keel; aperture quadrate.

VOLUTIONS about five, their sides wholly exposed, the back flattish, with two concentric grooves, and an intermediate keel; the radii are swelled towards the back, over which they are suddenly reflected, and gradually lost, as in several other carinated Ammonites; the keel is obtuse and entire.

Found in the Blue Lias of Bath and the neighbourhood, measuring from a foot to 21 inches or more in diameter, and rather remarkable for having frequently lost the inner whorls; which circumstance, by a sort of friendly pun, has given rise to the name given it, in honour of a meritorious and enlightened Geologist, the Rev. W. Buckland, who having found a large specimen, was induced by his ardour to carry it himself, although of considerable weight, and being on horseback it was not the less inconvenient; but the inner whorls being gone so as to allow his head and shoulder to pass through, he placed it as a French horn is sometimes carried, above one shoulder and under the other, and thus rode with his friendly companions, who amused him by dubbing him an *Ammon Knight*; and thus the specimen was secured, by diverting the tedious toil otherwise hardly to be borne. May his zeal for information always be rewarded: may his abilities continue to meet that attention they have hitherto so deservedly gained: may his horn be exalted with honour.

Mr. B. lately found *Ammonites striatus*, tab. 53. f. 1. in the transition slate of Filliagh, near South-molton, Devonshire.

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AMMONITES Conybeari.

TAB. CXXXI.

SPEC. CHAR. Depressed, carinated, volutions many, exposed, with obtuse radii; keel prominent, entire; back flattish, angular; aperture oblong.

VOLUTIONS 8 or 9; the radii even, or rather most elevated in the middle of each volution, and lost before they quite reach the angles of the back: keel large and prominent, with a slightly concave space on each side of it.

This species is rather remarkably variable in size, from 2 to 18 inches and more in width, and always having about 8 whorls, generally continuing very perfect to a small center. It is from near Bath. The composition it is preserved in varies much, like that of most of the shells of the Lias strata in general, being Carbonate of Lime more or less crystallized, Iron Pyrites, or mere casts of earthy Limestone, or a mixture of the whole, and shewing the foliated divisions, or nearly plain.

I feel a pleasure in distinguishing this by the name it bears, after two able Geologists, the learned friends and companions of the Rev. Mr. Buckland, whose zeal deserves to be remembered by posterity. This and the following species are generally companions in the same stratum, and are occasionally impressed with each others type.

AMMONITES Greenoughi.

TAB. CXXXII.

SPEC. CHAR. Depressed, volutions two-thirds concealed, obscurely undulated; aperture elliptical, deeply indented by the preceding whorl.

WHORLS four or five, the last nearly half the diameter of the shell, the undulations are continued and rather strongest over the rounding back, they are obscure in all but the central whorls, and the latter whorls of old shells are destitute of them. The outline of the aperture is a very regular ellipsis. The septa are near, very much and beautifully sinuated at their margins, and locked into each other.

This rather singular Ammonite is often formed of pyrites, of rich golden and iridescent tints, and crystallized in the greatest variety of forms, from the octaëdron to the icosædron, following the undulations of the chambers and the most attenuated ramifications of the spreading folliculæ, sometimes forming in the place of the shells, &c. &c. occasionally filled with a great variety of crystals of Carbonate of Lime an inch or more in length. Specimens vary in size from 12 to 18 inches or even more. The outer whorl has generally few or no undulations, while they are more distinct in the center, which, if seen separated, might be mistaken for another species. The attenuated and ramifying sutures of the septa are remarkably striking in the present specimen, and put me in mind of the friendly and attentive

Geologist, Greenough, whose genius spreads and rami-
fies so abundantly, that I could not resist commemo-
rating it with sentiments of friendship, that the suavity
of his manners has stamped on my mind. May he con-
tinue long to enjoy that ardour, which contributes so
much to his happiness, and is so instructive to all around
him.

ORTHOCERA annulata.

TAB. CXXXIII.

SPEC. CHAR. Slightly tapering, gently compressed, with strong annular undulations, and minute transverse undulating striæ.

THE undulations are slightly oblique, at a distance equal to about one-fourth the diameter from each other; about the aperture which is oval, there is a considerable space without a ring: the siphuncle is placed a little way within the broader side of the shell.

From a Limestone quarry at Colebrook Dale, Shropshire, it was presented to me by the friendly J. Cotton, esq. Lady Aylesford shewed me, some time since, a similar, but rather shorter specimen. It appears to taper so gradually, that we may suppose it 18 inches or more long when perfect. The upper part of the figure expresses the last chamber, which appears to extend three-fourths of an inch beyond the preceding septum. The form of the shell remains, it being replaced by Carbonate of Iron, thin, but distinct, thickest at the annulations, which are occasionally dark brown from having been worn when uncovered, or destitute of the buff Limestone. The specimen is rather weighty, as if much impregnated with Iron.

AMMONITES auritus.

TAB. CXXXIV.

SPEC. CHAR. Compressed, with obscure radiating undulations tuberculated at their origin ; inner whorls exposed ; back deeply channelled, bordered by large alternating compressed tubercles.

W HORLS four or five, the last nearly half the diameter, or twice the thickness of the shell long.

Discovered in the micaceous sand when the Devizes Canal was digging, by Mrs. Gent, who favoured me with some other productions from thence some time since: the stratum to which they belong appears to require their aid to distinguish it. It is more or less micaceous, and in most instances there are only casts remaining of the forms that existed or were enveloped in it, and which have not yet been recognised in any other formation that I know of:* they are preserved in a peculiar way, being of so loose and crumbly a texture as scarcely to hold together, and a little change of wet and dry would soon fit them to be dispersed by the slightest wind ; but a certain depth has protected them in a place where they might have been preserved for ages more securely than in the most careful hands.

* I have two or three species from Folkstone belonging to the same section as this, one of which I think is figured by Parkinson, *Org. Rem.* tab. 9, f. 8.

OSTREA canaliculata.

TAB. CXXXV.---*Fig. 1.*

SPEC. CHAR. Depressed, very long, curved, two eared; a descending sinus or two in the anterior margin near the front; sides nearly parallel.

GENERALLY three times as long as wide; the ears are rather large, nearly equal, and distinguishable in both valves: the posterior or concave side is often open: a few concentric undulations are observable near the beak of the lower concave valve: the upper valve is very flat, without a prominent beak.

This species of oyster was sent me by Mr. Richard Taylor, from the Chalk Cliff at Mundsley near Cromer, with *Magas pumilus*, tab. 119, (where the locality should have been given as here specified,) and *Terebratula carnea*, tab. 15. fig. 5 and 6. It seems pretty well identified by the ears both in the upper and lower valves, but most conspicuous on the incurved side: the convex side is also mostly plaited with two or more canaliculated projections. I could discover no marks of attachment at the beak, which is acuminate and apparently independent.

The *Ostreæ*, so universally distributed, are very puzzling in their varieties. I have therefore endeavoured to distinguish two or three here, that some reference may be had occasionally, if the characters I have used will answer the purpose of distinguishing them in the numerous places where they are found.

OSTREA acuminata:

TAB. CXXXV.---*Fig. 2 and 3.*

SPEC. CHAR. Depressed, very long, curved, with large subimbricated transverse waves beneath: beaks and front acuminated.

Two or three times as long as wide, the upper valve rather concave, smooth and nearly even, with a beak almost equal to that of the other valve.

Fig. 2. represents specimens sent me from the clay under the great Oolite of Bath, by favour of the **Rev. H. Steinhauer** in 1813: they have been parasitical on various formed things: have little or no auricles; they have large undulations, and vary much as to curvature. **Fig. 3.** are taken from shells found at Aynho, Northamptonshire, by Miss Wilson. They appear to be the same species as the last mentioned, and they vary very much as to their length, curvature, &c.: yet the undulations may help to distinguish them. I have similar shells from near Withyam, Sussex.

PECTEN *equivalvis*.TAB. CXXXVI.—*Fig. 1.*

SPEC. CHAR. Lenticular, with rounded diverging ribs and many acute concentric striæ; valves equally convex, the lower one smoothest; ears equal.

THE ribs vary in proportion; they sometimes equal the space between them, but are generally less; they are rounded and the striæ are more or less obliterated over them: the spaces between them are slightly concave.

Pectens are generically described by Lamarck as in-equivalve, wherefore, I suppose, he had not seen any otherwise; but the present species has both valves nearly, if not quite, equally gibbous: one valve being simply convex, the other having a trifling reversed undulation near the edge, and differing but little in the pattern. The auricles have not, as I have seen, been found perfect, they are, however, nearly so, and they then show an horizontal line on each side of the beak, with nearly perpendicular lineæ or striæ. I have one by favour of Dr. Sutton, which has nearly parallel lines with the hinge on the dexter auricle of the broader valve, with the broad costæ. This species is commonly found from three to seven inches in diameter. Mr. Strangeways, from whom I have received several specimens, observes, that they are characteristic of the coarse Limestone of Ilminster. I have had other specimens from near Lackington, by favour of Mr. Strangeways, also from Farley gateway, Gloucestershire; Carrington, Oxfordshire; and from Dursley, Gloucestershire. I believe the species is found in various other parts of England, and I have a specimen from France.

PECTEN fibrosus.

TAB. CXXXVI.—*Fig. 2.*

SPEC. CHAR. Depressed, orbicular, with a rectangular beak, nine or ten broadish diverging grooves and numerous sharp concentric striæ; ears equal, rectangular; margin undulated internally.

RATHER longer than broad; the back is formed of two straight lines meeting at an angle, sometimes greater, but seldom less than a right angle; the undulations within the margin are regular and rather deep. The striæ are composed of small very prominent sharp ridges that hold the shell firmly to the stone in which it lies.

This is remarkable at first sight for its broad and few sulci, and for the fine undulating transverse striæ all over them. I have but seldom seen it in pairs, but Mr. Strangeways has a pair from Carrington, Oxfordshire, and I have an excellent specimen from the Chatley Cornbrash, by favour of T. Meade, esq. and a small one showing the inside from Oxfordshire. These last two are figured. Mr. Mantell was so kind as to send me one from North Leach, Gloucestershire, which has only 9 costæ, and Mrs. Gent has met with something similar, but plainer at Kellaways; if these should prove to be distinct species, I shall notice them again.

ASTARTE.

VENUS *Linn. Lam.*

GEN. CHAR. Suborbicular or transverse. Ligament external; a lunette in the posterior side; two diverging teeth near the beak.

THE shells of this Genus have three muscular impressions; the cartilage on one side and the lunette on the other, together with the general form, gives them a resemblance to those of the Linnean Genus, Venus. Their outsides have transverse undulations or reflected depressed costæ, which give the surface a natural character, by which they may be distinguished upon general inspection. Their edges are mostly crenulated within. There is one tooth less in the hinge than in Venus; the beaks are generally filled up, not hollow within under the teeth; there is also commonly an obscure elongated tooth at some distance from the beak under the lunette. Of this Genus there are several recent British species and many Foreign ones, all of which have hitherto been classed under Venus; of the former are Venus Scotica, (which may be taken for the type of the Genus) *V. sulcata*, *Danmonia*, *paphia*, *fasciata*, *subcordata*. It was not until I sought for the proper place in the system for the fossil species, that I perceived the necessity of making a new Genus, to which I have given the name of one of the Heathen Deities, sometimes styled Venus.

ASTARTE *lurida*.TAB. CXXXVII.—*Fig. 1.*

SPEC. CHAR. Transversely oblong, convex, depressed, with many transverse undulations; lunette elliptical, sharp; margin crenulated within.

A RATHER thick shell with a straightish front, and arched back, half as wide again as it is long.

A blue sandy Clay in the Fox-hill quarries, Gloucester-

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shire, afforded Mr. Robert Taylor this perfect specimen, which he was so obliging as to communicate for general information. Mr. Taylor has also found it in coarse Limestone at Taunton.

ASTARTE elegans.

TAB. CXXXVII.—*Fig. 3.*

SPEC. CHAR. Transversely oblong, convex, depressed, with many small transverse costæ; lunette cordate; margin crenulated within.

MUCH resembles the last, but the front is not so straight and the back not so much arched; the teeth in the hinge are also more distant.

By favour of Mr. Strangeways, from Babling-hill, Yeovil; it so matches the upper specimen that the opposite shells fit at the hinges; it differs, however, in shape a little, having a more graceful turn on the side from the lunette, more of Hogarth's line of beauty, the other being straighter: it is also generally rather longer for its breadth: it is a cast in Carbonate of Lime.

ASTARTE cuneata.

TAB. CXXXVII.—*Fig. 2.*

SPEC. CHAR. Subcordate, acuminate, gibbose, with small transverse costæ; lunette cordate; margin entire within.

THE back of this is broad and flattened; anterior side acuminate; the general form is a triangle, of which the posterior side is the shortest. I have not seen the margin perfect.

From Chilmark, near Tisbury, Wiltshire, a quarry, supposed to correspond with that of Chicks Grove; Mr. Jackson, some time before his death, brought me specimens, and Miss Benett has since favoured me with variety. Some specimens are neater and more regular in their striæ than others, being deeper and wider. The shell is replaced by Carbonate of Lime, which is sometimes crystallized; the stone in which they are imbedded is an earthy Limestone containing a small portion of green sand.

TEREBRATULA pectita.

TAB. CXXXVIII.—*Fig. 1.*

SPEC. CHAR. Orbicular, gibbose, plicato-striated; with a flattish space extending from the front to the beaks; beak of the lower valve prominent, slightly incurved; back of the upper valve straight, with an incurved beak.

THE length and breadth are nearly equal and almost double the depth: the plicæ are small, rounded, and often furcate, hence they are not much larger at the margin than at the beaks.

Furnished by the green sand stratum, at Horningsham, near Longleat, four miles west of Warminster, and may be considered characteristic of the stratum and is figured by Townsend and Smith. Mr. Meade has a larger specimen from the same place. The figure in the French Encyclopædia is hardly satisfactory enough to be determined.

TEREBRATULA Lyra.

TAB. CXXXVIII.—*Fig. 2.*

SPEC. CHAR. Oblong, convex, with diverging furcated plaits; beak of the lower valve greatly elongated, that of the upper valve short, incurved.

LENGTH of the upper valve equal to twice its width; the beak of the lower valve is probably equal to the length of the upper valve, it contains two longitudinal

Septa :* the upper surface is smooth, with a slight sulcus along the middle and a stria on each side of it ; how it terminates is at present unknown.

This species is considered in the French Encyclopædia, where it is figured, as perfect at the perforated end, and although Mr. Meade and others have kindly lent me their best and most complete specimens, I have never seen one nearly perfect. The larger figure is about the size of Mr. Meade's largest specimen. Mr. Cumberland, indeed, considered it a new Genus and named it *Lyra Meadi*, in compliment to our worthy friend, whom I esteem so much, but the term *Lyra* is so apt I could not resist applying it to the specific name. The analogy of many species of similar construction, although not so much elongated, show that it cannot, with propriety, at present be separated from the perforated and plaited *Terebratulæ*, for want of distinguishing characters, (although they may hereafter be divided) till those further removed, being imperforate, are more settled.

I found some specimens in the green sand at Chute Farm, near Horningsham, chiefly silicized.

* I have observed indications of similar septa in the beaks of some Spirifers.

PATELLA. *Linn.*

GEN. CHAR. Univalve, not spiral, more or less conical, concave and simple beneath; margin and apex entire.

THIS Genus includes at present only such shells of Linnæus's Genus *Patella* as have entire margins and are not perforated at the apex; their form varies from nearly flat with an umbo to obliquely conical, with a curved apex, and there is a gradual succession of forms from one shape to the other, therefore, I cannot see the propriety of constituting Genera founded upon the form of the cone only.

PATELLA *latissima.*

TAB. CXXXIX.—*Fig. 1 and 5.*

SPEC. CHAR. Nearly orbicular, flat, smooth.

SHELL very thin, concentrically undulated; the umbo is excentric; the margin forms a very short oval.

Fig. 1 shows a specimen from a slaty Clay impregnated with vegeto-bituminous matter, approaching the Kimmeridge coal, that occurs in Lincolnshire. The foliated form of the Clay seems to arise from the same pressure which has flattened the shell so as to crack the margin, and make it rather doubtful how flat it would be if perfect: the upper surface is still attached to the Clay, it may possibly be roughish, but this I have not been able to ascertain; however, there are characters enough

to distinguish it from most other species. The stratum it occurs in, may probably be recognized by it in some other place. There are several places in Somersetshire where Ammonites are found compressed in a somewhat similar Clay. It is worth while to examine whether this or any other species of *Patella* occurs with them.

Fig. 5 is from a shell, or rather the cast of one in a compact Limestone, found in a rolled mass among lumps of Chalk, Sandstone, and Gravel, at Pakefield, in Suffolk; the stone has a largely foliated structure; it contains *Tellinæ*, Ammonites, *Vertebra*, &c.* all compressed in the direction of the laminae, but this *Patella* is not so much so as in the Clay, therefore, it is but little cracked at the edges.

PATELLA lævis.

TAB. CXXXIX.—*Fig. 3 and 4.*

SPEC. CHAR. Depressed, conical, smooth, shining;
base obovate; apex excentric.

A very smooth, even-formed shell, about one-third of its length high and rather slender.

I have two specimens of this. I believe it has hitherto been overlooked; the smaller one is from Whitby, where it was found in that inexhaustible formation, the Alum Clay, which, independantly of its value in the formation of Alum, has attracted notice from the many larger fossil productions, that in a manner eclipse this minute shell. The other specimen was found in Clay at Folkstone; I suspect it is a rare species.

* The same stone produced a *Lingula* figured at tab. 19. Mr. Thurtell sent me nearly the whole of it, and it has turned out very productive.

PATELLA equalis.

TAB. CXXXIX.—*Fig. 2.*

SPEC. CHAR. Conical, smooth; base obovate; back nearly perpendicular.

THESE are some faint signs of radii upon the surface of this; its height is nearly equal to its width; it is rather broader towards the front, and the apex, which is rather obtuse, is so excentric as to be almost perpendicular over the edge; the surface is covered with a light brown epidermis.

Good specimens of this are rarely found in the Suffolk Craig. Mrs. Cobbold favoured me with this from the Holywells estate near Ipswich.

PATELLA rugosa.

TAB. CXXXIX.—*Fig. 6.*

SPEC. CHAR. Depressed, obovate, radiated; apex excentric, depressed, slightly recurved; back concave above, with reflected undulations.

SYN. *Park. org. rem. 3.*

THE radii are rather numerous and strongly marked; the lines of growth are too faint to make a distinct decussation, but there are generally two or three large undulations around the shell which approach each other behind

the apex, and rise so much as to give the margin the appearance of having been rolled or gathered up, as one might gather up the edge of a woollen cap while holding it in the hand: the shell appears to be tolerably thick.

Hampton Common and Amberley Heath, near Minclinghampton, Gloucestershire, afford this shell, in Bath shelly Oolite. I have to thank the Rev. Mr. Newton for my specimen, a token of some years standing; it is characteristic of the bed in which it occurs, where it is not very rare, and is generally in a very high state of preservation.

PATELLA unguis.

CAPULUS. *Mont.*

TAB. CXXXIX.—*Fig. 7.*

SPEC. CHAR. Depressed, suborbicular, obscurely radiated; vertex oblique recurved, extended beyond the base, acute.

A rather flat shell, being about one-third of its width high; the whole of the beak is solid; the other parts gradually growing thinner to a sharp edge. The recent *Patella ungarica* of Linnæus is so very similar to this fossil, that I doubt if a distinction can be found; if there be any it lies in the radii, which are very obscure in this, a circumstance that may be attributed to wear; the beak is, perhaps, less oblique, but in this it is variable. My specimens came from the Holywells Craig.

PLANORBIS. *Lam.*

GEN. CHAR. Univalve, discoid, involute; without septa; spire flat or impressed; aperture entire.

THIS Genus has been well separated from *Helix* of Linneus, it contains shells composed of a simple tube curved into a Volute; in many species the latter whorls partly embrace those preceding, but this is not the case with several shells which otherwise have a natural relation to the type of the Genus, so I have omitted that part of Lamarck's Generic character which relates to it. The recent shells are inhabitants of fresh water.

PLANORBIS *equalis*.

TAB. CXL.—*Fig. 1.*

SPEC. CHAR. Equilaterally concave, with one obscure keel on the right side and two on the left; smooth; volutions exposed; aperture orbicular.

THE inside of the tube composing this is perfectly round, but the shell is thicker towards the front, so as to make the outer edge of the mouth obtusely obovate; the concentric carinæ are very obtuse and inconspicuous. There is a slight impression of the preceding whorl in the substance of the last.

A specimen of Limestone from Kendal afforded me this shell, it is replaced or cast in white Carbonate of Lime or Spathose Limestone, and is filled up with darker amorphous Limestone, which is somewhat of a redder

brown where exposed: there appear to be fragments of *Entrochi* also in the stone. The *Planorbis* resembles so much the fresh water *Helices* of Linnæus, that all the species have been considered by some as inhabitants of fresh water, but this would seem an exception.

PLANORBIS cylindricus.

TAB. CXL.—*Fig. 2.*

SPEC. CHAR. Cylindrical, left side concentrically striated; volutions three or four, adpressed; aperture oblong quadrangular.

THE aperture of this shell is transverse, being wider than long, nearly in the proportion of three to two; the angles are obtuse, and it receives no indentation from the preceding whorl. The shell is about three times its thickness in diameter, and the left side has six or eight obscure elevated striæ.

Some years since I was for a few hours at Cowes, on the Isle of Wight, and picked up a piece or two of stone which contained some of these shells, but as my time and immediate occupation did not allow me to extend my researches, I was content with what I had; this was in the severe frosty and stormy weather of February, 1808. I soon after visited by kind friend, Mr. Iremonger, at Wherwell vicarage, who gave me specimens he had from the Isle of Wight, on examining which I found several species of *Planorbis* and a *Lynnæa* much resembling *Helix stagnalis* of Linnæus, which I will add to this work hereafter.

The *Planorbis* here figured differs from *Helix contorta* in the whorls being more equal and angular on each side and less numerous: the figures are about the natural size of the best I have seen. The remains are shelly with a smooth inside: the outside shows the lines of growth.

PLANORBIS obtusus.

TAB. CXL.—*Fig. 3.*

SPEC. CHAR. Depressed, left side most concave; volutions embracing, slightly compressed on the right side; aperture obliquely and obtusely obcordate.

THE volutions are very few and much concealed, the obtuse rounding edge which gives the short obcordate form to the aperture distinguishes it from the next species: its thickness is equal to about one-fourth of its width: it is very pellucid and shining.

Found in the same stone as the last.

PLANORBIS lens.

TAB. CXL.—*Fig. 4.*

SPEC. CHAR. Lenticular, subcarinated, volutions embracing; aperture very oblique, obcordate.

ALTOGETHER much flatter than the last, with the sides more equally concave; about one-sixth of its width in thickness; it much resembles the recent British Planorbis.

From the Isle of Wight, with the above and following species.

PLANORBIS hemistoma.

TAB. CXL.—*Fig. 6.*

SPEC. CHAR. Depressed, smooth; right side convex, umbilicate; left side flat; aperture oblique, subtriangular.

A minute shell, seldom exceeding one line in diameter and a fourth of one in thickness: the volutions, although partly concealed by hanging over on the right side, make no impression on each other: the aperture is triangular, with the angles and one side rounded.

I picked this up in sand at Plumstead along with Cardium plumstediense and various other marine shells, Sharks' teeth, &c. The lower figures are magnified, the upper figure about the natural size.

PLANORBIS radiatus.

TAB. CXL.—*Fig. 5.*

SPEC. CHAR. Lenticular, radiated; left side umbilicate; volutions nearly concealed; aperture obcordate.

THIS is a strong shell; the radii are a kind of plaits gradually disappearing towards the margin and very sharp but not deep in the umbilicus: the mouth adheres, with swelling edges to the next whorl; about one-fourth of its diameter in thickness.

When describing the Planorbis in general, I could not help thinking it convenient to describe a shell from the micaceous green sand formation, and rather mixed with marine with fresh water products, and which may, perhaps, hereafter, with further information, lead to the separation of another Genus. It is remarkable for forming nearly the whole whorl on one side and having small indistinct inner whorls. In this green and micaceous sand we also find inner casts like fig. 8.

PLANORBIS euomphalus.

TAB. CXL.—*Fig. 7, 8, and 9.*

SPEC. CHAR. Depressed, subcarinated, concentrically striated; right side flat; left side largely umbilicate; aperture subtriangular.

WHORLS five or six, exposed, gibbose and rather angular on the left side, forming a deep umbilicus; the aperture receives a slight impression from the preceding whorl. The striæ are fine all over the shell, and here and there, upon the flat side in particular, are a few larger, more prominent ones.

This shell has been described as from the Isle of Wight, by Mr. Webster, in the Geological Transactions: my specimens are from the mass Mr. Iremonger gave me in 1808, containing several of the preceding species. I believe it differs sufficiently from the French species.

Fig. 8 and 9 represent casts, apparently of this shell, they were sent me by Mr. Davies, of Bath, found in the neighbourhood; occasionally such types may be useful: they are Limestone.

CIRRUS.

GEN. CHAR. Univalve, spiral, conical, without a columella; funnel-shaped beneath; volutions united.

MOST of the shells of this genus have round mouths, not indented by the last whorl, but united to it by an expansion and thickening of the substance of the shell. The apex is always elevated much above the base, and equally so at all ages of the shell; whereas, in *Euomphalus*, the genus nearest united to this, the apex is but little elevated, except sometimes in old shells, when the last whorl descends more than usual; from *Scalaria* it differs in the union of the whorls, and the want of ribs.

A shell of this genus is distinguished at once by the peculiar aspect of the funnel-shaped umbilicus which exposes the inner parts of the whorls. It is a curious genus, and would be considered a *Turbo* till modern discernment showed the necessity of nicer distinctions: having no columella it represents the whorl of some tendrils called *Cirri*, or a curled lock of hair, I have therefore named it *Cirrus*.

CIRRUS acutus.

TAB. CXLI.---*Fig. 1.*

SPEC. CHAR. Conical, sharp, with an obscure carina near the upper part of each whorl; aperture round.

WHORLS about eight; the height and the diameter of the base are equal: the volutions are united by only a small part of their surface, as is the case with most of the genus: the lines of growth are longitudinal, fine and regular.

This specimen was sent me long ago by Mr. Martin from Derbyshire; it is extremely neat; there are crystals of Carbonate of Lime within it.

CIRRUS nodosus.
TAB. CXLI.—*Fig. 2.*

SPEC. CHAR. Acutely conical, spire reversed, with two obscure transverse carinæ, upon which are numerous longitudinally extended tubercles; aperture orbicular.

THERE are two rows of tubercles on each whorl, formed by the intersection of transverse and longitudinal ridges, the upper row is the largest, and the other is inconspicuous: the aperture seems from the cast to have been somewhat plaited.

Dr. Leach, at present so well known for his extensive researches into Natural History, some years since presented me with this specimen, picked up near Yeovil; it is a reverse shell, and seems to have been gregarious: two were here crowded together: there were signs of Ammonites in the mass. It has had apparently a very acuminate spire, seven turns of which remain, and the space above for as many more, according to the general proportions.

CIRRUS plicatus.
TAB. CXLI.—*Fig. 3.*

SPEC. CHAR. Conical, transversely striated, base angular; sides flattened; umbilicus plaited or deeply striated; aperture oblong.

BASE rather broader than the height; the aperture is subquadrangular, and wider than it is long. The angular form of the outer edge giving a flatness to the cone it would form if perfect, will help to distinguish this species: the lines of growth are indistinct, the creases or plaits in the umbilicus, which is rather small, and looks as if formed by the curvature of the shell, are a help to its name.

From Folkstone, by favour of Mr. Gibbs: it has, like other productions of that place, some of the original shell remaining, which is occasionally finely iridescent; the present is rather chalky. The inside cast is a mixture of irony clay with lime.

TROCHUS similus.

TAB. CXLII.

SPEC. CHAR. Conical, base rather convex, volutions squarish, with tubercles upon their angles, transversely carinato-striate, and a rounding elevation in their centers; lines of growth decussating the three central striæ.

THE tubercles are numerous, rather depressed, but large, the striæ are undulated and pass over them; between the three central striæ which lie upon the elevated part of the whorls the lines of growth are seen very sharp, close and regularly arched: the columella is imperforate, and the interior of the shell is nearly plain, retaining but small signs of the tubercles: the aperture is square with rounded angles, and the inner lip is thickened, two characters not well expressed in the figure, which was taken from a handsome, but in this respect an imperfect specimen.

The Blue Lias at Weston near Bath, and in the neighbourhood of Yeovil, Lackington Park, Shotover, &c. abounds with this Trochus. Lister found it at Bugthorp, Yorkshire, and has figured it in his Conchology, f. 1036. It is found of considerable size, and more or less worn so as to disguise it in a way that makes it often difficult to distinguish the species. When most perfect it is very much ornamented with transverse undulating striæ, and often a rather conspicuous sort of belt, which has what some have occasionally denominated a herring bone marking. Among my specimens are several casts of the interior only; some are included in a mould of the outer surface, like the lower figure; and the space between

them contains a few crystals of carbonate of lime; other specimens have this space quite filled up, and the surrounding stone broken away; of such is the upper figure: some casts are beautified with octohedral crystals of pyrites.

A *Trochus* nearly resembling this is found in some parts of Normandy, but comparison will prove that they are distinct species.

CARDITA tuberculata.

TAB. CXLIII.

SPEC. CHAR. Heartshaped, longitudinally radiated, radii tuberculated ; valves equal, laterally compressed, longitudinally subcarinate, one side semilobate, the other nearly flat, beaks much incurved.

THE length, breadth, and depth are in the proportion of 5. 4. and 3. ; the radii are not deep,—they are numerous, and in sets of three or four, with more enlarged and conspicuous ones intervening.

The micaceous sandy strata dug through to make the Devizes canal, has afforded some curious casts and impressions of shells. The present was among others collected by the indefatigable and discerning Mrs. Gent, who has obligingly lent me the rarities of her collection to draw. The beauty of this specimen, and the tender adherence of the sand, infering the probability of time obliterating the greatest beauty of its ornamental striæ, I considered it a treat to preserve a resemblance of it, as every touch brings away some grains. It is rather obliquely compressed, as if by accident, yet it appears to be a compressed shell with elegant curved beaks. Should the same occur in greater perfection, we may possibly discover with certainty all its characters, in the mean time the utility of publishing it now will be appreciated by the information, which bids fair to lead the attention and elicit discovery.

CARDIUM semigranulatum.

TAB. CXLIV.

SPEC. CHAR. Gibbose, transverse, subtriangular, longitudinally striated, posterior side straight, longitudinally sulcated, and largely granulated.

VERY similar to the *Cardium edule* in general form, but often twice as large; it is a slender shell, smooth to the touch, but is covered with fine longitudinal striæ; upon the posterior side the striæ are enlarged and become sharp sulci, on the ridges between these sulci are many small irregularly globose tubercles or granules; the edge is minutely dentated.

Of this *Cardium* some large fragments were presented to me from Barton Cliff, by Miss Benett; I had previously received small ones by favour of the Rev. W. Bingley, and, in 1814, Mr. Bullock was so kind as to present me with a small, nearly entire specimen, from the Clay stratum, related to that of Highgate, in the Regent's Park, since which, in 1815, the same species has been found in the continuation of the same stratum, near the White Conduit House, at Islington. I do not know that it was ever found at Highgate, although many shells like the Highgate productions were found with it; it was accompanied in these places by two or three other species of shells not found at Highgate and some stems of *Pentacrini*, with the appearance of the shelly substance about them; none such were found at Highgate, and I am pretty confident no specimen of *Argonauta* was found there, although report has said there was.

This *Cardium* is very distinct from any of the Genus that I know, yet its general resemblance to those figured in tab. 14 would have found it a place near them had I possessed it at that time, and now I have no British congener to place with it: my best specimen is full of Pyrites, and may fall to pieces, for which reason it was advisable to secure a remembrance of it.

HELIX GENTII.

TAB. CXLV.

SPEC. CHAR. Discoid, gibbose, smooth, with a spiral band along the upper part of the whorl; aperture large, expanded, elliptical.



RATHER less than an inch high, and an inch and a half wide; the striæ of growth are rather obscure, except near the upper part of the whorl, where they run into a narrow sulcus that forms the spiral band.

I am favoured with permission to draw this pretty cast by Mrs. Gent, whose name I have given it in commemoration of that scientific zeal which trusted an unique tender micaceous sandy cast to travel so far. I presume it to be an Helix, as somewhat according with tab. 10 and the position of the band is probably a good characteristic distinction: it was gathered in the micaceous sand formation near Devizes.

PLEUROTOMA. *Lam.*

GEN. CHAR. An univalve, fusiform or subturreted shell; base of the aperture channelled; a deep sinus in the upper part of the outer lip.

THE form of the mouth in fossil shells of this Genus is seldom distinguishable except in the lines of growth; the thinness of the outer lip renders it so liable to accidents. The general form is similar to that of *Murex*, *Fusus*, &c. The beak is straight, and the columella without plaits.

 PLEUROTOMA *attenuata*.
TAB. CXLVI.—*Fig. 1.*

SPEC. CHAR. Fusiform, base attenuated; longitudinally undulated; undulations five or six, with a large compressed tubercle at the upper end of each; volutions transversely striated; aperture narrow, straight.

THE upper part of each whorl is nearly even, being only striated and is bounded by transversely compressed tubercles on the upper part of oblique undulations or costæ: over these and the remainder of the whorl are numerous small subtuberculated ridges with striæ between them. The aperture equals half the entire length of the shell: the beak is produced by the gradual tapering of the last whorl and is of the same length as the spire; the width is equal to one fourth of the length; a rugged aspect is given by the irregular lines of growth.

This species seems to be rare, I have only yet seen two pieces, found at Stubbington by Mr. Holloway. Although many species from that place agree with those found at Highgate and Barton, and the foreign ones, yet I believe this is found no where else.

PLEUROTOMA exorta.

TAB. CXLVI.—*Fig. 2.*

SPEC. CHAR. Turreted, base conical, elongated; whorls concave and smooth above, below longitudinally undulated and convex; with many elevated subtuberculated lines; aperture ovate, elongated, canaliculated.

SYN. Murex exortus. *Brand. f. 32.*

LONGITUDINAL undulations or costæ 12 or 14, rounded and strongest on the spire; the smooth concave part of the whorl is bounded by the commencement of the costæ which is rather sudden; length of the aperture, including the beaks, equal to two-fifths of the whole shell; the lines of growth are indistinct, but form small tubercles upon the transverse lines.

From Barton. It appears to be Murex exortus of Brander, or at any rate a variety approaching his *M. macilentus*. The *Pleurotoma dentata* of Lamarck, under which *M. exortus* is quoted, with a mark of doubt, is certainly distinct from any Hampshire shell I am acquainted with, as I learn from a French specimen sent me by Monsieur De France.

PLEUROTOMA rostrata.

TAB. CXLVI.—*Fig. 3.*

SPEC. CHAR. Fusiform, with many transverse ridges and short costæ, volutions obscurely decussated, expanded and slightly concave above, rather ventricose and roughish below: aperture elongated, canaliculated.

SYN. Murex rostratus. *Brand. f. 34.*

COSTÆ numerous, obscure on the latter whorls; the decussations on the upper part of the whorls are very slight, but most distinct near the edge; the transverse ridges are quite free from tubercles, but are roughened by the lines of growth; the aperture and beak occupy half the length of the shell.

This species is found at Barton Cliff; it differs a little from Brander's excellent figure in the characteristic space on the upper part of each whorl, and the less acuminated beak, but it can only be a variety. I have seen part of a cast in micaceous sand, from the Devizes Canal, very like this, but it had not the collar, if I may so term it.

PLEUROTOMA acuminata.

TAB. CXLVI.—*Fig. 4.*

SPEC. CHAR. Turreted, acuminated, longitudinally ribbed, transversely striated; whorls above, concave, edge fimbriated; below sulcato-striated; aperture elongated, canaliculated, one third the length of the shell; beak broad.

THE costæ are numerous, pretty close and a little waved; the edges of the whorls are elegantly marked by the lines of growth so as to appear fringed; volutions about nine; width equal to about one-fifth of the length.

The narrowness of this shell and difference in other respects, from Brander's *Murex macilentus*, or any other of his shells, seems to confirm it as belonging, exclusively, to some other place; it was found at Highgate. It is a curious fact that different places, frequently in the same country and of a similar formation, should have such specific distinctions.

PLEUROTOMA comma.

TAB. CXLVI.—*Fig. 5.*

SPEC. CHAR. Turreted, beaked, with acute transverse rising lines; volutions smooth in the middle, with many short curved costæ; aperture ovate, canaliculated; beak slightly curved.

THE costæ extend only over the smooth part of the whorl, they are swelled at the upper part, curved and pointed below, something like a comma; the rising lines are few, sharp, even and most prominent near the middle of each turn: aperture about two-fifths the length of the shell.

Stubbington has afforded this shell to Mr. Holloway, and I figure it at present as rare, not knowing that it has been found elsewhere.

PLEUROTOMA semicolon.

TAB. CXLVI.—*Fig. 6.*

SPEC. CHAR. Turreted, elongated, striated, with many curved costæ; whorls swelled with a granulated margin; base conical, decussated; aperture ovate, beaked.

THE granulae upon the margin of the whorls correspond with the costæ, which are long, narrow, curved, and swelled at the top: the beak is rather thick and obtuse; aperture one-third the length.

This does not appear to be a young shell although it is small, and as the characters are distinct and ripe, I was not willing to overlook it, not knowing of any other specimen of the same species. Mr. Holloway found it at Stubbington.

PLEUROTOMA colon.

TAB. CXLVI.—*Fig. 7 and 8.*

SPEC. CHAR. Fusiform, striated; whorls concave above; with a crenulated margin, below with many rugged transverse ridges and small short longitudinal undulations; base conical; aperture elongated.

THE transverse ridges alternate with the striæ, and in some specimens divide the undulations into two small tubercles; the crenulations on the margins are also sometimes doubled in the same manner: the beak is obtuse; aperture nearly half the length of the shell; the width is about one-third the length.

Probably this is not rare at Barton Cliff, I have figured two varieties which I at first thought might be distinct species, but intermediate specimens have led me to alter my opinion: the chief difference is in the longitudinal undulations, which in fig. 7 are very small and formed into a double row of minute tubercles or punctums, while in fig. 8 they are larger and scarcely affected by the transverse ridges, but in it the margin still retains the double row of punctums or crenulations. Can these be young individuals of *Murex turbidus* of Brander?

I have named the three last species from the resemblance of parts of their sculpture to the marks used in punctuation, as they afford terms easily remembered.

CERITHIUM funiculatum.

TAB. CXLVII.—*Fig. 1 and 2.*

SPEC. CHAR. Pyramidal, sides straight; whorls with four, nearly equal crenulated carinæ on each; base with several plain elevated ridges.

ALTHOUGH the carinæ are nearly equal, the uppermost or marginal one is rather the largest and the next the smallest; the carinæ look like closely knotted cords, twisted at equal distances round the spire.

This species was found at Plumstead, in a gravelly soil, with other shells formerly described. Before comparison, it so much resembled those of fig. 3 and 4 from Charlton, that I thought them the same species. I presume, however, they are different enough to be considered distinct.

CERITHIUM intermedium.

TAB. CXLVII.—*Fig. 3 and 4.*

SPEC. CHAR. Pyramidal, sides straight; whorls with a largely crenulated margin and five or six unequal carinæ on each; base with several elevated ridges.

THE difference between this and the last lies principally in the irregularity of the carinæ; the upper carina is so near the edge, so large and so deeply crenulated, that it forms a margin or border to the whorl; the others are unequal both in distance and size, and are either plain or irregularly subtuberculated; the lines of growth in both are sharp.

I have found these most abundantly at Charlton in a stratum of Clay above the sand, and rarely, if at all, elsewhere, although not easily distinguished till compared, and as difficult to describe; *C. funiculatum* from Plumstead, and *C. funatum*, tab. 128 are great resemblances, especially when more or less worn, as in fig. 3.

CERITHIUM *dubium*.

TAB. CXLVII.—*Fig. 5.*

SPEC. CHAR. Turreted; whorls with a row of compressed tubercles near the middle, and two transverse rows of lesser tubercles below; base with one or two rows of tubercles.

THE tubercles of the upper row are transversely compressed and sharp, they are placed at about one-third the length of the whorl from its upper edge.

Mr. Holloway found the present specimen at Stubbington and he has found *Cerithium giganteum* there, from which it would appear to accord with some of the French formations. This may possibly be a large variety of *Cerithium calcitrapoides* of Lamarck, described in his account of the Fossil shells found in the environs of Paris, p. 82.

CERITHIUM melanioides.

TAB. CXLVII.---*Fig. 6 and 7.*

SPEC. CHAR. Turreted, obscurely longitudinally undulated; whorls convex, bearing above the middle a largely tuberculated carina, below with two or three transverse tuberculated carinæ; beak very short.

A handsome shell, differing from the last in the bluntness of the tubercles, which have a less coronated form, and in the lesser number of volutions; it is smooth, generally shining; the lesser carinæ are about four, constant on the lower part of the whorls, but near the middle often little better than two elevated striæ or even quite wanting: the mouth is almost round; the beak is very short, if any, but I have seen no perfect specimen.

The peculiar abundance of this species at Charlton appears to claim for it a distinction. Fig. 6 is the whitest specimen I have seen, which I gathered there. Miss Rashleigh sent me a fine specimen, gathered at Southfleet, which is a variety with the smaller bands in conspicuous risings, and according with a specimen found in Clay above the Chalk, at Newhaven, by G. A. Mantell, Esq. who also sent me some marked Hamsey. I have also found it on the banks of the Croydon canal, near the Kent road, among gravel.

A figure of this Cerithium is given in the second plate of Smith's "Strata, identified by organized Fossils."

OSTREA deltoidea.

TAB. CXLVIII.

SPEC. CHAR. Equivalved, flat, thin, orbicular, with a deep sinus on one side, and a produced straight beak.

SYN. *Ostrea deltoidea.* *Lamarck Env. de Paris,* p. 265.

So flat is this oyster that there is very little room for an animal between the shells; the back part is elongated with parallel sides for a short space, forming a kind of neck terminated by the hinge: the pit of the hinge is of equal width with it: the front is rounded and produced on one side in a lobe which, together with the beak, forms two angles of a triangle, and gives the outline the general form of the letter D or Δ ; the shell is thin, the edges extend far beyond the interior surface, especially about the neck, and make the external outline more orbicular than the internal.

This oyster is a sort of proof of a characteristic constancy in shape that nothing can contradict, however, we might suspect otherwise in so variable a Genus; thus this species is known to all who have once recognized it, without any difficulty. The extreme flatness,* even when the shell is attached to more gibbous species, were it not constant, might be attributed to some pressure, for the space that the animal might have occupied seems insufficient to have allowed of its existence, and the shell possessing the usual characters of its tribe, the tripartite hinge, the multiplied lateral laminæ, &c. we should have

* Connecting the idea of flatness where there is much variety of colour is sometimes more difficult than might be expected, as dark tints generally serve for relief.

thought could not have exhibited them in so flat a form but by some accidental means, such as growth or pressure betwixt two rocks: that either should be so constant or so precisely regular, if admitted, would yet become an insurmountable circumstance, as they are found in a soft loose Clay on Shotover hill, which consists for the most part of an hardish Limestone, where numerous species of shells and animal remains, not compressed, are found, but none of these oysters; at least I could not find any of the same apparent species among the beds of stone. The species is most commonly known at Oxford, &c. as Heddington oysters: it is also found near Cambridge. Mr. Edward Bridgman found it at Lopham, in Norfolk, specimens of which were brought me by the Rev. Mr. Lambert. Miss Benett found great variety at Sandfoot Castle, near Weymouth, and favoured me with specimens, some of which are deeper than usual.

GRYPHÆA dilatata.

TAB. CXLIX.---Fig. 1.

SPEC. CHAR. Orbicular, obscurely lobed; upper valve flat, lower valve hemispherical.

Var. β distinctly lobed, Fig. 2.

SHORT as the beak of this is, it curves enough in most specimens to mark the Genus, besides this, the regular concavity of the lower valve and its lobed form are sufficiently characteristic; the back of the flat valve in old specimens is straight and occupied by the hinge pit, which is not curved, and consequently diverges from the curved pit in the other valve; the lateral lobe varies, in some specimens it is very distinctly defined, in others obscure; but it may always be traced; the var. β has the lobe very strong and produced in both valves.

This, and the varieties into which it sports, are not rare, it is, therefore, necessary, if possible, to distinguish its characters as a species. The hinge, at first sight, and in a single specimen would appear to be nearly sufficient to generalize it, and is certainly of much use, although many varieties of different species of oysters have some approach to the characters peculiar to Gryphites, such as the curved beak and the lobe or sulcus: the great breadth and uniform concavity of the deep valve with the gaping hinge appear to be the essential characters.

The upper specimen and some larger varieties, measuring eight inches and a half diameter, I have had long since from Suffolk, by favour of Dr. Sutton. An odd variety, very broadly aggregated, with the side laminae more extravagant than the one figured, was brought me from Pakefield. I have one with many Vermiculæ and

part of an *Ostrea delta* attached to it, from Sandfoot Castle, near Weymouth. The same species is also found at Born, in Lincolnshire, where it is called the Sickle oyster: at Brambery hill, Brora, in Scotland, of a large size; (the latter I have by favour of Mr. Farey;) and at the following places: near Broomham, Somerset; Rude Cliff, near Osmington; Radipole and Portland, like fig. 2; Coney Weston; Ilminster; near Woburn; Farley gate, Gloucestershire; Bennington, Herts, generally of a reddish colour; and with other shells on the high range of hills bounding Romney Marsh, in Kent.

Calne affords varieties of this species: my friend, Thos. Meade, Esq. has a fine oval specimen, wide and deeply hollowed, from the Clunch Clay bed, 200 feet thick, near Calne. The deeper variety is said to characterize the Stratum, and is common throughout Somersetshire, Wiltshire, Oxfordshire, and Bedfordshire, where they are found waterworn.

TEREBRATULA acuta.

TAB. CL.---*Fig. 1 and 2.*

SPEC. CHAR. Ovato-triangular, slightly transverse; middle elevated by one large acutangular plait; sides with one large and several small plaits each.

THE SINUS in the front of this is nearly an equilateral triangle, with slightly rounding sides; the lateral plaits are seldom more than two on each side, the first is large, sharp, and extends almost to the beak, the others are little else than marginal undulations.

Mr. Richard Taylor, jun. having sent this as found in the coarse Limestone of Staunton hill, Gloucestershire, and as it is rarely met with, I thought it desirable to see a figure, and as I have also received it from my kind friend, Mr. Strangways, from the coarse Limestone at Ilminster, it became the more convenient to publish a designation of it, and still further, as I have received the same species from France. It suggested its own name, by which it may be easily recognized. The British specimens that I have seen are much worn. The French one is a less transverse variety, also more acute in its form, with a straighter front and greater elevation of the middle: fig. 1 is a representation of it for comparison.

TEREBRATULA resupinata.

TAB. CL.---*Fig. 3 and 4.*

SPEC. CHAR. Oblong ovate, front depressed by a large rounded plait, sides elevated, rounded: lower valve obtusely carinated, with a sharp beak and a longitudinal ridge along each side.

LENGTH about one-fourth greater than the width: the sinus on the front is rounding in the middle with straightish sides; the lower sides of the shell are rounded and entire; the carina of the lower valve is very broad and rounded.

Mr. Strangways sent me this from Ilminster, he found it in the coarse Limestone: it is remarkable for being the reverse of the preceding species or resupinate in comparison with it; on which account, although a plainer shell without plaits on the edges, it has so general a resemblance at first sight, that the two have been laid together as the same species. I believe neither are yet commonly known; all that I have yet seen have an ochraceous tint.

CASSIS bicatenatus.

TAB. CLI.

SPEC. CHAR. Ovate, ventricose, with many depressed transverse ridges, decussated by small longitudinal costæ towards the upper parts of the whorls ; aperture ovate ; left lip obscurely tuberculated.

BETWEEN each of the ridges is a flat space rather wider than the ridge, in the middle of which is an elevated line : the costæ are most distinct upon the central whorls, they give a chain-like appearance to two or three pairs of ridges : the aperture is ovate, indented in the upper part by the body of the shell ; the right lip is thickened and crenulated within ; the columella plaited and expanded into the left lip, which is flat and extended over the open umbilicus.

This prize was found by the Rev. J. Lambert, of Trinity College, in the Crag at Bawdsey, Suffolk. There is no doubt of its being a Buccinum of *Linn.* and a Cassis of *Lam.* Morio of *Montft.* although the columella is plaited. We prefer Cassis, and use it ; we must confess we have not seen the perfect termination, but enough of it is preserved to show what genus it belongs to ; the dotted outline is added from Buccinum gibbum *Linn.* which bears a great resemblance to it, as does also Bucc. bilineatum, see *Lister* 998 ; it might indeed deserve that term as it is bilineated in some parts.

This is a curious proof of the antiquity of the formation, as it by no means agrees with any of the recent shells on our shores as the Murex contrarius *tab.* 23, and Murex striatus, *tab.* 22, of the same formation, are supposed by some to do.

LIMA. *Lamarck.*

GEN. CHAR. A longitudinal inequilateral eared bivalve ; hinge cartilage partly external, attached to a pit in each valve, placed on diverging surfaces between the beaks ; beaks distant ; valves gaping a little laterally.

THE peculiar conformation of the hinge of the shells of this Genus has caused them to be separated from the *Ostreæ* of *Linn.* or *Pectens* of late Authors, which they resemble in almost every other character, for most of them are longitudinally ribbed, and have distinct ears ; the line of the hinge also is straight and the hinge pit triangular ; it is the distance of the beaks from each other and the external situation of the cartilage that distinguishes them : there is also a degree of obliquity in the valves that forms a natural character. The Generic name is taken from a specific one of *Linneus's*, and is applicable to most of the species, particularly the known recent ones, all of which are decorated by deflected laminæ much resembling a rasp to the touch.

LIMA gibbosa.

TAB. CLII.

SPEC. CHAR. Elongated, gibbose, smooth, longitudinally plicated in the middle ; ears undefined.

SYN. *Lister* 495. ?

Walcot f. 22. ?

NEARLY twice as long as wide, slightly oblique, in the middle about 18 small sharp plaits without any scales or even roughness. The ears are hardly worthy of that name as they are only expansions of the sides from the ends of the hinge line: the depth is greatest near the commencement of the beaks, where it almost equals the width. I have some doubts about the propriety of calling this a Lima; the form of the hinge corresponds, but the want or imperfection of the ears and the valves not gaping are objections; there are, however, some recent species of the Genus, which nearly resemble it in these particulars.

Cotswold hills, Gloucestershire, and Taunton afforded this to Mr. Richard Taylor, jun. with a small *Isocardia* of *Lam.* and other shells in coarse Limestone with granulae like the small Oolite of Bath, &c. and I believe the species has been found near Bath, but has not been understood: I presume it will soon be better known.

Some of this Genus, at first sight, appear like *Plagiostoma*, but by careful examination may be distinguished by the thickness of the shell in the hinge, and the presence of the hinge-pit, both of which are readily seen in my specimen.

UNIO crassissimus.

TAB. CLIII.

SPEC. CHAR. Ovate, transversely undulated or imbricated; beak recurved, acute; posterior side short, round; anterior side obscurely subcuneiform; shell very thick.

THE hollow below the beaks is deep in consequence of the beaks being much incurved towards the posterior side; the cartilage slope is rounding and the front nearly straight: length two-thirds of the width. The shell is convex outside and in thickness equal to the internal depth; the hinge is particularly massive.

Mr. Wood having figured *Mya crassa* as a thick shell in tab. 20 of his *General Conchology*, I must now use the superlative degree of the word to this *Mya* of *Linn.* but *Unio* of later authors, and thus, in some measure, designate the species. I have had the specimens by me for some years, favoured by Dr. Sutton, of Norwich, and was pleased to find sufficient of the hinge to determine the Genus, which has puzzled Mr. Parkinson, who has, not without doubting, made it a *Donax*. This Gentleman observes they are usual in Gloucestershire and Wiltshire, near Bath, sometimes in the Lias Clay. Dr. Sutton gave me many specimens of Fossil shells as British, without localities, among which are several of this species, all formed of Carbonate of Lime; upon opening one of the pairs the hinge was found concealed among equiaxed crystallizations (*British Mineralogy* tab 13) beautifully showing the manner of modification, &c.

The imbricated surface and great thickness of this species seems at first to place it at a distance from others of the Genus, but there are many, both recent and fossil, to associate with it, and perhaps some of the characters may hereafter become Generic distinctions. I show a few more of this family on the next plate to make them more familiar: their external characters are sufficient to connect them, although we cannot always separate the valves as we have done in the present specimen.

UNIO Listeri.

TAB. CLIV.—*Fig. 1, 3, and 4.*

SPEC. CHAR. Cordate, transversely imbricated, beak recurved, acute; posterior side small; middle flattish; shell thick.

THE front of this species is sharper or more wedge-shaped than is usual in shells of this Genus; neither the posterior side nor the cartilage slope are so round as in *Unio crassissimus*: the breadth is but very little greater than the length.

This always puts me in mind of Lister's "*Musculus fluviatilis ē fluvio Thamesi ad Battersea*" tab. 184, and the varieties of *Unio ovata* in part corresponding with his figure and which I find occasionally at the same place, wherefore I have named it after him. Fig. 1 was sent me from Durham, as found in that neighbourhood some years since in Clayey Limestone: it accords much with some smaller mutilated specimens from Suffolk, by favour of Dawson Turner, Esq. and from an etching by favour of Mr. Richard Taylor, it appears to be found in Roydon gravel pit, near Diss, in Norfolk, rather more perfect and plentiful: but if the same species they differ a little in the state of preservation, being apparently less smooth, and formed of a lighter coloured Carbonate of Lime. The specimens, fig. 3 and 4, are from Scarborough; the smallest is a young shell before it has acquired its cordate form, from my friend Mr. Strangeways, who found several specimens there; the other I bought of a dealer from thence. Perhaps this is the "thick ovate shell, a little depressed, found at Malton and Scamer quarries, in length two inches and a half, in breadth three inches;" mentioned in Scarborough Fossils, p. 103, where it is put under the Genus *Tellina*.

I figure these on a presumption that they may lead to information, should any one find them and determine that they belong to the Genus *Unio* or otherwise; as far as I yet know, specimens exposing the inner construction have not been found.

UNIO hybrida.

TAB. CLIV.---*Fig 2.*

SPEC. CHAR. Oblong, ovate, anterior side sub-acuminate; surface imbricated; beaks recurved, acute; shell thick.

THIS differs from the recent *Unio ovatus* principally in the largely imbricated surface and thickness of the shell with the acute beaks; breadth about twice the length.

The specimen figured is from Nottinghamshire,

VENUS. *Linn.*

GEN. CHAR. An equivalved rather inequilateral bivalve with three hinge teeth in each valve, converging towards the beaks; ligament external, placed upon the anterior slope.

THE shells of this Genus have generally a cordate impression under the beaks, and their form is more or less orbicular or transversely oblong; their edges are often crenate; the shell smooth and ornamented with various elevations, mostly running in a transverse direction, while the colours that so frequently enliven their surfaces are placed longitudinally, zigzag, or irregularly, so to produce great beauty and much pleasing variety: the anterior side is generally more or less defined by an angle or the abrupt termination of the transverse ornaments.

The Genus Venus as defined by Lamarck is distinguished from other shells which Linneus included under the same head, by Linneus's own character, the number and position of the teeth in the linge; in conformity with this I found it necessary to form the Genus Astarte of such shells as have only two teeth in each valve. Other shells of the Linnean Genus Venus are arranged by Lamarck under his new Genus Cytherea, and distinguished by an additional tooth separated from the rest and placed under the lunula or posterior slope. But as there is no other difference, he seems himself to doubt the propriety of the separation, and I am unwilling to adopt it because the additional tooth is sometimes very small and seldom possesses the regularity of the other teeth. I have figured already two species of genuine Venus, *lineolata* and *plana* tab. 20. I have also figured two others as of this Genus, *V. equalis* and *angulata*, tab. 11 and 65, but they, together with Venus Islandica, which they much resemble, differ from Lamarck's character in the disposition of the teeth under the beak, and possess in one valve, besides them, a lamellar elongated tooth within the anterior side: these may, perhaps, hereafter form a good Genus.

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VENUS *incrassata*.CYTHEREA. *Lamarck*.TAB. CLV.---*Fig. 1 and 2*.

SPEC. CHAR. Orbicular, oblique, subdepressed, smooth; posterior slope straightish; lunula large, obscure; edge entire; a conical tooth under the lunula.

SHELL very thick, the anterior slope concave, holding the ligament; the central tooth of the hinge thick and blunt, but not bifid; the detached conical tooth which would make it a Cytherea, is small, but sharp, opposed to a corresponding hollow in the opposite valve: the lines of growth are fine, and very numerous near the edge.

I received this some time since from the Rev. Mr. Iremonger, from Brackenhurst, in the New Forest, Hampshire; it is sufficiently distinct from any other that I know. The specimen is very entire, and the two shells were so perfectly locked together by the narrow hinge tooth, between the two most adjacent ones in the opposite valve, that it broke in separating them. The gloss, in some measure, remains both outside and within, the former was apparently brown when fresh, the latter white; both are now stained with grey streaks and blotches. The specimens seem to have lain in a loose earth. I should suppose if the place were searched it would afford some well preserved reliquiæ.

VENUS *gibbosa*.TAB. CLV.---*Fig. 3 and 4*.

SPEC. CHAR. Orbicular, gibbous, with many transverse rugæ; lunula large and short; edge subcrenulated; hinge rather large.

VENUS *rugosa* is something like this, but that is shorter and less gibbous and has a much smaller lunula: its hinge also is much smaller: both have rudiments of a tooth under the lunula in each valve, but without corresponding impressions.

I have only received one specimen of this shell, some few years since, from Suffolk, and I consider it a variety. The present active spirit of research will in due time prove if it be more common than I expect. It is in a tender chalky state, and I conceive it proper to secure it as I think it is sufficiently distinguished to be recognized by moderate specimens. Its outer coat, with the rugæ, which it seems once to have been ornamented with, has split away: I cannot, therefore, say whether they were like those of *V. rugosa* or not.

CARDIUM proboscideum.

TAB. CLVI.---*Fig. 1.*

SPEC. CHAR. Suborbicular, gibbous ; anterior side straight, about 20 longitudinal rows of large canaliculated spines, with two rows of lesser ones between each cover the surface.



THIS corresponds in form with *Cardium ciliatum*, but the disposition of the rows of spines is altogether different and the shell is thicker: a few of the last formed thorns on the posterior side are very large and clumsy, and serve to relieve the elegant proportion of the others.

This elegant shell very rarely remains so finely replaced and in so extraordinary a manner as this specimen in semitransparent calcedony, covered by Cachalong, becoming transparent when wet and more opaque when dry. I am favoured with it by Miss Hill, from Blackdown, near Cullumpton, Devonshire. The larger doubled aculei are elegantly cast and with extreme neatness, as well as the two smaller rows, making generally three sets of aculei, and distinguishing it from any recent species: a few of the aculei are widened in an extraordinary manner, but they appear as if they were so in the original or recent state of the shell. It may be expected that the Lime of the shell has been carried away with the acting fluid that held the Calcedonic matter in solution to fill the space by some chemical means, with which we are as yet unacquainted. What information we may gain on this point by means of our new apparatus, we know not. The sand in which

this action has taken place is of an hard or harsh gritty feel, with particles of Mica; the whole more or less concreted. These and other shells I have, and shall occasionally show are very abundant in it, all in a silicized state.

CARDIUM umbonatum.

TAB. CLVI.---Fig. 2, 3, and 4.

SPEC. CHAR. Orbicular, gibbous, nearly equilateral, longitudinally striated and obscurely costated; anterior edge concave, and angular above.

LENGTH and breadth three-fourths of an inch; the costæ are so little elevated that the edge is nearly entire, but the margin is strongly toothed within; the anterior side is separated by a concavity, so that the upper angle of it forms a sort of boss; it was formerly thought to be the young of our common Cockle, *Cardium edule*; the evenness of the contour and the concavity around the anterior side will, I trust, always distinguish it, with very little difficulty.

Also from Blackdown and silicized: very neat specimens frequently occur. Fig. 4 shows an accidental canal of which there are slight vestiges in several specimens.

AMMONITES *Duncani*.
TAB. CLVII.

SPEC. CHAR. Depressed; inner whorls partly exposed; radii numerous, undulated; edge flat, bounded by two rows of tubercles in the interior whorls; a few tubercles occur upon the sides of the inner whorls: aperture ovato-sagittate.

THE radii are irregularly furcate, and more or less obscure about the middle of the sides: the tubercles on the interior whorls extend over the ends of two radii, but on the external whorls they are little more than swellings of the ends of the radii: the greatest diameter is about twice the length of the aperture and four times the thickness.

There is a peculiar elegance in this species that makes us regret its rarity, and the little chance we consequently have of seeing the exterior. The double row of button-like protuberances on either side the flattened outer edge, shewing the place of the siphuncle in the center, gives an appearance similar to that of some other species. The fine sharpness of the sinuated edges of the septa is beautiful. It has protuberating vermiculæ-like risings about it which interrupt the distinction of the whorls:—or are they stalagmitical droppings of pyrites? It is partly chalky on the outside, perhaps owing to the decomposition of the calcareous shell; the rest is pyritaceous except a little marle. It is from the forest or fen clay which runs through England from Weymouth to the wash of Lincolnshire, and was found by John and Philip Duncan, Esqrs. after whom I am pleased that it is named, at St. Neotts, Huntingdonshire.

PECTEN Beaveri.

TAB. CLVIII.

SPEC. CHAR. Depressed, orbicular, smooth, with irregular longitudinal costæ; ears as wide as the shell, nearly equal.

THE costæ vary in size and distance in the same shell, and there are between the principal ones now and then a small one or two: the shell is thin.

Among many specimens I have not seen so perfect an example to identify the species as this, lent me from the Oxford Museum, to which Mr. Beaver presented it; it is from the Rev. Mr. Beaver's quarry at Childrey, near Wantage, Berkshire. I take advantage of the opportunity thus allowed me of publishing the species; at the same time I beg leave of my friends and correspondents to say, that I shall still be glad of information or specimens, as it is very irregular in some of its characters, and the outside is as yet but imperfectly known. I have specimens of the same from Hamsey, Sussex, which Mr. Mantell kindly sent me, that identify a similar stratum (Chalk marl), but the shells being more mutilated and smaller, may indicate something relating to its age.

The upper figure is from an impression of the shell taken in clay; I have been able to separate a portion of the shell from a Hamsey specimen, sufficient to shew that it is smooth: this figure, therefore, exhibits the outside: the lower figure shews the inside of the shell which adheres by its outside to the stone, or rather hard marley chalk, in which it lies. There are a few spots of pyrites about it.

SANGUINOLARIA.

GEN. CHAR. A transverse equivalved bivalve, superior margin arched, sides slightly gaping; hinge with two approximating teeth in each valve, and an external cartilage.

THIS genus forms a link connecting Solen with Tellina; it contains shells whose hinge is analogous to that of some Solens, but in general form they differ much, resembling Tellina in their flatness and rounded margin, but are generally wider. They have been happily selected from among the Solens of Linnæus by Lamarck.

SANGUINOLARIA Hollowaysii.

TAB. CLIX.

SPEC. CHAR. Depressed, transversely elongate, ovate, and striated; anterior side gradually expanded; posterior side very small.

LENGTH equal to three and a half times its width; the lines of growth form fine sharpish striæ; the beak is minute, from it a slight depression extends towards the anterior side: the shell is thin.

This was gathered at Bricklesome Bay by the friendly Mr. Holloway, whose name I feel pleased to commemorate, four or five years since: although it is rather an abundant species it is rare to find one individual at all perfect: the pair figured here are held together by green sand; they are brittle: one shell is perfect, the other has been partly broken away so as to shew the hinge, and but little more is seen: it will readily be recognized if found again, and is at any rate a valuable addition to the catalogue of British fossil shells.

MACTRA.

GEN. CHAR. An equivalved subequilateral transverse bivalve, gaping at the sides; a ligament placed in a pit between the teeth of the hinge within the beaks; two elongated lateral teeth in each valve.

Most of the shells of this genus are free from striæ or other ornament; their form approaches to transversely oval; some are very flat, others are gibbose, and many have but a slight opening at the sides when the valves are closed: the lamellar lateral teeth of one valve are inserted into long grooves bounded on the inner side by plaits or lamellar teeth in the other: in several species both these teeth and the grooves are finely striated in a perpendicular direction.

Lamarck has confined his genus *Mactra* to such species of the Linnean Genus as have prominent lateral teeth; the remainder form the genera *Crassatella* and *Lutraria*.

MACTRA *arcuata*.

TAB. CLX.---*Fig. 1 and 6.*

SPEC. CHAR. Ovate, smooth, back and anterior margin arched; shell of an uniform thickness; posterior side smallest; hinge narrow.

Length equal to about four-fifths of the width: the lines of growth are strongly marked: it differs from *Mactra solida* in the narrowness of the hinge and the irregularity of the sides. The lateral teeth are striated.

Mrs. Cobbold sent me these fine specimens from the Holywell Crag pits in 1813: they had been compared with and received the name of *Mactra solida* of *Lin.*

MACTRA dubia.

TAB. CLX.---*Figs. 2, 3, and 4.*

SPEC. CHAR. Ovato-triangular, transversely elongated, smooth, thickened towards the margin, sides equal.

THIS is between *M. solida* and *stultorum*; it differs from the last only in being wider and thickened towards the edge: the lines of growth are conspicuous, and more particularly so when the surface has been corroded, a circumstance generally observable in bivalve Crag shells.*

I received a specimen of this species nearly as large as the last, by favour of Dawson Turner, Esq. but broken; I therefore figure smaller but more perfect specimens received since from the Rev. G. R. Leathes. I have had the same, smaller still, from Mrs. Cobbold at Ipswich, and from Woodbridge.

MACTRA ovalis.

TAB. CLX.---*Fig. 5.*

SPEC. CHAR. Oval, equilateral, smooth; thickness uniform.

LENGTH about three-fourths of the width: its regular oval form distinguishes it: it is also rather deeper than *M. stultorum*.

A Crag shell, sent me from Suffolk by Dawson Turner and W. J. Hooker, Esqrs.

MACTRA cuneata.

TAB. CLX.---*Fig. 7.*

SPEC. CHAR. Ovate, smooth, depressed towards the front, anterior margin acutangular.

LENGTH but little more than half the width; the anterior side is largest and angular.

These are from Bramerton-hill near Norwich, found by my late friend Charles Wilkinson, Esq.

* Nothing shews the necessity of nicety in description more than the difficulty of di-criminating the recent from the diluvian or antediluvian species: the accordance in the outside when worn, in most of these species and of Pennant's figures, has conveyed an idea of all being the same.

TELLINA.

GEN. CHAR. An equivalved inequilateral bivalve, more or less transversely ovate, with the anterior side irregularly bent: hinge slender, with two or three diverging teeth, and one or two elongated lateral ones.

LAMARCK'S principal distinction of this Genus is the bend or waving of the anterior side of the shell, and the lateral tooth or teeth. The individuals are mostly slender, compressed, smooth or striated, and white or elegantly painted; there is something in their general contour, partly produced by the above-mentioned bend, although in some species it is very slight, that indicates the Genus they belong to, and an inspection of the hinge soon determines it, for there is an apparent nakedness about it arising from the slenderness and simplicity of its parts, that makes it easily distinguishable. The cartilage is external.

TELLINA obliqua.

TAB. CLXI. — *Fig. 1.*

SPEC. CHAR. Nearly orbicular, convex, oblique, smooth; anterior side slightly defined by a longitudinal wave.

THE length and breadth are nearly equal; the depth of each valve is about one-sixth of the diameter; the anterior side is the smallest: the lines of growth are irregular, but rather sharply marked, and the spaces between them are rather elevated.

1817. 2. — Pl. X. & VI.

This species is common in the Crag of Norfolk, Suffolk, &c.; the large specimen. fig. 1, was among many by favour of the Rev. G. R. Leathes, from Suffolk: the smaller one beneath, from Aldborough, sent me by the Rev. J. Lambert, is of the more usual size. I have had pairs from Ipswich, sent me by Mrs. Cobbold, who finds them fine, of all sizes, and varying in colour. Messrs. Turner and Hooker have also favoured me with specimens of this species among some varieties of the following: they vary a little in general form.

TELLINA ovata.

TAB. CLXI.—*Fig. 2.*

SPEC. CHAR. Ovate, convex, smooth, equilateral, with a slight wave upon the anterior.

BREADTH one-sixth greater than the length; the lines of growth are sharply cut and very irregular; the spaces between them generally flat.

This is less circular than the last, and is found varying in size and colour, depending, like the others, on the quantity of oxyde of Iron in the bed in which they are situated. They are found at Framlingham and Bramerton, and in various parts of Suffolk.

CYCLAS. *Bruguiere.*

GEN. CHAR. An equivalved inequilateral bivalve, more or less transverse, with the anterior side even: hinge strong, with two or three diverging teeth and one or two elongated ones: cartilage external.

AN intermediate Genus between *Venus* and *Tellina*; it has the general form of *Venus*, with the lateral tooth or teeth of *Tellina*, from which, however, it differs, in being straight and less slender. The species do not present much variety of ornament, either in form or colour, and in most of them there is no lunula, and the edges are entire: several of the recent ones have a strong epidermis.

Venus Islandica of Linn. is a *Cyclas* of Bruguiere; this, and one or two analogous fossil shells, which I have published as of the Genus *Venus*,* I still suspect may form a new Genus distinguished by the hinge.

CYCLAS deperdita?

TAB. CLXII. — *Fig. 1.*

SPEC. CHAR. Ovato-transverse, rather gibbous, umbonate; lines of growth elevated, irregular: central hinge teeth three, lateral ones two.

SXN. *Cyclas deperdita.* *Lam. Enc. de Paris* 252.
Park. Org. rem. 3. 189?

THE form is a short oval, rarely a little angular towards the anterior side: two of the central teeth of the hinge are slightly bifid: the lateral ones sometimes finely striated perpendicularly, as in several others of the Genus.†

This is a common species at Charlton, along with the two following, and two or three species of *Cerithia*, forming together a stratum several feet in thickness, in

* See the Generic character of *Venus*, p. 125.

† I have a large species from China that shows the striæ very strongly.

which there is a mixture of black Clay: it lies between strata of ochraceous Clay and gravel, over a bed of white sand about an hundred feet deep, that rests upon Chalk. Some shells contain enough of the animal matter to give them consistency, and have a shining surface: I have one pair in which the cartilage of the hinge remains, others are chalky and moulder between the fingers. The same species occurs in sand at Plumstead, of all sizes, even to minute.

I suppose Parkinson considers it the same as the following species, which he figures as *C. deperdita* of Lamarck, but is too angular to answer Lamarck's description: not having seen the French shell I am still in doubt.

CYCLAS cuneiformis.

TAB. CLXII.—*Fig. 2 and 3.*

SPEC. CHAR. Transversely cuneato-ovate, gibbous, lines of growth numerous, fine; central hinge teeth three; lateral ones two.

SYN. *C. deperdita*. *Park. Org. rem.* 3. 189. t. 13. f. 5.

THE only difference between this and the last is the angular form of the anterior side, and the greater width.

I have many specimens of this, both from Charlton and Plumstead; it has also been found at New-cross, near Deptford. All the specimens agree precisely with Parkinson's figure, above quoted.

CYCLAS obovata.

TAB. CLXII.—*Fig. 4, 5, and 6.*

SPEC CHAR. Obovate, gibbous, anterior side obtuse; beaks large; central hinge teeth three; lateral ones two.

THE equality of the length and breadth distinguish this shell: the lines of growth are rather strong, but irregular; it rarely exceeds three quarters of an inch in length.

The Clay of Barton Cliff is plentifully supplied with this *Cyclas*: I have received it from thence by favour of the Rev. W. Bingley, Iremonger, &c. and I have found a variety, exhibited in the larger figure, at New-cross.

AURICULA. *Lam.*

GEN. CHAR. An univalve ovate or oblong pyramidal shell with an elevated spire ; aperture oblong, entire, contracted above with united lips ; columella plaited, independently of the decurrent attachment* of the outer lip.

IN general, shells that have plaited columellæ have also beaked, or at least notched, apertures. The Genus *Auricula* has been established to receive such as form an exception to this rule, and are not turreted, having entire mouths and plaits on their columellæ ; Bruguiere had separated them from the *Volutæ* of Linn. together with others that had no plaits, and formed the Genus *Bulimus* from which Lamarck has judiciously separated them. The spire seldom equals in length the last volution ; Lamarck observes, that the species are mostly inhabitants of rivers ; they are often decorated with various colours, are polished and transversely striated.

* In the Genus *Lymnæa* a plait is formed on the columella by this part of the outer lip.

AURICULA *incrassata*.TAB. CLXIII.—*Fig. 1, 2, and 3.*

SPEC. CHAR. Ovate, ventricose, transversely sulcated, longitudinally striated; spire short; mouth angular above, with very thick lips; columella three plaited.

SYN. *A. ringens*. *Parkinson* iii. 84. p. 5. f. 4. but not of *Lamarck*.

WHEN full grown this is about half an inch long, and two-thirds as wide; the outer lip is then much thickened for a considerable way back upon the last whorl, and this thickened part is marked by numerous lines of growth in place of the regular sulci; while the shell is young the lip is only slightly reflected at the edge. The longitudinal striæ only appear within the furrows, where they are elevated and sharp, dividing them into minute oblong rectangular cells, see fig. 3.

Miss E. Hill having presented me with both young and old shells of this species from Blackdown, and Mr. De France having also forwarded to me a valuable collection of shells from the neighbourhood of Paris, containing *Lamarck's A. ringens*, I am enabled to point out the incorrectness of *Parkinson's* reference; independently of the general form and difference of size; the want of striæ within the outer lip, and the presence of longitudinal striæ upon the surface distinguish the British shell.

AURICULA *turgida*.
TAB. CLXIII.—*Fig. 4.*

SPEC. CHAR. Ovate-acute, turgid, transversely striated, shining; spire short, acute; aperture oblong, with thickened lips; columella two plaited; outer lip smooth within, thickest in the middle.

A MINUTE glossy shell, rather more than a line long, varying in the thickness of its lips with its age. The spire is not quite so long as the mouth, which is con-

tracted in the middle by the thickened lip and the plaits upon the columella: the striæ are at a small distance from each other, and hollow without interruption.

So great is the resemblance of this to Lamarck's *A. ringens* that had he not mentioned the striæ within the lip, I might have overlooked the distinguishing character, although the French shell is double the size—a minute comparison also shews that *A. ringens* has rather a longer and more acute spire. *A. turgida* is the produce of the blue Clay of Highgate in which it sometimes adheres to the masses of indurated marl, &c.

AURICULA simulata.

TAB. CLXIII.—*Figs. 5 to 8.*

SPEC. CHAR. Oval, pointed, with close transverse laterally toothed costæ; whorls slightly ventricose; mouth angular above; outer lip sharp, striated within; two broad plaits upon the columella.

SYN. *Bulla simulata.* *Brander 61.*

NEARLY three-fourths of an inch long. There is a sinus in the lower part of the outer lip before it reaches the columella: the two plaits upon the columella are very prominent and laterally compressed; they are more or less oblique in different individuals. The costæ are small, flattish, and almost close to each other: the teeth upon the sides are minute, those in one rib being placed opposite those in the next form a series of elongated ovate hollows, as is represented at fig. 5.

Several of my friends have presented me with this from Barton Cliff. I possess also various specimens from Highgate; in one of these the outer lip is thickened and crenulated within, but as the shell had been broken just at the part, and has grown again, that may have arisen from the accident. Brander certainly meant the same shell, but his figure is too long: the name he has given it implies its resemblance in form to some species of *Buccinum*.

AMMONITES fimbriatus.

TAB. CLXIV.

SPEC. CHAR. Discoid; volutions cylindrical, internal ones exposed; lines of growth undulated, and in some parts fimbriated; mouth orbicular.



IT should appear from what remains in the specimen figured, that the mouth in a full grown shell, is furnished with an undulated reflected lip or ruffle, and the more or less perfect formation of this at various periods, produces either undulating lines of growth, some of which are obtuse and others acute, or thin annular fimbriæ, surrounding the volutions at certain intervals: the obtuse lines of growth are indented at their backs, but straight towards the mouth, and indicate that the undulation of the lip is strongest at the back of it. The whorls do not appear to have been very numerous; the shell is thin, and the margins of the septa have rounded lobes.

I could not refrain from publishing this curious Ammonite, although the fragment, for the loan of which I am indebted to the Rev. W. Buckland, is apparently so imperfect; however, it exhibits every essential character: it is from the Blue Lyas, at Lyme Regis, Dorsetshire.

AMMONITES vertebralis.

TAB. CLXV.

SPEC. CHAR. Discoid, radiated, and carinated; inner volutions partly concealed; radii prominent, numerous, tuberculated in the middle, then furcate, with a tubercle upon each branch; carina serrato-tuberculate; aperture orbicular.



A VERY handsome shell whose radii are a little undulated, and together with the tubercles upon them, are sharpish and compressed; they are very regularly furcate, and each branch has a tubercle about its middle, then passes on in an elegant curve to the carina, where it forms another somewhat reflected tubercle—the two branches again unite on the other side. The thickness is about equal to one-third of the diameter.

The Rev. W. Buckland has enabled me to exhibit this with his usual fondness for science; he informs me that it is found at Dry Sandford and Marcham, two adjoining villages on the N. W. of Abingdon, Berkshire, where it lies in silicious sandy beds, that contain subordinate Strata of a gritty Limestone, composed of small Quartz pebbles, sand, and shelly fragments, united by a calcareous cement.

I have not seen the outside of the shell, but from the space between the whorls in the cast, I suppose it must have been thick. It is named vertebralis from the resemblance of the carina to the vertebral processes in some quadrupeds.

AMMONITES plicatilis.

TAB. CLXVI.

SPEC. CHAR. Discoid, radiated; sides flat; front round, plain in the centre; volutions exposed; radii numerous, equal, straight, furcate; aperture squarish, with rounded angles.



THE radii on this Ammonite, from their straightness, closeness, and regularity, have much the appearance of artificial plaiting or crimping; they do not branch until they begin to turn over the front, in the centre of which they are nearly obliterated; they are sometimes simple and less frequently trifid. The septa are acutely sinuated. The thickness is about one-fourth the diameter: the aperture is somewhat longer than wide.

A sandy Stratum, containing beds of sandy Limestone, at Dry Sandford and Marcham, N. W. of Abingdon, produces this shell; I am indebted for the use of the specimen figured, to the Rev. William Buckland. Several other Ammonites occur in the same Stratum, among them is *A. concavus* of tab. 105*: most of them have lost the shell; the present is only a cast of the inside, it has a few crystals of Carbonate of Lime about it.

* The inside casts of this are so well preserved, with regard to the sinuosities, that I was almost induced to add a fresh figure of it from some elegant specimens lent me by the Rev. W. Buckland.

AMMONITES obtusus.

TAB. CLXVII.

SPEC. CHAR. Discoid, radiated; inner whorls exposed; front with two slight furrows and an obtuse keel; radii large, curved, sharpest in the middle; aperture oblong.



THE large undulations or radii are equal in number to the septa, each crossing the inner lobes of one septum; they are very prominent in the middle, but are lost after winding towards the front: the keel is rounded, not much elevated, and the hollows on the sides of it are very trifling. There are about four whorls; the aperture is longer than wide, equalling one-third the diameter of the shell. I have some suspicion that the external surface of the shell is concentrically striated, but the specimens I have seen have only a small portion of it remaining.

I am indebted to the kindness of Miss Philpot, of Linley, for the use of the larger specimen, which, from the high polish and rich colour of the crystallized Carbonate of Iron that has lined its chambers, is truly beautiful. The one I have taken my section from was sent me by my friend — Strangeways, Esq. They are both from Lyme, in Dorsetshire.

HAMITES armatus.

TAB. CLXVIII.

SPEC. CHAR. Flatted ; undulations simple, every second or third armed with a large thick spine on each side near the front.



BESIDES the two spines upon every third undulation, there are two obscure tubercles near the back upon the same ring, the intermediate undulations are less risen, and are almost lost upon the back ; the section is elliptical.

This large and remarkable Hamite was found in Chalk Marl at Roak village, near Benson, Oxfordshire, and sent me for publication by the Rev. William Buckland. It is extraordinary, more from the spines or thorns it is beset with than from its size, although this much exceeds that usually attained by species of the same Genus in England. The spines are three-eighths of an inch long, being one-third the length of the section at the largest end of the shell. The specimen is a cast stained with iron, it has not preserved any indications of the septa.

The specimens next in size at present known, are found in the Chalk marl of Sussex, but still more mutilated: we hope to give good specimens ere long. It would be an acquisition to find one perfect at the ends—such not having been seen.

LYMNÆA.

GEN. CHAR. An oblong subturreted univalve ; the aperture entire, longer than wide ; lower part of the right lip entering the aperture, and forming a very oblique plait along it.

THE *Helix stagnalis* of Linneus, is Lamarck's type of this Genus, and upon a comparison of this with the *Helix pomatia*, the propriety of their separation is immediately visible. The *Lymnea* is an elongated pointed shell ; in general it is smooth, tender, and has to boast of very little variety of colour: the recent species are known inhabitants of fresh water pools or rivers, and the few fossil ones hitherto met with belong, exclusively, to the newest depositions.

The thinness and semi-transparency or horny aspect of the shells of this, and many other fresh water Genera, is a great help towards distinguishing the fresh water formations from those of the salt water.

 LYMNÆA fusiformis.

TAB. CLXIX.—*Fig. 2 and 3.*

SPEC. CHAR. Subfusiform, smooth ; sides of the spire nearly straight ; aperture narrow, half the length of the shell.

THE narrowness of the mouth of this makes the two ends almost equally taper ; the spire is pointed ; the striæ of growth are tolerably sharp, between them the surface is

smooth and shining, without any transverse striæ, such as are upon *Lymnæa stagnalis*. It differs from Lamarck's *Lymnæus longiscatus*, and I believe from all other species in the flatness of its whorls, or rather the straightness of the sides of its spire; it is also shorter than *L. longiscatus*.

This shell is the produce of one of the fresh water depositions on the Isle of Wight; it was collected by the Rev. Mr. Iremonger, and sent me along with *Planorbis euomphalus*, tab. 140.

LYMNÆA minima.

TAB. CLXIX.—*Fig. 1.*

SPEC. CHAR. Elongated, smooth; volutions rather convex; aperture less than half the length of the shell, ovate; last whorl not ventricose.

A SMALL shell, only three or four lines long, nearly related to *L. longiscatus* but shorter.

It is probable that this may be the young of some other species; it occurs with a minute *Patella* along with the shell above described.

HELIX globosus.

TAB. CLXX.

SPEC. CHAR. Globose, slightly elongated, obscurely transversely striated; whorls but gradually increasing in size; outer lip reflected.

FROM the gradual increase in size of the whorls, the last of which is not remarkably larger than the preceding, joined to the slight convexity of their exposed parts, the shell assumes a globose aspect although it is not strictly spherical. The young ones are rather depressed, and have an umbilicus; the old ones are slightly elongated, and have the umbilicus concealed by the expansion of the inner lip. The lines of growth are distinctly marked: the transverse striæ irregular, numerous, hollow, and so superficial, that they are only to be seen in the best preserved specimens.

Specimens of this shell were presented to me by John Holloway, Esq. who found them at Shalcombe, on the Isle of Wight, where it is of rare occurrence. From its exact resemblance in generic characters to the *Helix pomatia*, it must be considered like it, to be a land snail, and should seem to have been accidentally imbedded with the water shells in the calcareous (now stoney accumulation) that has preserved them, and often filled their interiors: the shell has been replaced by crystallized Carbonate of Lime. I have been favoured with specimens of the Genus *Phasianella* in the same state of preservation, from the same rock. The rock is a compact Limestone, breaking with a smooth conchoidal fracture, and contains but a few fragments of shells; it is much harder than chalk, or even Portland stone, but softer than the Purbeck stone or mountain Limestone.

HELIX? striatus.

TAB. CLXXI.—*Fig. 1.*

SPEC. CHAR. Conical, depressed, subcarinated, obliquely striated, a rising band around the edge, crossed by arched striæ; columella solid, aperture subtriangular.

THERE is a great resemblance about the base of this shell to the genus *Trochus*, given it by the prominent columella; in other respects it strongly resembles *Helix carinatus*, (see tab. 10.*) from which it differs in not having an umbilicus, in the greater distance and sharpness of its striæ, and the strong arched striæ upon the band.

From the Limestone of Derbyshire, collected by Martin; the place of the shell is occupied by granular Carbonate of Lime, and the inside filled with grey Limestone. Had not the general form strongly resembled the *Helix* above mentioned, I might have been induced to have placed this as a *Trochus*, although it does not precisely accord with the characters of that genus. I might have formed a new genus of the two, to which the following species should have been added, did they not differ materially from each other in the characters that should distinguish it. Besides the aperture is very imperfect in them all. It is probable that other species may be found, and that by their help and that of more perfect specimens, the genera they belong to may be determined, or the characters of new ones ascertained, and this is the more desirable as they appear from their localities to be marine inhabitants, rather than land shells.

* In the description of this the striæ are said to be transverse instead of oblique by mistake, and the striæ upon the lower part have escaped notice.

HELIX? Cirriformis.

TAB. CLXXI.—*Fig. 2.*

SPEC. CHAR. Conical, acute, umbilicate, decussato-striated; with a band around the middle of the whorl crossed with arched striæ; aperture nearly round.

A SMALL space upon the upper part of each whorl is flattened, the remainder is very round, bearing upon the middle of it a broad band, strongly marked with lunate striæ; the decussating striæ upon the other parts are small, and most distinct above the band. The rounded volutions which touch each other only in a small part of their surface, the aperture being nearly round, and rather wider than long, together with the conical form of the spire, give this a great resemblance to *Cirrus acutus*, tab. 141; but the umbilicus does not appear large enough to authorize our placing it under the same Genus; I therefore leave it for the present along with a shell to which it has as great an affinity.

I received this along with the last from Mr. Martin; it is from the same Limestone; there is within it part of an *Encrinus*.

AMMONITES Henleyi.

TAB. CLXXII.

SPEC. CHAR. Discoid, gibbose, with many small radii ; inner volutions exposed ; radii flattened, with two compressed tubercles upon each ; aperture large, nearly round.

BETWEEN the two concentric rows of tubercles the shell is slightly flattened, otherwise the form of the mouth would be round, with a small sinus produced by the preceding whorl. The whorls are few, and increase rapidly in thickness as they proceed towards the mouth. The numerous radiating ridges are compressed, so as to be as wide as the spaces between them, and at the insertion of the outer tubercle are commonly split into two, that unite on the opposite side : a few of the radii proceed from the centre over the front without tubercles.

Lyme Regis, in Dorsetshire, is a place that has produced many fine petrifications peculiar to the blue Lyas ; the present is among the number that have fallen into the deserving hands of the Rev. Mr. Buckland. It was found upon an estate belonging to H. H. Henley, Esq. of Sandringham, near Lynn ; in kind remembrance of whom it has been named by Mr. Buckland. Its external surface, concamerations, and siphuncle, have not been preserved ; the specimen is only a cast in Lyas, with some crystallized Iron Pyrites in two or three parts.

AMMONITES rostratus.

TAB. CLXXIII.

SPEC. CHAR. Depressed, carinated, tuberculated; tubercles three or four upon each radius, largest towards the front; volutions exposed; aperture elliptical, with a compressed reflected beak.

THE aperture, exclusive of the beak, is somewhat less than a third of the diameter of the shell long; the beak is a little reflected and flattened, the edges of it so pressed together, as nearly to close it: the tubercles are more divided upon the inner whorls than upon the outer ones, where they begin to run into one another, and form ridges that are curved forwards, towards a prominent insulated keel: volutions about four.

So remarkable is the beaked mouth of this Ammonite, that I have named it from that character. The figure is taken from a specimen lent me with a valuable collection of the same Genus by the Rev. Mr. Buckland; it was found in Chalk Marl at Roak Village, near Benson, Oxfordshire. The terminal chamber or that in which the animal is supposed to have resided, being preserved entire, renders the specimen particularly valuable, as it is commonly broken off.

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CHAMA digitata.

TAB. CLXXIV.

SPEC. CHAR. Palmate, slightly recurved, gibbose, with five or six marginal elongated canalculated processes ; surface smooth.

THIS is an oblique elongated curved shell, with several ridges upon the deeper valve, that are drawn out at the margin into finger-like processes, which are concave beneath, and some of them slightly expanded towards their ends. The attached valve is unknown.

We are to thank the zeal of our friend, the Rev. Mr. Buckland, for communicating this curious species : casts of it very neatly formed, are contained in masses of porous flinty Chert ; the space formerly occupied is sometimes partially filled with brown Oxide of Iron or Calcedony. The casts of the inside are often hollow, and lined with quartz crystals.

The texture of the stone, and partial union of the two sides of the casts to each other, have rendered it impossible to expose the whole outline of the shell. I have given figures of four specimens that illustrate each other ; the two upper ones exhibit the claws (if I may so call the marginal processes) ; one of them (fig 1.) is a cast of the external surface : the other (fig. 2.) (which has been accidentally reversed by the engraver) shews a greater elongation of the processes, and a hollow with quartz crystals ; the lower figures are from two varieties, a broad shallow one and a narrow very deep one ;* the claws of these have been completely entangled in the

* Such varieties often occur in shells of this Genus, as well as among oysters.

stone, but they display enough of the hinge to prove that it has one elongated irregular tooth : one of them (fig. 3.) shews the concentric lines of a single muscular impression very neatly ; but I am unable to trace indications of two upon either of them to make their generic character complete. Three of the specimens have considerable portions of stone attached to them ; as they would render the shells less conspicuous I have omitted them in the figures, which, even now, are not so perfect as might have been desired ; but experience teaches us that we must depend much upon such specimens for our knowledge in geology, and rest satisfied when they are perfect enough for us to trace the identity of species.

Long Comb Girts, in the parish of Sudbury, near Sidmouth, where these specimens were found, is the only spot, I am informed of, that produces this species.

The attached valves have not been met with ; they have probably been left adhering to the rocks from which the others were washed, previously to their being deposited in the situation we now find them preserved in.

PHASIANELLA. *Lamarck*, Phasianus,
Montfort.

GEN. CHAR. An oblong subturreted pointed uni-
valve ; aperture entire, longer than wide ; left
lip sharp ; right lip reflected over the last
whorl ; a longitudinal ridge upon the columella.

A GENUS instituted by Lamarck ; it is distinguished
from his *Lymnaea* by the thick edge of the right lip not
entering the mouth, but reposing upon the body of the
shell. In general, also, the whorls are more equal than
in that Genus, and the shell is thicker, opaque, and var-
iegated.

The recent species inhabit the shores of islands in the
neighbourhood of New Holland.

PHASIANELLA *orbicularis*.

TAB. CLXXV.—*Fig. 1*.

SPEC. CHAR. Conical, acute, smooth ; whorls
about six, ventricose ; aperture nearly round.

THIS is nearly related to the Genus *Vivipara*, but the
spire is too much elevated and too acute ; it is marked
with lines of growth, and the smaller whorls have a few
obscure transverse lines upon them. There is apparently
an open umbilicus ; but if the shell were full grown or
perfect, it would probably be covered, as it is, but narrow.

I have referred to this species of *Phasianella* in the de-
scription of *Helix globosus*, tab. 170, along with which

it occurs in Limestone, at Shalcomb, on the Isle of Wight. I am also indebted to the liberality of the same friend to science John Holloway, Esq. for the specimens.

PHASIANELLA angulosa.

TAB. CLXXV.—*Fig. 2.*

SPEC. CHAR. Conical, smooth; whorls subcarinated; aperture nearly round.

THIS differs from the last only in the angular form of the lower part of each whorl, which makes the sides of the spire straighter.

From Shalcomb, along with the last.

PHASIANELLA minuta.

TAB. CLXXV.—*Fig. 3.*

SPEC. CHAR. Elongated, smooth; volutions five or six, obscurely squared; aperture oblong.

SCARCELY two lines long; the flatness of the upper parts of the whorls, which separates them from each other, is not easily overlooked.

From the Isle of Wight. The figure on the left is a magnified representation.

AMMONITES varians.

TAB. CLXXVI.

SPEC. CHAR. Depressed, thickish, carinated, with a row of large tubercles near the front, and one or two rows of tubercles placed upon furcate radiating undulations; inner whorls half concealed; aperture roundish.

No Ammonite is more variable than this in the strength of the undulation, and proportion of the tubercles; still, however, it may be known by the large tubercles near the front (these are sometimes flatted obliquely) and two lesser ones upon each radius near the commencement of it, the inner of which is generally smallest, and at times even obscure, or united to the other. The whorls are seldom more than three: the keel is much relieved, and entire. The length and breadth of the aperture are about equal to each other, and one-third the diameter of the shell.

So frequently are the casts of this handsome shell distorted, as if by the compression of the chalk, while in a soft state, of which they are composed, that specimens have often been exhibited in proof of the existence of elliptical Ammonites; but a series may easily be obtained, some individuals of which are circular; others compressed obliquely, and in such various directions, as to evince the effect of accident. The lower or hard chalk is well characterized by this fossil, as it contains it in

abundance. Some of the specimens figured are from Wiltshire, others from Sussex. I am indebted to many friends for varieties from the former county: G. A. Mantell, Esq. has kindly communicated a good suite from Hamsey, Plumpton, and other parts of the south of Sussex.

AMMONITES inflatus.

TAB. CLXXVIII.

SPEC. CHAR. Depressed, radiated, carinated; sides and front flattish; inner whorls exposed; the latter whorl inflated near the aperture; radii commencing with a tubercle, then furcated; keel distinct, entire; aperture square.

WHETHER this is a distorted cast may remain a question, as it does not appear to be fractured in any part; its elliptical form leads to suspicion. The sudden increase of the last volution near the end, and subsequent contraction, is a curious circumstance, if it be constant, and it can hardly be the effect of pressure in any direction. The undulations or rather radii are large, commencing with a compressed tubercle, then furcate, one of the branches being sometimes divided from the other, ending in elongated compressed knobs upon the front.

A cast in the green sand of the under cliff in the Isle of Wight, lent me by the Rev. William Buckland; the lower figure is a fore-shortened view of the same specimen.

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AMMONITES rusticus.

TAB. CLXXVII.

SPEC. CHAR. Depressed; whorls few, gibbose, exposed; with 6 or 8 conical tubercles upon the sides of each, and two rows of obtuse tubercles around the front; aperture wider than long.



WHORLS about three: the bases of the larger tubercles almost touch each other, and they expand nearly across the whorl; the front of the whorl is very broad and flattish; the tubercles upon it are numerous, and but little elevated. Aperture quadrangular: the inner side concave, and much shorter than the others.

A heavy clumsy shell, well characterized by its few large knobs, and broad front: it is a rare production of the lower chalk, at Comb Pyne, near Lyme, in Dorsetshire, and was lent me by the Rev. William Buckland.

ASTARTE plana.

TAB. CLXXIX.—*Fig. 2.*

SPEC. CHAR. Nearly orbicular, depressed; surface plain; lunette elongated, acute, deep; margin entire.

VERY analagous in general form to *A. Scotica*; and when the softer parts between the lamina have been corroded, the surface presents numerous concentric ridges; otherwise, it is only marked with fine lines of growth. The shell is thick, equilateral, with a pointed beak, and entire margin; its length does not always bear the same proportion to the width, sometimes being equal to it, but oftener less.

Occurs in a sandy alluvial stratum, at Bramerton, near Norwich, where I collected specimens in August, 1817.

: ASTARTE obliquata.

TAB. CLXXIX.—*Fig. 3.*

SPEC. CHAR. Obovate, transverse depressed; with many oblique concentric striæ upon the surface; margin crenulated.

THE numerous regular impressed striæ which cross the few lines, or rather waves of growth at a very acute angle, give rise to the name of this elegant shell; its width is greater than its length; it is somewhat depressed and slenderer than most of the Genus: the spaces between the striæ are rounded and smooth.

My active correspondent, Mrs. Cobbold, discovered this shell in the Crag pits at Holywells, near Ipswich, and indulged me with specimens in 1812: they are in a good state of preservation.

ASTARTE lineata.

TAB. CLXXIX.—*Fig. 1.*

SPEC. CHAR. Obovate, transverse, depressed, slightly truncated; with a few concentric acute ridges, and many minute intervening striæ upon the surface; lunette lanceolate, small; margin entire.

ALMOST lenticular; the anterior side is smallest and truncated: the slope upon which the cartilage lies is long and straight; the shell is thin, about an inch wide, and has nearly thirty prominent sharp lines or ridges.

It is with some hesitation that I give this as an *Astarte*, not having seen the hinge teeth it is probable that it will prove to be a *Lucina*. The only specimen known is filled with granular iron pyrites, and so liable to decompose, that I would not risk losing the opportunity of figuring it granted me by the Rev. Mr. Buckland: it was found in the selenite bed, in the Heddington Clay, near Oxford.

TELLINA obtusa.

TAB. CLXXIX.—*Fig. 4.*

SPEC. CHAR. Transversely ovate, convex, concentrically striated ; margin obtuse ; sides very unequal.



THE wave upon the anterior side that distinguishes the Genus *Tellina*, is very slight in this. The surface is most rapidly curved near the edge, which being obtusely oval, the whole has a blunt clumsy appearance; the striæ are concave, wide, and numerous. The anterior side is much the smallest. Young shells are flatter and less rounded towards the margin.

My friend, the Rev. P. Lathbury, first sent me this species of *Tellina*, from the Crag near Woodbridge, about twenty years ago: I have since received it from Roydon, by favour of the Rev. G. R. Leathes, and have found it at Bramerton in abundance.

NUCULA. *Lamarck.*

GEN. CHAR. An equivalved inequilateral bivalve ; hinge with two interlocking rows of small teeth in each valve, diverging from a space within the beaks ; beaks conniving, turned back.

LINNEUS's *Arca nucleus* is the type of this Genus, which is well distinguished from other *Arcae* by the disposition of the small interlocking teeth ; several of the species have a concave space or tooth between the two rows of teeth, but as it is not constant to all the species naturally allied to the Genus *Lamarck* has omitted it in the generic character given in his *Mémoire sur les fossiles des environs de Paris*.

NUCULA *Cobboldiæ.*

TAB. CLXXX.—*Fig. 2.*

SPEC. CHAR. Transverely obovate, convex ; surface marked with zigzag furrows, diverging over the sides ; edge entire.

THE posterior side is very short ; the space between the rows of teeth is elongated, and very concave ; the inner surface is decorated with a coat of pearl ; the outer surface is ornamented with numerous slight furrows, which are zigzag over the middle, and thence diverge on each side towards the front : it varies in gibbosity.

I have met with three varieties of this ; the first a small gibbose one, was sent me from Holywells, by Mrs. Cobbold ; a second, almost orbicular, was lent me by the

Rev. G. R. Leathes, who obtained it at Roydon; the third, and most regular one, I picked up at Bramerton, it is the one figured, and is very tender.

Being desirous of commemorating Mrs. Cobbold, whose copious collection obtained with great industry, in company with several of the junior branches of her family, whom she delighted to inspire with a love for the works of Nature, from the Crag pits of her own estate, evinces a degree of taste and zeal seldom met with; I have named this rare, and withal elegant shell after her.

NUCULA lanceolata.

TAB. CLXXX.—*Fig. 1.*

SPEC. CHAR. Transversely ovato-lanceolate, smooth; posterior side pointed, edge entire; a concave deltoid space in the hinge.

SIDES nearly equal, the anterior being rather the largest is most rounded; the shell is strong, and of almost equal thickness throughout, the beaks projecting but slightly; length half the width.

This curious Nucula was discovered by the Rev. G. R. Leathes, at Bawdsey, Suffolk, in Crag; the line of the hinge is broken, but not much bent; nevertheless it has the genuine characters of Nucula. It appears to be very rare.

TROCHUS lævigatus.

TAB. CLXXXI.---*Fig. 2.*

SPEC. CHAR. Conical, nearly smooth; sides straight; base convex, with an obtuse margin; aperture rhomboidal, with rounded angles.

HEIGHT and width nearly equal; the sides of the cone are almost straight, each whorl being very slightly convex: a few concave lines may be traced around the spire, they are obscure and irregular; the lines of growth are very fine, and thus the surface appears smooth. The base of the columella is oblique, which gives the mouth a rhomboidal form, there is no umbilicus.

This interesting Trochus nearly resembles *T. ziziphinus*, but is readily distinguished by its obtuse margin and plain surface. The specimen figured was presented me by Mrs. Cobbold, who found it in the Craig pits at Holywells: the external coat has peeled off in some parts, and exposes the pearly interior, whose pristine beauty may still be traced through the veil that time has cast over it in its subterranean cemetery.

TROCHUS similis.

TAB. CLXXXI.---*Fig. 2.*

SPEC. CHAR. Conical; sides straight, ornamented with many transverse ridges, two or three of which upon each whorl are granulated; base flattish, concentrically striated; aperture quadrangular; columella direct.

THE older shells of this species are rather wider than high; the superior whorls overhang the inferior ones a

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little, else the sides of the cone would be very straight : the ridges vary in size ; the largest are towards the lower part of each whorl, with minute intervening ones ; the granulated ridges have small plain ones between them.

Specimens from the Holywells estate, from two to six lines high : it does not appear to be rare. It bears a general resemblance to several species.

TROCHUS concavus.

TAB. CLXXXI.---*Fig. 3.*

SPEC. CHAR. Conical ; sides of the whorls concave ; base flattish ; margin carinated ; aperture acutely rhomboidal ; umbilicus none.

A FEW obscure transverse striæ decorate the spire ; in the concave part of each whorl is an indistinct row of tubercles ; the base is smooth, a little broader than the height of the spire.

The Rev. H. Steinhaur found this shell in the inferior Oolite at Little Sodbury. It is distinguished from the next with which it agrees in general form, by the transverse striæ, single carina, and solid columella.

TROCHUS duplicatus.

TAB. CLXXXI.---*Fig. 5.*

SPEC. CHAR. Conical ; sides of the whorls concave ; a double deeply crenulated carina round the base ; umbilicus open, with a tuberculated margin ; aperture quadrangular.

THE upper edge of each whorl is crenulated as well as the carinæ : the concave space between the two edges is plain ; the whole surface is shining. The umbilicus, which has about seven tubercles around it, forms a strong and remarkable character.

From Little Sodbury, along with the last.

 TROCHUS dimidiatus.
TAB. CLXXXI.---*Fig. 4.*

SPEC. CHAR. Conical ; base convex, with a carinated margin ; upper part of the whorl concave, with an entire carina in the middle ; aperture pentangular.

THE smaller whorls are convex ; the last formed ones only shew the carinæ and concave spaces between them : the carina in the middle of the upper part of the whorl projects so much as to give the shell a square clumsy form : the columella is direct and solid.

I have received a single example of this from Little Sodbury, along with the two latter species : it is dull and rather rough on the surface.

NAUTILUS striatus.

TAB. CLXXXII.

SPEC. CHAR. Slightly depressed ; umbilicate ; concentrically striated ; aperture half the diameter of the shell, nearly orbicular.



WHORLS rather gibbous, they are few, and increase rapidly ; the umbilicus is large, exposing a small part of the inner whorls ; the numerous striæ which cover the surface are irregular, elevated, and so strong, that they might almost be considered as ridges ; the front is a little compressed, giving the aperture a squarish form.

Found in the blue Lias at Lyme Regis, Dorset. The large fragment was lent me by the Rev. W. Buckland.

AMMONITES Loscombi.

TAB. CLXXXIII.

SPEC. CHAR. Discoid, compressed, umbilicated ;
inner whorls concealed ; radii many, shallow,
waved ; front rounded ; aperture oblong.

THE surface is smooth ; the umbilicus small, and not very deep ; the aperture is about two-fifths the diameter of the shell long, the thickness being only one-third the length of the aperture.

I was favoured with the loan of the shell here figured, by C. W. Loscombe, Esq. who obtained it from the blue Lyas of Lyme in Dorsetshire. It is in a good state of preservation, but the mouth had been broken in a way that led some genius to clear the stone from it, so as to give the appearance of a beaked termination to it : tab. 173, *A. rostratus*, shews a proper termination. I have thought fit to figure the present as a caution against deception.

AMMONITES Braikenridgii.

TAB. CLXXXIV.

SPEC. CHAR. Depressed; radiated; volutions exposed; front rounded; crossed by the radii; radii furcate; mouth round; lip expanded into two oblong lobes.

RADI prominent, numerous, rather sharp, and equal to the spaces between them: there is a small tubercle upon each at the base of the branches; the thickness of the last whorl is rather less than one-third the diameter of the shell: there are about three or four volutions. The lip is very striking, it commences with a square base, and having been continued a little way from the last radius it suddenly expands on the sides into two oblong lobes, on which are distinctly marked the lines of growth: the edges are sharp, and gradually bent a little inwards.

Perfect terminations of the Ammonites are rare; I have however, met with several specimens indicating the form of the lip, but none of them exhibit any thing much out of the usual way, excepting some French ones, and those now before us: in one of the French specimens the aperture is much contracted by the lip; in another, the lip forms a single arched lobe slightly bent inwards.*

These remarkable fossils are from Dundry near Bristol: they are composed of foliated carbonate of lime, and are imbedded in a compact limestone, replete with rounded shining grains of yellowish brown oxide of iron, and the remains of various other shells. They enrich the collection of George Weare Braikenridge, Esq. of Bristol.

* Of these I have made an engraving for comparison; they are found in a similar stone with the British one, at Bayeux in Normandy, and were presented to me by Mous. de Gerville, to whom I am much indebted for the fossil produce of the Cotentin.

AMMONITES *constrictus*.TAB. A.---*Fig. 1.*

SPEC. CHAR. Depressed, radiated, armed with a row of acute tubercles on each side the front ; inner volutions concealed ; radii undulated, of various lengths ; aperture even, oblong, contracted by a blunt-edged inflected lip.

IN some varieties there are a few tubercles near the centre, the same have also larger tubercles near the front : the tubercles are always largest about the middle of the last whorl, and gradually diminish towards the mouth and the inner turns, where they are entirely wanting ; on the contrary, the radii are most conspicuous on the inner whorls. There is a minute, apparently open, umbilicus. The mouth which is placed at an acute angle to the radii, is reduced to an oval form by an inflexion of the edge, and is so much contracted that the shape of its opening is not affected by the preceding whorl ; the edge of it is so bent that the closed part is placed nearly at a right angle to the remainder. The septa, the last of which lies about half a turn from the mouth, are much sinuated, and numerous.

Casts only of this shell have as yet occurred, but they are so perfect, that they exhibit every thing that can be expected. The termination of the last chamber is a very striking feature ; it is met with in almost all the specimens. From St. Colombe, in Normandy.

AMMONITES *Gervillii*.TAB. A.---*Fig. 3.*

SPEC. CHAR. Gibbose, umbilicate, radiated ; a small portion of the inner whorls exposed ; radii sharp, bent, furcate ; aperture transverse, oblong, arched ; lip arched, sharp edged.

THE thickness of this is rather more than half the diameter : the umbilicus is large, beautifully exposing the

ribbed edges of the whorls: the radii are nearly close together, and very regular until just before the last whorl is completed, when their place is supplied by two or three irregular waves; the shell is then finished with a sharp edge.

This species occurs in a marly Limestone, which is replete with grains of Iron Ochre: the place of the shell is supplied by foliated carbonate of Lime. It is from Bayeux, in Normandy.

AMMONITES Brongniarti.

TAB. A.---Fig. 2.

SPEC. CHAR. Gibbose; radiated; umbilicate; inner whorls concealed; umbilicus minute; aperture transverse, oblong, arched, with a thick or inflected lip; radii fureate, bent.

THICKNESS about two-thirds the diameter: the radii are close, waved, and very regular: the umbilicus is minute, round within, but oblong externally, in consequence of the last whorl being carried forward in a straight line for a short distance, after which it turns suddenly towards the mouth.

This is found in the same state of preservation in the same stratum with fig. 3; and it may be worthy of observation, that the Rev. Mr. Buckland possesses in his cabinet, a specimen from Yeovil of the same species with this, but in a stone very sparingly furnished with the ferruginous grains, and such as there are being in a decomposed state.

I have named these two last shells, the one as a testimony of respect to an enlightened and warm friend of science in general, and of Natural History in particular, Mons. de Gerville, who has laboured with much assiduity in collecting and arranging the fossils of the Cotentin:---the other in honor of Brongniart; its rotundity may be considered as a type of the orb of knowledge spread abroad by that luminary, in conjunction with Cuvier, after whom I have already named the spreading Inoceramus, Cuvieri.

My kind friend M. de Gerville, above named, furnished me with all the three species figured on this plate.

UNIO crassiusculus.

TAB. CLXXXV.

SPEC. CHAR. Oblong-elliptical, depressed; valves thick; surface marked by lines of growth; hinge strong.



THE surface of this shell is regularly curved, without any hollow or rising: the beaks are sharp, a little recurved: the lines of growth are not very prominent, except two or three of them near the edge: the hinge is light and elegant in comparison to that of *U. crassissimus*, although thick.

I am indebted to the Rev. G. R. Leathes for the knowledge of this *Unio*: he has obtained it from the Craig at Bawdesey, in Suffolk.

The valves have been replaced by carbonate of lime of a crystalline texture, and are attached to masses of ochraceous limestone, or lie loose in the craig.

PECTEN orbicularis.

TAB. CLXXXVI.

SPEC. CHAR. Orbicular, much depressed, concentrically striated; striæ elevated, sharp; one valve smooth; ears nearly equal, broadest at the base.

A THIN tender shell; the striæ are many, a line distant from each other; the length and breadth are equal; the ears rather large.

One of the tender products of the green sand of the Devizes canal, preserved by Mrs. Gent. It appears to be unfrequent, as I have seen but one individual.

MUREX coniferus.

TAB. CLXXXVII.---*Fig. 1.*

SPEC. CHAR. Elongated, with many longitudinal undulations, crossed by numerous unequal elevated striæ; volutiones few, inversely conical, their upper parts depressed and nearly smooth; beak open, rather short; aperture ovate.

THE general form of this Murex is that of a series of cones gradually diminishing in size, and so arranged, that the points of the smaller ones penetrate the bases of the larger: a few of the striæ upon the smaller whorls form carinæ, which are thicker where they cross the undulations or costæ, and give them a tuberculated appearance. The upper part of each whorl is distinguished by the want of transverse striæ. The aperture, including the beak, occupies half the length of the shell.

Highgate Hill afforded me this species, which I have not recognized elsewhere.

MUREX regularis.

TAB. CLXXXVII.---*Fig. 2.*

SPEC. CHAR. Rather elongated, with many longitudinal undulations, crossed by strong elevated striæ; whorls convex, the last contracted towards the beak; beak open, rather slender, aperture obovate.

THE volutiones vary in number, from five to eight; they are very regularly convex; the ribs and striæ are also

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pretty uniform : the beak has a slight bend : within the lip are a few small plaits, and the striæ of the surface are distinguishable upon the columella. The length of the mouth and beak together is half that of the whole shell.

This was sent me from Barton Cliff, by Miss Salisbury.

MUREX carinella.

TAB. CLXXXVII.---*Fig. 3 and 4.*

SPEC. CHAR. Rather elongated, with many longitudinal undulations, crossed by strong elevated unequal striæ ; whorls convex, subcarinated in the middle, the last contracted towards the beak ; beak open, rather slender ; aperture obovate.

VERY similar to the last ; its difference consists of the subcarinated form of the volutions, which is chiefly produced by the slight enlargement of one of the striæ.

This was favoured me along with the last : it bears some resemblance to the *M. craticulatus* of Brocchi's, tab. 7, f. 14 ; but the last whorl is not so ventricose, neither is the carina so strong.

CERITHIUM cornucopiæ.

TAB. CLXXXVIII.---*Figs. 1, 3, and 4.*

SPEC. CHAR. Turritid, subulate, punctated; whorls very numerous, superior ones with 3 or 4 unequal tuberculated carinæ, central ones tuberculated above, undulated below, with 4 or 5 transverse furrows; lowest whorls crossed by 9 or 10 elongated tubercles; aperture quadrate; columella plaited; beak short, curved.

So different are the several parts of an entire adult shell of this *Cerithium*, that fragments may be taken for distinct species. The whorls close to the apex have only one carina placed a little below the middle, and crenulated: in the succeeding whorls the upper edge gradually becomes tuberculated, a small knotted keel rises between it and the central one, and the lower edge appears crenulated: by degrees the tubercles on the upper edge increase in size, the central carina becomes flatter, and other carinæ arise on each side of it: near the middle of the shell these carinæ all become broader, and the spaces between them assume the form of furrows; the tubercles and crenulations remain in the form of waves: in the mean while the tubercles upon the upper edge are elongated, and towards the interior part of the shell join the waves below them, displacing the furrows by degrees, till having receded from the edge in the three or four last turns, they occupy the whole whorl in the form of blunt, oblong, rather oblique knobs. The minute hollow punctums that are dispersed over the whole surface are disposed in lines that diverge as they rise over the tubercles, and converge again as they de-

scend, very elegantly. The aperture in half grown shells is quadrate; in full grown individuals the right lip is semicircular. The beak is a little twisted; the edge of it rises upon the columella like a plait; above this is an obtuse plait upon the columella; and a third plait, or rather ridge, sometimes occurs just above the columella. Its length often exceeds a foot; the diameter of the last whorl is one-fourth the length in general, but sometimes the shell is less taper. The whorls are above 30 in number.

The clay, mixed with green sand, exposed at low tides under Stubbington Cliff, has afforded fragments of this, the most ornamental fossil shell I know; but these are in a bad state of preservation, not only in consequence of their exposure to the ocean, but from having been much perforated by some worms, that have threatened the rapid destruction of their usurped habitation before it was consigned to the earth, to be preserved for ages yet to come. I am indebted to the kindness of Mr. Holloway for a specimen, which from its situation was difficult to be obtained: it is represented at fig. 1: perhaps, if the stratum could be explored before the sea had acted upon it, specimens might be procured in a high state of preservation. My good friend Mr. De Gerville has sent me from the Cotentin a good series of the same species, delicately preserved, but not perfect at either extremity; several of them are worm-eaten, like the Stubbington ones: fragments of the upper parts are shewn for illustration at figs. 3 and 4. As it is often filled with minute shells, Mr. De Gerville has been in the habit of calling it by a name analogous to cornucopiæ, a name I have thought sufficiently expressive of its magnitude or capaciousness to apply: it is also applicable to the giver's generosity, whose horn of plenty I hope to have the pleasure of emptying into the lap of science at no very remote period.

CERITHIUM giganteum.

TAB. CLXXXVIII.---Fig. 2.

SYN. *C. giganteum.* *Lamarck Env. de Paris,*
p. 95. Knorr, III. tab. 107, f. 1.
Parkinson Org. Rem. III. 71.

SPEC. CHAR. Turrated, extremely long, transversely striated, minutely punctated; upper parts of the whorls tuberculato-nodose; columella uniplicated.

ACCORDING to De Lametherie, 30 inches is a length sometimes attained by this gigantic shell, the diameter of the last turn being then $7\frac{1}{2}$ inches. Unlike the last, this *Cerithium* is nearly uniform throughout its length; it differs from every part of it in the position of the tubercles, which are confined to the upper parts of the whorls: below the tubercles are 6 or 7 transverse striæ at equal distances from each other; while in those whorls of the *C. cornucopiæ* which have striæ below the tubercles, they are but five, and at unequal distances. This is also more taper than *C. cornucopiæ*.

It was not until I had described the preceding, that I discovered, upon comparing two specimens sent me by Mr. Holloway, very carefully, with an authentic one of *C. giganteum*, given me by Mr. Parkinson, that Mr. Holloway's were distinct from each other; and that the smaller one, although much worn, still retained characters enough to prove it to be the *giganteum*. It is extraordinary, that two species, hitherto met with in different parts of France, should be found together on the English coast. The worms that have committed such ravages upon both species, have in the specimen before us been more limited in their operations, confining them to straight lines, that branch in a dichotomous manner.

MUREX fistulosus.

TAB. CLXXXIX.---Fig. 1 and 2.

SYN. *M. fistulosus.* Brocchi, II. 394 tab. 7,
f. 12.*M. pungens.* Brander, f. 82.

SPEC. CHAR. Oblong, varicose; each varix foliated, and produced above in a recurved tube; aperture obovate, entire; beak nearly straight, closed.

BY no means a handsome shell, although remarkable: the varices, or ribs, are thick and clumsy; each has a sinuated thin appendage at the back of it, and a large arched tube at the upper part: the aperture is perfectly entire, the lips being joined all round: outside the right lip are four or five sinuated fimbriæ, more or less distinct in different individuals: the beak is broad, and in old shells is often double or triple, the earlier formed ones remaining uncovered. The width of the shell in the middle is about half the length.

I have met with two specimens of this found in Barton Cliff; they were presented to me by Mr. Bullock: in one of them the fimbriæ near the aperture are very obscure: allowing that they may sometimes be entirely wanting, there would not remain a shadow of difference between these shells and Brocchi's figure: Brocchi observes, that his shell is variable. Brander's fig. 82, seems to have been intended for this also, although in Dr. Solander's description it is not distinguished from *M. pungens*, fig. 81.

MUREX tubifer.

TAB. CXXXIX.---Figs. 3 to 8.

SYN. *Murex pungens.* Brander, p. 35, f. 81.*Murex tubifer.* Lamarck *Env. de Paris*,
p. 54. *Park. Org. Rem. Vol. III.*
p. 65. t. 5. f. 15.*Murex horridus.* Brocchi, II. 405. t. 7.
f. 17.

SPEC. CHAR. Ovate ; with four rows of erect tubes alternating with four solitary tubes upon each whorl ; aperture obovate, entire ; beak arched, closed.

VOLUTIONS convex and smooth, each furnished with four or five longitudinal rows of tubular spines, generally three in a row ; between each row is a solitary erect slightly arched tube, placed upon the upper part of the whorl. The beak is rather pointed, closed at the front, but open at the end.

It is remarkable that Brocchi should have mentioned Lamarck's *M. pungens* as related to his *M. fistulosus* ; while he has described *M. pungens* under the new name of *horridus*, in nearly the same terms as those used by Lamarck, without referring to him. Brocchi seems to have had finer specimens than are found in Hampshire, although it is probable that they come from a distant part of the same stratum, and consequently may have been buried at nearly the same period : is it not likely that one part of a stratum may have been in a situation more congenial to the growth of the individuals it has enveloped than others ? The more perfect state of preservation in which many of the foreign fossils are now obtained, probably arises from the climate in which they are exposed : that of England, especially by the sea-side, being more calculated for the destruction than the preservation of tender calcareous reliques.

The specimens numbered 3, 4, and 5, are from Barton ; the two former through the kindness of Miss Salisbury ; the latter, which is a young one, before the beak is closed, was sent me by the Rev. Mr. Bingley.

Figs. 6, 7, and 8, are from young shells found at Highgate : although they are nearly as large as fig. 5, the rows of tubes are not formed, but the solitary tubes are commenced : in fig. 8, which is the smallest, there are several indications of the first tube upon the varices. Had a larger extent of ground been opened, it is possible we might have come to the bed where this species had attained its full growth.

AMMONITES Brooki.

TAB. CXC.

SPEC. CHAR. Depressed, carinated, with a sulcus on each side of the keel; radiated; radii strong, simple, arched; inner volutions exposed; aperture oblong.



A BOLDLY marked shell, with four or five whorls, of which the inner ones are more than half exposed; the radii are large and prominent, equally broad with the spaces between them; each is composed of a single arch bent forwards; the keel is round and entire, with a deep furrow on each side of it. The surface of the shell is finely marked with lines of growth. The length of the aperture is about one-third the longest diameter.

From the Blue Lias of Lyme Regis, Dorset, favoured me by the Rev. W. Buckland. I have named this after H. J. Brooke, Esq. M.G.S. a gentleman well versed in Geology and Mineralogy.

AMMONITES Stokesi.

TAB. CXCI.

SPEC. CHAR. Lenticular, depressed, radiated; radii broad, slightly elevated; inner whorls half exposed; edge crenated; aperture sagittate.

LENGTH of the aperture two-fifths the diameter of the last whorl: the radii are little else than almost straight radiating undulations; they are lost near the edge: the cast shews some signs of concentric striæ upon the surface of the shell: the inner edge of the whorl is strongly defined.

Of this species I have only seen a cast; it was lent me by the Rev. W. Buckland, who obtained it from a Marlebed, connected with the inferior Oolite, near Bridport in Dorset.

I have the honour of naming this after Charles Stokes, Esq. M. G. S. whose acquaintance I have long valued, and whose abilities deserve our warm remembrances.

NUCULA lævigata.

TAB. CXCII.---*Figs. 1 and 2.*

SPEC. CHAR. Transversely elliptical, convex, smooth; posterior side truncated; edge entire.

NEARLY related to *N. Cobboldiæ*, but wider and perfectly smooth: it has not even the striæ beneath the surface, so usual in other species. The lunette is impressed, convex, oblong, and occupies the truncated part of the posterior side; it has a pit or compressed tooth in the hinge, similar to several other species.

Of this I have received fragments from Mrs. Cobbold, which were very pearly, although found in the Crag of Holywells. The perfect specimens represented are from Woodbridge; they are of the usual colour of the Crag, but still betray the once more pearly internal coat. They are nearly as perfect as living specimens; I was glad to see them; they were favoured by Mr. Parkinson.

 NUCULA similis.
TAB. CXCII.---*Figs. 3, 4, and 10.*

SYN. *Arca Nucleus. Brander, p. 40. f. 101.*
Brocchi, II. 480?

Nucula margaritacea. Lamarck Env. de Paris, 193?

SPEC. CHAR. Transversely obovate, depressed, obscurely striated longitudinally; posterior side straight; lunette imbedded; concave in the middle, oblong; edge crenulated.

THIS differs from the recent British *Nucula* (*Arca nucleus, Linn.*) in the angle formed by the two lines of hinge

teeth ;—in that it is a right angle,—in this it is greater. The lunette of the recent one is regularly convex ; in the fossil it is depressed in the middle, and also lies deeper. The fossil is generally less convex than the recent, and a trifle wider. The striæ in both are beneath the surface, except near the crenulated edge : in the fossil they are most conspicuous in old shells.

Found in Barton Cliff : the small specimens (figs. 3 and 4), are from Highgate : whether the latter, (fig. 4) should be considered as a distinct species, or only a variety, it is not perfect enough to determine : the striæ upon it are elevated over nearly the whole surface not confined to the margin.

Lamarck and Brocchi having declared their shells to be identical with the Linnean *A. nucleus*, in conformity with the general opinion respecting these fossils, I have added a query to their synonyma, for I have not seen foreign specimens, and they may prove to be different from either of the Hampshire ones, (*N. similis* and *trigona*.) which have also been confounded together.

NUCULA trigona.

TAB. CXCII.---*Fig. 5.*

SPEC. CHAR. Ovato-deltoid, compressed, smooth ; edge crenulated ; hinge-pit short ; lunette concave.

DISTINGUISHED from *N. similis* by its triangular form, flattened valves, and concave lunette, which also distinguishes it from *A. nucleus* of Linnæus.

Sent me along with *N. similis* from Barton, by Miss Salisbury : it appears to be quite new. I would propose to call the *A. nucleus* of Linn. *Nucula intermedia*, because it comes between this and *N. similis* in form, as the hinge of this is more acute than a right angle.

NUCULA pectinata.

TAB. CXCII.---*Figs. 6 and 7.*

SPEC. CHAR. Transversely elliptical, elongated, convex; posterior side truncated; longitudinally furrowed; lunette imbedded, flat, cordate; edge crenulated.

THIS is a large species of Nucula; its surface is covered by small diverging furrows, which are crossed by fine transverse striæ: the lunette is very conspicuous and broad. The specimens are not so opened as to shew the hinge pit, but I think it may be traced in the casts.

I am indebted to W. Borrer, Esq. an enlightened Botanist, for specimens found in clay in Sussex, long since. I have also received several from Folkstone and Dover, where they are abundant in various states. The shell is tender, and filled either with argillaceous Ironstone, or Pyrites: when the shell is decayed there remain neat casts of the inside, shewing the teeth and the two muscular impressions of each valve, which must have been deep in the shell, as the casts of them are much elevated. The shell is pearly within. The two figures 7 are different views of a cast in Ironstone of a similar but wider shell, in which the anterior side is more acuminate; probably this form is produced by the compression of the two valves together.

 NUCULA minima.
TAB. CXCII.---*Figs. 8 and 9.*

SPEC. CHAR. Transversely ovate, convex, transversely striated; posterior side acuminate; edge entire; lunette defined, elongated.

NEARLY twice as wide as long; the lunette is straight, it reaches from the beak to the angle of the posterior side:

the row of teeth swelling into the cavity of the shell beneath the lunette, give the inside a beaked appearance : the hinge pit is minute.

A small, though not unworthy present, from Miss Salisbury. I suppose it to be rare at Barton, as I have only seen a single valve. Figure 9 is the sketch of a cast from among a cluster that was found at Highgate : they appear to belong to a more gibbose, and perhaps curved species, but are not sufficient to decide from : the shell remains in part upon some of them in a very soft and friable state.

N. minima may possibly be young of *Arca minuta* of Brocchi, Vol. II. p. 482 ; but it is only striated, not sulcated ; and it differs from his *A. nitida*, in being rather gibbose than depressed, and not truncated.

TROCHUS punctatus.

TAB. CXCIH.—*Fig. 1.*

SPEC. CHAR. Conical, with straight sides, transversely striated; upper striæ upon each whorl crossed by oblique undulations, lower ones minutely granulated, a narrow band between the two sets.

VERY little higher than wide: the surface is tolerably even: the striæ are numerous; they are most prominent towards the upper parts of the whorls, where they are granulated by small oblique undulations: towards the apex the band is crossed by fine striæ.

From the inferior Oolite of Dundry, near Bristol.

TROCHUS elongatus.

TAB. CXCIH.—*Figs. 2, 3 and 4.*

SPEC. CHAR. Conical, elongated, transversely striated; striæ near the apex granulated; each whorl slightly undulated near the upper edge, with an obscure band below the middle; the inferior margin prominent.

BREADTH of the base two thirds the height; the striæ are less numerous, and the undulations larger but shorter than in the preceding: the sides of the whorls are slightly concave.

Very nearly allied to the preceding, but distinguished by the prominent margins of the whorls, and longer form. Found in the same stratum at Dundry. Mr. Braikenridge has in his cabinet a specimen $2\frac{1}{2}$ inches high, and two inches wide, being rather a broad variety.

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TROCHUS abbreviatus.

TAB. CXCIII.---*Fig. 5.*

SPEC. CHAR. Conical, shortened, transversely striated; striæ obscurely decussated by oblique lines of growth; inferior margin of each whorl very prominent, obtuse, with an obscure band above it.

BREADTH greater than the height; the prominent margins of the whorls are marked by semicircular lines; but they are not regular, being only lines of growth. The base is sharply striated.

This Trochus, and the two species above described, were sent me by George Weare Braikenridge, esq. who collected them at Dundry. I understand that they are not such perfect specimens as might perhaps be obtained at some future period, but I am anxious to make them public on account of their near resemblance to some Trochi found in a similar stratum in Normandy, of which I have given one or two of the products in illustration of Ammonites Braikenridgii. The Trochi I allude to have largely crenulated margins, which at once distinguish them; but one of them is characterized by sharp numerous elevated striæ, which cross the whorls obliquely on their upper parts, and in semicircles over the band and prominent inferior margin; there are vestiges of such striæ in the species before us, but the French shell differs also in having a greater number of transverse striæ, and being of a longer form, it is most like Trochus elongatus. They all have solid columellæ. It appears very remarkable to me, that strata agreeing together in their composition so closely should produce several shells resembling each other, but, as far as I have hitherto learnt, none are precisely the same. I wish to instigate further research. It is a circumstance corresponding with provincial differences among mankind; whether such differences among shells should be considered as specific, may remain a question.

NAUTILUS sinuatus.

TAB. CXCIV.

SPEC. CHAR. Thick, umbilicate, concentrically striated; side depressed, conical; front convex; aperture obtusely sagittate, truncated; the septa have a large sinus on each side.

THE most remarkable character of this Nautilus is, the large marginal rounded sinus or lobe on each side the septum: the septum is also much elevated towards the front. The striæ are nearly close together, moderately fine, and elevated: they gradually disappear towards the mouth. The inner whorls are wholly concealed, and few. The greatest diameter is equal to twice the thickness.

For the use of the only specimen I have seen of this, I suppose rare as well as remarkable shell, I am indebted to the well known author, Mr. Parkinson. It was found somewhere near Yeovil, but Mr. Parkinson is not acquainted with the exact locality. It appears to belong to the inferior Oolite: its chambers are lined with carbonate of lime stained with iron, and partly crystallized in acute rhombs. It is not broken so as to shew the situation of the siphunculus.

AMMONITES *Herveyi*.

TAB. CXCIV.

SPEC. CHAR. Gibbose, umbilicated, radiated ; margin of the umbilicus squareish ; radii numerous, sharp bi or tri-furcate ; aperture lunate, with obtuse angles.

THE inner volutions are almost concealed ; the small portion that is exposed is seen within a deep umbilicus, the sides of which are nearly straight from one whorl to another : the radii commence within the umbilicus, and having proceeded a small distance over the edge of it, and increased in thickness, they divide into two branches, and pass over the front, uniting again on the other side : it frequently happens, that the branches from one radius, instead of uniting again with each other, join the contiguous branches of two radii on the other side : sometimes there is a third branch which is free at one end. The thickness nearly equals half the diameter.

The larger specimen was found on the estate of the Earl of Bristol, near Spalden, in Lincolnshire : I have named it to commemorate the present enquiring and penetrating spirit of that noble family. The smaller is from Bradford : it has more of the structure of the shell remaining : they both appear to be from the lower Oolite. The outline is a section of the last whorl. Mr. Cumberland has sent me the same from Knowles Hill, in Somersetshire.

VENUS rustica.

TAB. CXCVI.

SPEC. CHAR. Sub-orbicular, gibbose, smooth ; anterior side obscurely defined, convex ; a thick lateral tooth within the anterior slope.

YOUNG shells of this species are nearly orbicular, if we may judge from the strong lines of growth, with a slight depression to distinguish the anterior side : as they advance in age they become rather more transverse. The hinge of the right valve is furnished with two thick teeth, which are united at their upper parts, and one elongated lamellar tooth ; these three are placed near the beak : at a distance from the beak on the anterior side is another tooth ; it is short, thick, and blunt. The lunette is cordate, obtuse, and not distinctly marked out.

The above description is taken from a single valve : it appears to be a full grown shell, and has been distorted in the latter part of its growth, as old shells frequently are, so as to make it oblong, and give it a tumid edge. There are marks of a Flustra that once covered its surface still remaining upon it. Its being strong and rather clumsy in its form has suggested its name. I am indebted to the Rev. Mr. Lambert, whose name I have had occasion formerly to mention, for the use of the specimen ; he obtained it from the Crag pits of —Woolnough, Esq. at Hollesley, Suffolk. I do not consider it properly arranged as a Venus ; but until some necessary divisions are made in that Genus, and in Lucina, to which it belongs more properly, it must remain there.

CARDITA? producta.

TAB. CXCVII.---*Fig. 1.*

SPEC. CHAR. Transversely oblong, gibbose, with six or seven angular longitudinal ridges; anterior side produced, plain.

THE length is about two-thirds the width: the ridges are highest towards the posterior half, and I suspect in the young shells they are tuberculated. The beaks are rather prominent. A cast from the inferior Oolite, near Bath, the Rev. H. Steinhauer. I have it young in Pisolite, from Chapel House, near Chipping Norton, given me by Mr. B. Clark; and also from Peterborough, in compact limestone, by favour of Mr. H. Jenkins.

 CARDITA? obtusa.
TAB. CXCVII.---*Fig. 2.*

SPEC. CHAR. Transversely obovate, recurved, gibbose, with from 7 to 10 longitudinal, nearly equal, tuberculated ridges.

THE anterior side is largest, obtuse, and plain; the slope above it is concave; the length is but little less than the width.

From the inferior Oolite, near Bath, and at Dundry, both casts: it was brought me from the latter place by Lady Wilson, whose zeal for collecting has seldom been equalled.

CARDITA? lirata.

TAB CXCVII.---*Fig. 3.*

SPEC. CHAR. Transversely oblong, gibbose, with 9 or 10 longitudinal tuberculated ridges; the ridge separating the posterior side is much the highest.

THE posterior side is well defined by a large ridge; it is convex, and has two or three tuberculated ridges passing over it; the anterior side is not so plain as in either of the other species upon this plate; the length is twice the width.

Occurs in the Lyas near Bath, from whence it was sent me by the Rev. H. Steinhauer, and also in the Cornbrash, as I learn from a mutilated specimen. On the Lyas specimen, part of the surface, formerly occupied by the shell, is now covered with a coat of calcarious spar, which shews that the shell was very thin.

 CARDITA? deltoidea.
TAB. CXCVII.---*Fig. 4.*

SPEC. CHAR. Very gibbose, obtusely triangular, with 8 or 9 longitudinal rugged ridges; anterior side pointed.

THE ridges are largest near the posterior part; they are very irregularly tuberculated: the beaks being prominent, and the anterior side pointed, give the triangular contour.

I have figured a specimen from Peterborough, cast in blue Lyas, and encrusted with Pyrites. I have another specimen in Cornbrash limestone, from Lechlade, in Gloucestershire. I have also a specimen nearly resembling it, but which may hereafter prove to be a distinct species, as it is flatter upon the posterior side, and is wider; it is in a ferruginous sandy limestone, from Kelloways Bridge; a portion of the shell remains upon it: it is thick, and is pearly beneath the outer coat.

These four species of *Cardita* have been long known by the appellation of Heart Cockles, and have been distinguished by their form, and the number of their ridges; both characters are liable to variation, but yet, the four species above described, may readily be recognized: it would have been fortunate had each been confined to a separate stratum. It is impossible to be certain of the Genus.

In Smith's Stratigraphical System of organized fossils mention is made of them under the generic name of *Cardium*, first in the Cornbrash, on p. 65, he describes the obtusa, and at letter *c* the lirata; and refers to them as the same that are found in the under Oolite, see p. 104. The *Cardita producta* is referred by him to the Fuller's earth rock. I have seen in Miss Benett's hands a specimen of the *C. producta*, from the inferior Oolite near Bayeux.

PHOLAS. *Linn.*

GEN. CHAR. A transverse bivalve, gaping at both extremities, with one or more accessory valves upon the back ; no shelly tube.

ONE or more accessory valves, an elongated tooth within each beak, and a more or less muricated surface, are characters that belong to a family of shells, the animals of which bore holes in stone or wood for protection: the *Pholas* of Linneus is the head of it: his *Teredo* also belongs to it: the first is extremely scarce in a fossil state, the latter very abundant: they are both confined to the newer strata. The recent *Pholades* may probably be divided into several genera, characterized by the form of the valves, or number of accessory plates: the shelly tube will always distinguish the *Teredo*.

 PHOLAS *cylindricus*.

TAB. CXCVIII.

SPEC. CHAR. Transversely elongated, nearly cylindrical ; posterior sides muricated, pointed, with a sinus in the edge ; beaks concealed by a reflexion of the edges of the back.

THE general form of this is a slightly compressed cylinder: the valves are transversely striated, and have many longitudinal elevations ; where these cross on the posterior half, are formed many sharp flat spines, but the other side is nearly smooth ; accessory valves have not been met with, but from the analogy it bears to *P. parva*, it should seem to be furnished only with one. It differs

from *P. parva* in its greater width, and the less degree of curvature of the posterior sinus; it is also smoother, and in some respects resembles *P. candida*.

The *P. Campechiensis*, referred to by Parkinson, at p. 198, Vol. III. is probably distinct.

I am indebted to Mr. Parkinson for the use of the specimens of this tender shell, found, rarely perfect, in Crag.

MUREX rugosus, var. (β).TAB. CXCIX—*Figs. 1 and 2.*

SPEC. CHAR. Elongated, subfusiform, transversely and uniformly striated; spire pointed, with about 12 longitudinal costæ; volutions ventricose; beak short, open.

SYN. Murex rugosus. *Parkinson, III. 64. t. 5. f. 16.*

ABOVE twice as long as wide: in this variety the last whorl is nearly free from costæ or undulations, it is drawn out into a short straight beak; the outer lip is thickened, but appears to have no striæ within its edge; aperture elliptical.

The larger specimen (fig. 1) is in Mr. Parkinson's collection; it is from the Crag, near Malden: the smaller one (fig. 2) I picked up at Plumstead from among sandy gravel.

MUREX costellifer.

TAB. CXCIX.—*Fig. 3.*

SPEC. CHAR. Subturritid, transversely striated, longitudinally costated; whorls rather ventricose; aperture ovate, expanded towards the beak; beak very short, spreading; costæ numerous, slender.

THERE are about 18 costæ or undulations around the spire: the striæ are sharp and numerous: the aperture is about as long as the shell is wide, that is, a little more

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than a third of its length : the slightly expanded lip is characteristic, it is entire.

A Crag shell from Malden, in Mr. Parkinson's collection.

MUREX echinatus.

TAB. CXCIX.---*Fig. 4.*

SPEC. CHAR. Turrited ; whorls round, reticulated, with acute tubercles upon the angles of the meshes ; outer lip striated within ; beak short.

SYN. Murex echinatus. *Brocchi*, 2, 423. t. 8. f. 3.

THE reticulated surface is produced by a number of longitudinal sharp ridges, crossed by transverse chords placed at about the same distance from each other, and equally elevated with the ridges ; at the points of their intersection they are raised into short angular spines ; the whorls are very round, the last one suddenly drawn out into the beak, which, though not long, appears to be more taper in the individuals before us than in those *Brocchi* described. The lip is thickened and furrowed internally. Length three times the width.

These specimens, which are smaller than the Italian ones, are from the Crag at Malden ; they are in Mr. Parkinson's cabinet. It is remarkable that the columella is wanted, or eaten out, a circumstance I have observed in some recent shells.

MUREX *curtus*.TAB. CXCIX.---*Fig. 5.*

SPEC. CHAR. Ovate, pointed, subventricose, longitudinally ribbed, transversely striated; aperture oval; beak short, recurved; whorls internally striated with elevated lines.

ABOUT twice as long as wide, with 12 rounded undulations or costæ upon each whorl; the striæ are sharp and rather distant, they are stronger upon the base; the beak is a little curved and open; the substance is thin, therefore the costæ appear as concave undulations within the whorl.

An interesting unique shell from the blue clay of Highgate Hill.

MUREX *gradatus*.TAB. CXCIX.---*Fig. 6.*

SPEC. CHAR. Ventricose, longitudinally ribbed, transversely striated; spire short, acute; costæ varicose above; aperture oval, with a short expanded beak.

THE enlargement of the costæ, which are about 10 in each round, produces a square appearance on the upper parts of the whorls, which seem to rise above each other like steps: the spire is small, and almost slender enough to be called mucronate. Width about two-thirds the length: the inner lip is smooth.

From Plumstead. I believe rare, as I have seen but one.

AMMONITES Banksii.

TAB. CC.

SPEC. CHAR. Discoid, very thick ; inner turns exposed ; sides concave, largely tuberculated ; front fluted, slightly convex ; aperture transverse, almost three times as long as wide.



A VERY bold formed shell ; the narrow sides of the whorls are much relieved from each other, they are convex, and occupied by about 10 large obtuse tubercles : the great width of the convex margin, which is obtusely fluted, gives the whole a very massive appearance. There are about five turns, the last but one is in diameter equal to the thickness of the whole.

In a valuable packet of fossils belonging to the inferior Oolite, sent by some disinterested friend at present unknown to me, from the west of England, was the ponderous mass represented in this plate ; it contains the ferruginous grains peculiar to that rock, with Belemnites, fragments of other shells, and also a piece of wood, changed almost into charcoal. I hope my friend will make himself known, and communicate the locality.

I have indulged my feelings of esteem and friendship, by giving this magnificent Ammonite the name of that staunch supporter of science in general, and of natural history in particular, who has presided so long and so ably over the Royal Society.

AMMONITES Blagdeni.

TAB. CCI.

SPEC. CHAR. Subcylindrical, obtusely fluted, umbilicate; umbilicus reaching to the margin, conical, with large radii terminating upon the edge in a tubercle; aperture transverse, quadrangular, three times as wide as long.

THE umbilicus is deep; it occupies the whole side; the tubercles round its edges, about 22 in each turn, are obtuse in the cast of the inside, but where there are some remains of the outer surface they appear to be spiniform, there are four or five furrows on the front to each; the front is very slightly convex.

A massive specimen from the lower Oolite, containing Belemnites, other Ammonites, &c.: it was given me by my lamented friend, Dr. J. C. Lettsom. I have named it after the highly discerning, meritorious, yet most unassuming Sir Charles Blagden. The analogy between this and the preceding, may remind conchologists of the long cordial friendship, subsisting between Sir Charles and Sir Joseph Banks.

AMMONITES Brocchii.

TAB. CCII.

SPEC. CHAR. Compressed; sides hollow, radiated; inner whorls half concealed; front circular, with many obtuse ridges; aperture lunate.

VOLUTIONS three or four, very round; twenty radii extend nearly half over them, the rest of their surface is covered by nearly six times as many obtuse, arched, not very prominent ridges. Were the hollow sides considered as umbilicate, the umbilicus would be conical but would have no defined edge; the aperture is lunate, inclining to transversely elliptical. Thickness half the diameter. The septa are remarkably numerous, and finely sinuated.

From the same friend, and probably from the same place, although of a greyer colour, as *A. Banksii*, I received the large specimen; it seems to have been exposed to the weather.

The small specimen is from Dundry, by favour of G. W. Braikenridge, Esq.

The name is to commemorate the author of a recent valuable work upon the fossil shells of his own country.

VENUS lentiformis.

Cytherea, Lam.

TAB. CCIII.

SPEC. CHAR. Orbicular, depressed, with concentric, reflected, minute, imbricated, ridges; anterior slope depressed, terminated by an angle in the margin.

SYN. *Venus exoleta. Parkinson III. 189.*



A SHELL that at first sight might be taken for the *Venus exoleta*, from which it is distinguished by the flat space upon the anterior slope, and the angle upon the margin. The striæ are few and much elevated near the anterior slope, but soon are doubled, or even trebled, as they proceed: upon comparison it is found to be thinner, flatter, more closely striated, and rounder on the posterior side. The lunette is also more pointed with straight sides.

From the Crag of Essex and Suffolk, Mr. Parkinson's cabinet.

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CORRIGENDA.

- Page 13, line 3, for " α " read β .
 42, line 10, add TAB. CXX.
 61, "CERITHIUM pyramidalis" read *CERITHIUM pyramidale*.
 Pages 77, 79, and 81 to 88 descriptive of tabs. 133 to 138 read 73, 75 and 77 to 84.
 Page 88, line 14, add and 8.
 95, "TROCHUS similis" read *TROCHUS anglicus*; so named to distinguish it from a French shell extremely like it, and to avoid a repetition of the name similis.
 124, "UNIO hybrida" read *UNIO hybridus*.
 126, line 27, dele "and 4."
 129, last line, "Neotts" read *Neots*.
 179, line 2, "Fig. 2" read *Fig. 1*.
 201, line 7 from the bottom "CXXXIX" read *CLXXXIX*.

I am informed by Miss Benett that it is the Chalk marl, and not the lower or hard Chalk that is characterized by the *AMMONITES varians*, Tab. 176; it has, however, been found in the hard Chalk, see page 169.

ADDITIONAL LOCALITIES TO SHELLS
DESCRIBED IN VOLS. I. AND II.

For the following localities I am indebted to Mr. Holloway. I trust that I shall be enabled to extend a list so important to Geologists, at some future period.

Cardium Plumsteadiense, *Tab. 14*, fragments are found at Stubbington.

Cassis carinatus, *Tab. 6*, Stubbington.

Dentalium cylindricum, *Tab. 79*, Sand pits, Emsworth Common.

Dentalium entalis, *Tab. 70*, Stubbington, filled with pyrites.

Fusus longævus, *Tab. 63*, ditto, small.

Melania sulcata, *Tab. 39*, Bricklesham Bay, Sussex.

Natica depressa, *Tab. 5*, East Cowes, Isle of Wight.

Pecten quinquecostata, *Tab. 56*, Emsworth, in Flint.

Pectunculus costatus, *Tab. 27*, Stubbington, worn.

Rostellaria? *lucida*, *Tab. 91*, ditto.

Scalaria acuta, *Tab. 16*, ditto.

Trochus Benettiæ, *Tab. 98*, ditto.

Turritella conoidea, *Tab. 51*, Bricklesham Bay.

Venericardia planicosta, *Tab. 50*, Stubbington.

Voluta spinosa, *Tab. 115*, ditto.

The *Chama digitata*, *Tab. 174*, has been found by Prof. Hailstone, at Huntcliffe, near Redcar, N. of Whitby, Yorkshire.

A SUPPLEMENTARY INDEX TO VOL. II.

Arranging the Shells described therein according to the several Strata in which they were found imbedded, from the newest towards the oldest in the British Series.

INSTEAD of any prefatory remarks of my own, I will insert the following Letter, received from my kind friend Mr. Farey, viz.

SIR,—I beg to apologize to your numerous and highly respectable Correspondents and Readers, for my delay in furnishing the Stratigraphical Index, sent herewith. I had foreseen, since the perusal of my friend *Mr. Smith's* "Stratigraphical System," Part I. and the three first numbers of his "Strata Identified," that a great deal of care and pains were necessary, (for which I could not until lately spare the time,) in collating these works of his, with the whole of the stratigraphical information contained in all your published numbers of "Mineral Conchology," before Indexes, at all satisfactory, could be made out, for you and Mr. Tilloch, such as I had imperfectly done at the conclusion of your first volume, in September, 1815.

I was in hopes, that by some delay, my labour in hunting through maps *for the situations* of a considerable portion of *the places* mentioned in your's and *Mr. Smith's* works, might ere this have been greatly shortened, by a reference to the manuscript Index which my valued friend, the able and indefatigable *Mr. Arrowsmith*, of Soho Square, has for near two years been preparing; and which is intended to contain *every Name*, of towns, villages, farms and cottages, mills, mines, collieries and quarries, rivers, streams, and water-falls, bays, headlands, cliffs, and light-houses, mountains, hills and valleys, parks, forests and woods, &c. &c.; together with the district names, &c. which are to be found, not only

in his own large and unparalleled *Map of England and Wales*, but also in all the largest county maps, local maps of canals, roads, mining districts, &c. &c. which either his own large collection contains, or to which he can have access, through the kindness of the friends of science: unfortunately, however, for me, this great *Index to Localities*, although all the names from printed maps were collected out, (and ascertained by bearings and distances,) and it is now rapidly proceeding towards its final revision and completion, it has not been in a state for me to consult it, as otherwise the kindness and liberality of Mr. A. would have permitted, prior to its publication, which now will soon take place, with the addition of the population, and a *blank column* for future corrections and additions, and to enable this volume to be made by scientific, curious, or travelling persons, into an *Universal Index to Localities in South Britain!*

In my Stratigraphical Index to Vol. I., I took the liberty of placing 33 notes of interrogation (? see Phil. Mag. Vol. XLVI. p. 212, note,) after as many species of shells, which had (by *the places* mentioned in that volume) been referred to *other strata*, besides that particular stratum, in which I concluded, from your descriptions, that the specimen drawn and actually described, had been found entombed. I could not hope, at the time of making these first stratigraphical arrangements of the shells and localities which you had described and mentioned, that I could escape errors: I regret, however, to find, now that further information is afforded, that they are so numerous as I find them to be; and more so, that the means do not at present exist of correcting many errors, which doubtless yet must remain, in that and the present Supplementary Index, after all that I can at present do; or, until your kind and generous friends and contributors send you up, either as gifts or

loans, a far greater number of individual shells, diversified as much as possible as to their localities, and not forgetting in any instances to name and precisely describe these localities; without which additions, fossil shells are of no real value for improving the present infant state of geological knowledge.

In the extended comparison of shells, named by you or Mr. Smith, with their places and strata, to which I have already alluded, I have been concerned to find, according to the best opinion I can form, from the local facts mentioned by you and Mr. Smith regarding them, and what I know of the ranges of the several strata, and of the distribution of fossil shells in their peculiar beds, from the experience I have gained in such quarries, banks, pits, canals, wells, &c. which produce them, almost throughout Great Britain, that no less than 104 of the shells (including some varieties) already named or described in the three works mentioned, should, for useful geological purposes, be made to form 279 species, each with its own compound name; or at least, that these 279 shells of as many distinct beds* of the strata (excepting here any errors in the recorded facts) should be distinguished, by the usual addition of Greek letters, as distinct varieties. This latter plan I have adopted in the Stratigraphical Index to Vol. II. instead of merely adding ?'s, as I did in the former Index; and for the information of your Readers hereon, I beg the favour of you to insert as follows, the names of all the described shells, &c. which as far as I can yet judge, require these marks, to distinguish the varieties of different strata, viz.

* It may be proper to keep in view, that I mean by this term, (as all practical men do) the thinnest natural divisions of Strata; and not in any case thick masses, or whole mountains, although of one mineral species, as some writers imply by its use.

	Varieties or Species?		Varieties or Species?
AMMONITES		Murex	
<i>Calloviensis</i>	2	<i>rogosus</i>	2
<i>communis</i>	4	<i>Mya</i>	(92) 3
<i>concauus</i>	2	<i>Natica glaucinoides</i>	2
<i>elegans</i>	2	<i>Nautilus intermedius</i>	2
<i>ellipticus</i>	2	<i>lineatus</i>	2
<i>Herveyi</i>	2	<i>Ostræa acuminata</i>	4
<i>modiolaris</i>	2	<i>crista-galli</i>	6
<i>Nutfieldiensi</i> s.....	2	<i>deltoides</i>	5
<i>planicosta</i>	3	<i>gregarea</i>	2
<i>splendens</i>	2	<i>Marshii</i>	2
<i>striatus</i>	2	<i>rugosa</i>	2
<i>tuberculatus</i>	2	<i>Patella latissima</i>	2
<i>Walcotii</i>	5	<i>Pecten arcuatus</i>	2
.....(SS p. 58, &c.)	2	<i>fibrosus</i>	7
.....(111)	2	<i>quinquecostatus</i>	2
.....(111)	2	.....(73)	2
<i>Astarte ovata</i>	4	<i>Perna aviculoides</i>	2
<i>Avicula costata</i>	7	<i>Plagiostoma gigantea</i>	3
<i>Cardita?</i> <i>deltoides</i>	2	<i>spinosa</i>	3
<i>lirata</i>	2	.....(8)	2
<i>obtusa</i>	2	<i>Planorbis euomphalus</i>	3
<i>producta</i>	3	<i>Pleurotoma rostrata</i>	2
<i>Cerithium cornucopiæ</i>	2	<i>Productus aculeatus</i>	2
<i>melanoides</i>	2	<i>Rostellaria</i>	(58) 2
<i>Chama digitata</i>	2	<i>Scaphites obliquus</i>	2
.....(45)	2	<i>Serpula crassa</i>	3
<i>Cidaris diadema</i>	2	.....	(41) 2
.....(19)	2	<i>Spatangus subglobosus?</i>	2
.....(33)	3	.....(20)	2
.....(53)	2	<i>Terebratula biplicata</i>	(3) 2
.....(69)	3	<i>carnea</i>	2
<i>Clavícula cucumerina</i>	2	<i>crumena</i>	3
<i>Clypeus sinuatus</i>	2	<i>digona</i>	3
.....(54)	5	<i>intermedia</i>	4
<i>Conulus</i>	(70) 3	<i>lateralis</i>	2
<i>Ellipsolites funatus</i>	2	<i>obsoleta</i>	8
<i>Euomphalus catillus</i>	2	<i>ornithocephala</i>	5
<i>Gryphæa dilatata</i>	7	<i>subrotunda</i>	3
<i>incurva</i>	3	<i>subundata</i>	2
.....(117)	2	<i>Trigonia clavellata</i>	7
<i>Helix</i>	(49) 2	<i>costata</i>	6
<i>Lima gibbosa</i>	2	<i>cuvirostra</i>	2
<i>Mactra gibbosa</i>	2	<i>Trochus</i>	(41) 2
.....(91)	2	<i>Turbo</i>	(41) 2
<i>Madrepora flexuosa?</i>	3	<i>Turritites costatus</i>	2
<i>porpites</i>	3	<i>Turritella conoidea</i>	2
<i>Melania Heddingtonensis</i>	2	<i>Unio acutus</i>	2
<i>striata</i>	3	<i>Listeri</i>	3
<i>Modiola bipartita</i>	2	.....(89)	2
<i>depressa</i>	2	<i>Venus equalis</i>	2
.....(64)	3	.....(61)	2
<i>Murex latus</i>	2	<i>Vivipara fluviorum</i>	2

Where *dots* are used in the above list, in the place of the *specific* or trivial name, reference is intended, to those species, which, although not *named* by Mr. Smith in his Strat. Syst. are by his references therein, described, as being of *the same species*, in two or more strata; and in parenthesis I have added, the first of his pages, in which each of such shells occur.

For an early number of the "Philosophical Magazine," it is my intention to communicate to Mr. Tilloch, the particulars of the *strata* and *places*, of each of the above 279 shells, with references to Min. Conch. and to Mr. Smith's two works on fossil shells; and I intend to accompany the same by a few general remarks, as to the great use and importance of fossil shells, in untheoretical and useful geology. I am extremely desirous of calling the attention of your Readers, and of requesting them to contribute all they can, in the way of *additional specimens*, and more precise localities, &c.* from the former and from new places of the shells in the above list, particularly the Ammonites, Terebratula, Ostrea and Gryphites, Cardita? Trigonia, Plagiostoma, Unio, Pecten, &c.

I have prepared, and shall in a few days send to Mr. Tilloch, (as I did on the conclusion of your first volume,) a List of the PLACES, alphabetically arranged, and *their situations*, from whence the shells described in Vol. II. are mentioned to have been obtained, *the stratum* at each

* Where several species or varieties of shells occur in the sinking of any particular quarry, well, pit, &c. or in the face of any cliff or bank, it would be of vast importance to know, their relative places and *heights above each other*; because this order will be found invariable, in different places, after making allowance for those particular species, which were the contemporaries of one or more shorter lived species.

place, as shewn by Mr. Smith's "Map of the Strata," published by Mr. Cary, (as correctly as the want of bearings and distances, &c. in so many instances would now permit of being done,) and the *species and varieties of shells* at each place, with references to the plates and figures in *Min. Conch.*

Conceiving your excellent work, to be contributing in a very eminent degree to the solid advancement of geological knowledge, I am very desirous to see it proceed more rapidly, by appearing *Monthly*; and I hope, not only that your present subscribers would approve this change, but that many new subscribers from amongst liberal and well-informed land-owners, and country Gentlemen and Ladies, would be attracted, by such an announcement of more speedy publication.—Wishing every success to your useful undertakings, for promoting a more intimate acquaintance with the works of the all-wise and beneficent Creator,

I remain,

Your obedient humble servant,

JOHN FAREY, Senr.

37, Howland Street, Fitzroy Square,
26th September, 1818.

A Stratigraphical List of STRATA, SHELLS, and PLACES, by Mr. John Farey, Sen.

ALLUVIA, or moved ruins of Strata

Gryphæa dilatata *rar* ϵ , *tab* 149, Pakefield Gravel Pit

Patella latissima β , t 139, f 5, Pakefield ditto

COWES Rock of Limestone; or pretended *fresh-water Formation!* of some Writers.

Helix globosus, t 170, Shalcomb?

Lymnæa fusiformis, t 169, f 2 and 3, Cowes

minima, t 169, f 1, Cowes

Phasianella angulosa, t 175, f 2, Shalcomb?

minuta, t 175, f 3, ditto

orbicularis, t 175, f 1, ditto

Planorbis cylindricus, t 140, f 2, Cowes

euomphalus, α , t 140, f 7, ditto

lens, t 140, f 4, ditto

obtusus, t 140, f 3, ditto

LONDON CLAY, upper part, with Ludus Helmontii (*dun blue* in Mr. Smith's Map.)

Auricula simulata, t 163, f 5 to 8, Barton and Highgate

turgida, t 163, f 4, Highgate

Cardium semigranulatum, t 144, Barton, Regent's Park, and [White Conduit House

Cerithium cornucopiæ α , t 188, f 1, 3, and 4, Stubbington (beach)

dubium, t 147, f 5, Stubbington

funatum, t 128, Hordle, and Newhaven Castle-bill

geminatum, t 127, f 2, Barton

giganteum, t 188, f 2, Stubbington, and Grignon

pyramydale, t 127, f 1, Barton, Hordle, and near [Paris

Murex carinella, t 187, f 3 and 4, Barton

coniferus, t 187, f 1, Highgate

curtus, t 199, f 5, ditto

fistulosus, t 189, f 1 and 2, Barton

regularis, t 187, f 2, ditto

tubifer, t 189, f 3 to 8, ditto, Grignon, and Highgate

Nucula minima, t 192, f 8 and 9, ditto, ditto

similis, t 192, f 3, 4, and 10, Barton, Highgate, and [near Paris.

trigona, t 192, f 5, Barton

Pleurotoma acuminata, t 146, f 4, Highgate

attenuata, t 146, f 1, Stubbington

colon, t 146, f 7 and 8, Barton

comma, t 146, f 5, Stubbington

exorta, t 146, f 2, Barton

rostrata α , t 146, f 3, ditto

semicolon, t 146, f 6, Stubbington

Sanguinolaria Hollowaysii, t 159, Bracklesham Bay

Venus incrassata, t 155, f 1 and 2, Brockenhurst

Voluta ambigua (*monstrosa*) t 115, f 5, Barton

luctator, t 115, f 1, Barton, near Paris, and Richmond [Well

spinosa α , t 115, f 2 and 4, Barton

— β , t 115, f 3, Barton, near Paris, and Stubbington

- Crag Marl,* or soft Limestone, in or on ? the London Clay (*light brown*).
- Astarte obliquata, t. 79, f 3, Holywell
 - plana, t 179, f 2, Bramerton, perhaps Alluvial?
 - Buccinum elongatum, t 110, f 1, Walton le Soken
 - granulatum, t 110, f 4, Holywell
 - reticosum, t 110, f 2, ditto
 - rugosum, t 110, f 3, ditto
 - Cassis bicatenatus, t 151, Bawdsey Cliff
 - Gryphæa incurva β , t 112, f 2, at Birdbrook, Alluvial?
 - Mactra arcuata, t 160, f 1 and 6, Holywell
 - cuneata, t 160, f 7, Bramerton
 - dubia, t 160, f 2 to 4, Holywell and Woodbridge
 - ovalis, t 160, f 5, Suffolk
 - Murex costellifer, t 199, f 3, near Malden
 - echinatus, t 199, f 4, ditto
 - rugosus β , t 199, f 1, ditto
 - striatus α and β , t 109, Holywell (I. p. 61)
 - Nautilus intermedius β , t 125, Birdbrook, and Culford Hall
 - Nucula Cobboldiæ, t 180, f 2, Bramerton, Holywell, and
 [Roydon Green
 - lanceolata, t 180, f 1, Bawdsey
 - lævigata, t 192, f 1 and 2, Holywell, and Woodbridge
 - Patella equalis, t 139, f 2, Holywell
 - unguis, t 139, f 7 and 8, ditto
 - Pholas cylindricus, t 198, Walton le Soken
 - Tellina obliqua, t 161, f 1, and m, Aldborough, Holywell, Nor-
 [folk, and Suffolk
 - obtusa, t 179, f 4, Bramerton, Roydon Green, and
 [Woodbridge
 - ovata, t 161, f 2, Bramerton, Framlingham, and Suffolk
 - Trochus lævigatus, t 181, f 1, Holywell
 - similis, t 181, f 2, ditto
 - Unio crassiusculus, t 185, Bawdsey Cliff
 - Listeri γ , t 154, f 1, Roydon Green, and Suffolk
 - Venus gibbosa, t 155, f 3, in Suffolk
 - lentiformis, t 203, Suffolk, and Walton, (Essex Cliff)
 - rustica, t 196, Hollesley
 - Voluta Lamberti, t 129, Aldborough, Bawdsey, Harwich, and
 [Holywell
- LONDON CLAY, lower part, with Woolwich Loam and chert nodules, Pot-
ter's Clay, &c. (*brown*).
- Cerithium funiculatum, t 147, f 1 and 2, Plumstead, (with cherts)
 - intermedium, t 147, f 3 and 4, Charlton
 - melanioides α , t 147, f 6 and 7, ditto, New Cross,
 [Newhaven, Castle hill, and Southfleet
 - Cyclas cuneiformis, t 162, f 2 and 3, Charlton, New Cross, Plum-
 [stead, and Wight Isle
 - deperdita ?, t 162, f 1, Charlton, near Paris, Plumstead,
 [and Woolwich
 - obovata, t 162, f 4 to 6, Barton, Charlton, New Cross,
 [and Plumstead
 - Gryphæa dilatata α , t 149, f 1, Bennington, Coney Weston, and
 [Suffolk

* In page 67 a sketch of the "District of Crag Pits" is given, and the following places mentioned, besides those already enumerated in these two volumes, as localities of the Crag shells described, viz. Balstead, Brightwell, Foxhall, Melton, Shotisham, Sudbourn, and Wberstead heath.

LONDON CLAY, &c.

- Murex gradatus, t 199, f 6, Plumstead
 rugosus γ , t 199, f 2, ditto
 Ostrea deltoidea β , t 148, Lopham, and near Paris
 Planorbis hemistoma, t 140, f 6, Plumstead

CHALK, upper, soft, flinty (*green*, mostly light).

- Magas pumilus, t 119, Mundesley
 Ostrea canaliculata, t 135, f 1, ditto
 Terebratula octo-plicata, t 118, f 2, Lewes
 plicatilis, t 118, f 1, Margate, and Northfleet

CHALK, lower, hard, flintless, but containing fine silicious grains, and Totternhoe, Ryegate or Fire Stone, (*green*, mostly deep).

- Ammonites rusticus, t 177, Comb Pyne

CHALK MARL, loamy or earthy Chalk, with chalky hard beds, or Clunch, red Cawk, &c. (*white*, No. 2.)

- Ammonites rostratus, t 173, Roak
 splendens α , t 103, f 1 and 2, Folkstone N E
 varians, t 176, Hamsey, Plumpton, and Wilts
 Cerithium melanioides β , t 147, Hamsey
 Cirrus plicatus, t 141, f 3, Folkstone, N E
 Hamites armatus, t 168, Roak, and Sussex
 Nautilus Comptoni, t 121, Earl Stoke
 elegans, t 116, Norton-Bavant and Ringmer
 Nucula pectinata, t 192, f 6 and 7, Dover SW, Folkstone N E,
 [and Sussex
 Patella lævis, t 139, f 3, Folkstone N E
 Pecten Beaveri, t 158, Childrey, and Hamsey

GREEN SAND, chloritic, micaceous sometimes, loamy (sometimes yellow, brown, or red) with Fuller's Earth, and Sulphate of Barytes, (*white*, No. 2.)

- Ammonites auritus, t 134, Devizes in the Canal
 inflatus, t 178, Under Cliff
 monile, t 117, Sandgate
 Nutfieldiensis α , t 108, Hythe, and Nutfield
 Auricula incrassata, t 163, f 1 to 3, Blackdown
 Cardita? tuberculata, t 143, Devizes in the Canal
 Cardium proboscideum, t 156, f 1, Blackdown
 umbonatum, t 156, f 2 to 4, ditto
 Chama digitata α , t 174, Long-Comb Girts
 Helix gentii, t 145, Devizes in the Canal
 Nautilus simplex, t 122, Boreham
 Ostrea gregaria α , t 111, f 1, near Devizes
 Pecten orbicularis, t 186, Devizes in the Canal
 Planorbis euomphalus γ , t 140, f 8, Haldon Hills
 radiatus, t 140, f 5, ditto
 Pleurotoma rostrata β , t 146, f 3, Devizes in the Canal
 Terebratula Lyra, t 138, f 2, Chute Farm
 pectita t 138, f 1, Horningsham

BRICK EARTH, or Blue Marl Clay, on Woburn Sand (*blue green*, No 3).

- Ostrea acuminata β , t 135, f 2, Withyham ?

PORTLAND ROCK, Aylesbury, Swindon, Purbeck, Kentish Rag, &c. Limestone; sometimes it has beds as white as Chalk, see pp. 58 and 59, (*bright blue.*)

Ammonites excavatus, t 105, Dry-Sandford, Marcham, and [Shotover Hill
giganteus α , t 126, Chicks Grove Quarry, Fonthill SE,
[and Purbeck

— β , t 126, Chicks Grove Quarry
plicatilis, t 166, Dry-Sandford, and Marcham
vertebralis, t 165, ditto, ditto

Astarte cuneata, t 137, f 2, Chicks Grove Quarry, and Chilmark
Gryphæa dilatata β , t 149, f 2, Adlington Hills?, Bromham
(Wilts), Portland Isle, Radipole, and Rude Cliff

Plagiostoma rigida, t 114, f 1, Shotover-Hill Quarry
Unio Listeri α , t 154, f 3 and 4, New Malton, and Seamer

OAK-TREE CLAY, of Thame, &c. hard, blue, with nodules of stoney Marl, and with Selenites, and Pyritic Fossils, bitumenized Wood, &c. *Sussex Marble* in its lower part? (*blue.*)

Astarte lineata, t 179, f 1, Headington Common
Ostrea deltoidea α , t 148, Cambridge N, and Headington Com-
[mon or Shotover Hill

CORAL RAG, and Pisolite under it; perhaps sometimes wanting, in or on the Woburn Sand? (*orange.*)

Ammonites splendens β , t 103, f 3, Westbrook
Ostrea gregarea β , t 111, f 3, ditto

CLUNCH CLAY, with beds near its top of Chalk-like Clunch, or Dogger Stone, on Alum Shale (*dun purple.*)

Ammonites Duncani, t 157, St. Neots
Gryphæa dilatata γ , t 149, Bourn, Calne W, Ilminster S, Sand-
[foot Castle, and Woburn N

Ostrea deltoidea γ , t 148, Sandfoot Castle
palmetta, t 111, f 2, Marston Field
Patella latissima α , t 139, f 1 Bolingbroke

ALUM SHALE of Whitby, &c. imbedding Cement Balls, Jet, &c.

Ammonites angulatus, t 107, f 1, Lyth, near Whitby
communis α , t 107, 2 and 3, near Whitby
Walcotii β , t 106, ditto
Patella lævis, t 139, f 4, ditto

KELLOWAY STONE, at Staiths, &c. with blue hard Cores, under Selenitic Clay (*deep purple.*)

Ammonites Calloviensis α , t 104, Kelloway's Bridge
Cardita? deltoidea β , t 197, f 4, ditto
Chama digitata β , t 174, Huntcliffe
Gryphæa incurva γ , t 112, f 2? Chatley
Pecten fibrosus γ , t 136, Kelloway's Bridge
Plagiostoma obscura, t 114, f 2, ditto

CORNERASH, or Bedford Limestone (*brown.*)

Ammonites Herveyi α , t 195, u, near Aswarby (not Spalden)
Cardita? deltoidea α , t 197, f 4, Lechlade N, and Peterborough
lirata β , t 197, f 3
producta β , t, 197, f 1, Peterborough
Pecten fibrosus α , t 136, f 2, Chatley

FOREST MARBLE (of Whichwood) Stunsfield and Collyweston grey Slate, or Tilestones, with Bones, and Vegetable Impressions! (*light blue*, No 6.)

Patella rugosa, t 139, f 6, Amberley Heath, and Hampton
[Common]

CLAY UPON UPPER OOLITE, (*white*, or light yellow.)

Ostrea acuminata α , t 135, f 2, near Bath E

UPPER OOLITE, great or superior Oolite, Bath Free Stone (*yellow*, No. 7.)

Pecten fibrosus β , t 136, f 2, Northleach

Plagiostoma cardiiformis, t 113, f 3, Petty-France

FULLER'S EARTH ROCK, lead-coloured, dark and purple Clay, occasioning great land *Slips* (*white*, No. 8, 9, and 10.)

Ostrea acuminata γ , t 135, f 3, Aynhoe

Plagiostoma ovalis, t 114, f 3, Small-Cossall

UNDER OOLITE, inferior or lower Oolite (*reddish orange*, No. 12.)

Ammonites Banksii, t 200, Sherborne*

Blagdeni, t 201, ditto*

Braikenridgii, t 184, Dundry Hill

Brocchii, t 202, Dundry, and Sherborne*

Brongniarti, t A, f 2, p 190, Bayeux, and Yeovil

Gervillii, t A, f 3, p 189, Bayeux

Herveyi β , t 195, lo. Bradford, and Knowles Hill

Stokesi, t 191, near Bridport? (in Marl)

Walcotii γ , t 106, Mitford, and White Lackington

Astarte elegans, t 137, f 3, Babling Hill?

lurida, t 137, f 1, Fox Hill?, and Taunton

Cardita? *obtusa* α , t 197, f 2, Bath, and Dundry

producta α , t 197, f 1, Bath, near Bayeux, and Chapel-
[house]

Cirrus nodosus, t 141, f 2, Yeovil

Gryphæa dilatata ζ , t 149, f 1, Farley Gate

Lima gibbosa α , t 152, near Bath, Cotswold Hills, and Taunton

Nautilus obesus, t 124, Norton under Hamdon

sinuatus, t 194, near Yeovil

Pecten equivalvis, t 136, f 1, Carrington, Dursley, Farley Gate,
[Ilminster, and White Lackington]

fibrosus η , t 136, f 2, Carrington

Planorbis euomphalus β , t 140, f 8 and 9, near Bath

Terebratula acuta, t 150, f 1 and 2, France, Ilminster, and Stan-
[ton Hill]

resupinata, t 150, f 3 and 4, Ilminster

Trochus abbreviatus, t 193, f 5, Dundry

concavus, t 181, f 3, Little Sodbury

dimidiatus, t 181, f 1 and 4, ditto

duplicatus, t 181, f 5, ditto

elongatus, t 193, f 2 to 4, Dundry

punctatus, t 193, f 1, ditto

MARLSTONE, in blue Marl, or upper Clay of the Lias, producing a district of Ant-hilly pastures, (*faint blue*, No. 14.)

Ammonites Walcotii α , t 106, near Bath

* The REV. MR. RACKET kindly and disinterestedly sent these three species of *Ammonites* to Mr. Sowerby, from Sherborne.

Blue LIAS, water-setting, beddy Limestone, with Bones of large Fish (often mentioned as Crocodiles,) &c. &c. (*deep blue*, No. 15.)

- Ammonites Brookii, t 190, Lyme Regis N E
 Bucklandi, t 130, near Bath W
 Conybeari, t 131, Bath W
 fimbriatus, t 164, Lyme Regis N E
 Greenoughi, t 132, Bath W
 Henleyi, t 172, Lyme Regis N E
 Loscombi, t 183, Lyme Regis N E
 obtusus, t 167, Lyme Regis N E
 Cardita? lirata α , t. 197, f 3, Bath W
 Gryphæa incurva α t 112, f 1, Bath W, Framilode, and Frethern
 obliquata, t 112, f 3, Donat's Castle
 Nautilus intermedius α , t 125, Keynsham
 striatus, t 182, Lyme Regis NE
 truncatus, t 123, Bath W, and Keynsham
 Plagiostoma pectinoides, t 114, f 4, Pickeridge Hill (in Clay)
 punctata, t 113, f 1 and 2, Barry Island, Cardiff
 [Castle, Donat's Castle, and Pickeridge Hill
 Trochus Anglicus, t 142, Bugthorp, Weston, White Lackington,
 [and Yeovil
 Unio crassissimus, t 153, Bath W (in Clay)

YELLOW LIMESTONE, buff or magnesian Limestone, with blue mild beds near the bottom? (Derby Rep. l. 157, II. 409) (*bright blue*.)

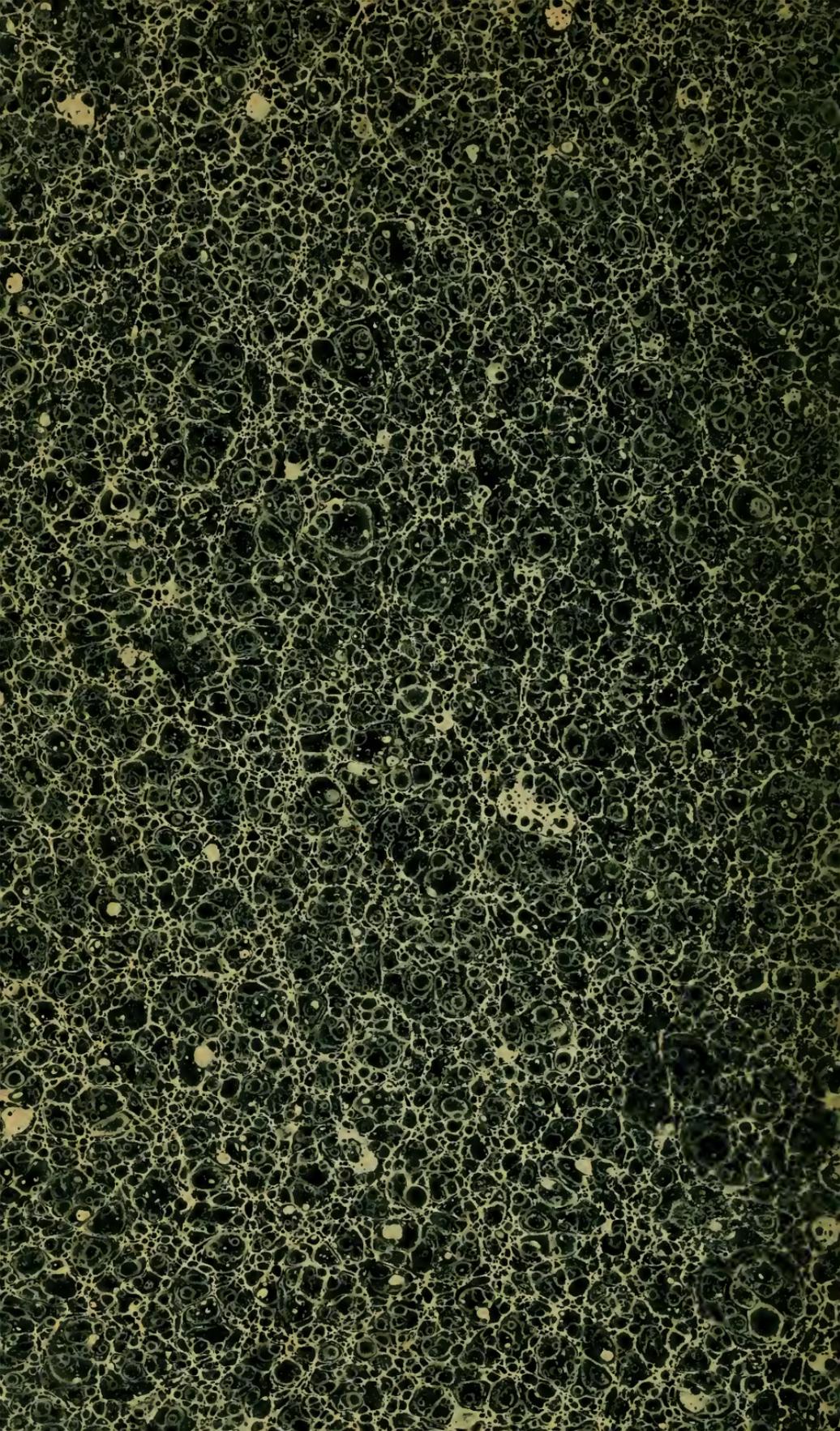
- Unio hybridus, t 144, f 2, Nottinghamshire
 Listeri β , t 154, f 1, 3 and 4, Durham.

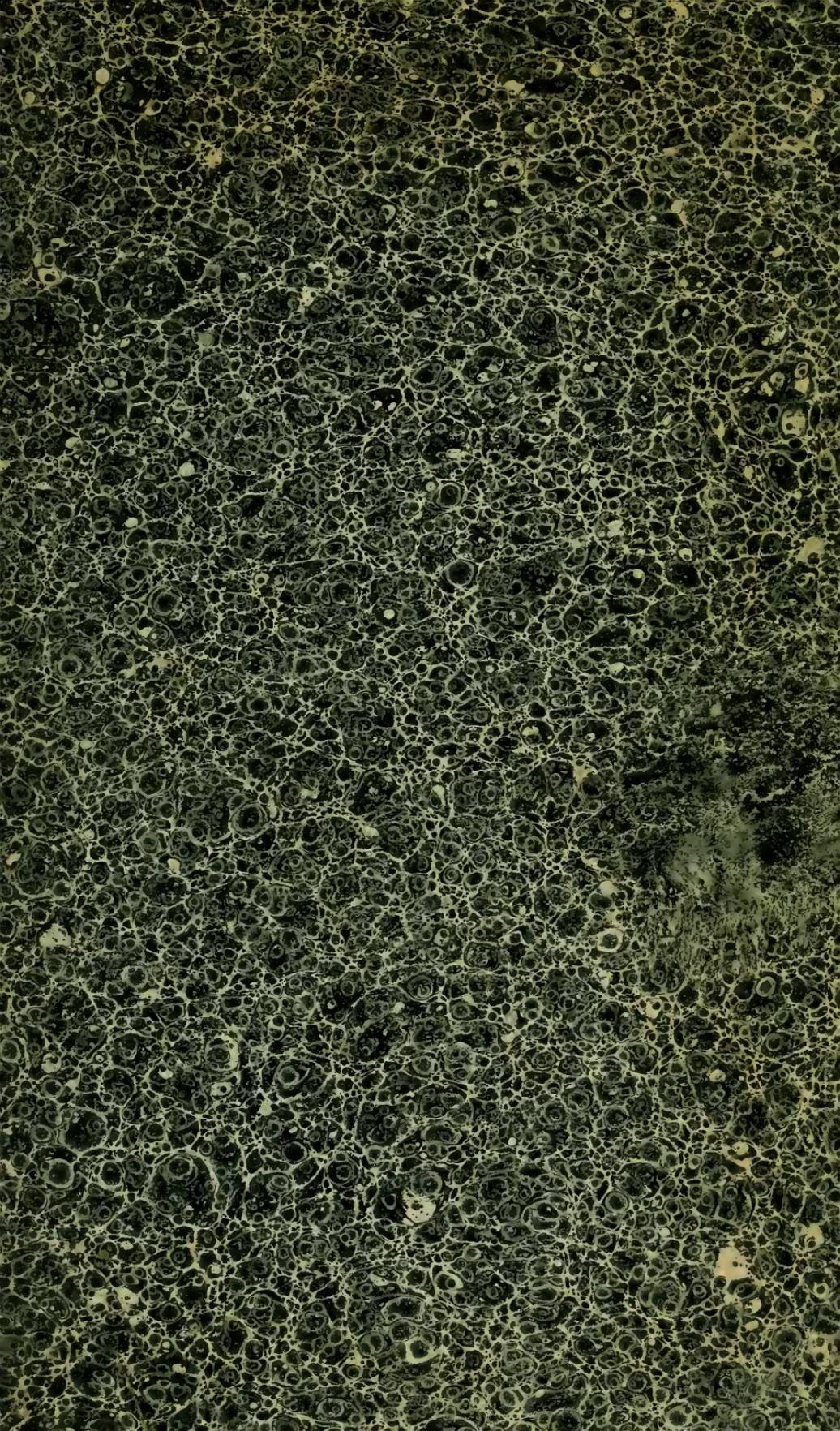
COAL MEASURES, Carboniferous Strata (*India Ink*.)

- Ammonites Walcotii δ , t 106, Colebrook Dale, (in Shale or Blae) and Trent River?

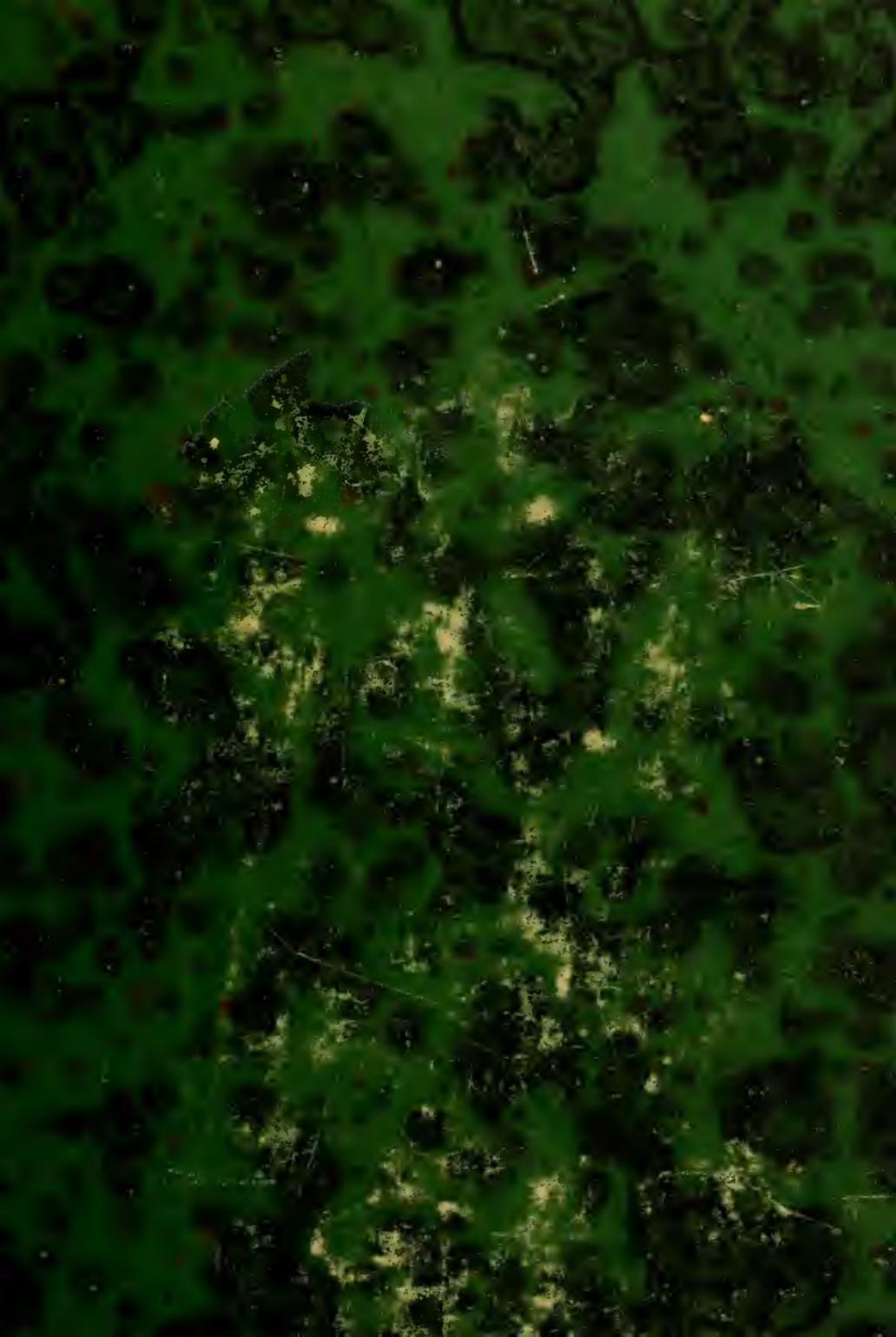
DERBYSHIRE PEAK LIMESTONE, *mountain* or metaliferous Limestone, sometimes interlaid with Basaltic strata, and sometimes with poor or barren Coal Measures (*purple blue*.)

- Ammonites Walcotii ϵ , t 106, Llantrissant, and Devonshire.
 Cirrus acutus, t 141, f 1, Derbyshire
 Gryphæa dilatata η , t 149, Bramberry Hill
 Helix? cirriformis, t 171, f 2, Derbyshire
 striatus, t 171, f 1, Derbyshire
 Orthocera annulata, t 133, Colebrook Dale
 Planorbis equalis, t 140, f 1, Kendal
 Spirifer cuspidatus, t 120, Castleton, Cork, near St. Hilary, and
 [St. Vincent's Rock
 Terebratula Wilsoni, t 118, f 3, Mordiford.









THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN;
OR
COLOURED FIGURES AND DESCRIPTIONS
OF THOSE
REMAINS OF TESTACEOUS ANIMALS
OR
Shells,
WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

By JAMES SOWERBY, F.L.S. G.S. W.S.
HONORARY MEMBER OF THE PHYSICAL SOCIETY OF GÖTTINGEN, OF
THE SOCIETY OF JENA, &c.
AUTHOR OF BRITISH MINERALOGY, EXOTIC MINERALOGY, BRI-
TISH MISCELLANY, ENGLISH FUNGI, A BOTANICAL
DRAWING BOOK, AND A NEW ELUCIDATION
OF COLOURS;
DESIGNER OF ENGLISH BOTANY, &c.

Many, O Lord my God, are thy wonderful works which thou hast done;
they cannot be reckoned up in order to thee: if I would declare and speak
of them, they are more than can be numbered.

PSALM xl. 5.

VOL. III.

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MDCCCXXI.

PECTEN cornea.

TAB. CCIV.

SPEC. CHAR. Orbicular, much depressed, smooth ;
ears small, nearly equal ; two obtuse teeth
near the ears within each valve.

A THIN fragile shell whose valves are very nearly alike, being both of them very flat and shining : the beak is acute ; the ears prominent and well defined ; at the base of each within the valves is an oblong blunt tooth : a slight difference observable in the relative position of these teeth points out the two valves most readily. Well preserved individuals retain some traces of the original markings ; such are of a deep brown colour with a horn-like transparency on the sides, and of an opaque pale brown from the front to the beak, near which the colours are very distinct : other specimens are altogether of a pale brown colour, these are the most tender.

Found in the Blue Marle stratum below high water mark, at Stubbington, in Hampshire. It has much affinity with *Pecten Pleuronectes*, but is more slender, and otherways distinct. Perfect specimens are very rare, and difficult to preserve ; I am therefore much obliged to Mr. Holloways for the pains he has taken to procure me such as exhibit clearly all the characters.

PECTEN obscura.

TAB. CCV.---*Fig. 1.*

SPEC. CHAR. Sub-orbicular, depressed, with obscure arched longitudinal rugæ upon the surface; ears large.

SOMEWHAT longer than wide: the surface is dull, almost smooth; but it has some indications of diverging furrows. The edge is thick.

Occurs upon the sandy Limestone slate of Stonesfield, near Oxford. My specimen was forwarded to me long since by Dr. Williams.

 PECTEN lens.
TAB. CCV.—*Figs. 2 and 3.*

SPEC. CHAR. Orbicular, convex; surface marked with diverging arched striæ; striæ deeply punctured.

NEARLY lenticular, but thickest near the beaks; the shell seems to be tender, as its remains are much broken: the ears are not perfect in either of my specimens.

A produce of the forest marble near Oxford.

PECTEN laminata.

TAB. CCV.—*Fig. 4.*

SPEC. CHAR. Suborbicular, depressed, striated; striæ arched, diverging: ears triangular, unequal; the largest plaited.

THE striæ are slightly undulated; to the naked eye they appear smooth, but when carefully examined with a lense, minute lines may be traced across them. The plaits upon the ear form a strong character, whence the name.

In shelly Limestone (Cornbrash) at Chatley Lodge, in Somersetshire.



PECTEN arcuata.

TAB. CCV.—*Figs. 5 and 7.*

SPEC. CHAR. Orbicular, depressed, with arched punctured and diverging striæ upon the surface: ears large; the side beneath the largest is arched.

A SMALL shell, prettily marked with arched, dotted, and sometimes forked furrows. The ears are dissimilar; the largest is quadrangular; they are both punctured.

I have a single valve of this (fig. 7.) in sandstone, along with *Ostrea gregarea* (tab. 111. f. 1 & 3.) from Devizes, and another upon Coral rag (fig. 5.) but not so perfect.

PECTEN similis.

TAB. CCV.—*Fig. 6.*

SPEC. CHAR. Suborbicular, depressed, striated; striæ arched, diverging; ears unequal; sides straight.

THIS differs from the last in having a straight side beneath the larger ear, in being longer, and having no dots in the striæ; but at first sight it much resembles it.

Upon shelly Limestone, probably belonging to the Forest Marble, from Shotover Hill, Oxford.

 PECTEN rigida.
TAB. CCV.—*Fig. 8.*

SPEC. CHAR. Orbicular, depressed; strongly striated; striæ arched, diverging; ears large, unequal, decussated.

ALARGER shell than the last, which it resembles, but is shorter, and has fewer and deeper striæ.

From Castle Combe, in Forest Marble, by favour of the Rev. H. Steinhauer.

CUCULLÆA oblonga.

TAB. CCVI.---*Figs. 1 and 2.*SYN. Cucullæa oblonga. *Miller, MSS.*

SPEC. CHAR. Transversely oblong, gibbose, longitudinally striated; anterior side wedge-shaped; lines beneath the cartilage numerous.

THE width of this Cucullæa is above twice its length: the front inclines slightly to the posterior side, which is small: the striæ upon the surface are numerous, irregular, and elevated: the edge is entire. The beaks are elegantly incurved; the flat rhomboidal space between them is marked with from 9 to 12 parallel lozenges.

The finest specimen of this shell as yet obtained is the pair figured: it belongs to a valuable collection that has been made with much labour and perseverance by Mr. J. S. Miller, of Bristol. G. W. Braikenridge, Esq. has also sent me a good example. They were both found at Dundry in the inferior Oolite, holding grains of iron ore. The single valve represented was sent me by the Rev. Mr. Steinhauer, from Cross Hands: it is in the same kind of stone. I regret that a single valve exhibiting the teeth more perfectly, which I have just received from Mr. Miller, did not arrive time enough for me to alter the figure. It shews the lateral plates bent at right angles near their bases where they approach the middle of the hinge. Mr. Steinhauer has also sent me fragments from little Sodbury.

The name is that Mr. Miller has given it in his letters, and in a catalogue of some valuable shells he has kindly lent me for publication.

CUCULLÆA decussata,

TAB. CCVI.---*Figs. 3 and 4.*SYN. Cucullæa decussata. *Parkinson III. 171.*

SPEC. CHAR. Transversely ovate; gibbose, with flattish longitudinal ridges; anterior side angular; lines beneath the cartilage few.

ABOUT one-fifth wider than long: the ridges are but little elevated, and are decussated by fine and close lines of growth: the interior margin in old shells is crenulated: the teeth of the hinge, when they are not worn, are striated or crenulated upon their sides, as I have observed when speaking of *C. glabra*, (Vol. I. p. 152, t. 67.)

I received this from the same gentleman who sent Mr. Parkinson the specimens he describes, Mr. Francis Crow, who collected them all near Faversham, in Kent: they are silicious casts, with a small portion of the shell remaining.

CUCULLÆA carinata.

TAB. CCVII.—*Fig. 1.*

SPEC. CHAR. Obliquely cuneiform, smooth; anterior side pointed, and distinguished by a ridge running up to the beak.

LENGTH and breadth nearly equal; but the ridge that bounds the anterior side being very oblique, is one sixth longer than the width. The acuteness of the angle made by the anterior side, with the remaining surface, is sufficient to distinguish this from *C. glabra* (tab. 67.) the smoothness of the surface may arise from wear.

A silicious cast from Black Down.

 CUCULLÆA fibrosa.
TAB. CCVII.—*Fig. 2.*

SPEC. CHAR. Obovate, gibbose, with numerous longitudinal elevated striæ upon the surface; anterior margin straight, prominent near the hinge.

LENGTH less than the width; in its general aspect much resembling *C. glabra*, but it is less oblique, and the anterior side is more gradually rounded unto the middle; the lines upon the surface are sharp, and frequently crossed by the lines of growth.

Cast in Calcedony, in a sandstone holding mica and green sand; found at Black Down, and transmitted to me by Miss E. Hill.

TRIGONIA *eccentrica*.TAB. CCVIII.—*Figs. 1 and 2.*

SYN. *Trigonia eccentrica.* *Parkinson, vol. iii. p. 175. tab. 12. f. 5.*

SPEC. CHAR. Transversely ovate, convex; anterior side produced, posterior side round, with oblique undulating ridges on the surface.

THE length is only half the width; the edge is very regularly curved till it comes to the produced part of the anterior side, where it bends a little forward, and then turns suddenly back. The ridges are straight and transverse near the beaks where they almost cross the shell; those placed nearer the front are confined to the posterior side, are undulated, and are crossed by the lines of growth.

I have given two views of one valve, which was found on Black Down by the Rev. J. H. Steinhauer; it is siliceous, stained perhaps by vegetable matter. I have the opposite valve imperfect from Hembury Fort, Devonshire, through the hands of Mr. Goodhall: also siliceous.

 TRIGONA *affinis*.
TAB. CCVIII.—*Fig. 3.*

SYN. *Trigona affinis.* *Miller, MSS.*

SPEC. CHAR. Transverse, oval, gibbose, half covered by transverse ridges.

VERY thick, regularly elliptical, about one-third wider than long, and remarkable for the slight protuberance of the beak, behind which there is not that cavity observable in *Corbula*, and many other shells. The transverse

ridges are very uniform, and somewhat inversely imbricated. The anterior half is smooth.

The handsome mass of silicized shells, upon which this rare species rests, was sent me for public use by Mr. Miller; it is named *affinis* in the catalogue of his collection, from its resemblance, although distant, to *Trigonia sinuata* of Parkinson.

CORBULA. *Bruguère. La Marck.*

GEN. CHAR. Shell with two dissimilar unequal-sided valves ; sub-transverse. Hinge teeth two, one in each valve ; ligament internal.

ONE of the most easily defined genera, being well distinguished by the dissimilarity of the valves, of which one is generally so small as to be included in the other, and by the single recurved conical tooth in the larger valve, and a corresponding pit with an irregular tooth in the other : both valves are more or less gibbose, with incurved beaks, a projecting and sometimes recurved anterior side. Several species, both fossil and recent, are described ; some are slender, others very stout shells.

 CORBULA gigantea.

TAB. CCIX.---*Figs. 5, 6, and 7.*

SPEC. CHAR. Gibbosc, when young suborbicular, when old transversely oblong ; anterior side produced, recurved ; surface concentrically furrowed near the beaks ; posterior side beset with short spines.

YOUNG shells have the furrows and ribs between, which are equal and very regular, extended over the whole surface of both valves ; they are broadest over the middle, and gradually diminish to the sides : as the shell increases in size, the ribs are closer, and less prominent towards the front, and at length disappear : when full grown, short obtuse spines placed in longitudinal rows occupy

the posterior side and part of the front. The posterior side is very concave, and separated by an obtuse ridge. The substance is very thin, except that of the hinge, which is strong.

This shell is abundant in the sandstone, called in Devonshire, Whetstone: it is mentioned by Parkinson in his 3d Vol. p. 226. I have received it in various stages of growth from my kind and amiable correspondent, Miss E. Hill.

CORBULA lævigata.

TAB. CCIX.---*Figs. 1 and 2.*

SPEC. CHAR. Orbicular, gibbose, smooth, and thin; beaks prominent, incurved.

A VERY smooth regularly convex thin shell, scarcely wider than long. I have only seen one, that is the smaller valve, and only an imperfect specimen of that; but it shews the hinge, in which it exactly agrees with *C. gigantea*. The tooth in this valve in both these species is situated upon the posterior edge of the pit that receives the tooth of the other valve, in which they differ from other *Corbulæ*, although in some of them there are traces of such a disposition.

From Black Down, by favour of Miss E. Hill.

CORBULA globosa.

TAB. CCIX.---*Fig. 3.*

SPEC. CHAR. Globose, smooth; anterior side of the larger valve produced into a lip; truncated; beaks equal.

A VERY small shell, equal in thickness to its length; the posterior side is round, the anterior obscurely trun-

cated, and the front obtuse : in many specimens the margin of the larger valve, which is always a little bent, is protruded in the form of a lip beyond the anterior side of the other valve : I say in many specimens, because I have a considerable number that differ in no other respect than the want of this lip ; they can hardly be younger, as they are mostly of the same, or even of a larger size.

Very abundant in the blue clay of Highgate Hill, frequently in clusters ; and I have never met with a divided pair.

CORBULA Pisum.

TAB. CCIX.---*Fig. 4.*

SPEC. CHAR. Subglobose, irregular, concentrically furrowed ; anterior side slightly truncated ; margin of one valve produced ; beaks unequal.

A RUGGED looking shell ; the beak of the larger valve is very prominent, even ventricose, especially in old subjects ; the expanded margin extends beyond the anterior side of the smaller valve, and a considerable part of the front. The furrows are commonly worn away ; which circumstance, together with some irregularity in the shape, give it the aspect of a shell that inhabits holes in stone.

Several of my correspondents have favoured me with this from Barton and Hordle Cliffs : among others Miss Bennett, the Rev. Mr. Iremonger, and the Rev. Mr. Bingley, wherefore I suppose it is a very common species there, although not noticed by Brander.

CORBULA *revoluta*.TAB. CCIX.---*Figs. 8 to 13.*SYN. *Tellina revoluta*. *Brocchi* 516. *tab. 12. f. 6.*

SPEC. CHAR. Transversely oblong, tumid, transversely furrowed; anterior side produced, truncated, with a carina running to the beak; margin of the larger valve prominent, inflected; beaks unequal.

Var. β (*costata*) transverse furrows few, deep; anterior side rather pointed, (*figs. 11, 12, and 13.*)

THE width is frequently twice the length; the edge of the lesser valve is almost wholly enclsd in the larger, the margin of which at the front is expanded, and rather bent inwards, whence the name given by *Brocchi*. The anterior side of the larger valve is extended in the form of a truncated beak, but liable, as well as the general form, to such irregularities as are common to shells which inhabit holes and cracks in rocks; the furrows are numerous and sharp, except in var. β , which has them rounded, and the ridges between them sharp. The beak of the larger valve is very gibbose in old shells.

From Barton Cliff by favour of the Rev. Mr. Bingley, in plenty; some have the furrows so irregular that it is difficult to say to which variety they belong, otherwise I should have been led by the general form to consider the var. β a distinct species.

MODIOLA subcarinata?

TAB. CCX.---Fig. 1.

SYN. *M. subcarinata?* *La Marck, Foss. de Paris, 191. Annales du Muséum d'Histoire Naturelle, Vol. VI. p. 122. V. IX. tab. 17. f. 10.*

SPEC. CHAR. Oblong, smooth, gibbose; anterior side keel formed, rather obtuse; posterior lobe convex; front concave.

THE margin of the front is arched inwards in this shell; whereas in *M. modiolus* of Linn. that edge is straight. The length, taking the measure obliquely, is above twice the width, and greater than in *M. modiolus* of Linn. It is often strongly marked by the lines of growth, and is very pearly beneath a thin brown epidermis.

This is probably not the *Modiola subcarinata* of La Marck, although it agrees with the description; but I must consider it as such until I obtain the means of distinguishing them. It may probably be one of the varieties of *Mytillus modiolus* of Brocchi; but as that author, who is apt to treat fossil species as only varieties of recent shells, does so in the present instance, it is not easy to determine this point. The specimens figured are the produce of Highgate Hill. The large one has been much broken by pressure, but the small one appears to retain its original form undisguised.

MODIOLA bipartita.

TAB. CCX.---Figs. 3 and 4.

SPEC. CHAR. Elongated, smooth, rather gibbose; anterior side obtuse, suddenly raised above the posterior; posterior lobe irregular.

NEARLY related in general form to the last, but readily distinguished, by the separation of the posterior lobe

from the remainder of the shell by a kind of step particularly prominent near the beak; the length is greater also; the carinated form of the beak not so evident; and the front edge has two or three waves in place of a regular curve. The shell seems to be very thin and not pearly.

Casts of this in ferruginous indurated marl, with nearly all the shelly remains worn off, have been forwarded to me by Miss E. Hill, who obtained them from Lanttrissent near Cardiff. Similar casts occur at Osmington; the plate contains two views of one of these that was given me by Miss Benett. Fig. 3 is from an imperfect cast in ferruginous sand, from Parkham Park, in Sussex: I received it from G. A. Mantell, Esq

MODIOLA *æqualis*.

TAB. CCX.---*Fig. 2.*

SPEC. CHAR. Oblong, convex, smooth, anterior lobe large, obscurely defined.

THE regular curvature of the margin which presents no angle, is a striking feature in this *Modiola*: the two ends are nearly equal in width, and the posterior lobe almost as large as the remainder of the valve, and very gradually united with it. The length is about twice the width.

A cast in loose ferruginous sandstone, from Parkham Park, in Sussex, by G. A. Mantell, Esq.

MODIOLA minima.

TAB. CCX.---*Figs. 5, 6, and 7.*

SPEC. CHAR. Ovato-subtriangular, smooth; front nearly straight, ends rounded, posterior lobe small, distinct.

ONLY half as long again as wide: it is very broad anteriorly, and has small beaks; the margin forms a prominent angle with the hinge line at their junction.

This occurs in a grey argillaceous Limestone; the largest was sent me from Taunton, by my friend R. Hare, Esq. One of the small ones was found near Belfast, by Dr. M'Donnel, along with Gryphites.

MODIOLA cuneata.

TAB. CCXI.---*Fig. 1.*

SPEC. CHAR. Elongated, convex, smooth; anterior part cuneated; back arched; front slightly concave; posterior side distinct, convex.

ABOUT twice as long as wide; most gibbose near the beaks, and gradually depressed towards the forward end in the form of a wedge.

From the inferior Oolite of Somersetshire.

MODIOLA gibbosa.

TAB. CCXI.---*Fig. 2.*

SYN. *Modiola anatina.* *Smith Strat. System 89.*

SPEC. CHAR. Elongated, reniform, very gibbose, smooth; back broad, arched.

NEARLY three times as long as wide; the depth of each valve is equal to its width. The end is obtuse, not

wedge-shaped as in the last, a character that distinguishes it in all ages. The posterior lobe is well defined and gibbose.

I have several specimens of this shell from Bradford, Wilts, and from Claverton Hill, near Bath. I believe it belongs to Smith's Fullers'-earth Rock.

MODIOLA reniformis.

TAB. CCXI.---*Fig. 3.*

SPEC. CHAR. Oblong, sub-reniform, smooth; anterior lobe slightly expanded; posterior lobe small.

A MORE obtuse and less curved shell than the last, and comparatively compressed: the length is about twice the width.

This shell, of which I have seen but one specimen, is said to be from the inferior Oolite, near Bath.

MODIOLA imbricata.

TAB. CCXII.---*Figs. 1 and 3.*

SPEC. CHAR. Oval, elongated; with imbricated ridges upon the surface; back angular, front concave.

THIS is a slightly compressed shell; about twice as long as broad; the ridges upon the surface are the edges of the shell left prominent after each successive addition to its margin during its growth. The anterior lobe forms a slightly elevated ridge extending to the beak.

The Rev. T. O. Marsh sent me the specimen (fig. 1) from Felmarsham, near Bedford. I have had larger casts brought me from Milton Ernest, also in Bedfordshire, by Mr. Goodhall, who has kindly favoured me with several shells obtained by him in the course of a short tour. Fig. 3 is from a much compressed and broken shell, taken out of clayey Limestone, found in an alluvial deposit in the parish of Gisleham, near Lowestoff, in Suffolk, by the friendly Mr. Thurtell.

 MODIOLA Hillana.
TAB. CCXII.---*Fig. 2.*

SPEC. CHAR. Depressed, elongato-ovate, concentrically striated; posterior end narrow; front slightly concave; posterior lobe obscure.

AN elegantly formed shell, rather more than twice as long as wide; the back forms a kind of keel from the centre of which the shell tapers towards the beaks; these are not very prominent; and together with the small

convexity of the posterior lobe, give that end a narrow contour. The striæ are obtuse ridges coinciding with the lines of growth; they are smooth.

Miss E. Hill, whose kindness I have often had occasion to acknowledge, sent me this shell from Pickeridge Hill, near Roundsford Park, Taunton. It is found in a grey argillaceous Limestone, that is in some parts so soft and loose that the shells may be picked out of it with ease; in other parts the stone is firm, and the shell adheres strongly to it, in which case the surface of the shell that is exposed by fracture has a glistening velvety lustre, arising from its crystalline structure. The specimens are frequently narrower than the figure.

MODIOLA aspera.

TAB. CCXII.—*Fig. 4.*

SPEC. CHAR. Ovate, elongated, posteriorly pointed; very gibbose, longitudinally striated; striæ elevated, rough, very numerous; posterior lobe obscure, wrinkled, small.

THE small and nearly flat posterior lobe leaves the beaked end of this *Modiola* so small as to give it much of the contour of a *Mytillus*. The depth of the two valves together is greater than the width, and the length is twice the depth. The roughness of the striæ proceeds from minute elevated scales, that are most conspicuous near the margin of the shell, and are nearly obliterated towards the beaks.

For this beautiful shell I am indebted to Mr. Goodhall, who brought it from a pit in Gregory's Land, at Felmarsham, near Bedford.

AMMONITES Sowerbii.

TAB. CCXIII.

SYN. A. Sowerbii. *Miller MSS. Catalogues.*

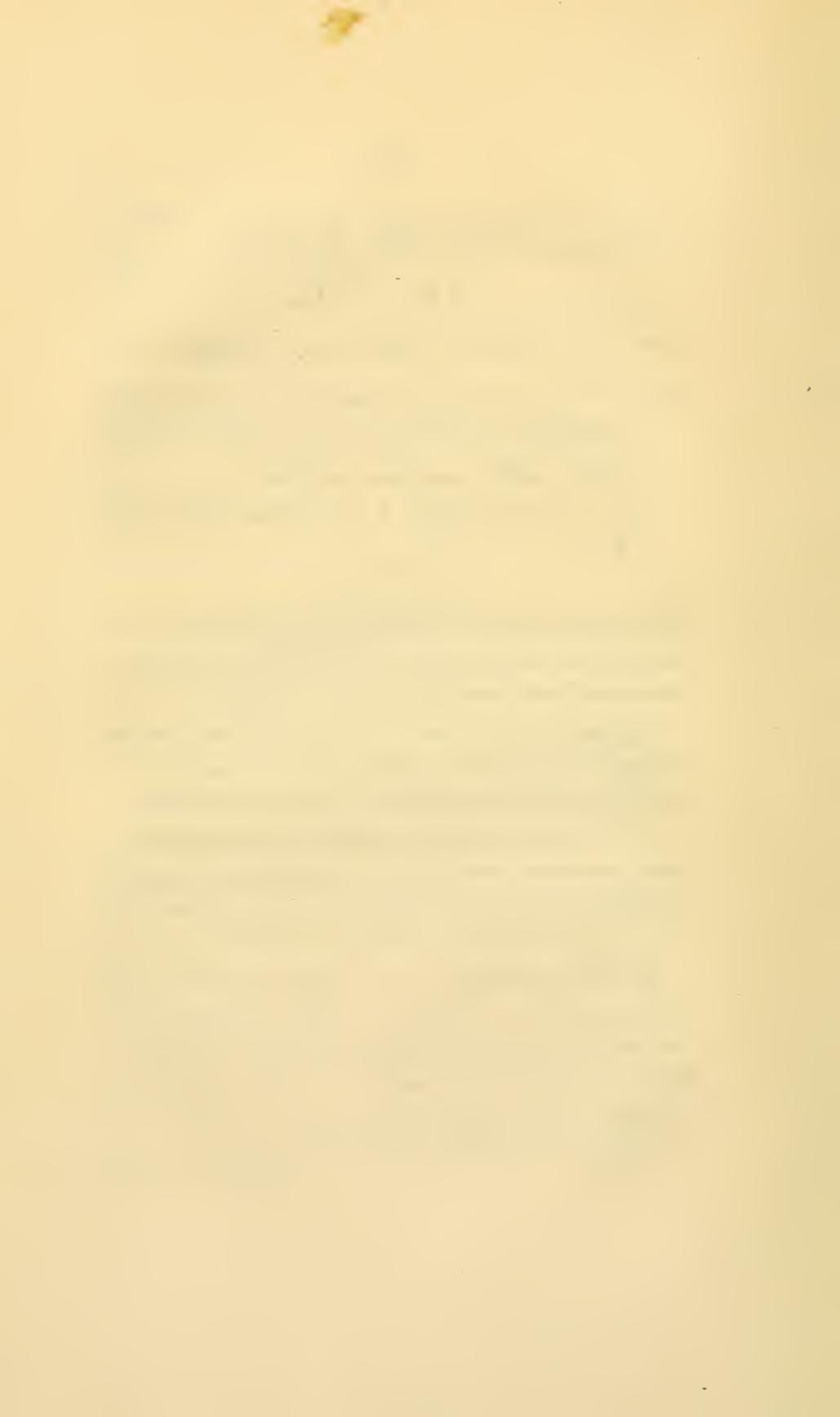
SPEC. CHAR. Discoid, carinated, with about eight spiniform tubercles upon each whorl; keel defined, entire; aperture elliptical.

Var. β aperture circular, keel sometimes impressed.

VOLUTIONS about four, the inner ones concealed to the bases of the tubercles; the outer part of the volutions has many gentle undulations; the inner part is even, except that the base of each tubercle is extended towards the centre in an obtuse ridge. The keel nearly separated from the body of the shell; it is round and entire.

In var. β the ridges from the bases of the tubercles are more prominent, and the keel sometimes so far sunk as to have a furrow on each side of it. The inner whorls of var. α appear to be more gibbose than the outer ones.

Mr. Miller considers the shell figured as one of his rarest specimens: his collection has also to boast of several smaller specimens, belonging to var. β , which vary in the gibbosity of the whorls; they were all found at Dundry, in the Inferior Oolite.



LIMA rudis.

TAB. CCXIV.---*Fig. 1.*

SPEC. CHAR. Obovate, oblique, with seven longitudinal costæ; anterior ear open, with thickened lobes.

SOMEWHAT longer than wide; the surface is convex; the costæ are large and rugged: one of the ears is small; the other long, with thick and reflected edges to its valves.

This is a rugged specimen of apparently a rugged shell; it was picked up by my good friend Mrs. Gent, at Calne.



LIMA antiquata.

TAB. CCXIV.—*Fig. 2.*

SPEC. CHAR. Elliptical, depressed, coarsely striated; anterior ear deeply wrinkled, open.

THE striæ are numerous, close, irregular, and ragged towards the margin: the width is about two-thirds the length. The smaller ear is striated like the rest of the shell, and closed.

The shell from which this is taken belongs to Mr. Miller; it was found in the Lias at Frethern, in Gloucestershire.

TRIGONIA alæformis.

TAB. CCXV.

SYN. *T. aliformis.* *Parkinson III.* 176. *t. XII.*
f. 9.

SPEC. CHAR. Wing-formed; anterior side produced, truncated, with a broad compressed ridge extended to the beak; posterior side costated, rounded, costæ many, thick, irregularly crenulated, oblique, recurved, and attenuated towards the ridge on the anterior side where they terminate.

UPON the upper part of the anterior side, above the ridge, is a concave surface ornamented with a few irregularly crenulated ribs, that extend across the ridge near the beak, and join attenuated ends of the other costæ, but are gradually lost upon the produced part of the side. The internal margin has a short groove corresponding to each of the external ribs, and two canals beneath the flat space upon the produced beak-like side, which are very evident in relief upon the casts, see fig. 2.

A long known shell among the siliceous fossils, often so admirably preserved in form in the green sand. The individuals represented in figures 1, 3, and 4, are selected from Mr. Miller's choice collection: fig. 4 is remarkable, as it exhibits the great gibbosity of the young subject. Fig. 2 is taken from a cast of the inside, in ferruginous sand, which occurs in Parkham Park, Sussex; I am indebted to G. A. Mantell, Esq. for it; it appears to be abundant, as many are included in the same mass: there are casts of the outsides also, allowing spaces

for the substance of the shells, of which there are no vestiges remaining. Other genera are often included, and to be comprehended also by casts only.

The existence of these hollow casts, contrary to the siliceous forms of the shells found in the green sand, is a curious fact that requires to be further attended to : something similar occurs among the Crag fossils.

HAMITES spinulosus.
TAB. CCXVI.---Fig. 1.

Dentalium? spinulosum. *Miller's MSS. Catal.*
SPEC. CHAR. Depressed, undulations regular, every other one armed with two sharp spines; opening elliptical; curvature very gradual.

THE undulations upon the sides of this elegant Hamite are all equally prominent, and almost disappear upon the narrow back. The spines are situated along each side near the front; they diverge a little. The curve, as exhibited by a small part only of an entire shell, is nearly as wide as the segment of a circle.

A delicate specimen of this shell was in the valuable envoy from Mr. Miller, out of which I have already figured several rarities: it is a cast in transparent Calcedony, with an opaque pulverulent crust. Although it be transparent, and evidently hollow, it does not shew any signs of Septa, but it may only be a cast of the outside, or as Mr. Miller observes, the chamber beyond the last septum. The deficiency has, however, induced Mr. Miller to call it a Dentalium for the present. It was found on Blackdown.

HAMITES spiniger.
TAB. CCXVI.---Fig. 2.

SPEC. CHAR. Depressed; undulations many, slender; two rows of sharp tubercles upon each side, those nearest the front largest; curvature gradual.

NUMEROUS, slightly elevated, irregular rings characterize this species: the anterior tubercles collect, into each of their bases, several of the undulations, which sometimes run a little way up them. The mouth is oval.

Found in marle, in the neighbourhood of Folkstone, by Mr. Gibbs. The pearly crust is nearly obliterated.

HAMITES tuberculatus.

TAB. CCXVI.---*Figs. 4 and 5.*

SPEC. CHAR. Depressed, undulations unequal, every third one largest, with two tubercles on each side, the lateral ones obscure ; curvature gradual.

Two small rings between each of the tuberculated ones, almost constantly occur upon this ; the tubercles are obtuse ; in other respects it nearly resembles the last.

From Folkstone, by Mr. Gibbs.

HAMITES turgidus.

TAB. CCXVI.---*Fig. 6.*

SPEC. CHAR. Depressed ; front irregularly swelled ; undulations regular, disappearing over the back ; two rows of obscure tubercles near the front ; curvature rather sudden.

WHETHER the irregular swellings on the front be accidental or not, the single row of tubercles on each side of it are sufficient to distinguish this species : they are placed upon every other ring, and are small.

A pyritous cast ; from Folkstone with the last.

HAMITES nodosus.

TAB. CCXVI.---*Fig. 3.*

SPEC. CHAR. Nearly round, undulations regular ; two rows of obtuse tubercles upon the front, each tubercle placed upon two undulations ; aperture obovate.

MORE gibbose than any other tuberculated species ; the tubercles are so large that they extend over two of the undulations or rings, which are not so numerous as in some others, and leave a simple one between each pair.

A cast in which the septa are coated by crystallized Pyrites ; the pearly shell remains outside. From Folkstone.

NERITA.

GEN. CHAR. A subglobose univalve, obliquely depressed beneath; columella solid, subtransverse, flattened, with a linear, sometimes toothed edge; aperture semicircular, closed by an operculum.

BOTH marine and fresh-water animals possess shells of this genus; but those of the fresh-water hitherto known have no teeth upon the edge of the expanded columella. Neritæ are generally strong shells with large apertures; they have but few whorls, the last of which is commonly very large. The aperture is semicircular in consequence of its being half closed by the flattened columella, which forms the character of the genus. The recent species, and some even of the fossil ones, are ornamented with various colours, but they are seldom bright, and in general few, and disposed in small markings.

 NERITA lævigata.
TAB. CCXVII.---*Fig. 1.*

SPEC. CHAR. Pointed, smooth; spire conical, with straight sides; base convex.

REMARKABLY smooth, shining; the aperture is much wider than long; around the centre of the last whorl is a very obscure sulcus.

From the inferior Oolite at Dundry, Mr. Miller's collection. The specimens do not exhibit the columella.

NERITA sinuosa.

TAB. CCXVII.---*Fig. 2.*

SPEC. CHAR. Obtuse, uneven ; spire short, with convex whorls ; aperture with a rounded sinus near the base, and an angular sinus above the middle.

AROUND the base of the last whorl is a kind of lobe, that terminates in a sinus in the edge of the aperture. In old shells the last formed turn is obtusely carinated, and they have a notch in the lip. The whole surface is strongly marked with lines of growth, that shew the gradual increase of this notch as they approach the edge of the aperture. The columella is broad and flat, but I have not been able to expose enough to learn whether the edge be toothed or not.

Several specimens have been in my cabinet four or five years, for which I am indebted to Miss Benett, who collected them at Chilmarsh, near Tisbury, Wilts. They are converted into crystallized carbonate of Lime, and are filled with chalky marl, mixed with white and green sand.

MELANEA lineata.

TAB. CCXVIII.---Fig. 1.

SPEC. CHAR. Acuminated, finely striated longitudinally; aperture angular above; volutions about nine.

THE sides of the spire are straight, excepting a very slight contraction towards the upper part of each whorl. The striæ are very fine, regular, and elegantly bent to the form of the lip. The length is above four times the diameter of the last turn.

From Dundry, by favour of G. W. Braikenridge, Esq.

MELANEA constricta.

TAB. CCXVIII.---Fig. 2.

SYN. Conchyliolithus Turbinites? constrictus.
Martin Pet. Derb. Vol. I. tab. 38, f. 3.

SPEC. CHAR. Turreted, smooth; volutions 8 or 10; convex below, contracted above, with an adpressed crenated margin.

ABOUT three times as long as wide, pointed; the crenated margin has somewhat the appearance of a fringe, from its width, and the length, and fineness of the crenulations: the aperture is broken, but it should seem to have an angle above.

I have exhibited two views of the same specimen Mr. Martin figured, which I had from his widow. Martin observes that it is found at Tisdewell, in Derbyshire, but not common.

CIRRUS nodosus.

TAB. CCXIX.---*Figs. 1, 2, and 4.*C. nodosus. *Min. Con. Vol. II. p. 94, tab. 141, fig. 2.*

SPEC. CHAR. Conical, acuminated ; or discoid, with an acuminated spiral umbo ; spire reversed ; whorls many, with two rows of longitudinally extended tubercles crossed by numerous small carinæ.

THE description formerly given of *C. nodosus* applies to the cast of the inside, which differs considerably from the outside, although it retains vestiges of the most prominent marks. Externally it is a rugose shell, a few of the numerous small carinæ becoming very prominent and sharp as they pass over the tubercles, and divide the upper row almost into two. Between the transverse carinæ fine regular elevated striæ parallel to the aperture are distinctly visible, especially upon the lower part of each whorl. The whorls that occupy the smaller part of the spire are nearly flat, with a crenulated keel at the lower edge. The most remarkable circumstance attending this shell, and which assimilates it to the genus *Serpula*, is the variable form of the spire, which is often a small pointed cone in the centre of a discoid base, consisting of two or three of the latter volutions : sometimes the conical part is larger than the discoid part, containing only one or two turns : and lastly, all the whorls unite to form a regular pointed cone, such as the figure formerly given.

I am indebted to Mr. Miller's indefatigable researches for a series of specimens illustrating the above observations, which are very interesting, and not a little perplexing, since they tend to connect the Generæ *Cirrus*

and *Euomphalus* together, the conical part of this shell belonging to the one, and the discoid part to the other. I have also some reason for suspecting that *Euomphalus pentangulatus* (tab. 45.) is liable to a similar variation by which it approaches to *Cirrus acutus* (tab. 141, f. 1.) Should this suspicion be confirmed by a series of specimens, one of the generæ must be expunged.

The specimens are from the inferior Oolite at Dundry.

CIRRUS Leachi.

TAB. CCXIX.—*Fig. 3.*

SYN. *C. Leachi.* *Miller's MSS.*

SPEC. CHAR. Conical, longitudinally striated; whorls many, with several rows of tubercles crossd by numerous small carinæ; upper row of tubercles spiniform, compressed.

THIS differs from the last in having a row of long compressed spines around the upper part of each whorl.

The unique specimen from which I have given the sketch at fig. 3, is so mutilated, and so united with the stone, that a correct notion can hardly be obtained of it. It is possible that the length of the spines may be variable; and consequently, some doubts may fairly be entertained of the propriety of treating it as a species. It is in Mr. Miller's cabinet, who kindly lent it me, with the following observation in his catalogue:

“*C. Leachi.*—I named this after my esteemed friend, Dr. W. E. Leach, whose zeal to promote enquiries in Natural History cannot be praised sufficiently. Having been the first who brought *C. nodosus* into notice, I wish to preserve his name in this genus.”—With Mr. Miller's sentiments I perfectly coincide; and therefore gladly publish them. There are some vestiges of a second specimen of this, along with the larger specimen of *Trochus sulcatus*, (tab. 220, fig. 3.) on the side not shewn in the figure.

TROCHUS fasciatus.

TAB. CCXX.---*Fig. 1.*

SPEC. CHAR. Conical, umbilicate, decussato-striated; volutions slightly convex, with a band around their middle; base flattish; aperture quadrangular.

THE width of the base is equal to the height; the transverse striæ, or rather ridges, are the most prominent; the longitudinal ones diverge from the central band both ways: the columella seems to have a single plait along it, and is tubular.

In G. W. Braikenridge, Esq.'s cabinet: found in the inferior Oolite at Dundry.

 TROCHUS granulatus.
TAB. CCXX.---*Fig. 2.*

SPEC. CHAR. Conical, very short, granulated, whorls rather convex above, with a band along the middle; base convex, in part nearly smooth.

THE granulated surface is the result of decussating furrows, which vary in depth and number in different individuals; they are generally deepest near the margin: the height is about half the width: it appears to have a small umbilicus, which probably led Mr. Miller to consider it an *Euomphalus*, from which the columella and left lip of the aperture clearly distinguish it.

In Mr. Miller's cabinet; from Dundry.

TROCHUS sulcatus.

TAB. CCXX.---Fig. 3.

SYN. T. sulcatus. *Miller's MSS.*

SPEC. CHAR. Conical, short, whorls convex, finely striated, with a sulcus around the middle; base flattish, umbilicate?

IN the latter turns of the spire, the transverse striae are confined to the marginal parts below the furrow; while at the apex they are sharp all over the whorls, and are crossed near the superior margin by numerous undulations: the whole surface is covered by fine lines of growth, diverging from the sulcus, which itself is crossed by minute striae. The columella being covered by stone, the existence of an umbilicus is doubtful, but there are some indications of one.

Preserved in the inferior Oolite of Dundry: from Mr. Miller's collection.

TROCHUS ornatus.

TAB. CCXXI.---*Fig. 1.*

SPEC. CHAR. Conical, depressed, with concentric furrows, and diverging striæ; whorls above depressed, with many tubercular undulations; in the middle flattened, with a longitudinal band; base convex, umbilicated, margin largely crenulated.

A RICHLY ornamented shell: the prominent undulations being crossed by rounded furrows, have a knotted appearance: the diverging striæ are in many parts rather obscure; where they cross the band, they have a semi-circular form. Diameter above twice the height. The umbilicus appears to be plaited sometimes.

The inferior Oolite of Dundry has supplied Mr. Braik-enridge with the specimens figured. The shells seem to have been very thick: their place is occupied by white transparent calcareous spar.

TROCHUS bicarinatus.

TAB. CCXXI.---*Fig. 2.*

SPEC. CHAR. Depressed, conical, with diverging striæ; volutions obscurely bicarinated, deeply undulated above, concentrically striated beneath; base convex, umbilicated.

THE cast of this shews the carinæ and undulations very clearly, but is otherways smooth. The outer surface differs only in having numerous sharp fine decussating ridges upon it. The base is concentrically striated, and has a large umbilicus.

Preserved in marl mixed with green sand, found in Marcham Field, near Oxford.

AMMONITES annulatus.

TAB. CCXXII.

SPEC. CHAR. Discoid, with numerous, close, very prominent radii, which are often divided as they pass over the rounded front; volutions from 5 to 7, exposed; aperture roundish.

THE numerous radii at first sight distinguish this from *A. communis*, (tab. 107;) the volutions are also more numerous than in that species. In some specimens the sides of the whorles are slightly depressed; in others gibbose. The radii are, externally, very prominent round ridges placed so near together as to form a deep sulcus between each, some of them are divided in their passage round the front, so that they appear equally distant over all parts. When the outer surface of the shell, which adheres strongly to the stone, is broken off, the ridges are much diminished; and instead of convex surfaces, like wires wound about the shell, they are flat, as if they were formed of square wire. The cast, when all the shell is removed from it, is also marked by slightly elevated rounded radii.

This species of Ammonite occurs along with *A. communis*, at Whitby, in Yorkshire. It is also met with in the lower sandy beds of the inferior Oolite, which approach the Lias at Cropredy, near Banbury, in Oxfordshire. Near Ilminster it is found, but with hardly any of the shell remaining.

Fig. 1. represents a specimen lent me by the Rev. W. D. Conybeare: it is in a grey porous limestone: its

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chambers are lined with Carbonate of Lime : it is from Cropredy. *Fig. 2.* is half a nodule of indurated Marle, containing a similar shell, from Whitby. *Figs. 3 and 4.* are two views of a small specimen given me by E. Strangeways, Esq. from the neighbourhood of Ilminster : the same Gentleman has likewise given me a specimen from Whitby. The large specimen, *fig. 5.* is remarkable for the gibbosity of its whorles ; but in other respects it does not differ from the small one, *fig. 4.* in the centre of it. It is from the same place, by favour of my valued friend, the late — Cunnington, Esq. It is in indurated Marle, with some few grains of Hydrate of Iron, indicating an approach to the inferior Oolite.

UNIO concinnus.

TAB. CCXXIII.---*Figs. 1 and 2.*

SPEC. CHAR. Transversely oblong-ovate, depressed, nearly smooth, thick ; posterior side very small ; beaks prominent, recurved.



ALMOST three times as wide as long, regularly convex, with a gently curved back ; the thickness of the shell is remarkable ; the lines of growth are sharp ; in other respects the surface is smooth. The front is slightly incurved near the anterior end.

This neat species was lent me by the Rev. W. D. Conybeare, who obtained it from the lower beds of the inferior Oolite, at Cropredy, near Banbury, in Oxfordshire : it exhibits the form of the hinge remarkably well.

MYA ? *literata*.

TAB. CCXXIV.---Fig. 1.

Parkinson, Vol. 3, p. 196, t. XIII. f. 16.

Descriptive Catal. of Minerals and Fossil Organic Remains of Scarborough, &c. p. 129, t. II, f. 1.

SPEC. CHAR. Transversely oval; subequilateral, convex, smooth, thin, with obtuse angularly bent ridges upon the central part; angles of the ridges in a longitudinal direction.

THE ridges constitute a peculiar feature of this and the two following shells; and at the same time that they distinguish the tribe from any other that we know, their variations serve as distinctions among themselves. In this species their angles are placed in a directly longitudinal series; they disappear at the sides, and are soonest lost upon the anterior: near the beaks the angles of several ridges are cut off by short straight lines. The shell is thin, and so much broken, that its general form is but imperfectly displayed.

The specimen here represented was sent me by some friend from Whitby; whether it was collected at Malton, or not, I do not know: in the Catalogue of Scarborough Fossils it is mentioned as being found at the latter place in grey Limestone, as this specimen is. It is not possible, from the firmness of the stone in which all the individuals of this tender family have been protected, to disclose the structure of the hinge, and consequently to determine with precision what genus to refer them to. Among recent shells we know of nothing analogous, except *Mya* (*Unio*) *corrugata*, which is a strong and differently formed shell, that will materially assist us; but as they somewhat resemble the thinner species of the genus *Mya*, they are placed under it, until chance may discover characters at present concealed.

MYA V. scripta.

TAB. CCXXIV.---*Figs. 2, 3, 4, and 5.*

SPEC. CHAR. Transversely oval, subequilateral, convex, smooth, thin, with obtuse angularly bent ridges upon the central part; angles of the ridges acute, in an oblique direction.

(Var. β) with an oblique elevation bounding the anterior side.

Figs. 2 and 4.

THIS differs from the species last described only in the oblique direction in which the angles of the ridges succeed each other, and these angles being more acute, altogether giving a different contour to the surface. In var. β the elevation which distinguishes it may possibly be the effect of pressure.

I have this species from the Kelloways rock at Little Somerford, by favour of the Rev. H. Steinhäuer, whose specimen is shewn at fig. 3; and from Kelloways, through the kindness of Mrs. Wetherall, who resides near the spot. Fig. 5 is from Bedford Castle, picked up by Mr. Goodhall.

The variety, figs. 2 and 5, are from two individuals in the possession of the Rev. W. D. Conybeare, who got them at Claydon, in Oxfordshire, out of the Shucborough bed of Lyas: they are very far from perfect.

MYA angulifera.

TAB. CCXXIV.---*Figs. 6 and 7.*

SPEC. CHAR. Transversely elliptical, elongated, gibbose, with obtuse angularly bent ridges upon the surface; anterior half widest, gaping; angles of the ridges acute, in an oblique direction.

THE ridges extend beyond the central part of this shell, and consequently many of them reach the front without being bent. The width is almost three times the length; the posterior side is very small.

Found in Limestone, in what is called by Smith the Fullers' Earth bed, at Smallcomb and Beacon Hill, Bath, by the Rev. H. Steinhäuer.

LUTRARIA lirata.

TAB. CCXXV.

SPEC. CHAR. Transversely elongated, recurved, gibbose, with numerous obliquely longitudinal ridges.

VERY much elongated transversely, being nearly three times as wide as long; the anterior side is nearly smooth, and rather compressed; the rest of the surface is almost covered by sharp ridges that diverge from the beaks: the front and back are parallel, the back being recurved.

Found in Limestone at Norton-under-Edge, from whence T. Meade, Esq. has sent it me.

LUTRARIA ovalis.

TAB. CCXXVI.

SPEC. CHAR. Transverse, elongated, elliptical, straight, convex, with about 9 diverging ridges.

A RATHER gibbose inequilateral shell, with the curvature of the front and back nearly equal; the sides rounded, and very little open; the posterior side is much the smallest, and has only one or two radii upon it; the anterior side is not curved as in the following analogous shells.

I have figured two casts apparently agreeing precisely in form. Fig. 1 is from Felmarsham, communicated by the Rev. T. O. Marsh. The other is from Portland; it has a partial coating of calcareous spar, indicating a thick shell.

LUTRARIA ambigua.

TAB. CCXXVII.

SPEC. CHAR. Transversely elongated, gibbose, slightly recurved, anteriorly gaping, with several oblique diverging ridges.

VERY variable in the width, and the elevation of the ridges: some specimens are nearly obovate, these have in general the strongest ribs, which are sometimes knotted; other individuals are oblong, with obscure costæ.

The longer varieties of this shell approach so nearly to the *L. gibbosa*, (tab. 42.) that the Rev. W. D. Conybeare brought me a series, from which I have selected those of an intermediate form for figuring, to prove their relationship; and the shortest seem so near to *Cardita producta*, (tab. 197.) that it is very doubtful whether they be distinct species. As to the genus we are totally in the dark with respect to all the shells of this radiated character, not having seen the hinge of one of them; and the strong resemblance of the longer formed ones to the *Lutraria*, makes that the preferable genus to place all of them in for the present.

FUSUS bifaciatus.

TAB. CCXXVIII.

SPEC. CHAR. Elongated, rugosely reticulated; volutions keel-formed; base produced.



FOR a FUSUS this is rather a short shell; the keel-like form of the whorles gives them two flat faces, from which the name is taken; the last whorle is slightly ventricose; the beak short, and rather broad at its commencement.

Of this rare shell I have only one mutilated individual, which is from Highgate; the lip is very imperfect, so that it is not to be positively determined whether it have a sinus towards its upper part, and so be a Pleurotoma of La Marck, or not. It somewhat resembles the figure in Brander of Strombus errans (fig. 42) of which I have not seen a specimen.

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MUREX tuberosus.

TAB. CCXXIX.—*Fig. 1.*

SPEC. CHAR. Ovate, pointed, transversely striated, with many blunt, short costæ upon each whorle; base convex.

THE number and bluntness of the knobs upon this Murex are strongly characteristic; its surface is rendered rough by lines of growth crossing the transverse striæ, which are rather strong; from the small portion remaining upon the specimen it appears that the beak is curved.

A very imperfect specimen of this has been obtained, imbedded in a septarium, from Highgate hill; it is the one I possess, and the only one I know; the probability of never obtaining better renders it necessary to figure this, as well as several other imperfect remains, since it is desirable to complete the list of shells found at Highgate, in conformity with the first intention of this work.

 MUREX minax.
TAB. CCXXIX.—*Fig. 2.*

SYN. Murex minax. *Brander, fig. 62.*

SPEC. CHAR. Short, transversely striated, spire tuberculated, acute; last whorle ventricose, with two rows of tubercles; the upper ones spiniform, furrowed; base sulcated; beak curved.

THIS Murex is about half as long again as it is wide; the last turn with the beak occupying the greater portion of its length. The plaited remains of lips of various ages are few, irregular, and but little prominent.

A rare species from Highgate: I have the same from Grignon; but I do not know that it is described by French authors.

MUREX cristatus.

TAB. CCXXX.—*Figs. 1 & 2.*

SPEC. CHAR. Ovate, transversely striated; longitudinal, costæ prominent, sharp, with three large plaits in each; the upper plait subspini-form, beak curved.

THE expanded lip that completes each successive period of the growth of this shell is very prominent, and forms a series of canaliculated spines upon the spire, in the proportion of six to each whorle; the spire extends to about one-third the whole length of the shell, and is sharp; the aperture is oval.

This species, as far as I have yet been able to learn, is peculiar to Highgate, from whence I have received good specimens, through the kindness of my esteemed friend, G. B. Snow, Esq. whose name I have had repeated occasions to mention.

 MUREX coronatus.
TAB. CCXXX.—*Fig 3.*

SPEC. CHAR. Oblong, transversely furrowed; costæ numerous, sharp; upper part of the volutions concave, bounded by a sharp ridge, and a strong spine upon each of the costæ.

TEN sharp ribs give a polygonal aspect to the spire, at the same time the spines upon them standing up around the concave space at the top of each whorle, form a kind of crown to it. The beak is slightly curved, and the outer lip crenulated.

From Highgate hill, where it is not very rare.

PECTEN barbatus.

TAB. CCXXXI.

SPEC. CHAR. Orbicular, depressed, transversely striated; rays 14, those upon one valve spinose; spines long, acute, depressed; ears nearly equal.



THE spinose valve is the flattest; the striæ upon it are sharp, and much elevated upon the sides of the rays, from whence they curve into the bases of the spines, of which there are about five to each ray. The rays upon the other valve are convex, equal in width to the space between them, and crossed by less elevated striæ than those upon the spinose valve. The sides of both valves, near the ears, are perpendicular and neatly pectinated.

This remarkable Scallop is from the collection of Mr. Miller, who obtained it from the inferior Oolite of Dundry.

CARDITA lunulata.

TAB. CCXXXII.—*Figs. 1 & 2.*

SPEC. CHAR. Rhomboidal, pointed, gibbose, transversely costated; anterior part separated by a projecting serrated keel; lunette deeply excavated; beaks involute.

ANTERIORLY this shell is pointed, and the beaks also project considerably, so that the general outline is an acute rhomb; the posterior side is rounded, and has an incurved edge about the confines of the lunette, which is very deeply impressed beneath the involute beaks; the anterior side is divided into several portions by slight elevations, or steps, the first of which is rather concave, forming a kind of truncation at the margin. There appear to be two teeth in the right valve, and one that locks between them in the left, immediately within the beaks: but distant teeth, if such ever did exist, are obliterated in the individual before us; the edge is toothed within.

A very extraordinary species named by Mr. Miller, in whose cabinet the specimens described are preserved; they were found at Dundry. There is a strong resemblance between it and *Cardium retusum* of Linneus, observed by Mr. Miller, but the resemblance is only general. I have seen the same species found in the inferior Oolite at Bayeux, in Normandy, by my highly valued friend Mr. De Gerville. *Figs. 2, 2*, give two views of the left valve.

CARDITA similis.

TAB. CCXXXII.—*Fig. 3.*

SPEC. CHAR. Rhomboidal, gibbose, transversely costated; anterior part separated by a projecting serrated keel; lunette heart-shaped, nearly flat; beaks involute.

So exactly does this shell resemble the last that it is difficult to point out any other difference than the form of the lunette; however the costæ are less prominent over the sides, and the front is less pointed.

I have not seen the interior of this shell, but from its close resemblance to the last it must belong to the same genus: it is also from Dundry, and in Mr. Miller's collection. Both species have somewhat the contour of several *Trigonæ*; hence the name *similis* is doubly applicable to the present.

ASTARTE excavata.

TAB. CCXXXIII.

SPEC. CHAR. Obovate, convex, concentrically costated ; anterior side truncated ; lunette hemispherical, excavated ; cartilage enclosed in a sulcus ; margin toothed.

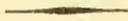
NEARLY one-third wider than long, with the back arched ; the beaks obscure, much inclined towards the posterior side, which is small. The lunette varies much in form, being narrow in young and broad in old shells, it is so deep that the cast of it resembles a globose bivalve. The furrow on the back for the reception of the cartilage is also deep, but it is very narrow and bounded by sharp edges that nearly approach each other. The costæ are not very much risen in any part, and near the front of large shells degenerate into irregular undulations. There are striæ upon the hinge teeth that might lead a casual observer to take it for a *Trigonia*.

Mr. Miller's collection contains the only exposed hinge I have seen, and the most perfect specimen for explaining the excavated lunette ; it is from Dundry. I have specimens also from G. W. Braikenridge, Esq. from the same place.

HAMITES plicatilis.

TAB CCXXXIV.—*Fig. 1.*

SPEC. CHAR. Slightly depressed, with numerous annular ridges ; two rows of large, equal, flat, tubercles upon each side ; curvature gradual.



THE tubercles are possibly the rudiments of spines like those upon *Hamites armatus* ; each one is so large as to extend over three of the annular ridges and flat ; the ridges continue all round without dividing, and are very regular ; the space between each tubercle is occupied by two of them.

I have figured this from the extensive collection Miss Benett has formed for scientific purposes ; it was found in Chalk Marl, at Bishopstrow, near Warminster.

At fig. 2 is a representation of a fragment, which I conceive belongs to *H. armatus* (see tab. 168) it serves to shew the great size that species may attain to. My friend, G. B. Snow, Esq. picked it up on the Isle of Wight last year.

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TRIGONIA gibbosa.

TABS. CCXXXV. & CCXXXVI.

SPEC. CHAR. Transversely oblong, gibbose, slightly arched, concentrically undulated, or irregularly sulcated; anterior side separated by a broad longitudinal furrow or plane space.

Var. β with large, concentric, interrupted, or nodose ridges.

A PECULIAR character is given to this Trigonía by several deep furrows that mark sudden increases of size; the first is placed about three-quarters of an inch from the beak; the next as much further; then several more approaching nearer each other as they come to the front. The breadth is somewhat greater than the length; the posterior side arched; the beaks rather prominent, incurved; the anterior side is nearly plain, divided into three parts by obtuse bends, the central one forming a straight edge; the back is concave. It seems to have been a strong heavy shell, as the cast is very thick.

In var. β , the undulations which in var. α are only conspicuous near the beaks are large all the way to the front, and much interrupted in parts, so as to form irregular blunt knobs: in other respects there does not appear to be the slightest difference.

The casts represented on plate 235, and upper figure of plate 236, are silicious: they are from the Limestone of Tisbury, in Wiltshire; it is remarkable that the external cartilage has been cast in Silix, as well as the less perishable shell, and is thus well preserved. The

lower figure of plate 236, is from the cast of the surface of var. β , in a sandy Limestone; it is much flattened: also from Tisbury. Miss Benett who collected these specimens we hope will, ere long, favour the world with a full account of the local circumstances and situations they are found in.

TRIGONIA striata.

TAB. CCXXXVII.—*Figs. 1, 2, and 3.*

SYN. Trigonía striata. *Miller's MSS.*

SPEC. CHAR. Obtusely triangular, convex, with arched, oblique, crenulated costæ upon the middle and posterior side; anterior side nearly covered by numerous elevated sharp ridges.

LENGTH and breadth nearly equal; the anterior side is divided into a smooth and a striated part; the smooth part is small, and forms a kind of lanceolate lunette near the hinge; the striated part is nearly flat: in some specimens it is again divided by an intersection of the ridges.

Found in the inferior Oolite at Dundry, by Mr. J. S. Miller, in whose collection the specimens are deposited, with the name above quoted. *Figs. 1 and 2* are different views of the same specimen.

 TRIGONIA duplicata.

TAB. CCXXXVII.—*Figs. 4 and 5.*

SPEC. CHAR. Transversely oblong; anterior side marked with small undulating ridges, and bounded by a strong tuberculated ridge; over the middle are longitudinal crenulated costæ, suddenly reflected over the posterior side; on the front are short intermediate ridges.

A SLIGHTLY depressed shell; it is wider than long; the posterior side is small; the principal costæ are nearly straight, and sometimes branched towards the front; but generally they are only thinner, and alternate with other

short ones ; those costæ which are near the posterior side are suddenly bent before they pass over it ; over the anterior side are scattered some small irregular thread-like lines, and near the edge a few obscure tubercles. The beaks are rather prominent.

This was sent me several years ago by the Rev. H. Steinhauer, from the inferior Oolite of Little Sodbury. None of my specimens have the anterior side complete : the dotted outline is from a specimen which belonged to the Rev. Mr. Townsend, in recollection of whose merits I take a pleasure in mentioning his name. It is from the double series of costæ near the front that the shell is named.

TRIGONIA pennata.

TAB. CCXXXVII.—*Fig. 6.*

SPEC. CHAR. Oblong, transverse, with concentric costæ ; along the middle of the anterior side is a ridge from which many tuberculated ridges diverge each way.

THE concentric costæ are striated upon their fronts ; at one end they join the ridges upon the anterior side which diverge from a central line like a feather.

I have only seen one, and that a very imperfect cast of this shell, but as there are characters enough to distinguish it by, I thought it might be a useful addition to this plate. It occurs with casts of other Trigonix and Oyster shells, in a mass of coarse Quartzose sand, mixed with green sand, cemented by Carbonate of Lime, which was sent me from Teignmouth, by Thomas Hare, Esq.

OSTREA expansa.

TAB. CCXXXVIII.—*Fig. 1.*

SPEC. CHAR. Broad, deltoid, angles obtuse, hinge pit wide, flat, slightly elevated, and nearly straight; cicatrix broad, with a sinus at the back.

LENGTH and breadth nearly equal; the margin is largely waved: I am not acquainted with the outside of the shell.

There is a remarkable circumstance connected with this and the following Oyster; but most strikingly in this; it is, that the softer part of the shell under the ligament, has resisted the action of the solvent, that introduced Silex in place of the chalky substance between the laminae in the other parts of the shell, but has subsequently decayed away, leaving an inclined hollow space reaching nearly to the beak.

These remains are found in the Tisbury Limestone, accompanied by empty casts of Trigonæ, &c.

OSTREA undulata.

TAB. CCXXXVIII.—*Fig. 2.*

SPEC. CHAR. Recurved, subtriangular, deep, posteriorly rounded; surface radiated; laminae imbricated, undulated; cicatrix elongated, ovate, oblique: hinge pit slightly elevated.

A MORE regularly formed shell than what usually belongs to an Oyster; it is thick, and at the beak retains marks of attachment to some uneven surface; its laminae are very regularly waved over the projecting radii. I have only seen the hollow valve.

This was brought to me by Miss Benett, along with the last, for the purpose of being figured, that a reference may be had to some at least of so numerous and obscure a tribe of shells. It is from Farley, near Salisbury. The cicatrix is excavated a little like the last, but there does not seem to be a silicious deposit between the laminae. The excavation in the cicatrix has been thought to characterize the last species; but it is a circumstance that may be observed, not only in other Oysters, but in other genera, both foreign and British: thus the flat valve or support of *Hipponix** *cornucopia* of De France has often a deep hollow in place of the arched cicatrix, in consequence of the shell being more liable to decay in that part.

Oysters and some other common shells are the most puzzling, because they admit of such extensive variation that, although there are certainly many species among them, the greatest discernment meets continually with stumbling blocks, while attempting to distinguish them from one another, or the recent from those of ancient times. The proportions of Oysters differ in every individual, more or less; the shape, placing, and even colour of the cicatrix also vary; and similar variations are to be found in both fossil and recent shells thus I have the placing and purplish colouring exemplified in fossil Oysters from Normandy, and in recent ones from America; the thickness of the shell and length of the hinge pit are sometimes characteristic, but vary much with age. The fibrous shell of the inferior Oolite is proved by specimens I have from Normandy to be an *Ostrea*, and is often above two inches thick; and I have a fossil hinge from the Tagus above four inches long; but other specimens of the same species are much shorter. Varieties of the common recent Oyster, which are distinguished by their localities, as Milton, Colchester, &c. although they are pretty well known by a general observer, yet, when compared individually, do not appear to possess any decided character; but after all, figures and a reference to a few characters must tend to assist us in understanding what shells are alluded to by Conchologists, and therefore I presume the present plate will be useful.

* A new genus established by De France, containing several shells that were classed with *Patella*, but which are found to be attached bivalves.

PECTEN lamellosus.

TAB. CCXXXIX.

SPEC. CHAR. Orbicular, convex; with concentric erect lamellæ upon the surface, and diverging striæ near the beaks; ears large, distinct.



BOOTH valves are convex, but the lower one is most so; the front is semicircular placed a little obliquely; the straight sides, to which the ears are attached, connive to form a right angled beak; when the erect edges of the lamellæ are broken off, which is commonly the case, the shell appears to be constructed of large imbricated plaits like an Oyster; small, irregular, impressed striæ, which are interrupted and gradually lost towards the front, diverge from the beaks.

I am indebted to Miss Benett for this Pecten; it occurs in the fifth bed of the Limestone of Chicksgrove quarry, described in Vol. II. p. 58; it is also found at Thame, in Oxfordshire, among Sand, of which a very large portion is dark green Talc, or Chlorite: this Sand belongs to the same stratum as the Limestone of Chicksgrove.

TURBO ornatus.

TAB. CCXL.—*Figs. 1 and 2.*

SYN. Turbo ornatus. *Miller's MSS.*

SPEC. CHAR. Conical, longitudinally striated; three or four acutely tuberculated ridges run along each whorle; the middle one largest.

AN acute shell, rather longer than wide; the tubercles are slightly flattened, and connected in transverse ridges by narrow keels; upon the base are three or four smaller ridges with blunt tubercles: the aperture is entire.

Fig. 1 gives three views of a worn variety, in which the tubercles are nearly lost.

Fig. 2 shows more perfect specimens.

In Mr. Miller's cabinet; found at Dundry. I have a Turbo from Normandy resembling this, but it wants the striæ; it is in the same kind of rock.

TURBO carinatus.

TAB. CCXL.—*Fig. 3.*

SPEC. CHAR. Conical, with many transverse crenulated ridges; whorles carinated.

POINTED, longer than wide; there are five or six ridges upon the exposed part of each turn, nearly close together, and deeply crenulated; the central ridge is so prominent as to form a carina.

Found in the Green Sand; but I do not know at what place.

TURBO muricatus.

TAB. CCXL.—*Fig. 4.*

SYN. Turbo. *Smith's Strat. Syst. p. 49. Strata Identified, p. 20. Coral Rag. Plate f. 1.*

SPEC. CHAR. Short, conical, with many muricated ridges ; lip plaited ; columella indented at the base.

POINTED, nearly as wide as long ; the ridges are equal to the concave spaces between them, they are covered with short semicylindrical hollow spines, the formation of which around the edge forms the plaited lip : this and the indentation of the columella are two very essential characters.

Common in the Coral Rag at Steeple Ashton and some other places ; another shorter, but somewhat similar species, is found in Long Leat Park, and a third in the Pisolite : the three have been confounded together, but I hope hereafter to shew that they are quite distinct.

MELANEA fasciata.

TAB. CCXLI.—*Fig. 1.*

SPEC. CHAR. Turreted, short, transversely striated; whorles about six, marked with three coloured bands, coronated; aperture ovate.

BETWEEN two and three times as long as wide; the upper edge of each turn is crowned with rather distant obtuse knobs; the bands are preserved of a light brown colour, while the rest of the shell is nearly white.

I am indebted to Dr. Dansey* for this interesting little shell; it was found in the fresh water formation on the Isle of Wight, but seems to belong to a genus often found among marine fossil shells; it is further remarkable for the preservation of its colours.

The central figure is of the natural size; the others are magnified.

MELANEA costata.

TAB. CCXLI.—*Fig. 2.*

SPEC. CHAR. Turreted, transversely striated, longitudinally ribbed; mouth obovate.

VOLUTIONS about eight; length above three times the width; the costæ are numerous, but not much elevated. The spire tapers very gradually, the sides being almost straight.

Hordwell Cliff.

The lateral figures are magnified.

* This gentleman has also favoured me with some new localities of shells formerly published, which I shall add after the Index to the third volume.

MELANEA minima.

TAB. CCXLI.—*Fig. 3.*

SPEC. CHAR. Turreted, smooth; sides straight; mouth ovate, pointed above; base slightly produced.

A VERY plain shell, composed of about eight whorles, which are flatish on the sides; nearly four times as long as wide.

From Brakenhurst, New Forest, Hants, by favour of the Rev. Mr. Iremonger.

MELANEA truncata.

TAB. CCXLI.—*Fig. 4.*

SPEC. CHAR. Conical, elongated, smooth; whorles angular below; mouth ovate, acute above, truncated below.

A SHARP polished spire and angular whorles distinguish this Melanea; the outer lip is a little thickened: the truncation of the edge of the lip, close to the columella, make it approach in appearance to a Cerithium.

From Brakenhurst with the last.

AMMONITES Lamberti.

TAB. CCXLII.—*Fig. 1, 2, and 3.*

SPEC. CHAR. Discoid, depressed, radiated; inner whorles partly concealed; radii numerous, bent forward over the front, alternately long and short, rarely furcated; front sharp, crenated; mouth lanceolate, short.

THE longer radii are strong obtuse ridges that proceed from the inner margin of each whorle and a little way beyond the middle are curved forward, sometimes they branch at this part, but generally the shorter ridges commence here and accompany them over the edge, where they produce an imperfect crenulated keel; in some specimens there are two or even three short radii between each long one, and in some the radii are much more elevated than in others, particularly in the last turn of large ones, where they are also proportionally less numerous. The diameter is nearly four times the thickness.

From Portland and Weymouth. Named after Aylmer Bourke Lambert, Esq. V. P. L. S. &c.

AMMONITES Leachi.

TAB. CCXLII.—*Fig. 4.*

SPEC. CHAR. Depressed, radiated; inner whorles half concealed; radii undulated and curved forward over the front, often furcated; front sharp, crenated; mouth ovate.

THIS differs from the last only in being more gibbose, and having fewer and more prominent radii; it is possibly only a variety.

From Weymouth. I have joined Dr. W. E. Leach's name to this Ammonite, as a further mark of that respect already paid so often to his abilities.

AMMONITES omphaloides.

TAB. CCXLII.—*Fig. 5.*

SPEC. CHAR. Gibbose, radiated: inner whorles half concealed; radii prominent, waved, bent forward in the middle of the front, generally furcated; front broad, rounded; mouth transversely oblong.

THE whorles of this shell increase so rapidly as to form a large umbilicus; in this respect and their gibbosity it differs from the preceding species; but the form of the radii is very analogous: the short radii are not always joined to the longer ones, but when they are they frequently unite to two alternate ones on the opposite sides of the whorles, forming a zigzag line upon the front, as is shewn in the outline.

The shells figured upon this plate are all from the clay which occurs in Portland Island and near Weymouth: the first species is very abundant; the two others are less frequent: they are all cast in Iron Pyrites, and were probably pearly shells, although now the shelly matter is nearly all lost. Such specimens as have been long exposed to the weather have lost their sulphur, but still retain their form. The first I have received from Dr. Leach and A. B. Lambert, Esq. The two latter along with a series of the first were transmitted to me by Prof. Buckland, for the purpose of being figured.

AVICULA echinata.

TAB. CCXLIII.

SYN. A. echinata. *Smith's Strat. Syst. p. 67. Strata Ident. p. 26, Cornbrash plate, f. 8.*

SPEC. CHAR. Obovate, gibbose; many muricated radii upon the deepest valve; flatter valve smooth, with the anterior ear pointed.

THE deeper valve is a trifle longer than wide, with unequal ears, the anterior of which is nearly right angled. The other valve is often wider than long, because the beak of it is not so prominent as in the convex valve: its anterior ear is elongated and pointed; it is convex: in general it is smooth and free from radii, but in the one figured, which exceeds the usual size, it is radiated towards the margin.

An abundant species in the Cornbrash Limestone, where it occurs in thin beds that contain great numbers closely pressed together, as is shewn in a mass I have from Chippenham, Wilts. Loose shells are found at Langton Herrn, near Weymouth, as I learn from Prof. Buckland's specimens.

The shells figured at No. 1 are from Pavingham, presented to me by T. O. Marsh, Esq.

Figures 2, 2 are from casts in a compact Limestone like the Lyas, but I do not know the locality.

ORTHOcera gygantea.

TAB. CCXLVI.

SPEC. CHAR. Shell gradually tapering, smooth, or striated; aperture oval, with the two diameters in the proportion of 7 to 8, siphuncle at a small distance from the centre, septa direct, numerous, deep.

THE aperture is eight or more inches in diameter, and as the shell diminishes at the rate of about one inch in a foot, its length may often exceed eight feet. The broader extremity is slightly expanded, and probably the other does not taper so rapidly as the middle, hence the above length may be under-rated. The thickness of the shell is about one fourth of an inch. On one small specimen the surface is finely striated longitudinally in the same way as *O. striata* (tab. 58) from which however it differs in not being compressed, and the siphuncle not being in the centre. The shell is so incorporated with the stone that it is difficult to discover the outer surface and consequently whether it be striated all over or only towards the smaller end.

This species of *Orthocera* does not agree with any of those described by Dr. Fleming*, or any other writer I have met with, but in general the descriptions are not particular enough for the discrimination of species, when more than one such are nearly allied. Had not the "*Orthoceratites superficie lævi*" of the Rev. Mr. Uret† been referred to by Dr. Fleming, under his *O. lævis*, which differs from *O. gigantea*, in the position of the

* See "Annals of Phil." V. 199.

† "History of Rutherglen and East Kilbride," p. 306, t. XVI. f. 3.

siphuncle and form of the septa : I should have referred it to this latter species, although it be of inferior size. I have been induced by the magnificence of their appearance to give full sized figures of a series of specimens, from the largest I possess to the smallest: I lately received them from that very liberal promoter of science and the useful arts, Charles Stewart Menteith, Esq. from his Lime-works at Closeburn, in Dumfriesshire. Mr. Farey (the gentleman to whom I have been indebted for the Stratigraphical Indexes) having been consulted by Mr. Menteith in 1815, respecting the probability of discovering coal on his estate, has furnished me with the following particulars :

“ The Closeburn Lime Quarry is situated about seven-eighths of a mile S.S.E. of the Church, and about half a mile E.N.E. from the well-known inn on the Toll Road to Sanguhar, called Brown Hill, in rather low ground, about one eighth of a mile distant to the S.W. from the commencement of a considerable Basaltic Hill, called Barn Muir. The sinking of the quarry and a boring near it, were stated to me by Mr. John Waugh, the resident agent, as follows :

“ 1st. Sandy Gravel 21 feet.

“ 2nd. Clayey Gravel or Till, intercepting the land springs from No. 1. seven feet and a half.

“ 3rd. Slaty beds, or hard laminated Clay.

“ 4th. Clay; the lower part of which in drying separates into small pieces.

“ 5th. Doggers ; a hard and bad Limestone, in three beds, two feet.

“ 6th. Upper rock of Limestone ; of a dun-red colour, and somewhat granular, with dark red joints, separating the parts or blocks of stone.

“ 7th. Lower Doggers ; a very bad Limestone, used for walling; it includes some clayey and shattery way-boards, nine feet.

“ 8th. Clay, used for brick, two feet and a half.

“ 9th. Flagstone, six inches.

“ 10th. Hard Clay, used for furnace or fire bricks, three feet.

“ 11th. Nodulings or pinney Beds, composed of lumps of good Limestone, set fast in earthy matter.

“ 12th. Lower Lime-roof beds, four feet and a half.

“ 13th. A hard, compact, good Limestone, from which, the principal supply of stone is now obtained, by mining underneath, and leaving pillars to support the roof; herein the *Orthocera* are found, accompanied by *Nautili*, and some other spiral shells, *Producti*, *Trilobites* and *Corals*, thirteen feet.

“ 14th. Clay, six inches.

“ 15th. Lowest Doggers, fourteen inches.

“ Below these, Sandstone and Limestone are said to alternate, for about 50 feet; and then a very hard rock commences, perhaps Basalt? The dip is N.E. 1 in 8.

“ In the Bajarg Lime quarries, situated about two miles W. S.W. from those of Closeburn, *Orthocera* 20 feet long have been found, in the Limestone rock (perhaps the same bed as No. 13 at Closeburn) as I was informed by Mr. John Milligan, the agent resident there.”

Mr. Farey also observes, “ It seems to me remarkable that Professor Jameson, in p. 91 of his ‘ Mineralogy of Dumfrieshire,’ when speaking of the Closeburn and Bajarg quarries, omits all mention of these remarkable *Orthocera*, but speaks of ‘ large Ammonites,’ as I believe by mistake.”

In pages 91, 97, and 99, Mr. Jameson says, “ that the petrifications of Closeburn and Bajarg, correspond with those of other quarries in a more southern part of the county at Brown-muir, Blacket-rig, and Chaldronlinns, where *Corallites*, *Chamites*, and *Mytilites* are mentioned.”

The Limestone rock of all which places Mr. Farey considers as undoubtedly belonging to the Under-coal or Mountain Limestone, and the same perhaps as that of Ashford, Bakewell, &c. in Derbyshire High-peak Hundred, wherein large Orthocerae of several species are found, see W. Martin's "Petrificata Derbiensia," tab. 38 & 39.

Orthoceratites have been considered as characteristic of Werner's Transition Limestone, but in England at least they are to be found more frequently in the mountain Limestone, and those Limestones or Shales which accompany the lowest seams of Coal. In the oldest Transition Rocks of Great Britain it does not appear that they have ever been found.

Very large Orthocerae are said by some authors to have been met with, but those who have taken the pains to give the measures of what they found, have not described any above a quarter of the size of our *O. gigantea*; hence I conceive it must be new.

The stone this is found in differs from the metalliferous or mountain Limestone of England in color, being of a deep red, and in having a micaceous shale dispersed through it. It contains many of the same shells and corals; but this and the following species of Orthocerae seem peculiar to it.

ORTHOCERA cordiformis.

TAB. CCXLVII.

SPEC. CHAR. Obconical; base contracted; sides convex; aperture round.

IN size and form this much resembles a bullock's heart; its septa are numerous, and placed directly across; the surface appears to be smooth and plane; the siphuncle is not quite in the centre; the tube of which it is composed is inflated into a globular form between each septum (see figs. 2 and 3); the last chamber is narrower at its opening than at its base.

If the Belemnites be really distinct from Orthocerae, the shortness of their alveoli will no longer be sufficient to distinguish them from Orthocerae, since the one before us is shorter than most of the genuine alveoli, and must still be considered as a true Orthocera, for it is not likely that a Belemnite, of a size proportioned to it, could have passed unnoticed, had it existed in the same quarry; and it is still less likely that it should have been destroyed, while its more tender chambered part remained so preserved as to resist the shock of worlds. I have been favoured with several specimens of this species by the same gentleman, and from the same place as the *O. gigantea*. One specimen is particularly interesting for shewing a section of the siphunculus, composed of a series of hollow globes: it is very much fractured, but there is enough of the outer part to prove that it belongs to this species, and not to the *gigantea*. A similar siphunculus is described and figured by the Rev. Mr. Ure ("History of Rutherglen and Kilbride," p. 306.

tab. XVI. f. 1.) from a more perfect specimen, as far as regards that part; but there seems to be less of the shell attached to it. Is it possible that it belongs to the present species, and not to the one he refers it to? especially as it appears, that only some specimens were thus inflated. We are not acquainted with the tube of *O. gigantea*.

MODIOLA cuneata.

TAB. CCXLVIII.—*Fig. 2.*

SPEC. CHAR. Transversely elongated, slightly compressed, nearly smooth; posterior side small, undefined; anterior side slightly curved and produced.

AN intermediate shell, between *Modiola* and *Mytilus*, but decidedly a *Modiola*, although the posterior side does not form a distinct lobe; it is four times as long as wide; the surface is irregularly striated by lines of growth; but otherwise smooth; the shell is moderately thick.

This was sent me as found in the upper beds of the Lyas Clay at Bourton, near Cropredy and Banbury, in Oxfordshire, by the Rev. W. D. Conybeare: it is also found near Bath.

MODIOLA plicata.

TAB. CCXLVIII.—*Fig. 1.*

SPEC. CHAR. Transversely elongated, slightly curved; back nearly straight, plaited obliquely.

THE anterior side is separated by a ridge, above which it is striated, and towards the back the striæ disappear gradually, and strong undulations commence, which, along the back, become sharpish plaits that diverge from the beaks; the rest of the shell is smooth, excepting that it is marked by blunt irregular lines of growth. The ante-

rior end is slightly truncated; the other obtuse; they are nearly equal in width, that is about one-sixth of the length.

I have seen this species from Felmarsham, in Bedfordshire, where it was collected by the Rev. T. O. Marsh,* and also from other parts of the Cornbrash Limestone stratum.

* This gentleman's name has been erroneously given at p. 75, for which I have to beg his pardon.

NAUTILUS pentagonus.

TAB. CCXLIX.---*Fig. 1.*

SPEC. CHAR. Discoid, subcarinated; inner turns partly concealed; aperture orbicular, obscurely 5-angled, and impressed by the preceding whorle, nearly half the diameter of the shell long.

BESIDES the carinated form of the front of the whorle it is flattened a little upon each side, which gives five inconspicuous angles to the aperture. The turns are few, and increase rather rapidly in size, the inner ones being about one-third covered by the outer. The septa are not very concave, rather numerous, with a central siphuncle. The surface is apparently smooth. The young shells seem to be less angular than the older ones.

The first specimen I received of this Nautilus was found in black Limestone, at Bathgate, Scotland, and given to me by my friend Dawson Turner, Esq. I lately received several specimens in red Limestone, from the same quarries at Closeburn which produced the gigantic Orthocera, tab. 246. through the liberality of C. S. Menteith, Esq. They are probably what Jameson has spoken of as large Ammonites. I do not know they are found much larger than the figure.

NAUTILUS bilobatus.

TAB. CCXLIX.---*Figs. 2 and 3.*

SPEC. CHAR. Subglobose, umbilicated; septa two-lobed; aperture 3 or 4 times as wide as long.

A NEARLY globose shell, with the front a little flattened, the umbilicus is small and nearly cylindrical; the si-

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phunculus is central, on each side of it the septa are remarkably concave, so as to form two elliptical lobes. It is nearly as thick as wide.

From Closeburn, with the last. Fig. 3 is from an impression taken in pipe-clay from the specimen represented at fig. 2.

NAUTILUS tuberculatus.

TAB. CCXLIX.---*Fig. 4.*

SPEC. CHAR. Discoid, thick, largely umbilicate; one row of large tubercles on each side; front rounded; aperture transversely elongated, two-angled.

THE width of the aperture is twice its length; the inner turns are almost wholly exposed by a large conical umbilicus. The septa are not very concave, but their edges are slightly waved.

This Nautilus bears some resemblance to *Ammonites Banksii* in general form, but perhaps is not so thick. It is from Closeburn, by favour of C. S. Menteith, Esq.

Fig. 5 represents the cast of some involute shell, the genus even of which I have not been able to discover. Should any observer be so fortunate as to meet with illustrating specimens, I should be happy to make them useful. I conceived all these specimens would be thought interesting as they are all from the same stratum, and there may never be better.

HIPPOPODIUM.

GEN. CHAR. An equalvalved obliquely transverse bivalve ; valves inflated, subbilobed ; one rugged tooth at the hinge ; cartilage external.

THE beaks of the Hippopodium are much incurved, and behind them there is a deep heart-shaped cavity ; the anterior slope is deeply sunk between the anterior lobes of the two valves. The cartilage of the hinge is external and elongated. In the left valve there is one thick rugged tooth beneath the beak, and only a small indication of a remote one beneath the cartilage.

The Rev. W. D. Conybeare first distinguished this genus, and named it in his M. S. catalogues. At present only one species is known, and of that the specimens hitherto found are not enough freed from the stone to shew the situation or number of the muscular impressions, or the tooth of the right valve, if it have one.

 HIPPOPODIUM ponderosum.

TAB. CCL.

SPEC. CHAR.

SYN. A bivalve fossil from Colebrook Dale.

Rashley's specimens of Minerals, tab. xx.

A VERY gibbose, rugged, and heavy shell : the lines of growth are strongly marked by irregular obtuse ridges. The anterior lobe is somewhat angular, and a little pointed ; the posterior lobe much smaller, rounded, and as it curves with the beak it forms the boundary of the heart-shaped pit beneath it : this pit is deep, and

apparently continues to the very tooth of the hinge, upon which the lines of growth are strongly marked, continuing from the edge of the valve. The depth of one valve is equal to its smallest diameter, and this is about half the measure from the point of the anterior lobe to the beak : the cordiform pit is wider than long. When placed upon the prominent parts of the anterior lobe, the front is so obtuse, that it resembles in its general form a horse's hoof; whence the name of the genus.

Found at Toddendam, near Shipston-on-Stour, in Gloucestershire, by the Rev. W. D. Conybeare. (See the upper figure.) It is also found at Fenny Compton tunnel, on the Oxford canal, whence the lower figure; and at Cheltenham; in all these places in the upper beds of the Lias, as I am informed by Mr. Conybeare.

MODIOLA ? alæformis.

TAB. CCLI.

SPEC. CHAR. Triangular, inflated ; back straight ; posterior lobe very small ; anterior lobe flattish ; central part convex, elongated, with projecting beaks.

LENGTH nearly twice the breadth ; the projecting part of the anterior side, which gives it a wing-like form, makes this shell approach to *Avicula*. The posterior lobe is somewhat acuminate : between it and the principal lobe is a concave space. The depth of the two valves united is equal to the width. The surface is rather rugged and imbricated.

This was sent me from Sandgate, on the Isle of Wight, by the Rev. W. D. Conybeare, who seemed to think it might possibly be a *Hippopodium*. It is however sufficiently distinct from the type of that new genus figured in tab. 250. It somewhat resembles *Avicula* and *Modiola*, but I am at a loss to determine to what genus it really belongs, and there is not much chance of discovering the parts about the hinge.

OSTREA Meadei.

TAB. CCLII.---*Figs. 1 and 4.*

SPEC. CHAR. Tongue-shaped, thick, elongated; attached valve very concave, longitudinally undulated; the other plain and flat.

A VERY rugged irregular shell, but generally much elongated; its substance is compact, in which it differs from somewhat similar recent ones, whose laminæ enclose large cysts. The flat valve in the specimen before us has the lateral crenulations near the hinge, common in this genus, very conspicuous.

I was favoured with this specimen some years ago by Thomas Meade, Esq. but do not know the locality; it is probably from Somersetshire. I have not been able to identify it with any species hitherto described.

OSTREA tener.

TAB. CCLII.---*Figs. 2 and 3.*

SPEC. CHAR. Depressed, elongated, thin, nearly plain; attached valve, nearly flat, with a canaliculated beak.

THIS slender, and consequently fragile Oyster, is generally much longer than wide; it is often much distorted, so, as it is never deep, the upper valve frequently becomes concave: both valves are free from radiating undulations, and possess an uncommon degree of smoothness, although they are composed of imbricated laminæ. The pointed beak of the upper valve included

in the canaliculated and often curved beak of the other, is a frequent character.

This shell is very abundant in one of the strata belonging to the plastic clay at Charlton in Kent: I suspect that it may also be found near Paris, but I have not seen specimens from that neighbourhood.

OSTREA flabellula.

TAB. CCLIII.

SPEC. CHAR. Oblong, arched; larger valve deep, longitudinally plaited, with a toothed margin; the other flat and imbricated, with an entire margin.

SYN. *Ostrea flabellula*. *La Marck Hist. des Animaux s. vertèbres, vi. 215.*

Chama plicata. *Brander, 84 and 85.*

VERY variable in form, like most Oysters, but constantly arched; the beaks are prominent, and especially of the hollow valve, much curved; the plaits are somewhat irregular, but commonly diverge from a curved line along the middle of the valve. Some specimens have a small wing in the hollow side. The lateral crenulations are very conspicuous on the sides and edges of the flat valve near the hinge.

This is certainly Brander's *Chama plicata*, and the same species as that found at Grignon: it is remarkable that De La Marck should hesitate to admit the plain valves as the same species, Brander's fig. 84 is so good: I have frequently met with the two valves attached.

Fig. 1 represents a specimen from Hordwell or Barton, from which places I have many of all sizes, from half an inch to near two inches long, by favour of Miss Salisbury, the Rev. Mr. Bingley, and other kind friends.

Figs. 2, 3, 4, 5, 6, 7, and 9, are from four specimens selected from a large number sent me by Charles Lyell Jun. Esq. who obtained them at a brick-kiln at Lyndhurst.

Fig. 8 is a variety, with an uncommonly large beak and hinge-pit, from Barton, by favour of Miss Salisbury. Larger individuals with stronger undulations are dredged up in Emsworth harbour, for specimens of which I am indebted to J. Holloway, Esq.

AMMONITES Strangewaysi.

TAB. CCLIV.---*Figs. 1 and 3.*

SPEC. CHAR. Discoid, radiated, radii twice curved; inner turns exposed; margin flattened, carinated, inner edges of the whorles obliquely flattened; sides nearly flat, with an obscure concentric furrow, aperture oblong.

FOUR or five turns are distinguishable in this Ammonite; its diameter rather exceeds three times the length of the mouth, which is twice as long as wide; the radii are largest and most distinct near the margin, on the other parts they are often obscure, they are very numerous, each forms two semicircles reversed to one another, the ends of which join in the obscure, or rather wide and shallow, furrow that runs round the sides. The oblique flattened surface that forms the inner edges of the whorles, slants from the centre, and becomes a strong character.

From Ilminster, by favour of E. Strangeways, Esq. a Gentleman well known as a practical Geologist.

AMMONITES falcifer.

TAB. CCLIV.---*Fig. 2.*

SPEC. CHAR. Discoid; radiated; radii curved and suddenly bent in the middle; inner volutions half exposed; margin convex, carinated; whorles convex on their sides; aperture elliptical.

THE diameter is little more than twice the length of the aperture. The radii are numerous and close together;

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as they diverge from the centre they turn a little forward, then bend suddenly back, and afterwards proceed in regular semicircles to the margin, somewhat resembling the curve of a reaping hook. The inner edge of the turns is elevated and obtuse.

This nearly resembles the last, but is not so flat, and wants the flat surface of the inner margin of the whorle. It is from the Inferior or Iron-shot Oolite of Ilminster.

AMMONITES Goodhalli.

TAB. CCLV.

SPEC. CHAR. Discoid, carinated, radiated; inner turns two-thirds exposed; radii large, undulated, irregular, obscurely tuberculated at each end; keel very prominent, thin; aperture oblong.



BOTH edges of the whorles of this Ammonite are gradually rounded; the sides nearly flat. Between the principal radii are sometimes shorter ones, the first have an elevation at each end forming a kind of tubercle, the latter have tubercles at the outer ends only, none of the radii are very prominent, although they are broad. The length of the aperture equals about two-fifths of the diameter.

The specimen here exhibited is a calcedonic cast in micaceous Sandstone, from Blackdown, Devonshire; it was given me by H. H. Goodhall, Esq. in commemoration of whose long continued researches we have named it.

VENUS turgida.

TAB. CCLVI.



SPEC. CHAR. Orbicular, gibbose, with concentric ridges; valves thick, with tumid crenulated edges.



THE ridges upon this shell are variable according to the age or state of preservation: in some specimens they are sharp and prominent, in others they are scarcely elevated. The tumid edge does not appear until the shell has attained its full growth, when it is sufficiently remarkable. The lunette is defined by a line; it is cordiform. The hinge possesses the small tooth that marks the genus *Cytherea* of La Marck.

I have this among the numerous contributions from the crag of Norfolk and Suffolk, lately made to me by the Rev. G. R. Leathes. The specimen of which two views are given at fig. 1. is in excellent preservation, and shews the prominent ridges, the other specimen appears to have been worn: the first is from Ramsholt, near Woodbridge, out of a newly discovered bed of clay; the latter from Woodbridge. I have also a younger white shell with a thin edge from Roydon.

ASTARTE planata.

TAB. CCLVII.

SPEC. CHAR. Transversely obovate, gibbose, with small obtuse concentric ridges; edges crenulated; lunette concave; shell thick.

THE ridges upon the surface are small, obtuse, close together, and lost near the margin; the edge is often very broad, flat, and crossed by sulci formed of extended crenulations, which are visible even when the valves are close. The anterior side is slightly truncated.

This is a plain looking shell, in consequence of the smallness of the ridges; it is nearly two inches wide, and above one inch and a half long when full grown: the whole of the broad crenulated margin being visible when the valves are close has a curious appearance.

Found in indurated Marl at Gunton, by the Rev. G. R. Leathes; and at Roydon by — Smith, Esq.

VENERICARDIA. *La Marck.*

GEN. CHAR. An equalvalved, inequilateral bivalve; ribbed longitudinally, hinge furnished with two thick teeth directed obliquely to one side.

A GENUS of shells externally much resembling *Cardium*, but with a totally different hinge, which consists of two teeth in one valve fitting into hollows in the other, they both rise near the beaks, and are nearly parallel with each other and the hinge slope; one is generally shorter than the other, and takes a more longitudinal direction; the longer one is often comparatively thin, and sometimes it is lost in the callosity that supports the cartilage.



VENERICARDIA *senilis.*

TAB. CCLVIII.

SPEC. CHAR. Obliquely cordate, thick, with large, convex, subimbricated, naked ribs; lunette obsolete.

SYN. *Venericardia senilis.* *De La Marck, Env. de Paris, 222.* *Parkinson, 3, 191, t. 13, figs. 15 and 17.*

By age this shell becomes transversely oblong, and when young it has somewhat of a square form produced by the elevation of the hinge slope; the ribs are about 17 in number; they are rather rugose in consequence of the edges of the imbrications being blunt and seldom reflected; the edge has a square tooth between each rib as is common in *Cockles*, *Pectens*, &c.

Fig. 1 represents a well grown individual of this species, and fig. 3 a younger one.

Fig. 2 is a thick variety, and seems to have been interrupted in its growth, having lived in a less congenial soil; it has been thought to be a distinct species, and the Rev. Mr. Leathes, to whom I am indebted for it, proposes to call it *Venericardia antiquata*.

They are all from the Suffolk Crag.

VENERICARDIA carinata.

TAB. CCLIX.---*Fig. 2.*

SPEC. CHAR. Transversely oblong, with 20 nearly smooth carinated ribs; lunette obsolete.

A GIBBOSE rather slender shell, but little indented below the beaks; the ribs are prominent, and rather square, with a sharp elevated smooth keel along each; the lunette is minute; the edges are toothed as usual. Width about one inch, and length 3-4ths of an inch.

This elegant species was procured by J. Holloway, Esq. at Stubbington.

VENERICARDIA deltoidea.

TAB. CCLIX.---*Fig. 1.*

SPEC. CHAR. Deltoid, with rounded angles; ribs 15, keel formed; hinge callous; beaks prominent; lunette small.

A RATHER strong shell, particularly heavy about the beaks; the ribs rise very gradually from the surface of the shell, and are sharp in the middle, they are smooth; the edge is toothed between the ribs.

A remarkable shell, found by C. Lyell, Jun. Esq. in clay, at Lyndhurst in Hampshire.

TAB. CCLIX.---*Fig. 3.*

Is the cast of a shell nearly allied to a Venericardia, but too imperfect to decide upon; it is of rare occurrence in the Marl of Ringmer, whence G. Mantell, Esq. sent it. I should be happy to meet with better.

CONULARIA, Miller.

GEN. CHAR. A conical, hollow, univalved shell, divided by imperforate septa, mouth half closed.

ONLY two species are known of this genus, therefore, but little can be said of its general form, that which is to be considered the type of the genus, is a straight four sided pyramid, ornamented upon the surface, and whose base is partly closed; the septa occupy perhaps half the length; they are convex towards the apex, and imperforate, unless there be a very minute siphuncle in one of the angles. It has hitherto been found only in a fossil state.

Mr. Miller, of Bristol, has very properly instituted this new Genus for the reception of a four sided fossil somewhat resembling an Orthocera, but furnished with imperforate septa and an inflexion of the lip, that nearly closes the mouth. It may perhaps belong to that family of Lamarek's order of shelly Animals Crassipedes, which inhabit tubes (Conchifères crassipèdes tubicolées) and contains *Teredo* and some other tubiform shells, whose tubes are sometimes jointed.

CONULARIA quadrisulcata.

TAB. CCLX, Figs. 3, 4, 5, and 6.

SYN. *C. quadrisulcata*, *Miller's M.S. catalogue*.
A curious fossil, *Ure, History of Rutherglen and Kilbride*, p. 330, t. XX. f. 7.

SP. CHAR. Foursided, straight, transversely sulcated, and Longitudinally striated; the four angles sulcated.

IN the centre of each side the sulci are bent, the spaces between them form very narrow ridges, and the longitudinal striæ are most conspicuous within the hollows; the furrows approach very close together near the base. Two of the angles opposite each other are longer

than the others, they are all equally excavated; the lips of two sides are inflected over rather more than half the base and meet opposite to the shorter edge, they are sulcated in the same manner as the rest of the surface; the septa are slightly and irregularly striated across.

The above description is taken from a very perfect specimen (fig. 4) found by the Rev. R. B. Plumtree of Gloucester, in transition Limestone, who gave it to Mr. Miller; it is the only one in which I have seen either a septum or the inflected lips. Fig. 5, is from a specimen also belonging to Mr. Miller, it is from the lowest bed of the Bristol Limestone about the Hotwells.

Fig. 3, is out of a dark coloured Transition Limestone that contains Mica, and some kind of Coral from a part of Westmoreland near Keswick. Fig. 6, is taken from a Scottish specimen found at Tronlie Bank near Glasgow. The three last mentioned specimens have the sulci closer together than the first, but as they are in a much worse state of preservation, we cannot pronounce upon their being distinct species or even varieties.

The Rev. Mr. Ure's specimen was in Ironstone, and he observes that specimens are "sometimes found inclosed in Ironstone like a nucleus; at other times found among Till (Schale) along with marine shells, &c. Specimens are very rare."

CONULARIA teres.

TAB. CCLX, Figs. 1 and 2.

SP. CHAR. Conical, round, slightly bent, transversely, striated, a smooth space near the apex.

The striæ are irregular, as well as the curvature, the general form approaches towards cylindrical, but the smooth part near the apex is more conical.

I have seen but one specimen of this; it was very imperfect, and I only place it here provisionally; it was found in Scotland, along with fig. 6, above described. It very probably belongs to a different genus.

NAUTILUS complanatus.

TAB. CCLXI.

SP. CHAR. Discoid, compressed, smooth; sides flat; inner turns exposed; aperture lanceolate. A reversed sinus in the edge of each septum, near the inner angle.



THE margin is rounded, but the sides very flat;* the inner volutions are completely exposed by a kind of truncation of the inner edges of the whorles, the surface left by this truncation is concave. The whorles are about four or five; half of the last is free from septa; the length of the mouth is 5 or 6 times its width.

This Nautilus appears to be entirely new; it was discovered in a slaty Limestone, at Scarlet, on the Isle of Man, by J. S. Henslow, Esq. This gentleman promises to give a more perfect geological account of the Isle of Man, than has hitherto appeared, and to correct many false ideas that have been circulated respecting it.

* I suppose this to be the original form, and not ascribable to the pressure of the Slaty Stone.

AMMONITES Henslowi.

TAB. CCLXII.

SP. CHAR. Discoid ; sides flat ; front rounded ; inner whorles exposed ; septa, with three entire tongue-formed sinuses upon each side ; aperture obovate.

ABOUT 12 septa, with margins that are remarkably entire for an Ammonite, occupy each whorle of this curious Shell ; the three sinuses on each side the edges of the septa correspond in shape with the intermediate projections which have, in the cast, the form of a tongue, or the sole of a pointed shoe, being contracted towards their bases ; on the front of the edge is an acute sinus, which contains the siphuncle ; the whorles are about four ; the length of the aperture is about two fifths the diameter of the shell and double the thickness.

This is one of many curious petrifications found by J. S. Henslow, Esq. during a visit to the Isle of Man in 1819 ; it is in the compact dark grey Limestone which occurs at Scarlet in that Island. The want of the minutely sinuated edges of the septa, is a character that several other Ammonites possess. The Woodwardian Professor at Cambridge has selected two foreign specimens which have the septa lobed, but unless the surfaces of the casts have been deeply worn, the lobes have entire edges : such species are not however numerous, and specimens of them are rare ; the foreign one I have made a 4to plate* of, for the sake of comparison and named it Ammonites Sedgwicki in honour of the Professor whose name I think it will be a pleasure to commemorate.

* I have also engraved several other foreign, unique, or remarkable Shells, which are sold separate.

AMMONITES Koenigi.

TAB. CCLXIII, Figs. 1, 2, and 3.

SP. CHAR. Discoid, convex, with radiating undulations ; inner whorles half exposed ; marginal undulations numerous ; central undulations few, very prominent ; aperture cordate elongated.

THE young state of this Ammonite is less depressed, so that the aperture is then nearly orbicular; when full grown the last whorle occupies two-fifths of the diameter ; the margin is rounded ; the undulations upon it extend also half way over the sides, and every third or fourth is met by a large undulation that rises almost into a low tubercle ; the septa are few, their lobes are not deeply sinuated ; whorles about six.

The young shells represented at figs. 1 and 2 are from Kelloways, which place also furnishes full sized specimens, with a dull sparry Carbonate of Lime in place of the shell. Fig. 3 is from Charmouth ; it is in a nodule of indurated Marle ; the shell is mostly reduced to a chalky texture, but is in some parts pearly. This was presented to me some years ago by Dr. W. E. Leach, of the British Museum. I name it Koenigi after his colleague, who is now so busily investigating fossil remains.

AMMONITES Browni.

TAB. CCLXIII, Figs. 4, and 5.

SP. CHAR. Discoid, with radiating undulations ; inner whorles half exposed, with large tubercles upon each side ; marginal undulations many, central ones few, rising into tubercles ; front rounded with a distinct keel ; aperture cordate.

IN general appearance very much like the last, but rather thicker and sufficiently distinguished by the keel and knobs upon the inner volutions.

From Dundry, by favour of my good friend G. W. Braikenridge, Esq. I wish by the name of this Ammonite to commemorate R. Brown, Esq.: a gentleman of general knowledge, and an excellent Botanist.

LIMA proboscidea.

TAB. CCLXIV.

SP. CHAR, Broad, ovate, convex, with twelve ribs, each furnished with several large tubular processes; ears small.

THE tubular processes are thicker than the ribs they arise from; they are an inch or more long, variously bent and pressed to the shell; their ends are often expanded, they are nearly alike on both valves; the ribs are large and smooth, except a few rudiments of processes here and there. The length is to the width as three to two nearly, the depth is not considerable.

Single valves of this shell, without the hinge, might be taken for Spondili, but the similarity of the two valves, and the opening between them on one side seem to confirm the idea of its belonging to the genus Lima; yet as we have not seen the inside of the hinge we may be deceived, and it may prove to be a new genus.

The larger figure is taken from a specimen lent me by the Rev. W. Buckland, it was found near Weymouth; the lesser one is from the same place.

SPIRIFER trigonalis.

TAB. CCLXV.

SYN. Anomites trigonalis, *Martin Petr. Derb. Tabl. 36, f. 1.*

SP. CHAR. Gibbose, transversely striated; with 26 radiating sulci; hinge line as long as the shell is wide; front semicircular; the three central ridges elevated; beaks incurved approximated.

ALTHOUGH this is named trigonalis, the front is so round that it can hardly be called even obtusely angular; the spaces between the sulci are rounded; three of them occupy the elevated part of the lesser or upper valve, and these are again obscurely divided, the central one into three and the others into two; the flat back meets the sides at an acute angle, it is striated; the whole surface is regularly and finely striated transversely; the striæ are elevated and sharp, but often are worn down or adhere to the stone the shell is imbedded in.

The first specimen of this shell in which I discovered the internal spiral appendages was imbedded in a mass of Chert that was presented to me by the most eminent friend to science Sir J. Banks, upon whose estate at Overton near Ashover, Derbyshire, it was found in the Mountain Limestone; I have confounded it with *Anomia striata* of Martin in my paper in the *Linnean Transactions*, vol. XII, part 2, p. 516. The shell is lined, and the spiral contents coated with minute crystals of Quartz. Within the last two years many specimens of

this and some other species of *Spirifer*, with the internal structure manifested, have been found in the Cave near Castleton, Derbyshire, by Mr. Mawe, and these have enabled me to decide the species of the one I formerly had (fig. 1) and to compare Mr. Martin's own specimen of *An. trigonalis* with those I found perfect enough for figuring, see figs. 2 and 3.

Fig. 4 represents two views of the spiral appendages separated, they are generally coated by crystals of Carbonate of Lime; within they are composed of a somewhat fibrous shelly substance.

R. Brown, Esq. is probably the first person who observed the spiral cartilage in a Calcedonic cast of another species found by him in New Holland.

AMMONITES *Heterophyllus*.

TAB. CCLXVI.

SP. CHAR. Lenticular, umbilicated, striated; sinuosities of the septa of two kinds, small and acuteangular, or large and ovate.

THIS is one of those Ammonites with the inner whorles concealed, which have often been called Nautili, but which an attention to the edges of the septa will always distinguish. It has the front rounded, the sides convex marked by very numerous diverging, elevated, and slightly waved, striæ; the umbilicus small and deep; the aperture elliptical with a notch for the reception of the preceding whorle, it is nearly two thirds the diameter of the shell in length. The edges of the septa are deeply sinuated and some of the sinuses are larger than others and much more obtuse so that the lines formed by them upon the surface of the cast, resemble two kinds of pinnated foliage, in one of which the terminal leaflets are oval and large, while in the other the divisions are all small and have acute points.

We have named this Ammonite after a configuration that in the specimen before us has been rendered remarkably distinct by the decay of the surface; in whatever state it occurs, however, sufficient traces of the edges of the septa may generally be found to show the character, unless the surface be very deeply eroded, for the shell itself is thin and adheres but slightly to the septa. It is often necessary to take into consideration

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the state of preservation, as it often disguises some characters while it discloses others useful to the Geologist.

The specimen figured is from Whitby, it was lent me by Colonel Birch, I possess a fragment of an equally large one for which I am indebted to the generosity of the Marchioness of Bath, it is interesting inasmuch as it shews that in the very young shell the septa are much less sinuated; I have also one about two inches in diameter in which the septa are perfectly formed. I believe they both came from Whitby.

AMMONITES Birchi.

TAB. CCLXVII.

SP. CHAR. Discoid, inner whorles exposed ; sides concave, armed with two involuted rows of spiniform tubercles ; front rounded, transversely and obscurely sulcated ; volutions 6. tubercles very numerous.

ABOUT 30 pairs of tubercles decorate each whorle, each pair is connected together by a slight elevation and the outer tubercle is the largest. The sulci upon the front sometimes continue over the sides but less distinctly. It is an essential character that the whorles do not encrease rapidly in size, consequently in a large shell they are rather numerous and its sides are not very hollow. The aperture is transverse, but very little longer than wide.

This Ammonite bears a strong resemblance to another found plentifully at Havre de Grace, in a similar clay soil but probably belonging to a different stratum, it is highly essential for Geologists to be acquainted with the characters that distinguish allied species especially when they belong to different formations. In the present instance the number of tubercles, as well as whorles, may be depended upon as sufficiently striking to prevent mistake, the French shell having only half the number of the former, and not more than 4 of the latter ; the tubercles are also larger and front undulated. When several species are nearly alike a descriptive name cannot always

be found, however desirable, for each of them, I have therefore named the one now figured after Colonel Birch whose labours in search of the bones of the Ichthyosaurus have been crowned with success, and whose generous method of disposing of his collection will long be remembered. The species from Havre I propose to call *biarmatus*, in allusion to the *A. armatus*, tab. 95, which has but one row of spines. The figure is taken from a specimen obtained at Lyme in Dorsetshire, by Colonel Birch, who kindly lent it me previous to his sale. I have it less perfect imbedded in a scull of the Ichthyosaurus from Charmouth; and small from Craymouth, by favour of my esteemed friend James Brodie, Esq. There is often much pyrites in the solid parts of the casts that gives them a pretty metallic surface, the same circumstance is observable in the *Am. biarmatus*.

SPIRIFER oblatu8,

TAB. CCLXVIII.

SP. CHAR. Gibbose, transversely obovate, smooth, with an obtuse rather square elevation along the middle ; beaks approximated.

A little wider than long, very smooth, and rounded in all its parts, the ridge that extends from the front to the beak and its corresponding concavity, are flattened in the middle. The flat part of the back is very small as well as the triangular foramen contained in it. The internal spiral appendages form two obtuse and irregular cones.

I have this species from the Mountain Limestone of Derbyshire, and Westmoreland, it seems to differ from the next only in not being quite so wide, and in being generally blunter in its contour. The largest figure is from a specimen given me by Mr. Farey, it is from Axton Quarry, S. W. of Llanasa in Flintshire.

 SPIRIFER glaber.
TAB. CCLXIX.—2 *Upper Figs.*

SYN. Conch: Anomites glaber, *Martin Petr.*
Derb : t. 28, fig. 9 and 10.

NEARLY twice as wide as long, edge generally sharp, in other respects exactly resembling the last.

This was sent me some years ago from Derbyshire, by Mr. Martin, the lesser figure is from an Irish specimen.

SPIRIFER obtusus.

TAB. CCLXIX.—2 *Lower Figs.*

SP. CHAR. Gibbose, transversely oval, very obscurely striated, with an obtuse rounded elevation along the middle ; beaks rather distant.

VERY much like the last but the elevated part is not flattened along the middle, but convex and the sinus at the edge is deeper, the beak of the lower valve is also more produced ; the width is full double the length.

Sent me from Scaliber, near Settle in Yorkshire ; by Mr. John Duckett.

SPIRIFER striatus.

TAB. CCLXXI.

SYN. Conch. Anomites striata, *Martin Petr. Derb. tab. 23.* Terebratula striata, *Sowerby Linn. Trans. XII. part 2, p. 515, t. 28. f. 1. & 2.*

THE small numerous unequal sulci, the wide but not deep back and the angular sinus in the front distinguish this from every other Spirifer. The back extends the whole width of the shell and makes the sides pointed, it is slightly striated; the beaks are incurved but not long.

As Mr. Martin observes, this is common in Derbyshire, I have received it also from near Cork, through the kindness of two or three friends. The only indication I have been lucky enough to meet with of the internal structure, has been obtained by cutting off one side as shewn in the figures.

 SPIRIFER pinquis.

TAB. CCLXXI.

SP. CHAR. Gibbose, transversely obovate, with a straight back, longitudinally sulcated, elevated in the middle; sulci eight or nine on each side, and one in the centre of the elevated ridge.

THE canal in the lower valve corresponding to the central elevation in the upper is free from sulci and near the

beak deep and very distinct. The hinge line is rather shorter than the shell is wide and is not very deep. The roundness of the spaces between the sulci and the bluntness of the edges give a kind of plumpness to the general contour from which it is named.

P. O'Kelly, Esq. has favoured me with several specimens of this *Spirifer* from the Black Rock, Ireland. It is a very distinct and apparently new species.

TROCHUS *concavus*.**TAB. CCLXXII.**—*Fig. 1.*

SPEC. CHAR. Conical, smooth; base carinated; volutions concave above, convex below; margin and base striated.

SOMEWHAT related to the British *Trochus Ziziphinus*, but taller, smoother, and having the upper half of each whorl concave, the other half being concealed; the edge is obtuse, faintly marked with elevated striæ; the striæ upon the base are strongest towards its centre; aperture rhomboidal; umbilicus closed.

Found in the Crag of Suffolk, by Professor Sedgwick; the shell is very tender, and still retains much of its original pearly lustre beneath its opaque coat.

TROCHUS *imbricatus*.
TAB. CCLXXII.—*Figs. 3 and 4.*

SPEC. CHAR. Pyramidal, with several transverse threads upon each whorl, crossed by fine longitudinal striæ, whorls angular, imbricating, flat above, very convex beneath.

ALMOST half as tall again as wide: the angular shape of the volutions gives the spire the form of a screw; the base is very convex, and striated in the same manner as the rest of the shell; umbilicus closed.

Found in clay near Cheltenham by Miss E. Warne, to whom I am indebted for the only specimen I have seen.

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TROCHUS reticulatus.

TAB. CCLXXII.—*Fig. 2.*

SPEC. CHAR. Conical, transversely reticulato-striated; whorls bicarinated; base convex.

THE upper carina is more acute than the other and is placed half way between it and the upper edge of each whorl; the numerous transverse elevated striæ are connected by rather less elevated, short ones, which are slightly curved; the aperture is obtusely 4 angled; about as high as wide; umbilicus closed.

One figure represents a neat specimen of this Trochus, the shell of which is converted into sparry carbonate of Lime and filled with marle; the other is from a cast of the inside, also marle not much indurated; they are both placed in the Woodwardian Collection by Professor Sedgwick, who found them at Ringstead Bay, near Weymouth, in the Kimmeridge Clay, and observed the same species at Portland Ferry in the same formation. An analogous species, with finer, and punctated rather than retiform striæ occurs in Limestone at Garsington near Oxford.

HELICINA expansa.

TAB. CCLXXIII.---*Figs. 1, 2, and 3.*

SPEC. CHAR. Carinated; above, depressed, conical, obscurely striated; beneath, ventricose; callus expanded.

A NEARLY smooth shell, the whorls of which are flat above, but very gibbose below an obtuse distinct carina. The callus which terminates the columella is considerably expanded over the base of the shell; aperture quadrangular.

Found in the Blue Lias of Lyme in Dorsetshire: it seems to be a rare species, as Mr. De la Beche, to whom I am indebted for the use of the specimen figured, has but one individual: it is in good preservation, in an indurated Marle, which fills it, but does not adhere strongly to the surface: the shell is converted into calcareous spar.

HELICINA solarioides.

TAB. CCLXXIII.---*Fig. 4.*

SPEC. CHAR. Subdiscoid, obtusely carinated; whorls depressed above, convex beneath.

THIS is very similar to the last, but is a much shorter shell: the callus is less spread and more convex, and the carina not so distinct: it is also obscurely striated.

Is it possible that this is the young of the preceding? Its carina being more obtuse rather militates against that idea. I know not what part of England it was found in: it is in a similar Marle with the preceding.

FUSUS acuminatus.

TAB. CCLXXIV.---*Figs. 1, 2, and 3.*

SPEC. CHAR. Elongated, acicular, obscurely costated, and longitudinally striated; volutions tumid, with 8 or 10 elevated striæ.

SYN. Murex porrectus. *Brander, f. 36.*

THE costæ upon this species, if costæ they can be called, are very slightly elevated, and very irregular; so much so that some parts of the shell appear entirely free from them: it is so much elongated as to be 6 or 7 times the length of its greatest width.

FUSUS asper.

TAB. CCLXXIV.---*Figs. 4, 5, 6, and 7.*

SPEC. CHAR. Elongated, costated; volutions tumid; costæ decussated by 4 or 5 elevated, rather acutely knotted, striæ or ridges.

A MUCH shorter shell than the last, and less strongly striated lengthwise; the ridges rise into sharpish elevations as they cross the costæ, which are most remarkable on the upper whorls: five times as long as broad.

This species is generally whiter than the others.

FUSUS rugosus.

TAB. CCLXXIV. *Figs. 8, and 9.*

SPEC. CHAR. Elongated, subcancellated, with many prominent costæ ; volutions tumid, with about 8 elevated striæ upon each.

SYN. Murex porrectus. *Brander, f. 35.*

Fusus rugosus. *La Marck, Env. de Paris, 56.*

THIS is distinguished from the last by the greater number of its ridges, and rounder and more prominent costæ : it has also a rough appearance, free from the sharpness that characterizes *F. asper*. The longitudinal striæ are fine, sharp, and numerous. The length five times the width.

Fig. 9 exhibits a variety, in which there is a greater space between the third and fourth ridges than the remainder ; in other respects it does not appear to differ.

I have all these species from Hordle Cliff, either by favour of Miss Dent, Miss Teed, Miss Beaminster, or the Rev. Mr. Iremonger ; and through the kindness of Professor Sedgwick I have been enabled to consult the Woodwardian collection, and thus by comparing numerous specimens, to establish them. It does not appear that there are intermediate varieties.

MYTILUS Antiquorum.

TAB. CCLXXV.---*Figs. 1, 2, and 3.*

SPEC. CHAR. Elongated, ovate, rather gibbose, smooth, straight; beaks obtuse, nearly close; hinge toothed.

A SLIGHT swelling opposite the hinge renders the two sides of the shell more similar than they are in the common Muscle; and the general roundness of its form also serves to distinguish it; the teeth in the hinge close to the beaks are very distinct, they are generally four, but vary in number. The length is rather more than twice the width.

I have received this shell from several Friends who have found it at Woodbridge, Ipswich, and in other parts of the Suffolk Crag. The most complete suite of specimens was lent me by Professor Sedgwick, some of which I have figured. The younger individuals possess a considerable degree of transparency; they are all so brittle that whole ones are seldom obtained.

 MYTILUS alæformis.
TAB. CCLXXV.---*Fig. 4.*

SPEC. CHAR. Obovate, with an acuminate beak, curved, depressed, smooth, with teeth in the hinge.

THE edge is sharp; it forms a very regular curve from the pointed beak round to the deeply indented side opposite the hinge: there are three teeth under the beak.

A single valve only of this muscle has come into my hands, for which I am indebted to Mrs. Cobbold, who found it at their delightful retreat, Holywells, near Ipswich. It seems to be a rare species.

The resemblance of both these to recent species is remarkable; and we think the latter want more discrimination than has hitherto been bestowed upon them even by the most judicious: it is also highly interesting to enquire into the peculiarities of other shells of the Crag formation which so often accurately correspond with the recent species.

ARCA *Branderi*.TAB. CCLXXVI.--*Figs. 1 and 2.*

SPEC. CHAR. Transversely elongated, rhombic, gibbose, finely decussated; beaks distant; longitudinal striæ strongest; teeth numerous; edge internally entire.

ABOVE twice as wide as long: the hinge line is long and straight, terminated at each end by an angle that almost forms an ear: from the beak proceeds an obtuse ridge towards the front of the longer side; the space between the beaks is plain except three or four impressed striæ, which are nearer perpendicular than usual.

I have seen several specimens of this Arc from Barton Cliff, but cannot refer it to any species before described, nor do I think it has been found in France. The shell represented at fig. 2, is in the Woodwardian collection at Cambridge, the other was given me by Miss Beaminster; it is by no means common; I have named it in commemoration of Brander, whose exquisite plates of Hampshire fossils will ever be admired.

ARCA *appendiculata*.TAB. CCLXXVI.--*Fig. 3.*

SPEC. CHAR. Transversely elongated, rhombic, gibbose, decussated; beaks rather distant; two oblong appendages upon the space between the beaks; edge toothed within.

STRONGLY resembling the last, but wider; the longitudinal ridges are not deeply cut by the lines of growth, they

are often furcate; but the most remarkable character is the oblong pointed appendage to each valve upon the space beneath the beaks extending the whole length of the shorter side; the teeth are not very numerous.

The only specimens I know of this curious shell are in the collection of Miss Dent, who found them at Barton, and has kindly allowed me to figure them.

TEREBRATULA Mantiaë.

TAB. CCLXXVII.--*Fig. 1.*

SPEC. CHAR. Depressed, subtrigonus; with 16 angular plaits, half of them, on one side, elevated; upper valve convex.

NEARLY an equilateral triangle, with the front rounded; the beak prominent, and but slightly incurved.

Collected in Ireland by Mrs. Mant.* It appears to be from the Mountain Limestone.

TEREBRATULA obliqua.

TAB. CCLXXVII.--*Fig. 2.*

SPEC. CHAR. Depressed, transversely obovate, with 15 angular plaits, the 5 central ones obliquely elevated from one side; beak prominent.

A SMALL Terebratula, remarkable for the form of the front, on one side of which about five plaits are turned downwards; then the first of the five central plaits is suddenly elevated considerably, the next rather less, and so on less and less, until the last is scarcely higher than the remaining lateral ones, which are not quite so low as those on the other side.

Found in the Chalk at Ramsgate.

TEREBRATULA inconstans.

TAB. CCLXXVII.--*Figs. 3 and 4.*

SPEC. CHAR. Globose, with about 26 angular plaits, half of them, on one side, elevated; beak incurved.

A REMARKABLY globose shell when full grown, one half of the edge is turned up, the other down, but indifferently

* The scientific Lady of the Rev. Dr. Mant, Lord Bishop of Killaloe.

the right or left, a circumstance I have not observed in other species; the beak is so much incurved as almost to touch the upper valve, the internal appendages to the hinge appear to be short and obtuse, but I am not certain that I have seen them perfect.

Not uncommon near Oxford in Clay, which is often sufficiently soft to be washed away and shew the inside of the valves, but in general very much broken. At Ringstead Bay and Weymouth Ferry it occurs more perfect, as I learn from specimens lent me by Professor Sedgwick and Mr. De la Beche. They are in Marl, sometimes indurated, which according to the Professor belongs to the Kimmeridge Clay formation.

Fig. 3, represents a more depressed shell, found in Marle, at Gunton in Suffolk; its inferior size, with the same disposition of its plaits, and equally incurved beak, lead me to think it is only the young of the *T. inconstans*.

TEREBRATULA dimidiata.

TAB. CCLXXVII.---*Fig. 5.*

SPEC. CHAR. Transversely obovate, subdepressed, with a projecting beak, plaited; upper valve convex; plaits about 30, half of which, on one side, are elevated.

BEAK nearly straight, and the width greater than the length. These characters distinguish this from *T. inconstans*, fig. 4; the straight beak distinguishes it from fig. 3.

This is a siliceous cast, in which the Calcedony has assumed the form of concentric rings. It is from Halldown.

TROCHUS Gibsi.**TAB. CCLXXVIII.—Fig. 1.**

SPEC. CHAR. Conical, short, umbilicated; sides straight; edge obtusely carinated; base convex, reticulato-striated; in the centre of the upper part of the whorls is an elevated band crossed by curved striæ; aperture rhomboidal.

THIS shell is wider than it is high: the upper part is smooth, except the concentric band, upon which are semicircular striæ, indicating a sinus in the outer lip. The umbilicus is large, and nearly smooth; and although the inner lip of the mouth is a little reflected over the columella, which is thin, it has no tendency to close it.

A cast in pyritiferous Clay mixed with Sand; found at Folkstone. This and several other shells, hitherto called Trochi, with the band around the spire, may more properly belong to the genus Pleurotomaria, which I may be induced at some future period to adopt. I have named this after Mr. Gibs, well known for many years as a worthy assistant to several collections of British shells.

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TROCHUS *extensus*.TAB. CCLXXVIII.—*Figs. 2 and 3.*

SPEC. CHAR. Depressed, conical; above rugged, obliquely striated; beneath convex, smooth; base expanded, with a broad undulated thin margin; aperture oblong; umbilicus not plicated, closed when old.

NEARLY twice as wide as high: the upper part of each whorl is irregularly undulated, and elevated in the middle into an angular ridge, which is more or less conspicuous in different individuals: the umbilicus is large and nearly smooth: it is sometimes covered over.

This Trochus in many respects resembles Trochus Benettia*; but although I have many specimens, none of them have attached shells or stones to themselves: one indeed has two or three oysters adhering to it; but from their position over the spire, it is evident that they were not picked up by the Trochus. The umbilicus distinguishes the species.

Fig. 2 represents a specimen filled with Pyrites, found in the Cliff at the Isle of Sheppy. The remaining figures were found in the Highgate Tunnel in 1811: they are filled with indurated Marl: we do not know how far they may extend their shells, but the lower figure seems extravagant.

* Vol. I. p. 224. tab. 98.

OSTREA pulchra.

TAB. CCLXXIX.

SPEC. CHAR. Orbicular, depressed; one valve nearly flat, with a short incurved beak; the other valve convex, with numerous radiating undulations; beak short; hinge line straight; laminæ thin, close pressed.

FOR an Oyster this is a very regular shell: it nearly resembles that variety of *O. edulis*, commonly known by the epithet Native, but it wants the ears so often observable in it, and which give it a square form. In general the pulchra is a deeper shell. *Ostrea edulina* of De Lamarck (*Animaux sans Vertèbres* VI. 218.) appears to have more elongated beaks, but I have not seen specimens.

A great abundance of this species of Oyster is deposited in some of the gravelly strata above the Chalk near Bromley in Kent. I consider it to be distinct from the one somewhat similar, but less regular, so plentiful near the Church at Charlton, which I shall take some future opportunity of figuring, when I can compare it with some others. The acknowledged difficulty of distinguishing the species of this genus cannot be hastily surmounted. The smaller figure is selected from many individuals found at Plaistow, and presented to me by the son of Sir John Lubbock; the other was given me by Dr. Menish, it is from the top of the hill in the pleasure grounds of Claud Scott, Esq. at Bromley.

AMMONITES Bechei.

TAB. CCLXXX.

SPEC. CHAR. Gibbose, umbilicate, radiated and concentrically striated, each side furnished with two rows of numerous small tubercles; radii numerous, thin; front rounded; aperture large.

THE aperture is as wide as long, and occupies half the diameter of the shell; the sides between the rows of tubercles are slightly flattened, the inner row is the highest; the radii are nearly straight, about two to each tubercle, and sometimes one between the tubercles; the umbilicus is deep, but not very large; the striæ are very regular, elevated, and numerous.

The specimen before us is in the collection of Mr. De La Beche, whose name I have given to it, as a memorial of a staunch and generous friend to science: he obtained it from the Blue Lyas at Lyme. I have seen an Ammonite with larger tubercles, fewer radii and different formed whorls, more resembling *Am. Henleyi*, tab. 172, but still I think distinct from both: had the specimen been sufficiently perfect I should have been glad to have given a figure next to this. It is from the sand beneath the inferior Oolite near Cropredy, and belongs to the Oxford Museum, presented by the Rev. W. D. Conybeare.

PINNA lanceolata.**TAB. CCLXXXI.**

SPEC. CHAR. Lanceolate, slightly curved, longitudinally striated, section quadrangular.

AN extremely elongated Pinna, being nearly four times as long as broad; each valve is divided into two flat parts by a line along the middle, but whether this be the natural form, or the result of a fracture, as is commonly the case in other Pinnæ, I am not certain: the curvature is very regular, and the shell in other respects appears very perfect.

The Rev. John Juland has been so kind as to lend me this remarkable and I believe very rare shell; it was found in Ochracious Limestone near Scarborough.

MYTILUS pectinatus.

TAB. CCLXXXII.

SPEC. CHAR. Quadrangular, oblong, gibbose, longitudinally striated; slightly curved; beaks produced; front straight.

THE striæ are rather deep, very regular and increasing in number as they approach towards the front. The surface of each valve is rather square, in consequence of two obtuse ridges proceeding from the angles of the front.

Not uncommon near Weymouth, where it occurs in the Kimmeridge Clay. The larger specimens were lent me by Prof. Sedgewick; the smaller by the Rev. John Juland.

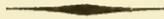
CARDIUM angustatum.

TAB. CCLXXXIII.—*Fig. 2.*

SPEC. CHAR. Transversely elongated, thin, rather depressed; costæ 27; margin toothed; anterior side truncate, posterior rounded.

IN the front of this *Cardium* there is commonly a slight depression or sinus, from which the anterior side is rather produced; the costæ are rounded, and roughened by transverse striæ, in decay they appear to be hollow. The length equals about two-thirds the width.

By no means an uncommon shell in the Suffolk and Norfolk Crag, yet not formerly noticed: I have received it from Alderton near Woodbridge, by favour of the Rev. G. R. Leathes and Prof. Sedgewick: I have also found it at Bramerton near Norwich.



CARDIUM edulina.

TAB. CCLXXXIII.—*Fig. 3.*

SPEC. CHAR. Nearly orbicular, convex, slightly oblique, thick; costæ 18, rugose; anterior side slightly truncated.

DIFFERENT from the *C. edule*, for which it is sometimes taken, in the form of the anterior side, which is not

cuneated; it is consequently much less oblique: it is also rather shorter in proportion.

Extremely common in Crag at Bramerton, Ipswich, Woodbridge, &c. where it is usually much rounded by attrition.

Fig. 1 represents *Cardium edule* in a half petrified state, from St. Austle in Cornwall: it serves to shew the difference of form between *edule* and *edulina*.

AMPULLARIA. *La Marck.*

GEN. CHAR. Shell univalve, ventricose, subglobose, with a projecting spire; base umbilicated; aperture oblong, entire, with no thickening on the left lip.

IN the shells of this genus the last whorl is, as La Marck observes, at least four times as large as the preceding, which gives the ventricose form to the whole. The recent species are inhabitants of rivers in warm climates, and are covered with a polished, generally greenish, epidermis, no vestige of which is to be traced in the otherways well preserved fossil species. La Marck and his followers are inclined to establish a distinct genus for these fossils, because they were probably marine shells, as they accompany other marine genera: the want of an epidermis might serve as one of the characters; the lower part of the mouth being somewhat reflected (versant) would form another.

AMPULLARIA *acuta.*

TAB. CCLXXXIV.—*Three Upper Figures.*

SPEC. CHAR. Ventricose, smooth, with a small acute spire; umbilicus half closed, small; aperture ovate, elongated.

SYN. Amp. *acuta.* *La Marck Env. de Paris, 147.*
Helix mutabilis. *Brander, figs. 58 and 59.*

THIS shell is much longer than wide, although the spire does not exceed one-fourth of the length: the umbilicus is most generally only half covered by the left lip of the mouth, but La Marck observes it is sometimes quite covered: the mouth is twice as long as wide, acute at the upper angle, and slightly curved on the body of the shell: below it is rounded with a depressed, nearly reflected edge: the left lip is entire.

Sent me from near Christchurch by my old friend the Rev. Mr. Iremonger long since, and lately by Miss Beninster.

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AMPULLARIA *patula*.TAB. CCLXXXIV.—*Two Middle Figures.*

SPEC. CHAR. Ventricose, smooth, with a short spire; umbilicus large, open, lined with a spiral, adpressed, plate; aperture obovate.

SYN. Amp. *patula*. *La Marck Env. de Paris*, 148.
Helix mutabilis. *Brander*, fig. 57.

LENGTH and breadth equal; the spire very short; the upper part of each whorl is sometimes a little depressed; the umbilicus is large, and only very partially closed by the left edge of the mouth, from the lower part of which branches out a corrugated lamina, that is applied close to the surface, and forms a spiral lining to the umbilicus: the mouth obovate; not much longer than wide, otherwise resembling that of the last.

This species was given me by Lady Burgoine: it does not appear to be so common as either of the others upon this plate. Her Ladyship picked it up at Barton.

AMPULLARIA *sigaretina*.TAB. CCLXXXIV.—*Two Lower Figures.*

SPEC. CHAR. Ventricose, short, with a small acute spire, and sharp, longitudinal, striæ; umbilicus covered, small, half filled by a spiral lamina; aperture suborbicular, right lip enlarged.

SYN. *Ampullaria sigaretina*. *La Marck Env. de Paris*, 148.

MORE ventricose than the last, being wider than long, but with a more elevated spire: the mouth is sometimes even shorter than wide, in consequence of the right lip being greatly produced: the left lip is divided as in *A. patula*, and part of it ascends the umbilicus, which it nearly fills, but it only lines half of its surface; the other portion closes the umbilicus. The lines of growth are generally somewhat regularly elevated, forming rather distant, sharp striæ, which seldom happens in the other species.

Miss Salisbury and another Friend have sent this from Hampshire: it also occurs in the Bognor Rocks. It does not appear to have been before observed as British, but it is as common near Paris as the preceding species are.

HELICINA polita.

TAB. CCLXXXV.

SPEC. CHAR. Subdiscoid, polished; spire elevated, acute; volutions marked with an impressed band, depressed above, below ventricose; callus thin, expanded; aperture nearly square.

THE short conical spire of this shell is rather concave on the sides, in consequence of the upper parts of the whorls being rather hollow: the lower part of the last whorl is separated from the spire by an impressed band, upon which the lines of growth are seen arched the reverse way, indicating a sinus in the right lip; the left lip of the mouth is reflected a considerable way over the base of the columella, forming in young shells a prominent callus, but in old ones it is pressed beneath the surface of the shell, leaving the columella, however, thickened. The height is about two-thirds the diameter.

So variable are the characters of the shells possessing the sinus in the lip, indicated by the band around the whorl, some possessing those of *Trochus*, others those of *Helicina*, as the present, and *H. expansa*, t. 273, &c. that we can hardly assign limits to the genus *Pleurotomaria*; it might even be shewn to be necessary to form two generæ.

The shell before us is from the sandy stone between the Lyas clay and the iron-shot Oolite: it was discovered by the Rev. W. D. Conybeare, in the neighbourhood of Cropredy.

SERAPHS. *Montfort.*

GEN. CHAR. A convoluted, elongated, univalved, shell; spire internal, concealed; base truncated; mouth longitudinal, extending to the apex of the spire; lip sharp; columella smooth.

MONTFORT has taken the only species known bearing the above characters from the Genus *Terebellum* in which La Marck had placed it, and we think, justly ranked it as a type of a new Genus. It is distinguished from *Terebellum*, by the wholly internal spire, otherways the narrow form of the mouth which is almost linear above and broad below with a truncated base, and the general shape of the shell bring them very near together.

There are at least two species found at Grignon, one of them is longitudinally ribbed.

SERAPHS convolutus.

TAB. CCLXXXVI.

SPEC. CHAR. Subcylindrical; apex obtuse; base truncated; the surface even.

SYN. *Bulla sopita*. *Brander fig. 29 a.* *Bulla volutata* *ib. fig. 75.*

Terebellum convolutum, *La Marck Env. de Paris p. 21.*

Seraphs convolutus. *Montfort, II. 375.*

A SUBCYLINDRICAL shell which tapers a little towards each end, it is very smooth, nearly white, and in some French specimens mottled with light fawn colour;

apex obtuse; base, but not the columella, rather obliquely truncated; columella taper, gently curved inwards; right lip entire above, pressed against the preceding whorl and wholly concealing the spire, the apex of which appears a mere hollow point; the length is rather more than three times the greatest width.

An extremely fragile, but by no means uncommon, shell, in the clay upon the Hampshire coast and in the neighbourhood of Paris. At Grignon it is found much larger than my figures, but rarely. The largest English specimen I have seen enriches the cabinet of Miss Dent; the next in size that of Lady Burgoine; two collections which have become very serviceable towards compleating a knowledge of Hampshire fossils.

I have followed the French authors in quoting both of Brander's figures, although I suspect he had the two shells given in this and the following plate; but I believe we have no means left now of determining this point, or which is which, if he had both.

TEREBELLUM. *La Marck.*

GEN. CHAR. A convoluted, elongated, univalved, shell, spire exposed; base truncated; mouth longitudinal, plain, narrow above, broader below, with a sinus near the base.

THE genus *Terebellum* was constituted by *La Marck*, who gave *Linneus's Bulla Terebellum* for the type, with the specific name *subulatum*: with this the above Gen. Char. will agree, to the exclusion of *Seraphs*. In *Terebellum subulatum* the spire is acute, and the upper edges of the whorls pass very obliquely round it, accompanied by a linear canal connected with the upper angle of the mouth: the surface is polished and destitute of epidermis: the columella slender, and nearly straight, free from plaits or teeth: it is an inhabitant of warm seas.

TEREBELLUM fusiforme.

TAB. CCLXXXVII.

SPEC. CHAR. Subfusiform, cylindrical, with a visible obtuse spire; aperture with an adpressed straight canal proceeding from its upper angle to the apex of the spire.

SYN. *Terebellum fusiforme?* *La Marck Env. de Paris, p. 22.*

THE aperture, excluding the canal at its upper angle, is about three-fifths the length of the shell, and is rather broader towards its upper part than in either *Seraphs convolutum* or the recent *Ter. subulatum*. The manifest obtuse spire is marked by the very oblique upper edge

of the volutions ; but the canal connected with the upper angle of the mouth, instead of following that edge as in *T. subulatum*, rises in a straight line to the apex. As this canal is not mentioned by La Marck in his description of *T. fusiforme*, and as he quotes no figure, it is with some doubt that we adopt his name while we enlarge his specific character. The position of this canal might form a foundation to establish a new genus upon, but at present that does not appear necessary. The columella is curved in the reverse direction, and more than in *Seraphs*, a character which will often serve to distinguish fragments of these shells from each other by: in both, the thin left lip which covers the columella is very apt to peel off, it is, although thin, rather tumid in the shell before us.

La Marck gives us no exact locality for his *T. fusiforme*: our's is rare: I have received it through the kindness of Lady Burgoine and Miss Beminster, who found it near Hordwell. It apparently sometimes equals in size the *Seraphs*. Mr. de Gerville has amongst the numerous favours for which I have to thank him, sent me two or three casts from near Valognes, that are probably of this species, as they shew the spire; but the canal from the mouth cannot be traced in any of them.

OLIVA. *Bruguiere.*

GEN. CHAR. A subcylindrical univalve shell, with a notched base ; whorls of the spire separated by a canal ; columella obliquely striated.

OF this genus there are but few species ; the recent ones are inhabitants of Tropical seas ; they have generally very narrow longitudinal mouths, whence the form of the shells is more or less cylindrical. This genus is distinguished from *Ancilla* by the plaits upon the columella, and the naked spire, whose turns are separated by a canal extending from the upper angle of the mouth : the right lip is thickened, and a corugated varix is often formed around the base of the columella : the spire is generally short but acute, and the surface of the shell polished and destitute of epidermis, because it is enveloped by the mantle of the animal.

OLIVA *Branderi.*

TAB. CCLXXXVIII.—*Upper Figure.*

SPEC. CHAR. Ovate; pointed, smooth ; spire prominent ; last whorl convex ; mouth oblong.

SYN. *Voluta Ispidula.* *Brander, f. 72, excl. syn.*

A REGULARLY ovate shell, with a slightly varicose and notched base : the right lip is thickened, and the left plaited near the base. Length almost double the width.

Dr. Solander, in *Brander's Hampshire Fossils*, has erred in considering this to be *Voluta Ispidula* of Linneus ; its form is totally different from any of the numerous varieties of that shell. It appears to be a rare Hampshire shell, and unknown in France. Miss Beminster favoured me with the specimen figured.

OLIVA Salisburiana.

TAB. CCLXXXVIII.---*Lower Figures.*

SPEC. CHAR. Subfusiform, short, ventricose, smooth ;
mouth oblong, both lips tumid above.

THE angular or fusiform shape of this will distinguish it from most of its congeners : its width is about two-thirds the length, the widest part being near the upper edge of the last turn, below which it is conical : the great thickness of the two lips at the upper angle of the mouth separates the spiral canal to some distance from the preceding whorls : the spire is short and conical.

A new species, generally confounded with *V. Ispidula* of Brander : the larger specimen is in the collection of Miss Salisbury, whose zeal I wish to commemorate. I have received a middling sized one from Miss Beminster, and Lady Burgoine has lent me the young state ; I find the characters the same in all.

VENERICARDIA globosa.

TAB. CCLXXXIX.-upper and middle figures.

SPEC. CHAR. Globose; costæ 16 to 20, carinated; carinæ tuberculated, tubercles compressed.

var. α . Rather depressed, costæ 20, tubercles distant.

var. β . Rugged, beaks prominent, costæ 16, tubercles subimbricated.

SYN. Chama sulcata. *Brander, f. 100.*

Few individuals of this species attain to three quarters of an inch in diameter; the tubercles in var. α . look like little bits of the ridges pinched up, and give the whole shell a considerable degree of neatness by their regularity, while in β . they are clumsy, irregular, and often very close together, and the striæ of growth are more conspicuous also, thus it has a rugged aspect; the beaks in var. α . are sometimes prominent, thus there is a transition from one variety to the other. The lunette is condante, convex, sunk beneath the beaks but very conspicuous in both varieties; the margin is deeply toothed.

This Venericardia is nearly related to *Ven. imbricata* of La Marek, but is more gibbose, much smaller, and has fewer costæ, it may possibly be *Ven. coracium* Env. de Paris p. 223, but the hinge does not agree precisely with the description, however I have seen no specimens with that name, and no figure is quoted.

Very abundant in Barton and Hordwell Cliffs, specimens may be so chosen from the two varieties as to look like distinct species.

VENERICARDIA oblonga.

TAB. CCLXXXIX.--*Three Lower Figures.*

SPEC. CHAR. Transversely oblong, unequal sided, subquadrangular, gibbose, with 13 knotted costæ.

Length about two-thirds the width; costæ strong, obtuse, irregularly knotted, margin strongly toothed.

EXCEPT in form this strongly resembles var. β . of the last; it is not quite so common, but I have received them both together from many Friends.

It also occurs in France, but I think has not been described.

VOLUTA costata.

TAB. CCXC.—*Figs. 1, 2, and 4.*

SPEC. CHAR. Ovato-fusiform, acute, costated, striated, with about three plaits upon the columella.

SYN. *Voluta costata.* *Brander, f. 45.*

ABOVE twice as long as wide, with nine costæ upon each whorl; the costæ are broad and obtuse, a little swelled at their upper ends: they are crossed by striæ that are least conspicuous about the middle of the body. The beak is short and very little curved: the columella is furnished with three folds, of which the lowest is much the largest: the mouth is very oblong, it has both lips smooth. The length of the spire is liable to variation; it generally consists of seven turns.

This is not a very common shell. The specimen, fig. 4, enriches the select cabinet of Miss Dent; it is the largest I have seen, and has the mouth well preserved. Fig. 1 represents a specimen in the possession of Miss Salisbury; the striæ upon the surface are remarkably neat. For the shorter variety, fig. 2, I am indebted to the kindness of Miss Dent: all are from Barton.

VOLUTA Magorum.

TAB. CCXC.—*Fig. 3.*

SPEC. CHAR. Ovato-fusiform, obtuse, costated, obscurely striated, with many plaits upon the columella.

SYN. *Voluta Magorum. Brocchi, II. 307, t. 4, f. 2.*

THE spire of this *Volute* is longer, more oval, and blunter than that of *V. costata*; it has besides, 12 narrower and less prominent ribs in place of 9. The striae are conspicuous and distant about the base, but the principal character is the number of plaits upon the columella, which rise to the top of the left lip; the lower ones are large and terminate bluntly, while the upper ones are small and irregularly interrupted.

The general outline of this shell is rounder than in *V. costata*, so that it might be distinguished even in imperfect specimens. I am not certain that I am correct in considering it the same as Brocchi's *V. Magorum*, the plaits on the columella of which differ somewhat, according to the figure, and it is described as smooth: the state of preservation is also said to be different, as it appears to be changed into spar, so it probably belongs to another formation. I have not seen a specimen. The one before us was kindly sent to me from Barton, by the Rev. Mr. Bingley; it is the only one I have seen.

FUSUS bulbiformis.

TAB. CCXCI.—Figs. 1 to 6.

SPEC. CHAR. Ovate, ventricose, nearly smooth; spire mucronated; beak obscurely striated, gently curved.

SYN. Murex Bulbus. *Brander, f. 54.*

Fusus bulbiformis. *La Marck Env. de Paris, 62.*

var. β , has the right lip plaited within.

var. γ , spire and beak produced more than in var. α ; upper part of each volution rather concave.

SYN. Murex Pyrus. *Brander, f. 52 & 53.*

var. δ , spire much produced; whorls sub-ventricose, with a deep obtuse canal around their upper parts.

THE type of this species is a short ventricose shell, with an acute, mucronated spire, and without the least concavity upon the upper parts of the whorls (fig. 4.) the left lip is thick, especially towards the upper part, and there is also a protuberance inside, near the top of the right lip, so that a narrow canal is formed at the upper angle of the mouth: the beak is a little curved, and rather broad. The variety δ at first sight has the aspect of a very distinct species, as it is much longer: it has a considerable obtuse ridge near the upper edge of each turn, produced by an increased thickness of the shell at that part, from whence results a flatness of the body of the shell, and an obtuse canal around the spire;

this character is generally prominent in young shells, although it frequently occurs in the largest specimens, especially those of Hampshire, which exceed the French ones in size. The var. γ is intermediate between α and δ ; the upper parts of its volutions are rather concave, but the body is not flattened, neither is there a distinct thickening of the shell to form a ridge as in δ : this is the most common variety in France. The plaits inside the right lip that characterize the first of La Marck's varieties are sometimes found in all the others, most commonly in young individuals whose shells have not acquired considerable thickness.

So numerous are the remains of this *Fusus* in the clay of Hordwell, and the New Forest in Hampshire, that I might add a long list of friends to whom I am indebted for specimens were it necessary, but its localities are already well established. It appears to be equally abundant in the analogous formation in France. It is liable to much variation in form, and in an extensive collection it would be difficult to draw a line between the several varieties, a circumstance that proves La Marck to be correct in associating Brander's two species together. The surface is liable also to some variation in degree of smoothness, some shells being striated irregularly all over, while others are only striated near the beak, and some indeed are wholly smooth. The outer surface is generally dull, the inside often beautifully polished. The figures of the several varieties are numbered upon the plate as follows.

Fig. 1, Young shell of var. γ . Fig. 2, Young shell of var. β , Fig. 4, different views of two specimens of var. α . Fig. 5 var. γ , Fig. 6. var. δ , a large specimen from the collection of Miss Dent.

FUSUS ficulneus.

TAB. CCXCI.—*Fig. 7.*

SPEC. CHAR. Ovato - fusiform, turgid, costated ;
 volutions subspinose above ; base striated ;
 beak twisted ; columella uniplicated.

SYN. *Fusus ficulneus*. *Lamarck env. de Paris*, 62.

var. α , smooth, costæ subspinose above the middle, and also near the upper edge of the volutions.

var. β , covered with elevated striæ, costæ subspinose near the upper edge of the volution only.

var. γ , striæ few, costæ obscure.

SYN. *Murex turgidus*. *Brander*, 51.

IN all the varieties the upper edge of each whorl is depressed, and upon the edge of the flat part is a row of more or less acute tubercles, which are sometimes even double ; below these the surface is concave and the costæ rise : in var. α , the costæ are elevated at the edge of the concave space into more or less obtuse, short, and rather flat spines, and the lower part of the whorl and beak are striated : in var. β , the costæ are highly elevated for a considerable length without any appearance of spines or even tubercles ; they are also crossed by numerous strong elevated lines, which are thickened as they pass over them : the third variety has similar striæ but not so numerous, and the costæ in it are often very obscure ; the spire is acute in all, and the proportions the same ; the width is about three-fourths the length.

The var. γ , is the only one I have seen British : var. β , is not I think described by any Author ; I have one specimen only of it, and am ignorant of its exact locality : var. α , and specimens approaching the others, are not rare at Grignon. Some of the English specimens are very like var. β , while others have hardly any appearance of costæ, except upon the spire ; these latter are most properly what Brander has called *Murex turgidus*. I am indebted to Miss Teed and another Friend for the series by which I have been enabled to trace the connection with the French varieties ; they are from Hordwell Cliff.

AMMONITES triplicatus.

TAB. CCXCII. & TAB. CCXCIII.--Fig. 4.

SPEC. CHAR. Discoid; volutions exposed, costated; costæ large, equal to the spaces between them, each divided into three as it passes over the front; aperture suborbicular.

THIS Ammonite has five or six volutions, across the latter of which there are two or three rather oblique, deep, furrows, or contractions of the whorl, probably formed by a thickening of the lip at several periods of growth, an occurrence that is rather rare in the genus, and has even been adopted as a generic character.* The costæ are nearly straight and equally elevated upon the sides; they are very regularly divided into three narrow ribs, as they pass over the rounded front. The cast of the inside differs from the outside in being plain along the middle of the front. The diameter is nearly four times its greatest thickness.

Sent me by Mr. Crawford, jun. from near Malton, in Yorkshire, where he found it in the Pisolite formation. Tab. 293, fig. 4. represents a part of another specimen found by myself some years ago at Shotover, near Oxford, in a marly Limestone containing much sand, probably the Calciferous Grit, a stratum contiguous to the above.

* See Montfort, p. 79, Genus Planulites; and p. 87, Ellipsolites; also Mineral Conchology, tab. 32, Ellipsolites funatus: and v. 2, p. 189 Am. constrictus. The genus Ellipsolites must certainly be abolished, and its species ranged under Ammonites, the oval form being quite accidental.

AMMONITES biplex.

TAB. CCXCIII.—*Figs. 1 and 2.*

SPEC. CHAR. Discoid; volutions exposed, costated; costæ numerous, small, split over the front; sides depressed, aperture oblong.



VOLUTIONS five or six, the numerous costæ are nearly straight, elevated and obtuse, a little before it passes over the front each is divided into two branches, equally thick with the undivided rib; the oblong aperture is narrowest near the front which is round; the external and internal surfaces do not differ.

This Ammonite occurs in a mixture of Clay with Septaria and Clalk Boulders, that extends over a great part of Suffolk. Fig. 2 is from Barrow, given me by Mr. Barnes, of Norwich.

AMMONITES rotundus.

TAB. CCXCIII.—*Fig. 3.*

SPEC. CHAR. Discoid; volutions exposed, costated; costæ thick, numerous, split over the front; aperture orbicular.

FROM the small piece I possess of this I am not able to make a very full description, but there is enough to distinguish it from the last; the costæ are less numerous, much thicker, shorter and not so regularly divided into two over the front, in a short fragment some are not divided others are split into three; the sides of the whorls are not compressed, on the contrary they are rather ventricose, so that the aperture is orbicular, except a small sinus produced by the preceding whorl.

From Purbeck, probably found in the Kimmeridge Clay.

 AMMONITES decipiens.

TAB.—CCXCIV.

SPEC. CHAR. Discoid, depressed; volutions exposed, costated; costæ large, obscure towards the front; front covered by numerous small ribs; aperture oblong.

FOUR or five volutions compose small specimens of this shell, they are compressed on the sides and round in front; the numerous large costæ are much elevated to-

wards the centre, and almost disappear near the edge of each whorl, where smaller ridges commence; there are about five small ridges to each of the large ones. Upon the outer whorls of large shells, the smaller ridges are wanting, so that fragments of the same individual appear like distinct species, whence I have named it *decipiens*.

This is found in the same kind of Clay as *A. biplex*, and, like it, often forms the nucleus of a Septarium. I have part of a very large one from Pakefield, near Lowestoft in Suffolk, given to me by my old botanical Friend, Dawson Turner, Esq. The fragments figured are from the inside of a decomposing Septarium, and are in such a state that they frequently break straight through instead of in the direction of the septa of the Shell. They are from the North side of Highgate Hill.

ISOCARDIA. La Marck.

GEN. CHAR. An equivalved cordiform bivalve, with distant involute beaks; teeth of the hinge two, compressed, one of them curved under the beak; one lateral tooth extended beneath the lunette; ligament external, anteriorly furcated.

IN several positions the shells of this genus present a cordiform outline, because they are generally very gibbose, and the notch in which the hinge is imbedded is very large; the incurved beaks assist greatly in distinguishing them when the hinge teeth cannot be examined, as is often the case in fossils. *Chama Cor* of Linneus is the type of the genus.

ISOCARDIA minima.

TAB. CCXCV.—*Fig. 1.*

SPEC. CHAR. Globose, subdeltoid; anteriorly slightly truncated, posteriorly flattened; cordate.

THE flat heartshaped posterior side of this shell distinguishes it from *Isocardia Cor* which otherways it resembles except in size, being much smaller, the anterior side is sharply produced a little way and slightly truncated.

I have only met with casts of this shell which do not exhibit the hinge teeth, and are besides rather rugged, but no better are likely to be found. I am indebted to Mr. Salmon for them; they were collected in Wiltshire, probably in the Cornbrash Limestone. I have similar ones from Madagascar.

ISOCARDIA tener.

TAB. CCXCV.—*Fig. 2.*

SPEC. CHAR. Obovate, with produced beaks; anteriorly subtruncated, posteriorly rounded; shell very thin, smooth.

AN elegant thin shell, rather wider than long, with a straightish front; it is less gibbose than the last, and the

posterior side is more convex; bounding the anterior side is a slight ridge marked near the edge with bent striae and projecting a little beyond it; the shell is so thin that it cannot be separated from the stone so as to shew the hinge, although it is so well preserved that the cartilage remains.

From Kelloways, by favour of Mr. Salmon, and the Rev. Mr. Steinhauer. The middle figure is from a cast in yellowish carbonate of Lime, somewhat transparent, from the same place.

ISOCARDIA rostrata.

TAB. CCXCV.—*Fig. 3.*

SPEC. CHAR. Deltoid, ventricose; anterior side produced, pointed; posterior depressed, rounded.

REMARKABLY ventricose, especially towards the front, which is rather straight and terminated at the anterior side by a short beak. About the size of a large hazle nut.

Two or three specimens which are only casts of this *Isocardia* in Limestone, were sent me with some other shells from the Coteswold Hill in Gloucestershire, by Mr. Taylor, in the year 1816. I have waited in vain thus long (5 years) for more perfect specimens, and therefore figure these such as they are, they may serve to Identify the species.

ISOCARDIA sulcata.

TAB. CCXCV.—*Fig. 4.*

SPEC. CHAR. Orbicular, deeper than wide, longitudinally sulcated, pearly; beaks remote.

A pretty little pearly shell, the beaks are much incurved with a considerable cordate cavity beneath them; the sulci are numerous and broad.

Only a single individual has been found in the canal at Islington, in the London Clay; it is much impregnated with Pyrites, so I fear will soon be lost, but I am not willing it should be quite forgotten.

VENUS varicosa.

TAB. CCXCVI.—*Figs. 1 and 2.*

SPEC. CHAR. Subglobose, with projecting beaks, transversely furrowed; two longitudinal varicose ridges within each valve.

NOT remarkable for any thing but the furrows that occur along the middle of the specimens, all of which are casts, in a light coloured limestone: the furrows are two upon each valve, one of them much larger than the other, and terminated before it reaches the edge by a deep hollow: corresponding ridges must have existed inside the shell, but whether they were visible externally cannot now be discovered: the concentric furrows that are strongly marked upon some specimens would seem to indicate a thin shell. It is nearly globose, but not so deep as long: the line of the hinge is two-thirds as long as the shell, and nearly straight; other characters of the hinge are not discoverable: the beaks are much incurved.

From Felmarsham, by favour of my good Friends Miss Ludlow, H. Goodhall, Esq. and the Rev. Thomas Oliver Marsh; the characteristic furrows are somewhat variable, the lesser being often very indistinct.

Miss Benett has kindly sent me many specimens of a large Venus from the Portland Limestone, in some of which there are similar furrows; they are less regular, shorter, and more lateral. As I hope to meet with the outside of this species, (I have fragments at present,) I postpone figuring it; in the mean time I may fairly expect to gain some further information respecting that

before us. There has been found by Mr. Gerville, at Golleville, and several other places near Valognes, a gaping shell, in many of the casts of which there are also similar furrows, but still less constant and less regular. The inconstancy of the furrows in these would lead us to suspect they arise from some disease or accident attending the growth or situation of the shell, similar perhaps to the formation of pearls.

CARDITA margaritacea.

TAB. CCXCVII.---*Figs. 1, 2, and 3.*

SPEC. CHAR. Transversely obovate, gibbose, with an obscure longitudinal keel and several small ridges, concentrically undulated, pearly within; anterior side slightly produced, posterior very short, convex.



THE only pearly *Cardita* with which I am acquainted: it is a thin rugged shell somewhat wider than long, the anterior side probably gapes a little; the beaks are prominent, much incurved, and have a considerable hollow beneath them; the posterior side is distinguished from the rest of the shell, by an obtuse keel or angle; the longitudinal ridges are very variable in number, they are crossed by rugged undulations and lines of growth.

A shell characteristic of the lower part of the London Clay. I have it from a well dug on the top of Richmond Hill, where it was brought up from the depth of 265 feet. Fig. 1 represents a very perfect specimen from Bogwell Bay, in the Isle of Thanet, given me by the late lamented Lady Wilson; Fig. 2 was given me by Mr. Sutton, who obtained it at Brentford. Fig. 3 is from a specimen collected in the dark coloured (London) Clay, next to the red Clay in Alum Bay, on the Isle of Wight, by Abraham Clarke, Esq. of Carisbrooke; they are all extremely tender, and variously compressed; some are mixed with Pyrites.

Fig. 4 is taken from a fragment of an analogous shell, too imperfect to draw up a specific character from, but evidently differing in the great size and angular form of the longitudinal ridges ; it is a cast in clay coated with Pyrites, and was found with Ammonites in the blue Bind between the Inver Brora Coal and the coarse Limestone above it near Clync in Sutherland, by Mr. Farey, Senior.

ROSTELLARIA macroptera.

TAB. CCXCVIII. CCXCIX. CCC.

SPEC. CHAR. Fusiform, smooth; lip large, nearly circular, with a canal extended along the spire, beak straight pointed.

var. β . has a sinus in the upper part of the lip. Tab. 299.

SYN. *Strombus amplus*, Brander, 76.

Rostellaria macroptera, La Marck. *env. de Paris*. 48.

Hippocrenes macropterus, Montfort, v. 2, p. 523.

IN the young state this shell is highly polished, fusiform, with an acute elongated spire whose sides are nearly straight and base concentrically grooved; as it advances the left lip is considerably thickened and the right lip expands until it extends the whole length of the spire, and exceeds in width half the length of the shell; when full grown the two lips together form at their upper junction a long canal that is variously bent over or around the apex of the spire; towards its upper part the left lip projects considerably over the other, covering and often almost concealing the canal beneath it, and then is again reflected towards the spire; the beak projects beyond the lip forming a narrow pointed canal; in perfect shells the last whorl is gibbose and the furrows upon its lower part concealed. In some specimens there is a deep sinus in the upper part of the large lip, separating it from the canal upon the spire; this is the character of var. β see tab. 299.

This magnificent shell has long been a favorite amongst collectors, but its fibrous structure renders it so fragile that it is very seldom found perfect, fragments and young individuals are very common at Hordwell, as well as in the cotemporaneous formation near Paris. It has also been found at Highgate, see tab. 30, sometimes imbedded in septaria. The variety β is by no means common, I have seen but one good specimen of it; it enhances the value of a fine collection of Hordwell Fossils belonging to my kind Friend Miss Dent, along with that from which the large figure upon tab. 298 is taken. The sinus in the lip of this variety is the more curious, since such an occurrence when constant would form a generic character as in *Pleurotoma*.

Tab. 298 shews the young state at fig. 1, 2, and 3; fig. 4 is from a fragment exhibiting a back view of the reflected canal, and the dotted outline indicates the size of the largest specimen in Miss Beminster's collection. Tab. 300 is from one kindly lent me by the Rev. John Ireland,* in it the canal is not reflected over the spire. As the shell grows old it increases more in thickness than in size, therefore it is not fair to judge, as Montfort would do, of the size by the comparative thickness of fragments, for the lips of full grown shells are often very thin. The var β might be confounded with *Rostellaria Columbaria*, of which I have given a figure among my miscellaneous plates, which will often be found useful for references, but the canal and winglike lip are very different in form and proportion: in *R. columbaria* the lip is narrowest at the lower part and rather triangular, and the canal perfectly simple, free from the additional swelling described above; it is also a much smaller shell.

* This Gentleman's name has formerly been erroneously given JULAND, for which I beg to apologize.

CONUS. *Linn.*

GEN. CHAR. Univalve, convoluted, inversely conical; spire short, composed of the upper edges of the whorls; aperture longitudinal, narrow, toothless, with parallel sides.

THE form of most of the species of this Genus is an elongated cone, from whose base proceeds the spire, itself more or less conical, and either simple or coronated, generally much shorter than the remainder of the shell, although sometimes quite as long; the aperture is nearly equal in width through its whole length, but rendered more freely open at the ends by a kind of truncation at the base, and a deep sinus at the upper part of the right lip; the left lip is hardly visible, except at the base of the columella, where it forms a small plait. The surface is often variously ornamented by a beautiful variety of colours, striæ, punctums, &c. The animal has two antennæ, and a small operculum, and the shell is enclosed in a membranous epidermis.

The recent Cones are inhabitants of tropical seas; they are very handsome, and highly valued. Montfort has separated those with coronated spires, to form his genus *Rhombus*, a division which appears to be too minute; some of the other abstractions he has made may prove more useful.

CONUS Dormitor.—TAB. CCCI.

SPEC. CHAR. Short fusiform, transversely striated, striæ elevated, the intermediate spaces neatly crenulated.

SYN. *Conus dormitor*, *Brander*, 24.

THE length of the spire is about equal to the greatest width of the shell, the aperture is rather longer, but these proportions are liable to slight variation as shewn in figure 3; the elevated striæ are rather numerous and sometimes placed in pairs, the crenulations between them are conformable to the lines of growth; the right lip is semicircular.

I have been favoured with specimens of this Cone found at Muddiford, by Lady Burgoyne; I have also received it from Barton, through the kindness of Miss Dent, and several other Friends. It occurs frequently in a high state of preservation.

Fig. 1 exhibits a young shell with a peculiar smooth band; I conceive however that it is only a variety. Fig. 2, gives the general appearance, the middle figure is

remarkable for size. Fig. 4 is inserted to give an idea of the crenulations between the striæ.

CONUS concinnus.—TAB. CCCII.—*Fig. 2.*

SPEC. CHAR. Fusiform, angular in the middle, spire ornamented with knobs and granulated striæ; base produced, sulcated.

THIS elegant Cone is nearly three times as long as broad, the spire occupying little more than one third of the length; both ends are pointed; the sulci upon the base are deepest towards the point.

From Highgate Hill, and Barton; not very common.

TAB. CCCII.—*Fig. 1.*

As it is not likely we shall again have so good an opportunity of searching the clay of Highgate Hill, as was afforded by cutting the road through it in 1811, I have thought it adviseable to figure a very much corroded and imperfect Cone found there, without being able to give a satisfactory character or name to it. It is not impossible that it may be a very large specimen of *C. concinnus*, but the canal around the spire, and its shorter form, render it doubtful: there are obscure indications of tubercles or large crenulations upon the spire: I cannot refer it to any species described by Lamarck or Brocchi.

CONUS scabriculus.—TAB. CCCIII.

SPEC. CHAR. Fusiform, rather short, striated; striæ elevated, toothed.

var. β, elongated, striæ numerous, minutely toothed, (fig. 2.)

SYN. *Conus scabriculus.* Brander, 21.

THE greatest width in *α* is rather less than half the length: in *var. β* it is only one-third: the striæ vary from 7 to 24; when few, each consists of a series of large, sharp, compressed teeth, in proportion as they are fewer they are more elevated, and the teeth are smaller; the last whorl is rather swelled out of the regular conical form; the aperture is longer than the spire; the right lip is sometimes plaited at the edge, opposite the teeth in the striæ, and the left lip is not visible.

A common shell at Barton. I am indebted to Miss Salisbury for several specimens.

MUREX interruptus.

TAB. CCCIV.

SPEC. CHAR. Subturrited ; body covered by broad, transverse sulci ; the remaining whorls smooth with two sulci along their upper edges.

SYN. Murex interruptus, *Pilkington, in Trans. Linn. Soc. VII. p. 117 t. 11, f. 5.*

SHELL about twice as long as wide ; a broad flat space runs along the smaller whorls, above it are two sharp furrows ; the last whorl in full grown individuals is quite covered with furrows, which are broader than in the other whorls, it is also convex, the right lip is plaited within, the left so thin that it receives the impression of the sulci beneath it and so becomes striated ; the beak is elongated and slightly curved.

One of the varieties of this shell was first published by Mr. Pilkington, who discovered it in a collection of Hampshire fossil shells made by I. T. Swainson, Esq. ; others have since been noticed at Barton by Lady Burgoyne, from whose choice cabinet the specimens fig. 1 are taken ; I have since received it from Miss Beminster, and an unknown Friend ; in the specimens from these latter persons the band does not extend so far down the spire as in those collected by Lady Burgoyne, (see fig. 2.)

I have no hesitation in pronouncing them to be the same as Mr. Pilkington's shell although Miss Beaminster's specimen is nearly three times as long; the specimen at fig. 2, is intermediate, and the smallest of Lady Burgoyne's corresponds exactly.

INOCERAMUS concentricus.

TAB. CCCV.

SPEC. CHAR. Unequalvalved, ovate, one of the beaks much produced, incurved.

SYN. *Inoceramus concentricus*. *Parkinson in Trans. Geol. Soc. vol. V. p. 58. t. 1. f. 4.*

Birostrina lævis. *Jean André De Luc, M.S.*

ONE of the valves of this shell is rather deeper than the other, and has an acute, produced, incurved beak; the beak of the other is very short; both are transversely striated and undulated; the striæ are the edges of distant imbricated plates; the length is nearly double the width: the hinge is straight, containing about a dozen grooves for the reception of the ligament: the shell is composed of two coats, the outer brownish and of a fibrous structure, the inner pearly. There is apparently no sinus for the passage of a Byssus.

Found abundantly in the dark coloured blue Marl at Folkstone, and also in blue Marl of a lighter colour near Lewes in Sussex. Figures 1, 2, and 3, shew portions of the hinge.

Miss Curtis was so kind as to favor me in 1813 with the first specimen in which I saw the hinge; I have not since seen better, and should have figured it long ago, but did not wish to be too precipitate. It was found at Folkstone.

I defer giving the characters of the Genus *Inoceramus*, until I figure the species found in Chalk, which I have named *Cuvieri*, in a paper read before the Linnean Society in 1814. I must observe however, that it differs from *Perna* in not having a sinus for the passage of a Byssus.

INOCERAMUS sulcatus.

TAB. CCCVI.

SPEC. CHAR. Unequalvalved, oblong with prominent beaks, and about 9 large, longitudinal, plaits; beak of one valve incurved, acute.

SYN. *Inoceramus sulcatus*. *Parkinson in Trans. Geol. Soc. vol. V. p. 59. t. 1. f. 5.*

Birostrina costata. *De Luc, MS.*

IN general form this resembles the last, but it is rather shorter and more spatulate: it has also fewer crenulations in the hinge: the angular folds resembling those of *Ostrea Crista Galli* are a sufficiently remarkable distinction.

Equally abundant with the last, at Folkstone: it has also been found near Lewes in Sussex. Mr. Jean André De Luc, of Geneva, has good specimens of both, collected at Folkstone by himself in 1797; but as he had not seen the hinge, he was induced to name the genus under which he placed them, from the beaks; and in 1820 was so kind as to send me sketches of them named as above quoted: should the inequality of the valves prove a generic character, to distinguish them from *Inoceramus*,* or should Mr. De Luc's name have been given prior to 1814, it will be right to retain it, and also his specific names, if they have been published.

Figures 1, 2, 3, 4, and 7, are from Folkstone specimens: fig. 5 is from Lewes, collected by G. A. Mantell, Esq.: fig. 6 is from a clay cast found at Clophill in Bedfordshire: similar ones are said also to be found in the Campton and Southill Marl-pits, and near Beadlow in the same county, above the Woburn Sand.

* The *Inoceramus Cuvieri*, the type of the genus, is probably an equalvalved shell, as I have been led to suspect by some good specimens I have lately examined.

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ERRATA.

- Page 1, line 1, for "cornea" read "cornus."
 3, line 1, "obscura" read "obscurus."
 4, line 1, "laminata" read "laminatus."
 13, "arcuata" read "arcuatus."
 5, line 11, "rigida" read "rigidus."
 11, line 9 from the bottom, "TRIGONA" read "TRIGONIA"
 18, line 13, and last but one "Parkham" read "Parham."
 27, line 1, "alaformis" read "aliformis."
 4 from the bottom, "Parkham" read "Parham."
 46, line 1, "V. scripta" read V-scripta."
 line 22, "5" read "4."
 75, line 3, from the bottom "T. O. Marsh, Esq." read "the Rev. T. O. Marsh."
 78, line 14, "radi" read "radii."
 81, line 1, "gygantea" read "gigantea."
 87, line 1, "cuneata" read "Scalprum" Unfortunately the name cuneata had been previously applied to another Modiola, see tab. 211.
 89, line 24, "I do not know they" read "I do not know that they."
 93, line 1, "alaformis" read "aliformis."
 125, line 2, "CCLXXI" read "CCLXX."
 18, "pinquis" read "pinguis."
 132, line 6, from the bottom "Beaminster" read "Beminster."
 133, line 20, "alaformis" read "aliformis."
 135, line 17, "Beaminster" read "Beminster."
 139, line 1, "Gibsi" read "Gibbsi" and line 3, from the bottom "Gibs" read "Gibbs."
 141, line 6, from the bottom "genius" read "genus."
 143, line 18, "different" read "differently."
 145, line 3, and } "Juland" read "Ireland."
 147, last line }
 149, line 7 from the bottom, and 150 last line "edulina" read "edulinum."

The description of *Fusus ficulneus*, tab. 291, f. 7 was accidentally omitted, it will be found upon a separate leaf in Number 53. The Binder is requested to place it next to page 166.

A SUPPLEMENTARY INDEX TO VOL. III.

Arranging the SHELLS described therein, according to the several STRATA in which they were found imbedded, from the newest towards the oldest in the British Series.

THE following Letter, received from my kind friend Mr. FAREY, which inclosed his manuscript of the Supplementary Index to my Third Volume, which he had kindly prepared, I beg to insert here, by way of preface to that Index.

SIR,

IF on the completion of my STRATIGRAPHICAL INDEX to your Second Volume, I had occasion to apologise to you and your Readers for delay in completing the same, I feel that I have now much greater indulgence to claim, for the very protracted appearance of the enclosed INDEX to your Third Volume: and which indulgence I trust that yourself and they will grant, on being assured, that circumstances unforeseen and not within my controul, have prevented, at any earlier period since you finished printing the Volume, my giving that very careful, and I may say laborious attention, to the compiling of this Index, which I had determined to bestow upon it, and which now the same has had.

IT is to me a subject of the deepest regret, that since the period when I compiled the Index to your Second Volume, only one more Number (the 4th) of "Strata Identified by Organised Fossils," has appeared, from the pen of my greatly respected and very ill-used friend Mr. WILLIAM SMITH; and, that besides the three remaining Numbers of this work, the second part of his "Stratigraphical System of Organised Fossils," is also yet unpublished.

FOR want of my being able to consult the latter part of Mr. Smith's Catalogue and Arrangement of Organised Fossils, and for want of knowing the localities, whence his specimens in the British Museum were obtained, with regard to all those parts of the British Series of Strata which lay below the Marlstone, I have experienced considerable difficulties, and have been in much doubt in several instances, whilst compiling the present Index; suffice it to say, that I have spared no pains to do my best, towards presenting a correct and useful arrangement of the Shells of this volume.

ALTHOUGH I was by no means first in discovering the important *truth*, that particular and definable species or varieties of Shells or other organic Remains, are peculiar to, and not elsewhere found (fossil or living), but in certain beds or definable portions (as to thickness) of the Strata of the Earth, yet I believe myself to have been the first to *publish*, and the most steady and consistent of any one else in maintaining this doctrine, so replete with interest, and so fertile in consequences deducible from it, both of a theoretic and a practical kind: and my chief endeavours herein have been directed, not to the bringing forwards individual cases, wherein the doctrine appears to be supported; that task I leave to yourself and others, whom many of my cotemporaries will be disposed to think more impartial evidences, and who are performing this task as effectually as I could wish; but to the pointing out, as I have done at some length in Vol. 53, p. 112, 120, &c. of Dr. Tilloch's "Philosophical Magazine," as many as possible of those instances, in which at present, Shells passing under the same name, appear from their localities, as probably referable to more than one Stratum each: with my earnest request, which I beg here to repeat, that observers and collectors of shells in different parts of the country, would direct their particular attention to the shells in this list, (of which an abstract is given in page 243 of your second volume, and some additions thereto which I now present,) and send up for your inspection, as many individuals as possible, and well authenticated as to localities, for enabling you to discriminate and decide, as such accumulation of new facts might appear to warrant.

A continuation of the Table in p. 243 of Vol. II. (which was brought down to Vol. III. p. 77); particularizing such species of SHELLS, as are in the present Volume, referred to more than one STRATUM, and are in the Index which follows, distinguished by the Greek Letters α and β , unless otherwise mentioned below:

Genera.	Species.	No. of Species or Varieties.	Page.
Ammonites	annulatus	2	41
	Bechii	2	143
	Koenigi	2	113
Avicula	echinata	2	75
	inequivalvis, α , β & γ	3	78
Cardita	margaritacea	2	175
Conularia	quadrisculcata	2	107
Hippopodium	ponderosum	2	91
Inoceramus	sulcatus	2	184
Lutraria	ovalis	2	47
Mya?	literata	2	45
	V-scripta, α , β & γ	3	46
Terebellum	fusiforme	2	157
Terebratula	inconstans	2	137

In the present volume, 179 species of Shells are named, besides 13 varieties, marked β , of Shells belonging to the same Strata, with their relative Shells, marked α ; besides which, my recent investigations have led to the separation of 19 other varieties, on account of their belonging to different Strata: making thus 198 species (or varieties) belonging to distinct Strata, and which I am inclined to wish, had as many distinct names assigned them.

Doctor Tilloch, in the 46th and the 52d volumes of his Phil. Mag. did me the favour to print alphabetical tables, of the PLACES which furnished the Fossil Shells, described in your two first volumes; and I have prepared, and am now about to send to him, a like table of the PLACES, Strata and Shells of the present volume;—and wishing now, again, success to MINERAL CONCHOLOGY, I remain, SIR, your obedient humble servant,

37, Howland Street, Fitzroy Square,

April 26, 1822.

JOHN FAREY.*

* P.S.—Whilst my Son John F., assisted by his three younger Brothers, carried on under my roof, a professional concern, (that now Joseph F. pursues), which occasioned them to be far more extensively and widely known and corresponded with, than myself, I avoided many mistakes, by an addition to my Name, which now, since each of my Sons has a separate Residence, has become unnecessary.

Additional Localities of Shells described in this Work.

Ammonites annulatus, tab. 222.—Mya angulifera, tab. 224, f. 6 and 7.

These have been found in Oolite at Sherborne in Dorsetshire, by Dr. W. Dansey, of Blandford.

Avicula inequivalvis, tab. 244.—Robinhoods' Bay, near Scarborough.

Orthocera gigantea, tab. 246.—Red Limestone Quarries, at Castle Espy, near Comber, in the county of Down, Ireland, James Clealand, Esq. with the following observations from Dr. Macdonnell: "The dip of the Graywacké on which the Comber Lime rests is generally 45° or " upwards, sometimes vertical; the direction of the Graywacké is " always NW. by W $\frac{1}{2}$ W. by compass. The Limestone is in beds, from " one to three feet thick, of which beds there are 15 or more, on the " sea shore, and only a little inland on the south side of Newtown Laugh. " This body of Lime is always somewhat salmon-coloured, and is exactly " similar, in its colour and dip, and in the petrifications it contains, to " the great body of Lime at Ardmagh. Its coralline contents are very " numerous; among these I could often recognise the Basaltiform Ma- " dreporite: there are several large bivalves. Each stratum appears " to differ in some respects from the others, in texture, thickness, " and fossils: they lie all strictly parallel, and never conformable with " the Graywacké."

Productus Scoticus, tab. 69, f. 3.—Castle Espy, Js. Clealand, Esq.

Other Localities are inserted in the Supplementary Index.

A Stratigraphical List of STRATA, SHELLS, and PLACES ;
 BY MR. JOHN FAREY.

ALLUVIA, or water-moved ruins of Strata: diluvial masses or patches.	
Ammonites biplex	<i>Tab.</i> 293, f. 1 and 2. Barrow (in Lond. Clay?)
decipiens	294, Pakefield Gravel-pit (in L C. Septarium?)
Modiola imbricata.....	212, f. 3. Gisleham (in Cornbrash?)
COWES, or Headen Hill, Strata; containing, supposed <i>fresh-water beds?</i>	
Melanea fasciata	241, f. 1. Isle of Wight.
LONDON CLAY, upper, <i>blue</i> or septarian clay; the lower beds plastic, and mostly red and white mottled:—on Mr. <i>Smith's</i> maps, coloured <i>dun blue</i> , and in his Geological Table, numbered 1 and 2.	
Ammonites decipiens	294, Highgate NE.
Ampullaria acuta	284, <i>up.</i> Barton, Christchurch, and near Paris.
patula	284, <i>mid.</i> Barton, and near Paris.
sigaretina	284, <i>lo.</i> Barton, Bognor, & nr Paris.
Area appendiculata	276, f. 3. Barton.
Branderi	276, f. 1 and 2. Barton.
Cardita margaritacea β	297, f. 2. Alum Bay and Brentford.
Conus concinnus	302, f. 2. Barton and Highgate.
concinnus major?	302, f. 1. Highgate.
dormitor	301, Barton and Muddyford.
scabriculum α & β	303, f. 2. Barton.
Corbula globosa.....	209, f. 3. Highgate.
pisum	209, f. 4. Barton and Hordwell.
revoluta α & β	209, f. 8 to 13. Barton.
Fusus acuminatus	274, f. 1 to 3. Hordwell.
asper	274, f. 4 to 7. Hordwell.
bifaciatu.....	228, Highgate and Barton?
bulbiformis α to δ	291, f. 1 to 6. Barton, Brockenhurst, Hordwell, and nr Paris.
ficulneus α to γ	291, f. 7. Barton, Grignon, and Hordwell.
rugosus	274, f. 8 and 9. Hordwell and near Paris.
Isocardia sulcata	295, f. 4. Islington G. J. Canal.
Melanea costata	241, f. 2. Hordwell.
minima.....	241, f. 3. Brockenhurst.
truncata	241, f. 4. Brockenhurst.
Modiola subcarinata?	210, f. 1. Highgate and near Paris.
Murex coronatus	230, f. 3. Highgate.
cristatus.....	230, f. 1 and 2. Highgate.
interruptus.....	304, Barton.
minax	229, f. 2. Barton, Grignon, and High- gate.
tuberosus	229, f. 1. Highgate.
Olva Branderi	288, <i>up.</i> Barton.
Salisburiana.....	288, <i>lo.</i> Barton.
Ostrea flabellula	253, Barton, Emsworth-harbour, Grignon, Hordwell, and Lyndhurst.
Pecten corneus	204, Stubbington-beach.
Rostellaria macroptera α & β	30, 298, 299, } Barton, Highgate, Hord- and 300. } well, and near Paris.

	<i>Tab.</i>	
Seraphs convolutus	286,	Barton and Grignon.
Terebellum fusiforme α	287,	Hordwell and near Paris.
Trochus extensus	278, f. 2 and 3.	Highgate and Sheppy Isle.
Venericardia carinata	259, f. 2.	Stubbington.
deltoidea	259, f. 1.	Lyndhurst.
globosa α & β	289, <i>up. & mid.</i>	Barton and Hordwell.
oblonga	289, <i>lo.</i>	Barton and France.
Voluta costata	290, f. 1, 2, & 4.	Barton.
Magorum	290, f. 3.	Barton.
CRAG MARL, or soft irregular Limestone, superficially mixed with Alluvia.....		(<i>light brown, No. 3.</i>)
Astarte planata	257,	Gunton and Roydon.
Cardium angustatum.....	283, f. 2.	Alderton and Bramerton.
edulinum	283, f. 3.	Bramerton, Ipswich, and Woodbridge.
Mytilus aliformis	275, f. 4.	Holywells.
antiquorum	275, f. 1 to 3.	Ipswich and Woodbridge.
Terebratula inconstans β	277, f. 3.	Gunton.
Trochus concavus	272, f. 1.	Suffolk.
Venericardia senilis	258,	Courtagnon, Harwich, and Suffolk.
Venus turgida	256,	Ramsalt, Roydon, and Woodbridge.
LONDON Deep-Well, Woolwich, or Newbury Strata; Loams, Sands, and <i>Nodules*</i> mostly of Chert		(<i>light brown, No. 3 & 4.</i>)
Ammonites biarmatus	p. 122.	Havre de Grace.
Cardia margaritacea α	297, f. 1 and 3.	Pegwell-bay, and Richmond-park Well-bottom.
Ostrea pulchra	279,	Bromley and Plaistow.
tener	252, f. 2 and 3.	Charlton.
undulata.....	238, f. 2.	Farley.
?	p. 141.	Charlton.
CHALK, upper, soft, flinty, of Chiltern Hills, South and North Downs, &c. (mostly <i>light green, No. 5.</i>)		
Terebratula obliqua	277, f. 2.	Rausgate.
CHALK, lower, hard, grey, flintless; Hurloch, white Cawkstone, Firestone; Dunstable NW. N. and NE.....		(<i>deep green, No. 5.</i>)
CHALK MARL, Malm or Blue Marl, Holmesdale Strata: earthy or coloured Chalk, red Cawkstone, Clunch, Firestone, &c. (<i>white, No. 6.</i>)		
Hamites armatus (see tab. 168)	234, f. 2.	Isle of Wight S pt.: see II. 153.
nodosus	216, f. 3.	Folkstone, NE.
plicatilis	234, f. 1.	Bishopstrow.
spiniger	216, f. 2.	Folkstone, NE.
tuberculatus	216, f. 4 and 5.	Folkstone, NE.
turgidus	216, f. 6.	Folkstone, NE.
Inoceramus concentricus	305,	Cambridge, Folkstone, NE. Lewes, N. and Malling.
sulcatus α	306, f. 1 to 5, and 7. }	Cambridge, Folkstone, NE. Lewes, N. and Malling.
Trochus Gibbsi	278, f. 1.	Folkstone, NE.
Venericardia?	259, f. 3.	Ringmer.

* There are those who pretend that these are rolled or rounded FLINTS, notwithstanding, in some instances, these *nodules* may be cut with a knife, like semi-indurated Clay, and some appear also like indurated Chalk, internally; in shape and surface, likewise, they no way resemble rolled pebbles.

GREEN SAND, or Sandstone, chloritic? and often micaceous Sand, Fuller's-earth, Nutfield Sand, Haldon Rock...(very light blue, No. 6.)
Tab.

Ammonites Goodhali	255,	Blackdown-hills.
Corbula gigantea	209, f. 5 to 7.	Blackdown.
levigata	209, f. 1 and 2.	Blackdown.
Cucullæa carinata	207, f. 1.	Blackdown.
decussata	206, f. 3 and 4.	Faversham-field.
fibrosa	207, f. 2.	Blackdown.
Hamites spinulosus	216, f. 1.	Blackdown.
Pecten arcuatus α	205, f. 7.	Devises, N.
Terebratula dimidiata	277, f. 5.	Haldon (or Haldedown.)
Trigonia affinis	208, f. 3.	Haldon (or Alldown.)
aliformis	215,	Blackdown and Parham-park.
eccentrica	208, f. 1 and 2.	Blackdown and Hembury-fort.
pennata	237, f. 6.	Tainmouth.
Turbo carinatus	240, f. 3.	
BRICK EARTH, micaceous, or blue-marl, Clay on Woburn Sand, or on Portland Rock; Marden (<i>Kent</i>) or Tetsworth Strata. (<i>blue green</i> , No. 7.)		
Modiola æqualis	210, f. 2.	Parham-park.
bipartita α	210, f. 3.	Osmington and Parham-park.
PORTLAND ROCK, or 4th Oolite, Aylesbury, Wardour, Swindon, Purbeck, or Kentish-rag Limestone, part Oolite, in Sand and Marl..... (Sand, <i>brownish red</i> , Nos. 8 and 10, Limestone, <i>blue</i> , No. 9.)		
Lutraria ovalis α	226, f. 2.	Portland Isle.
Modiola? aliformis	251,	Sandown.
Nerita sinuosa	217, f. 2.	Chilmark.
Ostrea expansa	238, f. 1.	Tisbury.
Meadei	252, f. 1 and 4.	Somersetshire.
Pecten lamellosus	239,	Chicks Grove, Portland Isle, Swindon and Thame.
Terebratula inconstans α	277, f. 4.	Oxford, SE. Portland-ferry, and Ringstead-bay.
Trigonia gibbosa α & β	235, 236,	Tisbury.
Trochus reticulatus	272, f. 2.	Garsington, Portland-ferry, and Ringstead-bay.
Venus (large)?	.....	p. 173.
OAK-TREE CLAY, blue, of Thame, Standford, &c.; nodules of stony Marl, Selenite, pyritic extr. Fossils, bituminous Marl...(<i>greenish blue</i> , No. 11.)		
Ammonites rotundus	293, f. 3.	Purbeck Peninsula.
Inoceramus sulcatus β	306,	Beadlow, Campton, Clophill, and Southill.
CORAL RAG, and pisolite, or 3d Oolite, local in Woburn Sand; Wootton-Basset, Hedington, Pickering, &c.....(<i>orange</i> , No. 12.)		
Ammonites trifidus	292 & 293, f. 4.	New Malton and Shotover.
Lima rudis	214, f. 1.	Calne.
Mya? literata β	224, f. 1.	Scarborough, Castlefoot & North Sands, New Malton.
Pecten arcuatus β	205, f. 5.	Calne.
similis	205, f. 6.	Shotover-hill, NW.
Pinna lanceolata	281,	Near Scarborough.
Trochus bicarinatus	221, f. 2.	Marcham field.
Turbo mucricatus α	240, f. 4.	Bagley-Wood-pit, Banner's Ash, Derry-hill, Steeple-Ashton, and Wootton-Basset.
(— β & γ)?	240,	Longcat park, W.

CLUNCH CLAY, or Fen Clay; of Blackmoor, Otmoor, Oxford, &c.:
beds of Clunch, or dogger-stone?.....(*light purple*, No. 14.)

Tab.

Ammonites Lamberti..... 242, f. 1 to 3. Portland Island, NE. and Sandfoot Castle.
Leachi..... 242, f. 4. Sandfoot Castle.
omphaloides 242, f. 5. Portland Island, NE. and Sandfoot Castle.

Lima proboscidea 264, Sandfoot Castle.

Mya? literata α 224, f. 1. Felmersham.

Mytilus pectinatus..... 282, Sandfoot Castle.

ALUM SHALE, of Whitby, Titherton, &c.; Cement Balls or Septaria,
(wrongly called *Lias*) Jet, Selenite, &c.(*dun purple*, No. 15.)

Ammonites annulatus α 222, f. 2. Near Whitby.

heterophyllus..... 266, Near Whitby.

KELLOWAYS STONE, of Kelloways Bridge, Staitlis? &c.(*ditto*.)

Ammonites Koenigi α 263, f. 1 and 2. Kelloways-bridge.

Avicula inequalvis α 244, f. 2. Kelloways-bridge.

Isocardia tener 295, f. 2. Kelloways-bridge.

Mya V-scripta α 224, f. 3. Kelloways-bridge, and Little Somerford.

CORNBURASH, or Bedford Limestone(*yellowish brown*, No. 16.)

Avicula costata γ 244, f. 1. Near Stony Stratford.

echinata α 243, f. 1. Chippenham, Clossworth, Draycot, Langston-Herring, Lullington, Chertou (Nerth,) Norton, Pavingham, Sheldon, Stony Stratford, Tellisford, SW. Trowle, and Wincanton, NW. and SW.

Isocardia minima 295, f. 1. Madagasear Isle? and Wiltshire.

Lutraria ovalis β 226, f. 1. Felmersham.

Modiola aspera 212, f. 4. Felmersham (Gregory's-pit)

imbricata 212, f. 1 and 3. Felmersham and Milton-Ernest.

plicata 248, f. 1. Felmersham.

Mya V-scripta γ 224, f. 5. Bedford-castle.

Pecten laminatus 205, f. 4. Chatley-lodge.

Venus varicosa 296, Felmersham.

FOREST MARBLE, Whichwood, Collyweston, Stonesfield, Yeovil, &c.:
grey Slate, Bones, Teeth, &c.(*light blue*, No. 18.)

Pecten Lens 205, f. 2 and 3. Oxfordshire.

obscurus 205, f. 1. Stonesfield.

rigidus 205, f. 8. Castle Combe, E.

CLAY ON UPPER OOLITE, S. and E. of Bath, Bradford, &c.; Stonebeds, Corals, &c.(*very light yellow*, No. 19.)

Avicula costata δ 244, f. 1. Bradford, Charterhouse-Hinton, E. and Winsley.

UPPER OOLITE, great or superior O.; oolitic; calcareous Freestone,
of Bath, Ketton; upper Cotswolds, &c.(*yellow*, No. 20.)

FULLERS-EARTH Strata, grey, lead-coloured and purple Clay; slippery soil.....(*very light orange*, No. 21.)

Modiola gibbosa..... 211, f. 2. Ancliff, Bradford, S. and Claverton-hill.

Mya angulifera 224, f. 6 and 7. Beacon-hill and Smallcomb.

UNDER COLITE, inferior, lower or bastard O: of Dundry, lower Cotswolds, &c.....(*reddish orange*, No. 22.)

Tab.

Ammonites annulatus β	222, f. 1, 3 to 5.	Cropredy and Ilminster.
Browni	263, f. 4 and 5.	Dundry.
falcifer	254, f. 2.	Ilminster.
Sowerbii α & β	213,	Dundry.
Strangewaysi.....	254, f. 1 and 3.	Ilminster.
Astarte excavata	233,	Dundry.
Cardita lunulata.....	232, f. 1 and 2.	Bayeux and Dundry.
similis	232, f. 3.	Dundry.
Cirrus Leachi.....	219, f. 3.	Dundry.
nodosus...141, f. 2. and	219, f. 1, 2 & 4.	Dundry and Yeovil.
Cacullæa oblonga	206, f. 1 and 2.	Crosshands, Dundry, and Little Sodbury.
Isocardia rostrata	295, f. 3.	Cotswold-hills.
Lutraria lirata.....	225,	Wootton-under-edge?(query Norton-under-Hamdon.)
Melanea lineata.....	218, f. 1.	Dundry.
Modiola cuneata.....	211, f. 1.	Somersetshire.
reniformis.....	211, f. 3.	Near Bath.
Mya V-scripta, β	224, f. 2 and 4.	Claydon.
Nerita lævigata	217, f. 1.	Dundry.
Ostrea (fibrosa)?	p. 66.	Normandy.
Pecten barbatus.....	231,	Dundry.
Trigonia duplicata.....	237, f. 4 and 5.	Little Sodbury.
striata	237, f. 1 to 3.	Dundry.
Trochus fasciatus	220, f. 1.	Dundry.
granulatus	220, f. 2.	Dundry.
ornatus.....	221, f. 1.	Dundry.
sulcatus	220, f. 3.	Dundry.
Turbo ornatus.....	240, f. 1 and 2.	Dundry.
Unio concinnus	223, f. 1 and 2.	Cropredy.

SAND and Sandstone of many colours, Northampton, Enstone, &c..... (*white*, No. 23.)

Ammonites ——— ?	p. 143.	Cropredy.
Helicina polita	285,	Cropredy.
MARLSTONE, Marl, &c.; of Glastonbury.....	(<i>very light blue</i> , No. 24.)	
BLUE MARL, above, or Clay on Lias; Cheltenham. (<i>light blue</i> , No. 25.)		
Ammonites Bechei, α	280,	Lyme Regis.
Birchi	267,	Charmouth, Craymouth, and Lyme Regis.
Koenigi, β	263, f. 3.	Charmouth.
Avicula inequalvalvis, γ	244, f. 2.	Dursley.
Helicina expansa	273, f. 1 to 3.	Lyme Regis.
solaroides	273, f. 4.	Lyme Regis.
Lutraria ambigua	227,	—? alluvial at Narford.
Modiola scalprum	248, f. 2.	Bourton.
Plicatula spinosa	245, f. 1 to 4.	Braunston-tunnel, Crick-tunnel, France, Leonard-Stanley, and Uley.
Trochus imbricatus	272, f. 3 and 4.	Cheltenham.

BLUE LIAS, beddy, water-setting or Hydraulic Limestone: of Watchet, Aberthaw, Southam, Barrow.....(*dark blue*, No. 26.)

Avicula echinata, β	243, f. 2.	—?
inequalvalvis, β	244, f. 2.	Frethern and Kelweston.
Gryphites ——— ?	p. 19.	Near Belfast?
Hippopodium ponderosum, α 250,		Cheltenham, W. Fenny-Compton, and Toddentham.

Tab.

Lima antiquata	214, f. 2.	Frethern.
Modiola Hillana.....	212, f. 2.	Pickeridge-hill.
minima.....	210, f. 5 to 7.	Near Belfast? & Taunton.
RED MARL, red ground or earth, Cheshire Strata. ....(red, No. 28.)		
YELLOW LIMESTONE, buff, red-land, or Magnesian Limestone; Pop- plestone, Cornstone: Aberford, Sunderland....(greenish blue, No. 29.)		
COAL MEASURES, carboniferous Strata; Sandstones, Crowstones, fire Clays, Coals, Ironstones; Derbyshire, Newcastle. (Indian Ink, No. 30.)		
Ammonites ———?	p. 176.	Inver Brora.
Cardita ———?	297, f. 4.	Inver Brora.
Conularia quadrisulcata, β ...	260, f. 6.	Troulie Bank.
? teres	260, f. 1 and 2.	Troulie Bank.
DERBYSHIRE PEAK, Limestone Under-coal, Metaliferous, Basaltic, or Mountain Limestone: Kendal, Aldstoe. ... (purple blue, No. 31.)		
Ammonites Henslowi.....	262,	Scarlet Head
Conularia quadrisulcata, α ...	260, f. 3 to 5.	Hot-Wells&Westmoreland.
Hippopodium ponderosum, β 250,		Colebrook Dale.
Melanea constricta	218, f. 2.	Buxton & Tideswell (3d L.)
Modiola bipartita, β	210, f. 4.	Llantrisant.
Nautilus bilobatus	249, f. 2 and 3.	Closeburn.
complanatus	261,	Scarlet Head.
pentagonus	249, f. 1.	Bathgate-hills & Closeburn.
tuberculatus	249, f. 4.	Closeburn.
Orthocera cordiformis	247,	Closeburn & Thornlie-bank.
gigantea	246,	Bajarg and Closeburn.
Spirifer glaber	269, <i>up</i> .	Chelmerston, Ireland, and Tideswell, 3d L.
oblatus	268,	Axton-Quarry, Derbyshire, and Westmoreland.
obtusus	269, <i>lo</i> .	Scaliber.
pinguis	271,	Black Rock.
striatus	270,	Bakewell&Castleton, 1st L. and(Cork) Black Rock.
trigonalis	265,	Cave Dale, N. Monyash, and Overton (1st L.)
Terebratula Mantiaë	277, f. 1.	Ireland.

Note.—I have been unable to place in the above List, either *T. fusiformis* β , p. 158, or *Venus?* p. 174, for want of more *local* information.

ERRATA which have unfortunately escaped correction in the printing of the 3d Volume, in addition to the List, p. 186.

Page 3, last line, for "near Oxford" read "Oxfordshire."

41, after line 3 insert "SYN. *Lister's An. Aug. t. 5, var. a, Phil. Mag. Vol. 54, p. 136.*"

47, line 11, for "Norton" read "Wooton."

67, after line 2 insert "SYN. *Pecten - - Smith's Strat. Syst. p. 40, and Strata Identified, p. 16, and Portland Stone, plate f. 6.*"

67, line 6 from the bottom, for "fifth" read "third."

78, line 9 from the bottom, for "the other figure" read "fig. 3."

82, line 17, for "Sanguar" read "Sanquar."

82, line 4 from the bottom, for "ports" read "posts."

93, line 8 from the bottom, for "Sandgate" read "Sandown."

108, line 15, "Keswick" read "Kendal."

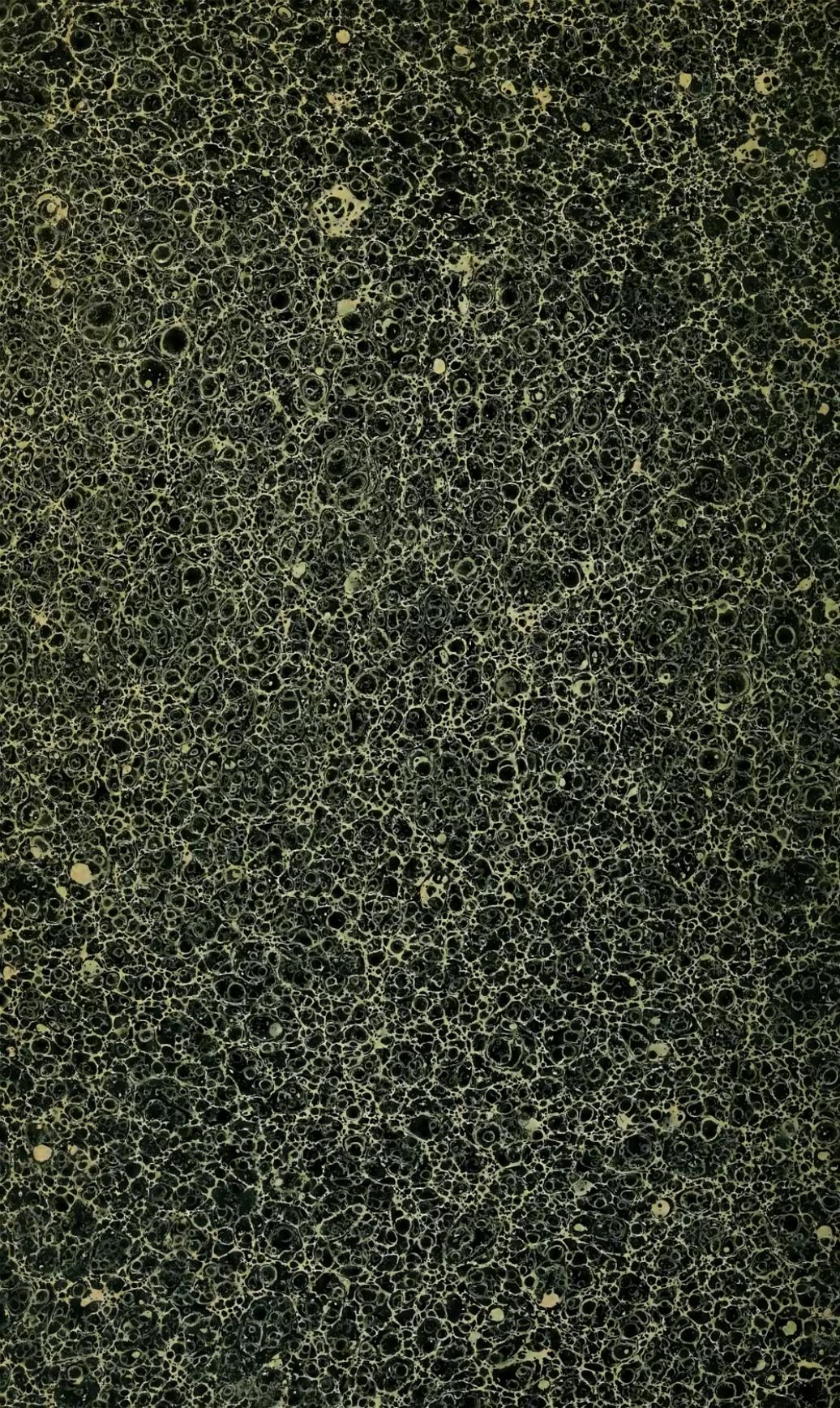
123, line 5 from the bottom, for "28" read "48."

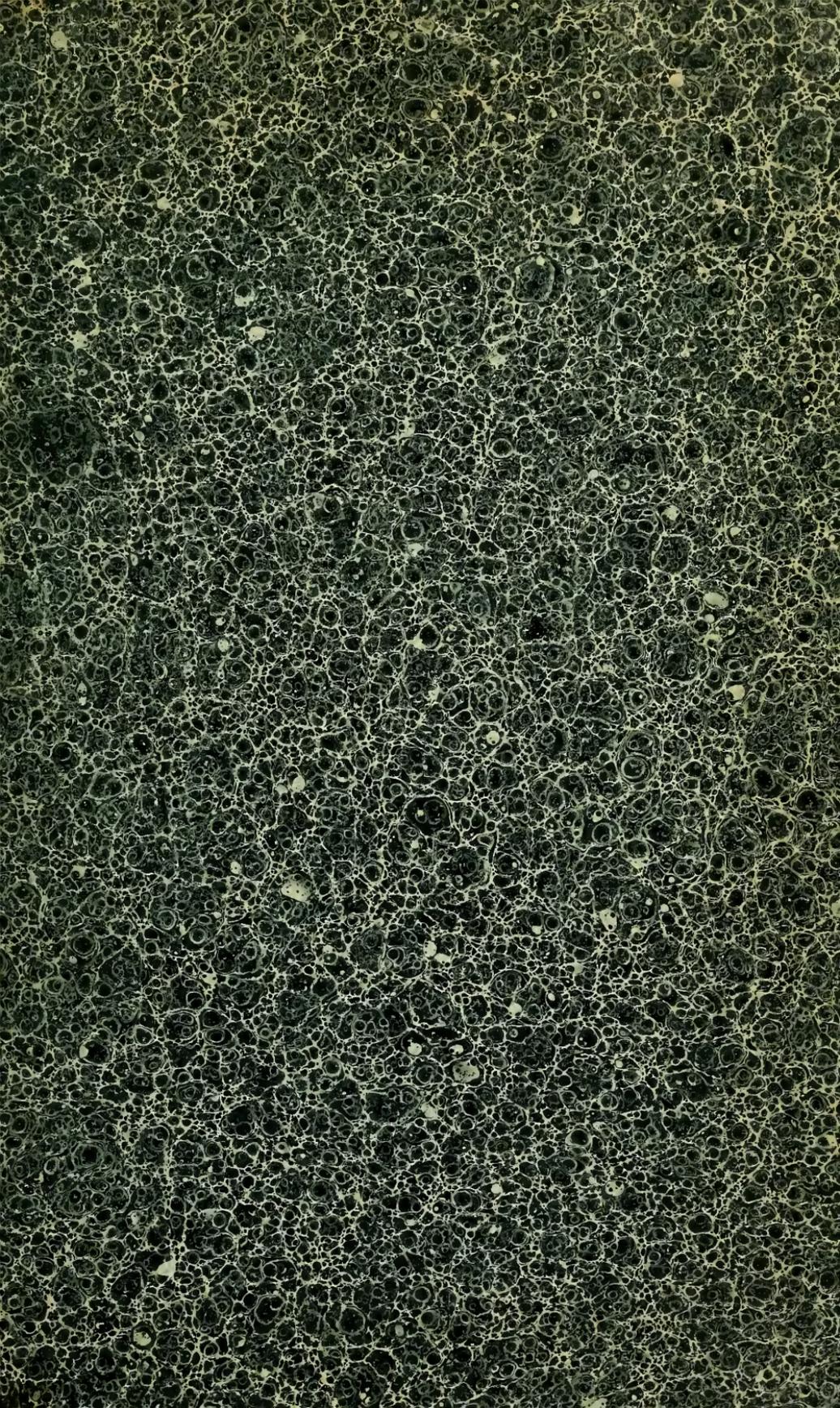
167, first line, for "triplicatus" read "trifidus" in consequence of triplicatus having been used before: the same erratum occurs in the Index.

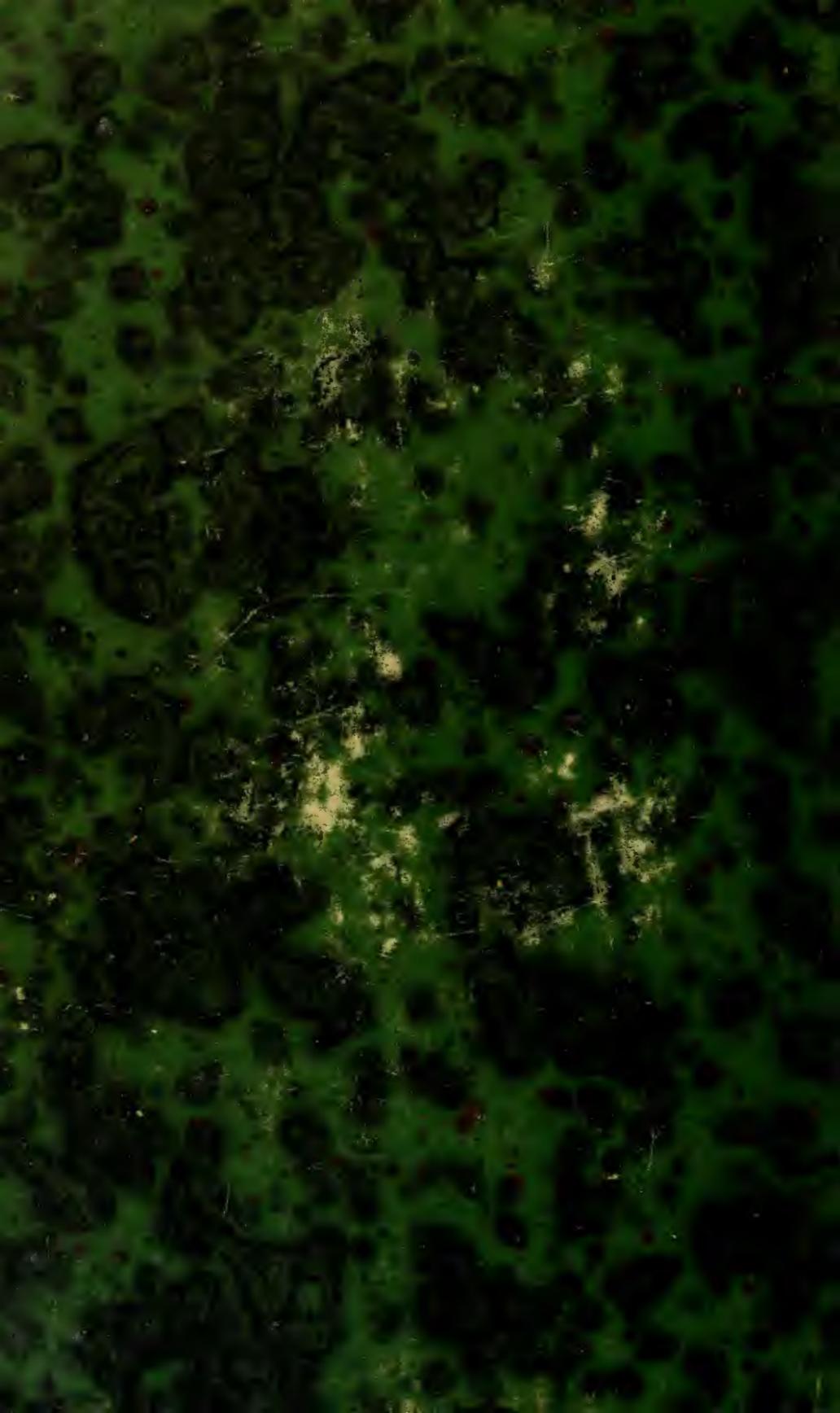
180, line 17, for "1 and 2" read "1 and 3."

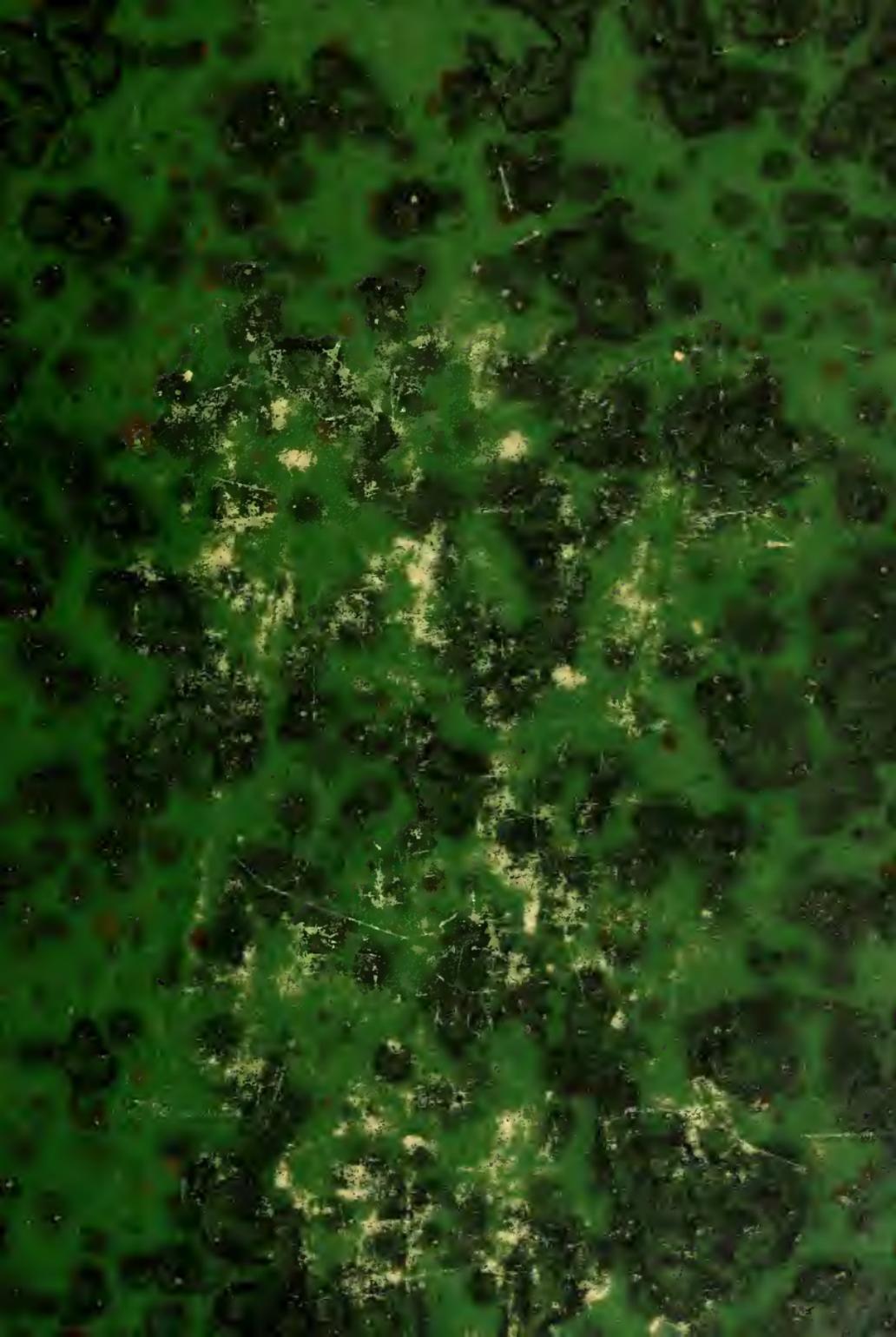
And in the Index, for "Murex interruptus" read "M. interruptus"; for "Trigonia excentrica" read "T. eccentrica"; and also insert "Ammonites biarmatus," page 122.

Several Errors in spelling the Names of Places are corrected in the Supplementary Index.









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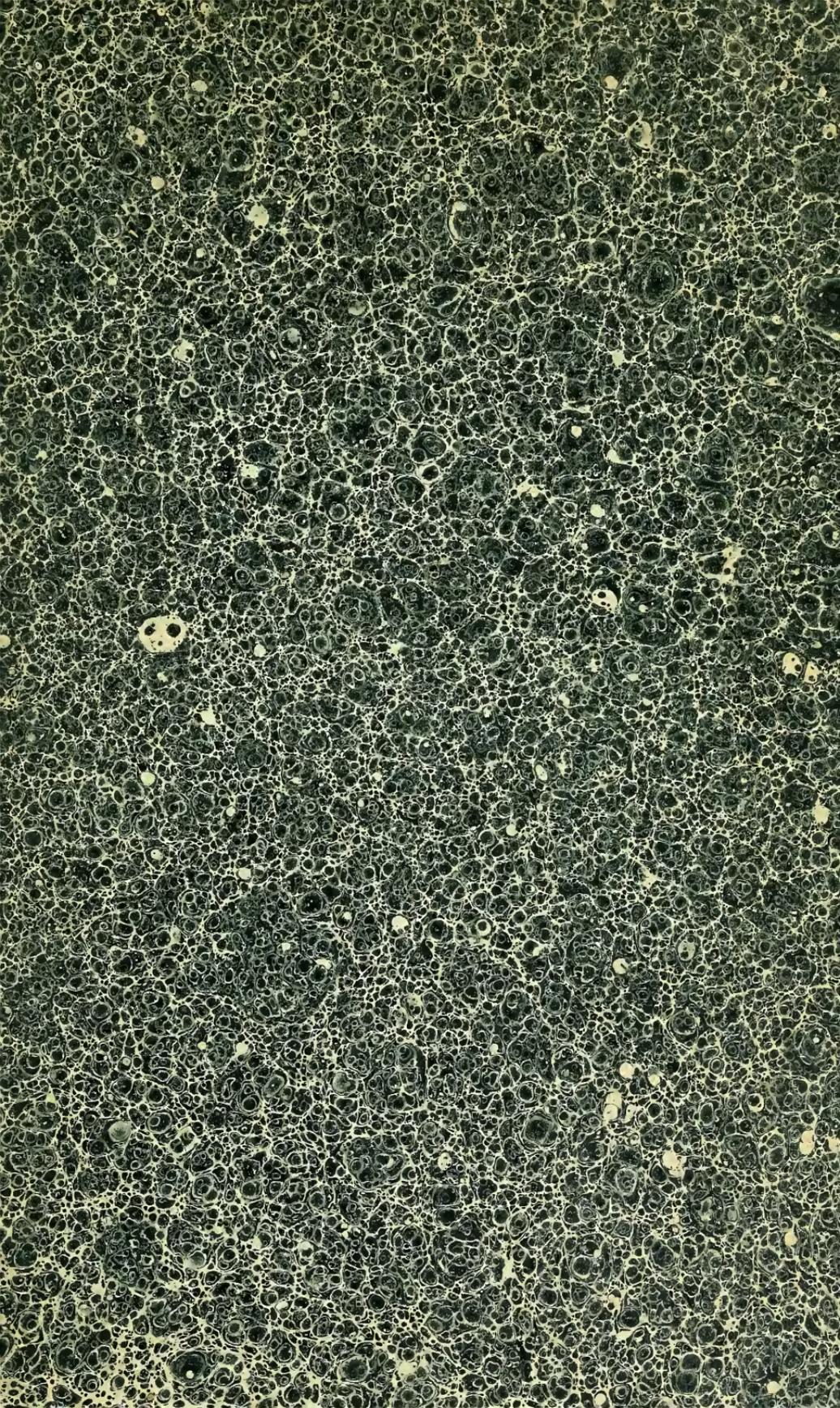
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THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN;
OR
COLOURED FIGURES AND DESCRIPTIONS

OF THOSE
REMAINS OF TESTACEOUS ANIMALS

OR
Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

BY JAMES SOWERBY, F.L.S. G.S. W.S.

HONORARY MEMBER OF THE PHYSICAL SOCIETY OF GOTTINGEN, OF
THE SOCIETY OF JENA, &c.

AUTHOR OF BRITISH MINERALOGY, EXOTIC MINERALOGY, BRITISH
MISCELLANY, ENGLISH FUNGI, A BOTANICAL
DRAWING BOOK, AND A NEW ELUCIDATION
OF COLOURS;
DESIGNER OF ENGLISH BOTANY, &c.

Many, O Lord God, are thy wonderful works which thine hand done; they cannot be reckoned up in order to thee: if I would declare and speak of them, they are more than can be numbered.

PSALM XLV.

VOL. IV.

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M DCCCXXXIII.

AMMONITES Parkinsoni.

TAB. CCCVII.

SPEC. CHAR. Discoid, with numerous highly elevated radii; whorls numerous, the inner ones exposed; radii slightly arched, bifid near the front which is very narrow and plain.

VOLUTIONS numerous, with slightly convex sides and narrow edges: the arched radii are bent forward at their outer ends, and nearly meet at an acute angle upon the front, but do not pass over it: the edge of the shell is nearly flat, in the east it is hollow in consequence of the removal of the siphuncle; the aperture is oblong, narrowest towards the front.

This is the Ammonite so frequently split, polished, and sold at Bath: its outer surface is also often ground and polished, shewing ramifying, sinuated, or simply undulated edges to the septa, according to the depth to which it has been worked. Misled by worked specimens that had lost the flat space in the middle of the edge, I have erroneously referred this species to the *Am. giganteus*, at page 55 of Vol. I. while speaking of such as are found near Keynsham, and those fine specimens given me by Dr. Lettsom, all of which are flatter than even the variety α of the *giganteus*, and have more whorls. The species before us occurs chiefly in Lias, a stratum not known to contain any silicious deposit; it is consequently never imbedded in Chert or Flint, like the *A. giganteus* β . I suspect it also may be found

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in the lower beds of the Ironshot Oolite, as the specimen now figured is from near Yeovil, and contains vestiges of ferruginous grains. I am indebted to the kind attention of Dr. W. E. Leach for preserving it from the gothic hands of the mason, who is often as destructive of the essential characters of fossils, as some dealers still continue to be of the natural forms of recent shells, and who rob them without mercy of venerable coats that had resisted with various success the combined efforts of numerous sea-born enemies, whose ravages even, leave marks more worthy of contemplation than the formal beauty betrayed by the file or polishing brush.

Fig. 2 shews a cast of the margin; it is from a part of an outer whorl found at Shotover Hill, near Oxford.

A section, shewing the chambers filled partially with crystallized Carbonate of Lyme, is given at tab. 12 of British Mineralogy. It often extends to 18 inches or more in diameter, and when cut thin and viewed by transmitted light, offers a specious excuse for the unscientific mason.

AMMONITES dentatus.
TAB. CCCVIII.

SPEC. CHAR. Discoid, umbilicate, radiated; front square*; radii prominent and forked near their commencement, terminating upon the edges of the front.

SYN. *Am. serratus.* Parkinson in *Trans. Geol. Soc. V. 57.*

ALTHOUGH this shell may be described as umbilicated, the inner whorls are in part exposed: the radii are slightly curved; they are most prominent at a short distance from their commencement, where also they are forked; each branch is slightly enlarged and bent forward upon the edge of the front, where it ends: thus the front has two serrated edges, the intermediate space being plain: the aperture occupies about two-fifths of the diameter of the shell in length, and is one-fourth in width.

This appears to be *A. serratus* of Parkinson; but as it is totally different from the Ammonite, to which that name had been previously given at tab. 24 of this work, it has become necessary to change it.

AMMONITES lautus.
TAB. CCCIX.

SPEC. CHAR. Discoid, radiated; inner whorls half concealed; front narrow, slightly concave; principal radii slender, varicose, or tuberculated near their commencement; shorter radii alternating, united in pairs to form compressed tubercles upon the edges of the front.

SYN. *Am. lautus.* Parkinson in *Trans. Geol. Soc. V. 58.*

var. α , radii long, elegantly arched, and regular.

var. β , radii short, irregular, with strong tubercles near their commencement.

THE inner whorls are more exposed in this than in the last, and the sides of the whorls generally more convex, especially in α : in var. β the lesser radii are often joined at the tubercles to the larger ones; the form of the aperture approaches to elliptical.

Figures 1 and 2 are from var. α , and fig. 6 var. β ;

* The siphuncle is sometimes decomposed away, and leaves a hollow that may deceive.

the others are intermediate ; fig. 3 shewing long radii with large tubercles ; and figures 4 and 5 irregular radii with undefined tubercles.

AMMONITES tuberculatus.

TAB. CCCX.—*Figs. 1, 2, and 3.*

SPEC. CHAR. Depressed, radiated ; volutions gibbose, half concealed, front rather flat ; radii arising in threes from large round tubercles and uniting in pairs to form large compressed tubercles upon each edge of the front ; aperture suborbicular.

THE sides of the whorls are very convex especially in young shells which have the aperture transverse, the round tubercles are placed near the middle of the side of the whorl ; the radii after uniting to form the flat tubercles upon each edge of the front, bend forward and continue over it as far as the siphuncle, which they meet at an acute angle ; the length of the mouth is about two-fifths the diameter of the last whorl, its width variable with age.

AMMONITES proboscideus.

TAB. CCCX.—*Figs. 4 and 5.*

SPEC. CHAR. Depressed, tuberculated ; volutions ventricose, partly concealed ; front concave ; tubercles upon the sides of the last whorl and both edges of the front, subcylindrical ; aperture orbicular.

var. α , tubercles connected by very irregular and short radii.—var. β , destitute of radii.

THE orbicular aperture, and elongated nearly cylindrical tubercles, distinguish this species : there are about eight sets of tubercles only upon each whorl, in the preceding species there are 12 or more : the front is broad but not well defined, and the siphuncle very large. The aperture is about one-third the diameter of the shell wide.

The four species of Ammonites above described are all from a stratum of Marle below the Chalk at Folkstone ; they are also found in a similar stratum at Cambridge and other places. It is difficult to divide the species, as there appears to be a regular series from that without tubercles (*A. dentatus*) to one with large flat tubercles upon the margin (*A. auritus*, *M. C. t.* 134,) and to another with cylindrical tubercles at each end of the rays, (*A. proboscideus*) ; the extremes are, however, so distinct, that it is difficult to refuse them the rank of species. They are all splendidly pearly shells, but are very apt to be destroyed by the decomposition of the Pyrites, with which they are commonly more or less completely filled ; those parts that are not pyritous are in the Folkstone specimens filled with black indurated Marle.

AMMONITES *Gulielmii*.

TAB. CCCXI.

SPEC. CHAR. Lenticular, with a narrow front, radiated; volutions exposed; radii dissimilar, terminating in small tubercles, principal radii furnished with two tubercles near their commencement.



A VERY flat shell, bordered by two rows of tubercles that terminate the radii upon the edges of a flat front: the longer radii have each a tubercle at the commencement and another at about one-third their length, where they divide and alternate with shorter radii: they are all arched and rather acute; the aperture is elliptical, rather more than one-third as wide as long.

A very elegantly marked Ammonite; the specimen retains part of its pearly shell with the coat over it: some of its volutions are filled with Carbonate of Lime, others with Iron Pyrites. Dr. W. E. Leach kindly presented it to me some years ago: I suspect it was found in the clay above the Kelloways Rock.

This elegant shell I have named after one of my oldest Oxford friends, Dr. George Williams, Regius Professor of Botany, an assiduous lover of science and every good, a commemoration which will, I have no doubt, gratify many, who, when thinking of him, will feel as I do a reviving pleasure and esteem.

TEREBRATULA *coarctata*.

TAB. CCCXII.—*Figs. 1 to 4.*

SPEC. CHAR. Subheptagonal, gibbose, hispid, and decussated; lesser valve convex, subtrilobated; larger valve biplicated, with a deep angular sulcus between the plaits.

SYN. *Terebratulites coarctatus*. *Parkinson Org. Rem. III. 229.*

Terebratula reticulata. *Smith Strat. Syst. 83. Strata identified. 30. fig. 10.*

PERHAPS it would be more correct to describe this shell as five than as seven-sided, two of the sides being generally very small and convex: the length is rendered greater than the width by the projecting beak: the two plaits or ridges upon the larger valve appear as if pinched up, whence the name: the minute bristles that render the surface hispid, are short, often tubular, and are situated upon the angles of intersection of the two sets of lines, of which the longitudinal are elevated and cut by the transverse.

This is characteristic of the clay upon the Great or Bath Oolite; I have received it from C. W. Loscombe, Esq. and other friends from Hinton, near Bath, &c. Supposing this to be *T. coarctatus* of Parkinson, I have retained that name for it, and applied Smith's name *reticulata* to the following, which he either did not know, or did not think to be a distinct species. It is figured by Walcott in his *Petrefactions found near Bath, No. 28*; his specimens are from Hampton Down.

TEREBRATULA reticulata.

TAB. CCCXII.—*Figs. 5 and 6.*

SPEC. CHAR. Obovate, gibbose, subhispid, decusated; front obscurely 3-sided; lesser valve convex; larger valve obtusely biciplicated, with a shallow channel between the ridges.

Terebratula reticulata? *Smith.*

THE general form of this is much rounder than of the last: the ridges are not much elevated, and the spines hardly rise above the surface, but appear as if pressed into it; it is also a larger species.

Found in stone excavated for the alteration and improvement of the Road between Nunnery and Frome, by my kind Friend the Rev. John Ireland who first pointed it out as distinct,

PINNA. *Linn.*

SPEC. CHAR. A longitudinal, equalvalved, cuneiform, bivalve, open at the larger end; hinge lateral, without teeth, with a marginal, partly internal, linear cartilage. Animal attached by a byssus. Muscular impression nearly central.

As there is no danger of confounding any other genus with Pinna, no difficulty will occur on that head, but the distinction of the species is by no means easy, they so nearly resemble each other in form. It is one of those perfectly natural and insulated Linnean genera in which it has been found needless to form any division. The general form is an acute isocetes triangle, with the shorter side rounded and gaping, and the acute angle sometimes truncated: it is described by Linneus as *subbivalvis* in consequence of the close connexion of the valves by the linear cartilage, a connexion rendered so close often by being on the hollow side, as to prevent all motion of the valves, which in one species even (*P. saccata*) sometimes grow together at the opposite edges. The fibrous structure of the outer coat, which extends far beyond the inner pearly one, has become in a manner proverbial; but the outer coat of other shells, even univalves, is generally composed of perpendicular fibres, although not often of so coarse or loose a texture, and seldom extending far beyond the inner laminated compact or pearly coats. In the genus *Perna*, however, this structure is more remarkable from the length of the fibres.

 PINNA *tetragona*.
TAB. CCCXIII.—*Fig. 1.*

SPEC. CHAR. Narrow, smooth, or obscurely ribbed, prismatic; valves longitudinally carinated with a suture in the middle.

SYN. *Pinna tetragona*. *Brocchi, II.* 589.

P. subquadrivalvis? *Lam. Hist. Nat.*
VI. 134.

ABOUT twice as long as wide, with many slightly elevated ridges chiefly placed above the suture; section nearly square, but variable.

The imperfections in the specimens described by

Brocchi and Lamarck (manifested by the remains being wholly pearly,) are still more extensive in the one before us, which is only an imperfect cast in sand mixed with a small portion of Mica, the carinated form of the valves may arise from pressure, since recent specimens are very apt to break in that direction, and almost every fossil *Pinna* has more or less of that form: hence the doubts that exist respecting the identity of the two species above quoted, neither of which is figured. The subject of my figure was sent me from Devizes by Mrs. Gent. I have another cast in sand probably of the same *Pinna*, from Sandfoot Castle, on the Isle of Wight, upon which some of the shell remains. I am indebted to Miss Benett for it.

PINNA affinis.

TAB. CCCXIII.—Fig. 2.

SPEC. CHAR. Cuneiform, ventricose, straight, longitudinally ribbed, rather thick, smooth.

NEARLY related to *P. ingens*, but shorter, smoother, and thicker: the ribs are small, but slightly elevated, and disappear near the edge opposed to the hinge: the length is not much greater than the width: a considerable portion of the shell is pearly.

Very abundant in the sandstone of the Bognor Rocks, where it is accompanied by an *Anomia*, similar to one commonly attached to the recent *Pinna ingens*. It has also been found at Highgate in *Septaria* composed of sandy Marle. I suspect Lamarck's *P. margaritacea* may be the same species deprived of its fibrous coat.

PINNA arcuata.

TAB. CCCXIII.—Fig. 3.

SPEC. CHAR. Nearly equilateral, ventricose, finely ribbed, arched.

NEARLY as deep as long; the hinge line is gently curved; the opposite edge much arched; in other respects this strongly resembles the last.

Having several specimens of this arched *Pinna* from Highgate exactly alike, as well in curvature as size, I cannot but consider it a distinct species: it appears to be quite different from *P. incurva* of Linn.: it occurs in *Septaria*.

AXINUS.

GEN. CHAR. A free equalvalved, transverse, bivalve; anterior side very short; posterior side produced, truncated, with a lunette near the beaks: hinge with a long oblique ligament placed in a furrow.

THE regular lunette, and the extremely short anterior side, with the hinge cartilage extended along almost the whole of its edge, seem to point out this as a distinct genus, and it is much to be regretted that there is very little probability of discovering the interior structure of the hinge, but I suspect it has no teeth. The shell appears to be thin, but I can trace neither the cicatrices of the muscles, nor of the edge of the mantle in the *angulatus*, which I consider the type of the genus.

The name,* and indeed the genus itself, cannot be considered as well established, until more is known respecting the shells included under it: a bad name is however better than none.

AXINUS *angulatus*.

TAB. CCCXV.

SPEC. CHAR. Obovate, subhexangular; posteriorly cuneiform, surface subbicarinated; beaks small, recurved.

A DEPRESSED shell, whose greatest length is nearly perpendicular to the hinge cartilage; the base (front) rounded terminated at each end by an angle from which two obtuse keels run up to the beaks; the anterior keel is sharpest, near to and almost parallel with the hinge: the posterior keel is very obtuse, from it to near the lunette the surface is almost flat, but just upon its border the shell rounds with an obtuse angle upon its edge: the lunette is impressed, ovate, pointed, and curved.

Found in the London Clay, near the White Conduit House at Islington; and by Mr. Gibbs in clay brought up from a well in the road from Vauxhall to Wandsworth, generally filled with Pyrites.

* Taken from the hatchet-like form of the posterior side.

AXINUS obscurus.

TAB. CCCXIV.

SPEC. CHAR. Obovate, posteriorly cuneiform; anteriorly rounded; surface convex, with one obtuse keel; beaks large.

SOMEWHAT resembling the last in form, but not so wide, and having no angles upon the anterior end; as the specimens are all casts the lunette is not observable, but the impressions of the muscles and the edge of the mantle are strongly marked; the latter is entire.

This uncommon shell was brought to me by Mr. Farey, from Garforth Cliff quarry, near Leeds, where it was discovered by Wm. Smithson, Esq. and also from Selby, eight miles distant, supposed to be out of the Magnesian Limestone, a rock but sparingly supplied with fossil shells. The cast enclosed in the mass of stone (see the lowest figure,) may possibly be another species, but it is too imperfect to decide upon. Mr. Farey found it by the road-side one mile N.W. of Pontefract, in a stratum 6 or 8 inches thick, probably similar to another at Westbridge Hill; it has part of the shell remaining upon it.

ASTARTE rugatus.

TAB. CCCXVI.

SPEC. CHAR. Obovate, anteriorly subtruncated, when young transversely costated, afterwards slightly wrinkled; edge internally crenulated; lunette concave, obovate, pointed.



A RATHER gibbose shell, with a regularly concave short lunette; the costæ extend only a little beyond the beaks, and are often entirely lost by erosion, although the animal probably inhabited ancient seas, if we may judge from its analogy to *A. Scotica*, *Danmoniensis*, &c. to the latter it bears so strong a resemblance that it might easily be taken for it, were it not more gibbose and smoother, or rather, not regularly costated. Fig. 1 represents a young individual, the edge of which is not crenated, neither are there any crenulations upon the edges of those given at figures 2 and 3, but as they are chipped all round, it is possible that they may have been crenulated when perfect: the entire edge is the only character that distinguishes *A. Scotica* from *Danmoniensis*: I have doubts respecting its sufficiency, and in the present case am not inclined to admit the young shell with an entire edge to the rank of a species, since it exactly agrees with the marks upon the umbones of the larger shells.

Found at Highgate when the Archway was digging through the hill.

PRODUCTUS Martini.

TAB. CCCXVII.—Figs. 2, 3, and 4.

SPEC. CHAR. Semicylindrical, convex above, with a flattened front, deeply striated, spinous; lesser valve nearly flat, deeply inserted; hinge line equal to the width of the shell.

SYN. *Anomites productus.* *Martin Pet. Derb. tab. 22. f. 1, 2, and 3.*

THIS is the *Productus* spoken of at p. 158 of the first Vol. of this work; it is distinguished from every other by the width of its hinge, the neatness of its rather distant striæ, and the great length of its produced front: the ridges between the striæ are often furcated upon the front, where also all vestiges of spines in general disappear: very seldom are spines found in connexion with any part, but the casts shew the roots of spines scattered over the convex surface, and disposed in two rows upon each ear: the few spines I have met with are long and pointed.

Not uncommon in the Derbyshire Limestone. Fig. 4 represents a cast in ochraceous sandstone, from the river Barn, in Yorkshire; favoured by Mr. Danby some years ago.

Fig. 3 is from a large, very concave, specimen, somewhat corrugated, and thus intermediate between *P. Martini* and the following.

PRODUCTUS antiquatus.

TAB. CCCXVII.—Figs. 1, 5 and 6.

SPEC. CHAR. Semicylindrical, short, very convex above, longitudinally sulcated and transversely corrugated, spinous; lesser valve nearly flat; hinge-line shorter than the width of the shell.

SYN. *Anomites semistriatus?* *Martin Pet. Derb. tab. 32 and 33. f. 1, 2, 3, and 4.*

DISTINGUISHED from the last by its less regular striæ, and in being corrugated; the sides near the hinge are particularly rugged; it is in general also a larger and shorter shell.

The specimen fig. 5. is from Cloghran in the county of Dublin, and was given me by Mr. Joseph Humphreys. Fig. 6 is from Derbyshire, through the kindness of the late Mr. Salt; it is by no means an uncommon shell in the Mountain Limestone. I have quoted Martin's figures with a doubt, because my specimens are not enough reticulated to agree with them, though they are probably only varieties of his *semireticulatus*.

PRODUCTUS concinnus.

TAB. CCCXVIII.—*Fig. 1.*

SPEC. CHAR. Semicylindrical, convex above, with a concave front and narrow back, neatly striated and spinous; lesser valve flat, deeply inserted.

A POLISHED, thin, evenly made shell, much resembling *P. Martini*, but smaller and smoother.

Found in very dark brown Limestone in Derbyshire and near Richmond in Yorkshire. The flat space around the edge of the lower valve occurs also in *P. Martini*, as Mr. Martin's excellent figure shews, but it does not appear to be constant.

PRODUCTUS lobatus.

TAB. CCCXVIII.—*Figs. 2 to 6.*

SPEC. CHAR. Bilobed, very convex, furrowed, and spinous; spines few.

IN general form much like *P. Martini*, but divided into two lobes by a deep cavity along the front extending to the beak: the sulci or deep striæ are few, and the hinge as long as the shell is wide, which is seldom three-quarters of an inch.

Fig. 2 exhibits two views of a specimen, in which the shell is almost rotten: it is from the same locality as the following.

Figs. 3 and 4 are remarkably elongated: they are from a kind of Marle, probably decomposed Limestone, that occurs in Well Houses farm, belonging to the Rt. Hon. and Rev. Lord Charles Annesly, at his seat called Little Park Tower, in Northumberland, and are accompanied by *P. Concinnus*.

Fig. 5 is in Limestone; it was collected by Dr. W. E. Leach on the Island of Arran.

Fig. 6 is from a cast in Sandstone, and shews the bases of four spines very regularly placed: it is from Cumberland.

I have this species also from Derbyshire.

PRODUCTUS horridus.**TAB. CCCXIX.—Fig. 1.**

SPEC. CHAR. Quadrangular, with a large furrow along the middle, eared, thorny; ears prominent, subcylindrical; beak much incurved, large.

THE spines are scattered all over the surface upon obscure ridges, are large and rather numerous, those upon the ears are placed in rows and are particularly strong: the surface of the larger valve is so much curved, that the ears appear to project from the middle of the sides; they are rather large, convex above and concave beneath; both sides have spines; the lesser valve is very concave.

Not very rare in Derbyshire, communicated by Mr. White Watson, from the seventh bed of his first Limestone, probably Magnesian, as it is above the Coal series.

**PRODUCTUS sulcatus.****TAB. CCCXIX.—Fig. 2.**

SPEC. CHAR. Semicylindrical, short, convex above, with a concave space along the middle; spinose? coarsely sulcated; hinge line as long as the shell is wide.

THE concave space along the middle, and the distance of the furrows from each other, distinguish this from

P. antiquatus,* tab. 317: the remains of spines are so obscure that, except upon the ears, their existence is doubtful.

The only individual I have met with of this species was given me by the late Mr. Jonathan Salt: it is from Derbyshire.

* By some mistake the reference to Martin's Synonym is given "semistriatus" instead of "semireticulatus."

PRODUCTUS giganteus.

TAB. CCCXX.

SPEC. CHAR. Transversely oblong, with dilated sides, and rugose irregular striæ, longitudinally undulated; larger valve gibbose.

SYN. Conch. Anomites giganteus. *Martin*
Pet. Derb. tab. 15.

MEASURING from the edge to the highest part of the gibbose valve the length is equal to the width, but from the front to the hinge it is much less: the expanded sides do not form distinct ears, but are rather pointed: there is in general a more prominent elevation near the front, otherways the undulations are very irregular, and often branched: the striæ are extremely irregular, much branched, and inosculated: they are numerous. The cast of the interior is very remarkable, but not so striking as that exhibited in the next plate, which it somewhat resembles.

Two views of a Derbyshire specimen given me by Mr. Martin are represented upon this plate; it is accompanied by P. Martini. I have the same species from Yorkshire.

PRODUCTUS personatus.

TAB. CCCXXI.

SPEC. CHAR. Hemispherical, irregularly striated, beneath very concave; within the larger valve are three deep cavities, one connected with the beak, and two remote.



FROM the impressions of the cavities, which become protuberances, the cast of the larger valve has the appearance of a bird's head; the remote ones are not very prominent, but are large; that about the beak is divided into three lobes, of which the lateral ones are striated, and the central one is connected with the remote protuberances by a ridge. The surface was probably covered with small spines, but this is not well ascertained.

Such is the resemblance of this shell to a face, that the name *personatus* was thought apposite; when less completely deprived of the shell than the specimen figured, there remain numerous small elevations which are probably the bases of spines, these have been taken for the roots of feathers, and so strong a resemblance was then found to an owl's head, that the owner of a large specimen, which he brought to shew me, would hardly be persuaded that it could be any thing else. This specimen was found in Derbyshire: the figure is taken from one picked up near Kendal.

PRODUCTUS humerosus.

TAB. CCCXXII.

SPEC. CHAR. Oblong, squareish, depressed, striated, spinose? or hispid? hinge line less than the width of the valve; in the larger valve are two very deep cavities near the beak, and a third connected with the beak; front flattish.



As no other indications of this species than casts remain, the existence of spines and striæ upon it, can only be inferred from the punctums which are arranged in irregular rows upon the cast of the larger valve: the protuberances that correspond to those cavities which are distant from the beak, are blunt cones; while that which filled the beak is obscurely divided into four lobes, and bears a slight resemblance to a head between two high shoulders, as the name implies. The length rather exceeds the width.

From Breden, near Derby, by favour of the lamented S. Tennant, Esq.; the same specimen is figured in my British Mineralogy, tab. 217, as an example of Magnesian Limestone in which it occurs.

PRODUCTUS punctatus.

TAB. CCCXXIII.

SPEC. CHAR. Transversely obovate, gibbose, depressed in the middle, hispid; surface composed of concentric imbricated laminae; lesser valve nearly flat.

SYN. Conch. Anomites punctatus. *Martin Pet. Derb. tab. 37. f. 6, 7, and 8.*

A short hinge line, and a beak not very prominent, give this *Productus* a regularly obovate outline. The cast appears transversely striated and minutely punctated: the striæ are above a line apart, and are very regular: the punctums are impressed except when a portion of the shell remains, and then they are elevated: it is only when the whole thickness of the shell exists, that the real nature of it can be ascertained: it is then found to consist of laminae placed at regular distances, and pressed close upon each other: the surface is hispid, but the bristles appear to be very short.

This is found in the Mountain Limestone of Derbyshire, and often contains Bitumen, crystals of Carbonate of Lime, &c. My good friend, S. Wright, Esq. of Cork, has sent me specimens from the Black Rock in his county, where they are in common with other fossils much distorted, as if they had been, along with the stone, reduced to a soft state and then bent about: in this rock, too, the shells are more incorporated with the stone, and their small parts less distinct.

TEREBRATULA acuminata.

TAB. CCCXXIV.—*Fig. 1.*

SPEC. CHAR. Heartshaped, front much elevated, with a deep acute-angular sinus in the margin; surface finely striated.

SYN. Conch. Anomites acuminatus. *Martin Pet. Derb. tab. 32 and 33. f. 5, 6, 7, and 8.*



A RATHER gibbose shell; the front is so much elevated, that the upper valve is nearly divided into two distinct ovate lobes: the beaks are very small, and the numerous striæ inconspicuous.

Found on Scaliber, near Settle in Yorkshire, in Derbyshire, and in the Black Rock near Cork, from which latter place S. Wright, Esq. has favoured me with specimens. It strongly resembles the *Terebratula*, fig. 1, in plate 246, of the *Encyclopédie Méthodique*, but is not so strongly striated. This is named *T. spirifera* by Lamarck in his *Hist. Nat. des Animaux sans Vertèbres*, VI. p. 257. but I suspect he has confounded it with *Spirifer cuspidatus*.

TEREBRATULA affinis.

TAB. CCCXXIV.—*Fig. 2.*

SPEC. CHAR. Orbicular, strongly striated; upper valve gibbose, with an elevated sinus in the front, lower valve nearly flat.

HINGE line rather straight, almost equal to the width of the shell in length: the sinus in the front is obtuse, filled with a tongue-shaped elevation of the lower valve: the striæ are deep and very regular.

The strong resemblance this bears to the recent *Terebratula dorsata* of Lamarck, &c. (*Anomia dorsata* Auct.) makes it at first sight to be taken for it, especially if figures alone are consulted; but the great inequality of the valves is a sufficient distinction.

The specimens are from near Horncastle, and appear to be from decomposing Mountain Limestone; they were given to me by Mr. G. Weir.

Smaller ones have also been sent me from the Malvern Hills by Miss Molesworth, and from Dudley by Mr. Ryan.

TEREBRATULA resupinata.

TAB. CCCXXV.

SPEC. CHAR. Transversely ovate, longitudinally striated; striæ minute, numerous, and equal; imperforate valve most convex.

SYN. Conch. Anomites resupinatus. *Martin Pet. Derb. tab. 49. f. 13 and 14.*

LENGTH about two-thirds the width: the hinge line is not very long, but it is straight, and accompanied by two nearly flat surfaces, perpendicular to each other, between it and the beaks; that beneath the prominent beak of the flatter valve has a triangular foramen in the middle of it. The little ridges between the striæ are often interrupted by punctums that appear to be the bases of slender depressed spines: the middle of the more convex valve is slightly concave.

I have met with several hollow specimens of this shell, but have seen no vestige of a spiral cartilage in any; nor does it appear that either of the beaks has a circular perforation. The form of the hinge strongly resembles that of the genus *Spirifer*, but is not incompatible with that of *Terebratula*, with which at present this species must remain.

Not very rare in the Mountain Limestone of Derbyshire.

TEREBRATULA Fimbria.

TAB. CCCXXVI.

SPEC. CHAR. Orbicular, gibbose ; margin undulato-plicated.



FULL grown shells of this species are more orbicular than young ones, which are rather quadrangular, and not so gibbose : the plaited margin or frill occupies about a fifth part of the diameter of the shell, and is partially separated from the remaining smooth part by a sudden elevation.

Found in fine grained Limestone, at Charlton Kings, in Glostershire, and at Cleeve Hill, near Cheltenham ; from the former locality it was sent me by Mr. Richard Taylor, and from the latter by Miss E. Warne.

LUTRARIA angustata.

TAB. CCCXXVII.

SPEC. CHAR. Transversely elongated, costated, gibbose, anteriorly rather compressed; costæ oblique, numerous, acute.



COSTÆ about twelve; carina-formed; the surface is rendered rugged by rather deep irregular transverse striæ, and intermediate ridges: it does not appear that either side is gaping; the posterior one is rounded, and extends a very little way from the beaks: the substance of the shell is thin, so that the carinæ are as conspicuous within it as outside.

From the cabinet of the Rev. John Ireland: found at Nunney, near Frome, in a calcareous gritstone: the shell still adheres to several parts of the specimen.

PRODUCTUS hemisphaericus.**TAB. CCCXXVIII.**

SPEC. CHAR. Hemispherical, longitudinally striated; striæ fine; lower valve very concave.

THIS *Productus* appears to be quite free from spines: it is much wider than long, and has a straight back as long nearly as the shell is wide: there is but a small space between the valves for the animal, because the lower one is very concave: the sides are slightly corrugated, otherways the general contour is characteristically regular.

The larger specimen is from some part of Wales, by favour of my kind friend Dr. Williams, Reg. Prof. and the others from Mynidd Careg, near Kidwelly, in Carmarthenshire, through the kindness of Mr. Richard Taylor. They are both from Mountain Limestone, as I believe the whole genus is.

PRODUCTUS comoides.**TAB. CCCXXIX.**

SPEC. CHAR. Semicircular, gibbose, very finely striated; disk inflated; back straight, extending the whole width of the shell.

THE fineness of the striæ, and form of this shell together, give it the contour of a smoothly combed head of

hair. The back is remarkable for a flat space between the beaks, not generally observable in this genus. The surface has several large longitudinal furrows, without regularity, and excepting the fine close striae, is smooth. The shell is very thick, and rough within.

Collected by Mr. Farey, in the Wayboards between the Limestone, under the Coal, at Llangaveni in Anglesea: it is accompanied by small Trilobites imbedded in a kind of Shale.

PRODUCTUS latissimus.

TAB. CCCXXX.

SPEC. CHAR. Transversely oblong, depressed, coarsely striated; beak much incurved; hinge line very long.

THE long hinge line, partly concealed by the beak, and the coarse pattern upon the surface, distinguish this from the last: the shell also appears to be thinner, and the space between the beaks is much narrower.

Found in a Cherty Limestone, at Tyddmawr Farm in Anglesea, by Mr. Farey. The shell is in many parts gone, and its place supplied by Silex in numerous small drops, each surrounded by several irregular rings of the same material, a form of Silex not rare among fossil remains of shells composed of laminæ strongly impregnated with gluten, as *Ostrea Pectens*, &c. in the green sand and other formations, and lately met with, forming hollow tuberosse masses that fall out of decomposing Limestone in Devonshire.

The upper figure is from a neat little specimen brought from Puffin's Island, N. of Anglesea, by Samuel Hawkes jun. Esq. The shell upon it is entire.

PYRULA. *Lamarck.*

GEN. CHAR. A pyriform univalve; beak an elongated canal; spire short without variciform sutures; columella plain, lip entire.

AN extremely short spire, almost enveloped in a ventricose body, the lower part of which is produced, characterizes this genus, and distinguishes it from *Fusus*. From those species of *Turbinellus* that resemble *Pyrula* in form, it is distinguished by the plain columella and adpressed inner lip.

Shell collectors and dealers, a class of amateurs who often perceive natural affinities, are in the habit of classing several species of this genus under the common appellation of *Figs*.

The recent species are inhabitants of the sea in warm climates.

PYRULA *nexilis*.

TAB. CCCXXXI.

SPEC. CHAR. Obovate, clavate, with decussating elevated striæ; transverse striæ uniform, most prominent; spire slightly produced.

SYN. *Murex nexilis*. *Brander, 55.*

Pyrula nexilis. *Lamarck Env. de Paris 67.*

ALTHOUGH strongly resembling the *Bulla Ficus* of *Linnaeus*, it is readily distinguished by the prominent

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spire, as Solander has well observed in Brander's Hampshire Fossils : the striæ are also much less numerous, and bear a stronger resemblance to a net enclosing the shell ; and the aperture rather more suddenly contracted into the beak.

A well known, and when perfect, much prized shell found at Barton, and also at Grignon. I am indebted to Miss Teed, Miss Beminster, and other friends, for examples.

MELANOPSIS. *Lamarck.*

GEN. CHAR. Univalve, subfusiform or turritid; mouth oval, pointed above, emarginate below; outer lip sharp edged, entire, upper part pressed against the spire; inner lip thick, tumid above; columella plain, acute, curved; operculum coriaceous.

A GENUS of Fresh water shells lately established, and of which there are several recent species; the lower part of the mouth in some of them is produced into a very short beak, and in all it is more or less dilated; the epidermis is rather thick smooth, and generally of a blackish green colour, as in most fresh water genera; the animal closes the mouth of its shell with a coriaceous operculum, that increases from a point situated near the lower part of its inner edge; it is rather partial to temperate climates.

MELANOPSIS fusiformis.

TAB. CCCXXXII.—*Figs. 1 to 7.*

SPEC. CHAR. Fusiform, in the middle subcylindrical, smooth; mouth half the length of the shell.

THIS species is liable to considerable variation in length, some specimens being much elongated, others ovate and pointed. The shorter ones have most of the subcylindrical form of *Ancilla*, and also a slight sinus towards the upper part of the outer lip, where it is applied to the opposed callus, which is largest in such individuals. Since there is a series of these forms found in the same place, and as the mouth is constantly half as long as the

shell, they cannot be considered two species. It differs from *M. buccinoides* in the form of the mouth which is narrower in the lower part, being equally elongated with the spire, and in the subcylindrical form of the middle portion. The striæ of growth are more or less conspicuous, but in general they are obscure, and the surface highly polished with much of the aspect of an internal marine shell.

Foreign Collectors have confounded this with *Melanopsis buccinoides*, a shell that lives in the rivers between Tyre and Sidon, and is indeed very similar. The shell mentioned by Mr. Webster in the Second Volume of the Transactions of the Geological Society, as occurring in the upper marine formation on the Isle of Wight, and at Woolwich, and called by Mr. Parkinson, *Ancilla buccinoides*, appears to be the one before us: imperfect specimens of it might easily be mistaken for *Ancilla*, to which the spire and even the callus in the mouth bear a strong resemblance; and more especially at a time when the Genus *Melanopsis* had not been pointed out. It was moreover found in the vicinity of Marine shells, even of *Ancilla subulata*. The *Melanopsis fusiformis* is one of those presumed fresh water shells that occur in the upper Marine formation only, and have produced a variety of opinions respecting it.

Figs. 1 and 2 represent the extremes of form selected from the Isle of Wight specimens collected by Prof. Sedgwick and Mr. G. B. Sowerby.—Fig. 3 was found at New Charlton by H. Goodhall Esq.—Fig. 4 is from Woolwich, picked up by the Rev. H. Steinhauer.—Fig. 5 represents one from New Cross near Deptford.—Figs. 6 and 7 are from Hordwell specimens, one of which is truncated in a way common to some land shells, but very extravagantly.

MELANOPSIS subulatus.

TAB. CCCXXXII.—*Fig. 8.*

SPEC. CHAR. Conical subulate, smooth; mouth ovate, one third the length of the shell.

THE mouth of this species is remarkably short, and extends but a little way up the spire, which has about seven whorls, and is above three times as long as wide, and much more produced than the base.

Found along with the last on the Isle of Wight, I have seen but one individual.

ANCILLA subulata.

TAB. CCCXXXIII.

SPEC. CHAR. Subulate, smooth, and shining; spire and base polished; spire elongated, acute; the varix at the base of the columella striated.

SYN. *Ancilla subulata*. *Lam. env. de Paris*. 24.

AN elongated, ovate, pointed shell, whose spire and base are wrapped (as in others of the Genus) in a shining case constructed like, and partly proceeding from the inner lip, the space between is faintly striated, the aperture is not remarkably open, the notch at its base is rather deep.

So nearly do *A. buccinoides* and *subulata* resemble each other, that it is sometimes difficult to decide to which species a certain individual may belong; in the specimens before us the spire is shorter than in most of the Grignon specimens of *A. subulata*, but it is longer and the last whorl is less ventricose than in the *buccinoides*, now as some of them appear to be shortened by wear, it seems right to refer them to the *subulata*.

In certain beds of the stratum of clay filled with fossil shells, commonly called the upper Marine stratum, in the Isle of Wight, are many shells by some supposed to have been inhabitants of fresh water, while in others are Oysters, Volutes, and numerous marine shells, amongst them is the *Ancilla* here described; it also occurs in perhaps

a part of the same stratum upon the opposite coast. The specimens figured 1 and 2 are from Bramble's Chine on the Isle of Wight, collected by Prof. Sedgwick of Cambridge. Fig. 3 is from one given me by Miss Be-minster from near Christchurch. For fig. 4 I am indebted to Charles Lyell Esq. jun. the son of my Botanical Friend often mentioned in English Botany, who obtained it from a Brickiln at Lyndhurst in Hampshire. It is a scarce British shell.

TEREBRATULA? lineata.

TAB. CCCXXXIV.—*Figs. 1 and 2.*

SPEC. CHAR. Transversely oval, gibbose; minutely striated longitudinally, and transversely sulcated; sulci distant; no sinus in the front.

SYN. Conch. *Anomites lineatus*, *Martin Pet.*
Derb. t. 36, f. 3.

SHELL nearly twice as wide as long, with incurved beaks neither of which is perforated, but in the confined space occupied by the hinge, there is an angular sinus. The longitudinal striæ are extremely minute and close, but the concentric furrows are conspicuous and rather remote.

Until the internal structure of this and the following shell is disclosed by some happily preserved specimens, we must remain uncertain of the proper genus to place them under; it is, however, clear that they are not true *Terebratulæ*: they are, very probably, *Spirifers*.

From the Metalliferous Limestone of Derbyshire.

TEREBRATULA? imbricata.

TAB. CCCXXXIV.—*Figs. 3 and 4.*

SPEC. CHAR. Transversely oval, gibbose, imbricated; longitudinally sulcated; front slightly elevated; sulci obsolete.

RATHER longer than the last; the surface is composed of about 12 sulcated laminæ lying close upon each other, with remote edges; the beaks are prominent incurved; the hinge line short, and the front very slightly sinuated.

Fig. 3 is taken from a Derbyshire Limestone specimen, and fig. 4 from one found at Settle in Yorkshire. This species has probably been confounded with the preceding by Martin.

SPHÆRA.

GEN. CHAR. A globose, eared, bivalve ; with one central and two? remote teeth about the hinge.



EARS obtuse, short, incurved ; the line of the hinge is long, slightly curved, and terminated at one, perhaps at both ends, by a flat obscure tooth beneath the commencement of the ear ; in the centre of it, is a large irregular tooth, transversely flattened and turned towards the incurved beak ; the shell is thick and very gibbose.

Of this newly discovered Genus only one species has been found, and of that only one valve, therefore it is not known whether it be equalvalved or not : neither has the situation of the ligament, or impressions of the muscles been ascertained, the shell is so strongly cemented to the stone ; it is thought convenient, however, to publish it for the purpose of inducing further research, and of supplying Geologists with a name for it, as it is a fossil characteristic of a stratum where shells are rare.

SPHÆRA corrugata.

TAB. CCCXXXV.

SPEC. CHAR.

A VERY gibbose heavy shell, with a coarsely corrugated surface, rugæ transverse obtuse, largest about the sides, and extended over the ears, nearly lost in the middle.

Lately discovered by Professor Sedgwick in the Iron Sand formation, on the eastern side of Sanddown Bay, on the Isle of Wight, where the beds are inclined.

GRYPHÆA sinuata.

TAB. CCCXXXVI.

SPEC. CHAR. Suborbicular; one side cuneiform; beaks very small, laterally incurved; one valve convex, subcarinated; the other nearly flat, with a sinus above the angle of the cuneiform side; hinge pit marginal, long, narrow and curved.



THE bilobate form of the deeper valve, marks this shell as a Gryphæa, while its incurved, although small beaks, help to distinguish it further from Ostrea. The sinus between the beaks, and the angle of the cuneiform side is not very deep, and in the adult shell is nearly obliterated in the margin, but it is easily recognized by the lines of growth upon the surface near the beaks; when the specimen is not in a state to exhibit this character, the form of the hinge may help to discover the species.

This gigantic Gryphite grows half as long again as the figure. It seems to be peculiar to the Iron Sand Formation; it is found near Ashford, and upon the high range of hills bounding Romney Marsh, five miles from Hythe in Kent, as I learn by specimens sent me by A. Power, and H. Walker, Esqrs. of that County. I have also a large rather elongated specimen with remarkable bilobed

or furcated plicated Oysters adhering to it, from near Folkstone ; and lately it has been discovered by Professor Sedgwick, in various stages of growth, in regular beds throughout the Iron Sand on the Isle of Wight, the best specimens were obtained in the Black Gang Chine, and Shanklin Chine about midway of the Cliff, associated with a furcate Cockscomb or plicated Oyster resembling that from Folkstone.

BULIMUS. *Scopoli, Lamarck, &c.*

GEN. CHAR. An univalved, subturreted, ovate or oblong shell; aperture longitudinal, entire, longer than wide, with the edge of the outer lip reflected when old; columella smooth, neither truncated nor expanded at the base; no operculum.

A GENUS of shells belonging to land animals, very closely allied to those of the genus *Helix*, and equally destitute of opercula; it is well distinguished by the longitudinal position of its entire aperture, the inner lip of which is closely applied to the columella, and the edge of the outer one, when fully formed, reflected; the want of an operculum is also of importance, but is not generally useful, because it is a negative character not easily proved.

The species are numerous, the warm climates supplying many large kinds, but the temperate chiefly small and even minute ones: there are several fossil species described by Lamarck as found near Paris.

The *Bulimus roseus*, a species 4 inches long, is said by Montfort to be excellent food.

1810. 4. 41X.

BULMIMUS ellipticus.

TAB. CCCXXXVII.

SPEC. CHAR. Elliptical, elongated, rather obtuse, longitudinally ribbed; ribs numerous, very small, straight; aperture small, twice as long as wide, upon the left side.



REMARKABLE for the exact similarity in form of the two ends, and for the left-handed spire. It is three times as long as wide, rather obtuse at both ends, and perhaps umbilicated; the upper angle of the mouth is acute, the base rounded; the columella seems to be a little curved. Length sometimes nearly four inches; the ribs are but slightly elevated, and the space between them is concave.

From the fresh water formation at Schalecomb on the Isle of Wight, by favour of Js. Holloway and Prof. Sedgwick.

POTAMIDES. *Brogniart.*

GEN. CHAR. A turreted, univalved shell ; aperture nearly semicircular, without a canal in the upper angle, contracted at the base into a short slightly truncated beak ; outer lip dilated ; operculum corneous.

A GENUS so nearly allied to *Cerithium* that it is very difficult to distinguish it, nevertheless it is desirable so to do, since the shells composing it are inhabitants of fresh water, and have probably a structure suitable to the necessary difference in their economy. The principal differences hitherto noticed between the Genera are the following : *Potamides* has a corneous epidermis, and is frequently decollated or eroded ; *Cerithium* has an extremely thin epidermis, if any, and is generally perfect ; *Potamides* has a very short, not recurved beak, and has no well defined, reflected canal at the upper angle of the mouth, but sometimes a groove in the lip in place of it ; *Cerithium* has a recurved beak, and often a distinct canal at the upper angle of the mouth, and generally the form of the aperture in *Potamides* is proportionally shorter than in *Cerithium*.

Although this genus was separated from *Cerithium* by *Brogniart* so long ago as in 1810, we were unwilling to adopt it for fossil species, until we came to examine *Buccinum rigidum* of *Brauder*, when we were so much struck by its similarity to *Potamides ater* of *Brogniart*, that we were constrained to admit his genus. Could we with certainty determine fresh water or marsh shells among fossils, by inference from their association, we

might with less hesitation point out which of those at present called Cerites ought to be removed to Potamides, but the two genera are as likely to be mixed as the Oysters, Cyclades, Malanopses, Ancillæ, &c. that accompany them, in beds, between the two fresh water strata, on the Isle of Wight, or above the white Sand at Charlton, &c.

If the characters above mentioned could be relied upon, which we fear is not strictly the case as far as concerns the form of the mouth, the following species, published at tab. 147, should be arranged as Potamides, *Cer. funiculatum*, *Cer. intermedium*, *Cer. dubium*, and *Cer. Melanioides*; the two last have the best claim to removal; perhaps *Cer. funatum*, tab. 127, ought also to be removed; it appears to have a small groove or canal at the junction of the right lip with the spire, although hardly enough to be considered of importance; indeed such a groove is observable in some of the recent Potamides.

POTAMIDES rigidus.

TAB. CCCXXXVIII.

SPEC. CHAR. Subulato-conical, nearly smooth; lower whorls surrounded by a keel near their upper parts.

SYN. *Buccinum rigidum*. *Brander*, 43.

SOME obscure furrows indicating the lines of growth are observable regularly covering the otherways smooth surface of this shell: from the curvature of these lines, and

of others where the growth has been interrupted, we infer that a slight sinus exists in the lip at the part where the keel is formed in the two last whorls : the mouth appears to be oval with an extremely short beak, or rather, only a sinus in its lower angle, and an expanded outer lip : the keel is placed about one-third down the whorl, it is large and rises rather suddenly ; above it the grooves before mentioned are sometimes decussated ; a small portion of the dark epidermis is remaining upon one specimen.

I am indebted to Lady Burgoine and Miss Beminster for the specimens figured of this rare Barton fossil ; I consider it to be a fresh water shell, from some one of the mixed beds above the London Clay of the Hampshire coast.

The decussated grooves had escaped observation until I saw them strongly marked in a specimen kindly lent me by the Viscount Fitzharris. The apex is commonly destroyed, and holes corroded in various parts of its surface, by the action probably of some acid developed during the fermentation of vegetable matters, in the marsh or at the bottom of the river where the animal anciently lived, a circumstance that is not so likely to arise in salt water, and has therefore been used to distinguish fresh water shells by.

Figures 1 to 4 represent *P. rigidus* in different stages of growth : figs. 5 and 6 are outlines of the mouth of *P. ater* ; they shew the lip more enlarged than usual in the genus, and not reflected or expanded, as in some species.

POTAMIDES concavus.

TAB. CCCXXXIX.—*Figs. 1 and 2.*

SPEC. CHAR. Subulato-conical, transversely striated; volutions rather concave towards the upper part, costated; costæ obscure, arched, with a slight eminence above the middle of each; base with one or two granulated carinæ, convex; lip enlarged below, with a small groove in its upper angle.



THE concavity near the upper edges of the volutions crossed by the irregular costæ is the distinguishing mark of this shell: the columella is smooth with a produced and somewhat recurved base; the aperture is nearly round, notched at the base, which forms a short beak; the transverse striæ are not very deep, so that in worn individuals they are wanting.

I first received this from the Rev. Mr. Iremonger, who collected it on Barton Cliff, see fig. 1; it has since been met with in what is called the upper marine formation at Headon Hill on the Isle of Wight, by my son G. B. Sowerby; a specimen brought by him is given at fig. 2. This species differs from small worn specimens of *P. Melanioides*, with which it might easily be confounded, in the length and curvature of its beak, as well as the concave surface of its whorls. Fig. 3 represents a small variety of *P. Melanioides* from Plumstead Heath for comparison.

POTAMIDES? margaritaceus.

TAB. CCCXXXIX.—*Fig. 4.*

SPEC. CHAR. Conical, turreted; five close rows of bead-like granules surround each whorl, the first and fourth row minute, and the fifth larger than the other two; lip expanded, plicated; columella recurved, obtusely carinated.

SYN. *Murex margaritaceus.* *Brocchi 447, t. 9. f. 4.*

THE granulated surface has a very rough aspect; the spire is rather shorter in proportion than many of the genus; the largest row of granules is placed near the upper edge of each whorl, but is not sufficiently distinct to merit the title of a corona; the lip is thickened and a little expanded, it has two or three furrows within its upper part, and resembles much that of the recent *P. muricatus*.

Brought from the upper marine formation of the Isle of Wight by Professor Sedgwick. It is unquestionably the shell described by Brocchi.

 POTAMIDES? cinctus.
TAB. CCCXL.—*Fig. 1.*

SPEC. CHAR. Subulato-conical, with three rows of nearly equal granules upon each whorl, and two carinæ near the edge of the base; suture subcanaliculated; columella with one plait.

SYN. *Cerithium cinctum.* *Lamarck Env. de Paris 81.*

A LONGER shell than the last, and not so rigid in its aspect; it has a flatish base, and a thin but enlarged

lip : the plait upon the columella is independent of the inner edge of the beak, which is obtuse. It differs from *P. Lamarekii* of Brochant in having a longer beak, and this plait upon the columella.

From the same formation as the last ; collected by Mr. G. B. Sowerby at Headon Hill.

POTAMIDES? plicatus.

TAB. CCCXL.—*Fig. 2.*

SPEC. CHAR. Subulato-conical, or subcylindrical ; whorls longitudinally plaited, transversely sulcated and striated ; sulci 3 or 4 ; base convex ; lip crenulated.

SYN. *Cerithium plicatum. Lamarck Env. de Paris, 84.*

THE crossing of the sulci over the plaits form arched rows of obtuse tubercles ; the plaits are deepest upon the upper part of each whorl, so that the base appears less regularly tuberculated ; the beak is rather contracted, and there is moreover a small canal at the upper angle of the otherways round aperture.

Found in the upper marine formation, upon the Isle of Wight, by Prof. Sedgwick.

POTAMIDES duplex.

TAB. CCCXL.—*Fig. 3.*

SPEC. CHAR. Subulato-conical, with two rows of tubercles upon the upper, and three upon the lower whorls ; upper rows of tubercles largest ; sides of the whorls flat ; base flat, with two carinæ near its edge ; beak short, inner edge rising upon the columella.

THIS differs from *P. cinctus* in having only two rows of granules upon the upper whorls, and in their being so

disposed as to give that part of the spire nine sides : the turns are not easily distinguished from each other, except by the larger row of tubercles.

Out of the upper marine stratum at Headon Hill, where it is abundant : it resembles *Murex turbinatus* of Brocchi, p. 443, but is evidently distinct.

POTAMIDES *ventricosus*.

TAB. CCCXLI.—*Fig. 1.*

SPEC. CHAR. Conical, turreted ; whorls *ventricose*, costated, transversely striated ; striæ two or three upon each whorl, most elevated upon the costæ ; aperture orbicular, with an extremely short beak.

A SMALL well circumscribed species ; the striæ that cross the costæ upon the spire almost divide each of them into three tubercles : there are two more striæ upon the base which is convex ; the orbicular aperture appears to have no furrow even within its upper part ; the columella is smooth, and the beak obscure.

This gregarious shell is very abundant in some parts of the so called upper marine formation of the Isle of Wight, accompanied with hardly any other shell except the last species. I have received it also from France, but without a name.

POTAMIDES *acutus*.

TAB. CCCXLI.—*Fig. 2.*

SPEC. CHAR. Conical, turreted ; whorls *convex*, bica-
rinated ; carinæ acute ; base *convex*, *bistriated* ;
 aperture orbicular, with a narrow short beak.

ABOUT half an inch long ; an elegant, smooth, sharply *carinated* species.

Discovered in a thin bed belonging to the lower fresh

water formation on the Isle of Wight, by Prof. Sedgwick ; it is accompanied with *Melaneæ fasciata* and *costata* t. 241, *Lymneæ*, and other shells.

Should the genus *Potamides*, to which the above species are referred, continue to be received by Conchologists, it is likely that many, if not the greater part of Lamarek's 60 fossil *Cerites* will be referred to it ; for as there are very few in the London Clay in England, it is probable that most of the species he has described belong either to the acknowledged fresh water formations, or to the doubtful or mixed strata known by the name of Plastic Clay, or upper marine formations, such as those of Woolwich, Newhaven, the Isle of Wight, the neighbourhood of Paris, &c.

PSAMMOBIA. *Auctorum.*

GEN. CHAR. A transverse, elliptical, or ovato-oblong, bivalve; depressed, slightly gaping at the sides; beaks not incurved; hinge furnished with two teeth in the right valve, and one in the other.

A GENUS nearly related to *Tellina*, but distinguished by the absence of lateral teeth in the hinge: some species have a general curvature of the valves to one side, but not the irregular twist in the margin peculiar to *Tellina*; many of the species are prettily marked, and most of them are furnished with an epidermis. There are three internal impressions from the attachment of muscles, one of them irregular and small is placed near the beak; there is also a deep sinus in the line to which the mantle was attached; one tooth in each valve is commonly bifid. The recent species are inhabitants of the sea in various latitudes.

 PSAMMOBIA *solida*.

TAB. CCCXLII.

SPEC. CHAR. Transversely elongated, depressed, tumid, nearly smooth, slightly curved; an obtuse carina marks the anterior side.

NEARLY twice as wide as long: a thick bluntly shaped shell, with a slight oblique truncation upon the anterior extremity; it is more gibbose or tumid, although upon the whole not deeper than *P. Ferroënsis*, which it some-

what resembles; it is also smoother, and in many respects sufficiently different never to be confounded with that species.

Lately discovered by Mr. G. B. Sowerby in the upper marine formation at Headon Hill: fragments have also been found in other parts of the same formation upon the Isle of Wight, by Prof. Sedgwick.

LIMNEA longiscata.

TAB. CCCXLIII.

SPEC. CHAR. Elongated, smooth; aperture ovate, elongated, two-fifths the length of the shell; plait upon the columella obscure.

SYN. *Limneus longiscatus?* *Brongniart Mémoire sur des Terrains formés sous l'eau douce, p. 16. t. 1. f. 9. Annales du Mus. tom. 15. t. 22, f. 9.*

A SHELL rendered conspicuous by the length of its spire, and the broad obtuse edge of the columella which hardly rises in the form of a plait. The volutions are not inflated in general, but in many specimens the upper ones are a little so at their lower parts, so as to project over the following turns; the aperture is nearly twice as long as wide, its inner lip is a little relieved; the surface is regular and shining, with the lines of growth finely marked.

This seems to have a wider and shorter aperture than the figure given by Brongniart of his *Limneus longiscatus*, but as it is liable to some variation I have ventured to refer it to that species, although I have not seen authentic specimens for comparison; should a difference really exist, it may distinguish the species of the upper from the lower fresh water formations: Brongniart found his shell only in the lower; the one figured is from the upper; it was collected by Mr. G. B. Sowerby upon Headon Hill last year.

MUREX argutus.

TAB. CCCXLIV.

SPEC. CHAR. Ovate, pointed, costated, transversely striated; costæ knotted; striæ many, elevated, several of them large; varices few; whorls inflated beyond each varix; aperture toothed; beak ascending.

SYN. Murex argutus. *Brander*, 13.

SOME of the striæ upon this shell are elevated into carinæ, especially two or three near the middle of each whorl: the same striæ form the knots upon the slightly elevated costæ, and have deep hollows between them at the backs of the varices; the aperture is nearly round, with about six obtuse teeth within the right lip, and several irregular varicose elevations upon the left lip, which is but a little relieved from the columella.

Solander has compared this with *Murex pileare* of Linneus, about which Gmelin has made much confusion: *Murex distortus* of Brocchi (p. 399. t. 9. f. 8.) also resembles it, but in that the volutions are more carinaform, a character which is pointed out by Brocchi to distinguish it from *M. pileare*, which he gives as a fossil species closely resembling the recent analogue from the Mediterranean sea: it is, however, probable, that they are distinct, and that the fossil one is the same as Brander's *M. argutus*, although Brocchi has not quoted it, I cannot be certain, for I have not seen authentic specimens, so could not place *M. pileare* of Brocchi among the synonyma.

This is not a rare species in the Barton Cliff, but seldom exceeds an inch and a half in length; I have specimens of that size from several friends. The larger figure is taken from a magnificent individual in the possession of the Viscount Fitzharris.

CRASSATELLA. *Lamarck.*

GEN. CHAR. Shell equalvalved, inæquilateral, transverse; hinge with two strong teeth in one valve, receiving one tooth from the other valve, ligament internal, inserted into a pit in each valve; lateral teeth none or obsolete; sides closed; attachment of the mantle entire.

CRASSATELLÆ are commonly strong shells, although some of the fossil species are not remarkably so, whilst others are extremely thick and weighty: the valves are depressed, often ovate, and sometimes approaching orbicular: the pits for the attachment of the hinge ligament are placed on the anterior side of the teeth; there does not appear to be any true lateral tooth, but in the right valve there is often a pit, bounded by a short process, that receives the edge of the other valve: since this may be considered as the rudiment of lateral teeth, the strongest character to distinguish this genus from *Mactra* by, will be the entire marginal line of attachment for the mantle, which in *Mactra* is deeply sinuated anteriorly, this character is more valuable because it must be immediately connected with the structure and habits of the animal, and also with the open or closed sides of the valves.

For further particulars of this genus see *Genera of recent and fossil Shells*, by G. B. Sowerby.

CRASSATELLA sulcata.

TAB. CCCXLV.—*Fig. 1.*

SPEC. CHAR. Ovato-elongated, transversely sulcated; anterior side produced, obliquely truncated, defined by a ridge; edge toothed within.

var. β , sulci broad, lost upon the anterior side.

SYN. *Tellina sulcata.* *Brander*, 89.

THIS may be considered either as sulcated or costated, for the sulci are deep and rounded, equal to, and precisely the reverse of the spaces between them, that is in var. α ; in β they are broader and shallower, and the spaces between them assume the form of small and but slightly elevated ribs, that are lost as they pass over the ridge bounding the anterior side, while in β they are reflected at an acute angle, and pass over that ridge: the var. β is also a wider, more depressed and delicately formed shell: the teeth of the hinge are perpendicularly striated in both, and the anterior side pointed.

This is quite a distinct shell from Peron's and Lamarek's recent *C. sulcata* from New Holland, although possibly the latter author may consider it a variety, but he does not quote Brander, whose shell is entitled by priority to the name *sulcata*, so that Lamarek's requires a new one. The one before us is a common shell at Barton, nor does it appear that one variety is more common than the other.

 CRASSATELLA plicata.
TAB. CCCXLV.—*Fig. 2.*

SPEC. CHAR. Oblongo-ovate, concentrically and minutely plicated; plicæ reflected; anterior side defined by an obtuse ridge, obscurely truncated; margin toothed within.

A VERY neat and I believe new species; the anterior side is less produced and not so strongly defined as in *sulcata*; its truncation is also longitudinal, not oblique; the teeth are similarly striated.

Found in a bed of clay eleven feet thick and twenty-one from the surface, in a well dug at Bartley Lodge, Stone Cross, near Southampton, and presented to me by the Son of the worthy proprietor of that seat, Charles Lyell, Esq.

CARDIUM turgidum.

TAB. CCCXLVI.—*Fig. 1.*

SPEC. CHAR. Obovate, transverse, smooth, gibbose; anterior side longitudinally striated; edge minutely toothed.

SYN. *Cardium turgidum.* *Brander, 96.*

AN elegant almost orbicular shell, whose surface is in part very even and smooth, but marked with fine lines concealed beneath it, and which are rather hollow near the margin: the anterior side has 20 or 30 furrows cut longitudinally into it, so close together as to leave only sharp highly elevated lines between them: the teeth upon the edge are blunt, they are largest at the ends of the above mentioned furrows; the width exceeds the length a trifle, and the anterior side is slightly truncated.

This seems to be one of the few shells belonging to the London Clay, only described by Brander; it probably with several others is not found near Paris. May not the several formations that lie in strata, or coats, over the nucleus of the earth, have successive zones replete with the fossil remains of the animals, &c. peculiar to them, besides such as are universally distributed through them, which zones might be discovered by a diligent comparison of the fossils of different countries, and indicate the probable position of the poles previously to the destruction of life in those strata, for the order and perfection of many of the remains seem to indicate that they are not far removed from their original sites.

The shell before us has been presented to me by Miss Beminster, and several other friends, who have picked it up at Barton.

CARDIUM porulosum.
 TAB. CCCXLVI.—*Fig. 2.*

SPEC. CHAR. Orbicular, anteriorly obscurely truncated, longitudinally sulcated, with a row of erect, approximate spines, united near their points, alternating with each sulcus; sulci terminated by ligulate teeth; hinge line straight.

var. β , with spines united through their whole length by a membrane; and their bases sunk beneath the edges of the sulci.

SYN. *Cardium porulosum*. Brander, 99. *Lamarck enc. de Paris*, 207. *Hist. Nat. des Anim. sans Vert.* VI. 18.

STRICTLY speaking, the smooth spaces between the deep and decussated sulci, can hardly be called costæ, they are so flat, or rather, especially in var. β , concave along the middle; upon these spaces are placed rows of erect almost cylindrical spines at very small distances from each other, and these spines are united for a great part of their length by a thin expansion of their sides, leaving their bases and extreme points free, forming little arches, a construction that is as elegant as it is remarkable; the long, canaliculate, marginal teeth, whose parallel sides render them quite unlike the teeth of a saw, are largest, and the series of united spines are highest upon the posterior side of the shell. The var. β is, if possible, more elegant than the α ; it is certainly much neater, although the pores between the teeth are filled up: the edges of the deep narrow sulci that characterise this variety are considerably elevated, very even, and sharp; this var. has frequently more transparency, and a deeper colour (resembling what is technically called green ivory) than the other. Both varieties in the young state, or what is the same thing, near the umbo, are furnished with granules only in place of the united spines.

Found at Barton, but not very commonly, and very rarely approaching perfection: in the neighbourhood of Paris it occurs abundantly, and in a good state of preservation, yet I have not met with one so large as this figure from an individual kindly presented to me by Miss Beminster: Miss Dent has the finest specimen I have seen, but not quite so large.

The var. β is unknown at Barton.

PINNA granulata.

TAB. CCCXLVII.

SPEC. CHAR. Broad, nearly equilateral, convex, obscurely decussated, with a small elevation in the centre of each division ; anterior side rounded.



A BROAD shell, particularly thick about the anterior side and edge ; there is a rounded longitudinal elevation towards the posterior side which makes some fragments resemble those of a *Mytilus* ; the length of the specimen figured is $8\frac{1}{2}$ inches, the width 6.

Some time ago I was shewn fragments of this shell from the Kimmeridge Clay, near Weymouth, and mistook them for parts of *Mytilus amplus*, (*M. Con. t. 27.*) which by the bye is surely a *Pinna*, by Prof. Sedgwick. The specimen figured being much more perfect has set me right I trust : it is in the cabinet of Mr. De la Beche, who obtained it at Weymouth.

CHAMA squamosa.

TAB. CCCXLVIII.

SPEC. CHAR. Attached by the right valve ; nearly orbicular, subglobose, imbricated ; lamellæ undivided, somewhat erect, anteriorly produced, and adpressed ; posterior part of the right valve obsolete costated ; left valve rather convex ; smooth within.

SYN. Chama squamosa. *Brander, 86 and 87.*

DISTINGUISHABLE from Chama lamellosa of Lamarck, who has referred to Brander for his shell, by its undivided and not even lobed lamellæ.

In the section to which this species belongs the right valve is the largest and the one attached to foreign substances : by considering this the two sections of the genus made by Lamarck will be as readily recognised, as by observing whether the beaks turn to the right or the left hand, and the definition become more intelligible.

Extremely common at Barton, where perfect pairs are often found : it seldom exceeds in size the specimens figured ; it is consequently a smaller shell than C. lamellosa : I have small individuals from some part of France ; I think the neighbourhood of Paris ; it is however rare in that country.

ROSTELLARIA Parkinsoni.

TAB. CCCXLIX.—*Figs. 1 to 5.*

SPEC. CHAR. Turreted, costated, transversely striated; last whorl tricarinated; aperture expanded, with a one-angled entire lip; superior canal short.

SYN. Strombus Pes Pelicani. *Brocchi, II. 385.*

Rostellaria, having only one spur-like process *Parkinson, Vol. III. 63.*

R. Parkinsoni, *Mantell Geol. Sussex, p. 72 and 108.*

A SHELL strongly resembling *Strombus Pes Pelicani*, but well distinguished by the shortness of the superior canal of the aperture; and as Parkinson observes, by there being only one process from the wing-like lip; in *Pes Pelicani* the upper canal has a process besides the three that proceed from the lip; the striæ, costæ, and general form are the same in both.

The fossil *Strombus Pes Pelicani* of Brocchi is presumed to be the same as the one before us; but whether the green sand species mentioned by Parkinson, see his tab. 5, fig. 11, and by Mr. Mantell, be also the same, until we have more perfect specimens for comparison than have hitherto been met with, is very doubtful.

The present species occurs in the London Clay, and in the sandstones beneath it, but above the Chalk.

Fig. 1 exhibits the natural cast of the inside in a ferruginous sandstone, and the artificial cast of the outer surface from the opposite impression in the same stone, from Maidenhead, between Bray and Windsor; given me by Mr. Walter; it is accompanied by several other fossil shells known in the London Clay, in some of which the shelly matter still remains, especially of *Dentalia*.

Fig. 2 is from a cast also in ferruginous sandstone, from the low Cliff under Reculvers Church, in Kent.

Fig. 3; the shell remaining in the sandstone of Bognor Rocks.

Fig. 4; two views of a Highgate specimen. And Fig. 5, a similar one from Folkstone. Specimens resembling those from Maidenhead are also found in Gunter's-hill Sand-pits, near Emsworth, Hants, as I am informed by my good Friend Js. Holloway, Esq.

ROSTELLARIA calcarata.

TAB. CCCXLIX.—*Figs. 6 and 7.*

SPEC. CHAR. Turreted, costated, transversely striated; costæ linear, curved; last whorl carinated; outer lip furnished with a large oblong process, the upper angle of which is formed into a long curved spine; beak pointed; superior canal obtuse.

Parkinson, Vol. III. p. 63, tab. 5, f. 2.

THE last whorl of this elegant shell has several carinæ besides the principal one, but they are very little elevated: the spire has no carinæ, but is costated, and has some varicose sutures remaining upon it, which do not occur in the preceding species. The squarish wing-like process upon the outer lip is somewhat variable in form, its angles being more or less conspicuous: the spine from its upper angle is an elongation of the carina upon the whorl: the inner lip is entire, with a rounded edge.

This shell was first noticed by Parkinson: it is by no means rare in the whetstone-pits of Blackdown. The largest individual I have seen belongs to Mr. De la Beche; it is given at fig. 6. The specimens are all silicious casts.

AMMONITES Davoci.

TAB. CCCL.

SPEC. CHAR. Depressed; sides nearly flat; volutions exposed, ornamented with numerous transverse sulci, and a few distant, obtuse tubercles; aperture nearly orbicular.

IT is of little importance whether this shell be called sulcated or ribbed, the sulci and spaces between them are so nearly equal. When one coat of the shell is removed these spaces are flat, as happens in *Ammonites annulatus*, tab. 222, which this much resembles, the distant tubercles being the distinguishing mark; it has also fewer whorls; each tubercle covers, and as it were attracts together about four of the sulci.

Found in the blue Lias of Lyme Regis, in Dorsetshire, and preserved by Mr. De la Beche. I have named it to commemorate the present intelligent President of the Royal Society, as I had formerly done the late President.

AMMONITES Brodiei.

TAB. CCCLI.

SPEC. CHAR. Largely umbilicate, gibbose, costated; costæ radiating, large and numerous, terminated upon the sides of the whorls by obtuse tubercles, front rounded, plicated; aperture transversely oblong, curved,

SOMEWHAT resembling *Ammonites Brocchii*, tab. 202, but less gibbose and more strongly marked. The radiating ribs are slightly curved: from each of the tubercles

that terminates them proceed about four plaits or lesser ribs, that pass around the front, and meet the tubercles upon the opposite side : this part of the inner volutions is concealed.

This shell was given me a long while ago, as found on Portland Island, but with some doubt, by my kind and worthy friend, *Js. Brodie, Esq.* whose name I wish to perpetuate : from the appearance of the stone I should rather suspect it to have come from the under or Iron-shot Oolite.

AMMONITES perarmatus.

TAB. CCCLII.

SPEC. CHAR. Depressed, armed with two concentric rows of large pointed tubercles ; volutions exposed, few ; front rounded ; aperture nearly orbicular.

THE tubercles are joined transversely by obtuse ridges into 18 or 20 pairs upon each whorl ; the remaining portion of the shell is even : it is rather remarkable that the tubercles are as sharp nearly in the cast of the inside as the outside of the shell : there are about four whorls : the aperture is in length about one-third of the diameter of the shell, and is rather longer than wide.

A very conspicuous Ammonite ; found in the Pisolite at Malton, and given me by *Mr. Alexander Crawford*, of Scarborough. Besides other characters which distinguish it from *A. Birchii*, tab. 267, the acute cast of the spines is a conspicuous one ; the size of these spines will distinguish it from a somewhat similar Ammonite not yet figured, found near Oxford.

ASTARTE obovata.

TAB. CCCLIII.

SPEC. CHAR. Obovate, uniformly convex, corrugated; lunette impressed; anterior margin subtruncated, interior edge crenulated.



THE transverse rugæ are most conspicuous upon the anterior part of the surface, where they are also somewhat waved. From *A. excavata*, tab. 233, it may be distinguished by the anterior side not forming a separate lobe, and by being less elongated transversely.

Found by Prof. Sedgwick in the inclined beds of the ferruginous Sandstone, beneath the green Sand, on the eastern side of Sandown-bay, on the Isle of Wight; and mentioned by him in his paper on the Geology of the Isle of Wight, in the third Vol. new series of the *Annals of Philosophy*, p. 335, No. 5.

PECTEN papyraceus.

TAB. CCCLIV.

SPEC. CHAR. Depressed, obliquely oval, with large unequal, rectangular ears, striated, very thin.



NUMEROUS elevated striæ, that are decussated, upon the larger ear especially, by lines of growth, cover this very thin flat shell: there is no sinus between the ears and the rest of the shell, so that it is not easy to say where they begin: the length exceeds the width about one-fourth: the two valves are very nearly equal.

Preserved in the Woodwardian cabinet at Cambridge by the late Prof. Hailstone, who obtained it in the schale of North Oram Coal-pits, near Bradford. It is a curious circumstance that a marine shell should be found so near the remains of land vegetables common in the Coal formation, a formation in which shells of any kind are very rare, and where hitherto only fresh-water ones had been found. Casts of Pecten are very abundant in the Schale filled with decomposing Iron Pyrites; no other shells accompany them except rarely an indistinct species of Anomia. The specimens are decaying very rapidly.

NAUTILUS regalis.

TAB. CCCLV.

SPEC. CHAR. Gibbose, plain, not umbilicate; front flattish; sides convex; aperture rather wider than long.

THE volutions of this Ammonite increase rather more rapidly in size than those of *N. imperialis*, which is near akin to it, and from which it is further distinguished by the solid columella or axis, by the convex, not straight, sides of the aperture or section, in the young shells, and the expanded sides and straight front of the aperture in the adult.

It is remarkable that the prevailing species of Nautilus, found at the depth of about 60 feet, in the Regent's Canal, near the White Conduit House at Islington, in 1815, and also in Hyde Park, should prove different from that found at Highgate, and upon the Isle of Sheeepy, yet numerous specimens prove that fact.

I have named it *regalis*, as it seems little inferior in splendor to the *Imperialis*, and nearly equals it in size, though it appears from two or three specimens I have with small remains of the thickened edge of the aperture near the axis, that it is full grown when about nine inches in diameter and five in thickness. I believe no Author has noticed it. It probably belongs to the lower part of the London Clay stratum, and is accompanied by vertebral columns of *Pentacrinites subbasaltiformis*.*

* Miller's Natural History of Crinoidea, p. 140.

NAUTILUS radiatus.

TAB. CCCLVI.

SPEC. CHAR. Gibbose, umbilicated ; surface marked with curved, radiating undulations ; sides and front rounded ; aperture orbicular, deeply indented.



A SPECIES intermediate between *N. elegans* and *undulatus*. It is more regularly convex, and has more undulations than the latter, as many as four or five to each septum, but not near so many as occur in the former. The length and breadth of the aperture are nearly equal and exceed half the diameter of the shell. I am not acquainted with the situation of the siphunculus. The waves upon the surface are most elevated, and meet from the sides upon the front at an obtuse angle.

Lately found in the neighbourhood of Maltor, probably in the lower part of the Green Sand formation. I have received but one specimen, a cast in Marly Limestone, mixed with grains of *Silex* and of blackish Green-earth. The umbilicus is so open as to shew the inner whorls and the edges of the septa very beautifully. It is possible that if the shell had remained, the umbilicus would have been filled, but in that case the shell must have been very thick, so I have ventured to describe it as open.

AMMONITES peramplus.

TAB. CCCLVII.

SPEC. CHAR. Discoid, with a few large obtuse radii; whorls ventricose, the inner ones half exposed; front rounded, plain; aperture transversely obovate.

SYN. A. peramplus. *Mantell, Fossils of the South Downs, p. 200.*

VOLUTIONS four or five, almost half concealed and rapidly increasing in size, so that the last occupies one-third of the diameter of the shell: the aperture is but a little wider than long, but pressure has so much influence upon this proportion, that it is not easy to determine the original form, some specimens perhaps being pressed in the opposite direction to others. The radii are most prominent at the inner part of each whorl, and are lost before they reach the front: there are about 14 upon the specimen before me: the crisped and deeply sinuated edges of the septa form an elegant ornament upon some parts of the surface of the specimen.

Two or three large fragments and nearly perfect specimens of this Ammonite, have been at various times presented to me by Gideon Mantell, Esq. who had obtained them in the neighbourhood of Lewes. The largest mass, as observed in a note to his description, p. 201, is part of a shell that was probably three feet in diameter. When this Ammonite is laterally compressed it approaches to the following.

AMMONITES Lewesiensis.

TAB. CCCLVIII.

SPEC. CHAR. Discoid, obscurely radiated, radii large and obtuse; whorls depressed, inner ones half exposed; front narrow, rounded, plain; aperture sagittate.

SYN. A. Lewesiensis. *Mantell, Fossils of the South Downs, p. 199, tab. 22, f. 2.*

So rapidly do the volutions of this shell increase in size, that it has the appearance of being umbilicated, although about half of the inner whorls is visible. The breadth of the last whorl, or what is the same thing, the length of the aperture, seldom, as far as I have had an opportunity of observing, equals half of the diameter, although one of the three proportions given in Mr. Mantell's description, makes it equal to 9-14ths, possibly pressure may make as much irregularity in the proportions as are observable in different parts of that description, evidently taken from several individuals. The radii are broad, very little elevated, and often entirely obliterated, in which latter case the edges of the septa become beautifully developed.

Several varieties of this gigantic Ammonite have been sent me from Lewes, by Gideon Mantell, Esq. whose zeal for science has not been checked by the weight of the masses that have fallen in his way, or the difficulty of their removal. I have given a diminished figure of a specimen fifteen inches in diameter and four inches thick, which has lost, almost entirely, the obtuse radii, a cir-

cumstance that renders it more distinct from *A. peramplus* than otherwise it would appear. I have an intermediate specimen from Dover, by favour of Mr. Sankey, the aperture of which is elliptical; and a small one from Lewes, between the two; both these have the radii distinct, especially the small one, in which they extend nearly to the front: these specimens lead me to suspect the *A. Lewesiensis* is only a compressed variety of the *peramplus*. Mr. Phillips has observed in his paper on the Chalk Cliffs near Dover, (Trans. Geol. Soc. V. p. 30 and 33), that the Ammonites lie horizontally in the Chalk: this may account for their being so frequently compressed: but as Mr. Mantell has had numerous opportunities of observing them, I have followed him in describing them as two species. I have seen one on the beach near Dover that measured full three feet across, but it is so long ago that I do not know which species to refer it to.

AMMONITES *Plicomphalus*.

TAB. CCCLIX.

SPEC. CHAR. Discoid, umbilicate; umbilicus large, with 8 or 10 diverging, rather sharp, protuberances around it; front rounded, plain.



APERTURE ovate; about 3-7ths the diameter of the last whorl long; narrowest towards the front; the eminences about the inner edges of the volutions are wide, and extend over a part of the sides: the umbilicus is large, equalling half the length of the mouth.

Presented to me by Mr. Weir, who found it in a very mutilated state in the harder part of the Sandstone stratum, at Bolingbroke, Lincolnshire.

CANCELLARIA.

GEN. CHAR. Oval, subturritid ; last whorl more or less ventricose ; aperture almost entire, lower angle either slightly canaliculated or produced into a short recurved beak ; outer lip sulcated within ; inner lip expanded ; columella plaited.

BUT few of the species of this genus are much elongated, the form of the last whorl generally giving them an ovate contour. The decussated ridges upon the surface have given an apt name to the genus, although in some species the transverse ridges are not sufficiently prominent to give the appearance of lattice work ; while the longitudinal costæ are strong and sharp : in a few species varicose sutures are formed at different periods of growth by the inflated outer lip ; such species approach to Murices, but are well distinguished by the folds upon the columella ; these folds are few, very prominent, and compressed ; they are sometimes accompanied by two or three irregular protuberances. Some species are elegantly colored ; they all belong to marine animals.

Auricula simulata of tab. 163 is a species of this genus, with only one proper plait upon the columella.

CANCELLARIA quadrata.

TAB. CCCLX.

SPEC. CHAR. Ovate, elongated, cancellated, without either varices or beak ; two obtuse plaits upon the columella, besides the spiral edge ; outer lip sharp, entire, striated within.

AN elegant shell, a little resembling *Cancellaria* (*Auricula*) *simulata*, but more pointed and very differently marked ; it has also another fold upon the columella : the surface is covered by small hollow squares formed by a number of elevated lines that cross each other with much regularity, of which however the transverse are rather the strongest : all the whorls are convex ; the last occupies nearly two-thirds the length of the shell.

This species may be arranged in the last of the four sections Mr. G. B. Sowerby has divided the genus Can-

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cellaria into, although it does not precisely agree with some other species belonging to that section, but it would probably be better to form another section.

The size varies considerably; the extremes are shewn in the plate. I am indebted to Miss Salisbury, and other friends, for specimens found at Barton.

CANCELLARIA *læviuscula*.

TAB. CCCLXI.—*Fig. 1.*

SPEC. CHAR. Short, ovate, pointed, furnished with varicose sutures and costæ, crossed by numerous obtuse elevated lines; columella biplicated; aperture scarcely canaliculated.

NEARLY allied to *Cancellaria costulata* of Lamarck, but shorter and more strongly decussated; it has one or two sutures upon each whorl, with several rather curved costæ: the columella has two folds besides its spiral rather sharp edge: the outer lip is thickened near the edge, and internally ribbed.

Found at Highgate by G. B. Snow, Esq. at Barton by the Rev. Mr. Bingley, and at Lyndhurst by C. Lyell Esq. jun. It is rare. I have been favoured with the same species by Mr. De Gerville, found in Normandy.

CANCELLARIA *evulsa*.

TAB. CCCLXI.—*Figs. 2, 3, and 4.*

SYN. *Buccinum evulsum*. *Brander, 14.*

SPEC. CHAR. Short, ovate, pointed, furnished with varicose sutures and costæ, crossed by several acute carinæ, most elevated upon the costæ; columella biplicated, aperture scarcely canaliculated.

VERY nearly like *C. læviuscula*, but large, and distinguished by the small number and elevation of the carinæ that cross the costæ, and give it a rugged aspect and feel: they have intermediate rather elevated striæ that are very obscure.

These both belong to the second of Mr. G. B. Sowerby's sections of this genus, although they do not altogether agree with the definition.

Plentiful at Barton: it was also found at Lyndhurst by C. Lyell, Esq. jun.: and it occurs in the neighbourhood of Paris.

CORBULA nitida.

TAB. CCCLXII.—*Figs. 1, 2, and 3.*

SPEC. CHAR. Ovate, subtrigonal, equilateral, gibbose, anteriorly truncated, smooth; valves nearly equal.

A THIN shell, most gibbose towards the beaks, which are somewhat produced; the young individuals are rather pointed on the sides; the old ones oval, with a small truncature anteriorly; the surface is smooth, often shining, and the valves very nearly equal: length rather more than half the width.

Very small, not exceeding three-tenths of an inch in width: the almost perfect equality of the valves is remarkable, but the form of the hinge is exactly that of the genus *Corbula*, from which it cannot conveniently be separated.

First observed with the following, by Professor Sedgwick, in several parts of the Isle of Wight, below the upper fresh-water formation.

Figs. 2 and 3 are magnified representations.

CORBULA cuspidata.

TAB. CCCLXII.—*Figs. 4, 5, and 6.*

SPEC. CHAR. Transversely oblong, tumid, inequivalved, subequilateral; anteriorly carinated and cuspidated; lower margin of the left valve expanded and inflected.

A THICK blunt-edged shell, whose anterior side is obliquely truncated, and defined by a ridge that ends in a projecting point on the margin; the lip-formed edge of

the left valve bends over the margin of the other, and encloses about half of its base : the disk is rather rugged when full grown.

This occurs along with the last in what is called the upper marine formation in Colwell and Whitecliff Bays, on the Isle of Wight. They have both been introduced to notice by Professor Sedgwick.

Figs. 5 and 6 are enlarged to three times the natural length.

CORBULA complanata.

TAB. CCCLXII.—*Figs. 7 and 8.*

SPEC. CHAR. Transversely oval, elongated, depressed, and sulcated; sulci few; anterior side smallest, subtruncated, and defined by an obtuse ridge; left valve enclosing the other.

THE posterior part of the right valve is peculiarly flattened and thickened : the surface is smooth between the six or eight furrows that appear to be formed by periodical interruptions of growth : the left valve is most convex ; the lower edge of it encloses that of the other valve. Length about half the width.

Newly discovered by the Rev. G. R. Leathes in the Crag at Roydon. It is rare. The outer coat is generally corroded, so as to give it a costated appearance, a circumstance common in Crag fossils.

MYA? gregarea.

TAB. CCCLXIII.

SPEC. CHAR. Obovate, convex, subdeltoid, smooth; anterior side truncated; lower margin of the left valve produced.

THE anterior side of the right valve is rather cuneiform and truncated; the left valve is only truncated; it is larger all round than the right, so that it receives the upper edges of that valve upon the thickened parts on each side of the hinge: on the posterior side it has a remote tooth, that with its accompanying hollow forms a secure lodgment for the corresponding edge of the right valve: within the anterior edge it has only a slight furrow: the outer surface is nearly smooth, except a few lines of growth and the eroded beaks. The line upon the inner surface to which the mantle of the animal was united, has a small sinus equal only to the quarter of a circle, placed close to the anterior muscular impression.

It is highly probable that this shell will become the foundation of a new genus, to which will be associated *Myæ labiata* (Linn. Trans. Vol. X. p. 326, t. 24, f. 1, 2, and 3,) *plana* and *subangulata* (Min. Conch. t. 76, figs. 2 and 3.) The former of these is a fresh-water shell, inhabiting the Rio de la Plata, a circumstance strongly confirmatory of the fresh-water origin of the stratum near the top of Headon Hill, in which immense numbers of the species now before us are closely grouped together unmixed with other shells. The remote tooth, the small sinus in the mantle, and the inequality of the valves, are among the characters that distinguish it from *Mya*; the inequality of the valves, however, upon which much

stress has been laid, is too variable, as we have just seen in the genus *Corbula* at tab. 362, to be relied upon; and an examination of the recent species is still wanting to establish the two other points: the erosion of the umbones does not occur in the other fossil species.

First observed by Mr. Webster (*Trans. Soc. Geol.* VII. p. 227), and again by Mr. G. B. Sowerby, who has compared it to *Mya labiata* (*Annals of Phil.* new series, Vol. II. p. 220). They found it near the top of Headon Hill: Prof. Sedgwick has since found it at Calbourne; and it probably occurs near the top of the upper fresh-water formation on other parts of the Isle of Wight.

MYA arenaria.

TAB. CCCLXIV.

SPEC. CHAR. Ovate, anteriorly rather pointed, posteriorly rounded; hinge tooth large, with a lateral appendage.

Mya arenaria. *Linn. et Auctorum.*

So perfectly does this resemble the recent *Mya arenaria*, that we can find no distinguishing mark. In all probability this is one of the few shells belonging to genuine diluvian deposits, and accidentally mixed with the older fossils. It is frequently found, but rarely perfect, in the Crag pits of Norfolk and Suffolk. I first received it from Mrs. Cobbold of Ipswich. The figures are taken from specimens in the possession of the Rev. G. R. Leathes.

OSTREA carinata.

TAB. CCCLXV.

SYN. *O. carinata*. *Lamarck Hist. Nat. VI.* 216.

SPEC. CHAR. Elongated, pointed at both ends, arched, plaited; sides flattened; middle longitudinally cariniformed; plaits numerous, angular, and regular; ears two, variable.

THE pointed ends, the depth of the valves, and regularity of the plaits, are characters by which this Oyster may generally be known: the curvature and ears are variable, the anterior or exterior ear being often obsolete in old shells.

A series of specimens of various ages have been selected for the illustration of this species: it will be seen that the curvature varies considerably. Fig. 1 is the most elongated variety: it is from the grey Marl below the Chalk at Folkstone in Kent: the remainder are silicious: they are from the green Sand of Chute Farm near Longleat Park. An extremely elegant French specimen, nearly double the size of any here figured, was some time ago given to me by Mr. de Gerville, with intentions that render his friendship more dear to me than even his numerous presents do: it is from the Chalk Marl, and is so much curved as to form three-quarters of a ring: the outer ear is obscure, but the inner is very large. A figure of this specimen is given in Mr. G. B. Sowerby's work upon the Genera of Shells. The Rev. Mr. White in his Natural History of Selburne, has figured a similar specimen: and the same species probably is given by

Faujas St. Ford, (Hist. Nat. de Maestricht, t. 24, f. 1) as a Gryphite. It appears to be a species common to the green Sand and the strata between it and the Chalk, and will serve to identify that range; while the *O. gregaria*, which is a less curved and much more irregular shell, distinguishes the Pisolite.

BULIMUS costellatus.

TAB. CCCLXVI.

SPEC. CHAR. Ovate, rather acute, longitudinally costated; costæ small, numerous; aperture elongated, acute above.

ABOUT an inch and a quarter long, and rather more than an inch wide; the aperture occupies half the length of the shell. The ribs are very thin and numerous, rather sharp, and nearly straight; there are no striæ between them.

A considerable resemblance may be observed between this shell and *Bulimus ellipticus* (tab. 337.) but they differ in general form; the aperture and last whorl are proportionally much larger in *B. costellatus*, than in *B. ellipticus*, and it is also a right handed shell, which the latter never appears to be. I am indebted to J. Holloways, Esq. for the use of what appears to be a unique specimen, from the freshwater formation of the Isle of Wight. It was found along with *B. ellipticus*, in a pit on the North of the road at Schalcomb, where I have in vain sought for another. It is possible that if a perfect specimen were examined, some characters might be discovered that would remove it from the genus *Bulimus*, and also from among the land shells.

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TROCHUS monilifer.

TAB. CCCLXVII.

SPEC. CHAR. Conical, transversely striated; volutions rather convex with three rows of tubercles and crenated edges; base slightly convex bearing six rows of granules; aperture quadrangular; columella curved along one edge of the aperture, truncated.

SYN. Trochus nodulosus. *Brander, f. 6.*

T. monilifer? *Lamarck env. de Paris, p. 99.*

A REGULARLY conical shell whose base is equal in diameter to the height. The aperture is placed obliquely, it has an entire waved edge. The tubercles upon the spire are placed upon transverse elevations, that give the volutions a convex appearance; the centre of the base is smooth but not umbilicated; the inside is pearly.

For excellent specimens of this long known elegant Trochus, we are indebted to Miss Teed, who sent them from Hordwell. It is probable that the T. monilifer of De Lamarck is a distinct species, although nearly related to the Hampshire Trochus nodulosus, for the only specimen I have from France has rather concave whorls, a flat base, with the columella projecting, and eight rows of granules, agreeing with Lamarck's description and besides, the surface shews no transverse striæ, but it is not perfect, it is certainly a distinct species; but that it be Lamarck's, I have no proof, and Lamarck refers to Brander's nodulosus, which is quite distinct from the recent species of that name.

GRYPHÆA bullata.

TAB. CCCLXVIII.

SPEC. CHAR. Transversely obovate, irregular, smooth, thin, depressed, beaks small; upper valve concave; lateral lobe obscure when old.

WHEN full grown this Gryphite is often wider than long, and the very small beaks, although incurved, have not the great degree of curvature common to other species of the genus. In the young state the beaks are more prominent, and the lateral lobe, although small, is distinct and very different from the spurious ear sometimes observable in Oysters; the surface is smooth and undulated, not imbricated; the substance uniformly thin, and the point of attachment generally minute.

Although much resembling an Oyster in general form, there is a something in the aspect that distinguishes this shell from that Genus, and the two generæ from each other; the existence of a lobe in the young state confirms this a Gryphite; the uniform rounding of the convex valve, and the want of imbricated laminae, assist in the discrimination.

A handsome series of this species has been liberally afforded me by Mr. Weir, who obtained it in the Clunch Clay, at Bracken Wood End, near Horncastle in Lincolnshire; the thickness of the shell joined to its convexity, has given rise to the name of bullata.

GRYPHÆA vessiculosa.

TAB. CCCLXIX.

SPEC. CHAR. Subrhomboidal, oblong, deep; lesser valve concave, small, thin; larger valve curved, composed of several distant coats.

LONGER than wide, with pointed beaks, and a small hinge; the depth and width are equal; both less than

the length ; the lobe is distinct, but not sharply defined ; the surface is smooth, and nearly free from laminae.

Casts in *Silex*, supplying the place of the shell itself, are very abundantly collected in masses, in loose green sand stained by iron, occurring near Warminster, and generally unassociated with other fossils. I am obliged to Miss Benett for the specimens figured.

PECTEN asper.

TAB. CCCLXX.—*Fig. 1.*

SPEC. CHAR. Nearly orbicular, convex on both sides, bearing about 17 sets of rays roughened by subtubular imbricated scales; margin internally fimbriato-crenated; ears distinct, nearly equal.

SYN. *Pecten asper*. *Lamarck Hist. Nat. VI.*
180. *Lister Conch. t. 470. f. 28.*

THE rays are from 5 to 7 in a set, depending upon the age of the shell; the centre of each set has the largest scales, and is much elevated; the contour is oblique, much resembling that of the common *P. opercularis*. The inside is plain with a furbelowed margin.

Very abundant in the Green Sand, especially at Horningsham near Frome. Lamarck describes *P. asper* as having 20 to 22 rays; this is not the case in the English specimens.

PECTEN obliquus.

TAB. CCCLXX.—*Fig. 2.*

SPEC. CHAR. Obliquely oval, convex on both sides; radii very numerous, roughened by semicircular imbricated scales; ears large, distinct.

EVERY third ray is larger than the two intermediate ones, they are all close together, the larger amount to about 20. The two valves are not equally convex, but otherways they are similar; the breadth is about two-thirds the length.

Drawn many years ago from a specimen in green sand belonging to my lamented friend Mr. Cunnington.

PECTEN cinctus.

TAB. CCCLXXI.

SPEC CHAR. Orbicular, gibbose, longitudinally striated, imbricated; edges of the laminae, thin, erect; ears small; edge entire.



Remarkable for concentric, erect laminae, that are very numerous, especially towards the edge; but from their being thin, they are commonly worn off. The ears are strongly marked with close ridges: the valves are thick, especially towards the hinge, and of nearly equal convexity. The striae are sunk and rather irregular.

Dawson Turner, Esq. of Yarmouth, celebrated for his botanical knowledge, was the first Friend who sent me this interesting shell. It was found in the alluvial clay of Suffolk. The specimen figured was sent me from the neighbourhood of Horncastle by Mr. Wier, both are remarkable for having grains of iron ore, arranged in one, two, or three regular rows between the concentric laminae, according to the distance of those laminae, the grains being uniform in size. It is probable that they both belong to the inferior or Ironshot Oolite, although the first is filled with indurated marl.

AMPULLARIA *Ambulacrum*.

TAB. CCCLXXII.

SPEC. CHAR. Globose, with a canal around an acute spire ; umbilicus plain within.

STRONGLY resembling *Ampullaria acuta* (tab. 284.) but well distinguished by the deep spiral canal around the upper edge of the whorls : this canal is flat at the bottom with nearly upright sides, resembling a trench cut round a hill. It is distinguished from *A. canaliculata* of Lamarck, by the form of the canal, by the roundness of its sides, and by the umbilicus not having a spiral groove within it ; it also grows much larger.

This species has been frequently sent me from Hordwell, by Lady Burgoine, Miss Teed, Miss Dent, and other kind Friends to the Science ; it has also been found at Muddiford, whence the upper figure, by Lady Burgoine, and at Stubbington by Mr. Holloway ; but I have never met with a French specimen.

The probability of this and the other shells from the London clay stratum, classed under the Genus *Ampullaria*, being the exuviae of marine animals, is so great, that it does not seem correct to arrange them with the recent species ; they ought, as Lamarck has observed, to form a distinct Genus, which it is to be hoped will soon be defined, unless it ought to be included in *Natica*.

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NATICA patula.
TAB. CCCLXXIII.

Three lower figures.

SPEC. CHAR. Hemisphæroidal, smooth, spire small, depressed; umbilicus open containing a spiral ridge.

THE last whorl is very large and expanded, so as to give the entire shell the form of half a flatted spheroid cut along its axis. The surface is smooth, or so obscurely striated that it is difficult to persuade oneself that the striæ are worn away, I speak of concentric striæ; the lines of growth are visible enough. The umbilicus is large, and not quite half filled by a large callus, that does not spread over it, and is accompanied by a smaller one, which forms a spiral ridge. The spire occupies less than a fifth of the shell, and is barely relieved from the general surface of the last whorl.

Found in the Suffolk Crag at Ipswich, by Mrs. Cobbold, generally about an inch wide, but sometimes, as specimens lent me by the Rev. G. R. Leathes prove, an inch and a half; the lower figures exhibit these specimens.

NATICA striata.
TAB. CCCLXXIII.

Two upper figures.

SPEC. CHAR. Subhemisphærical, smooth; spire small, depressed umbilicus open; base concentrically striated.

GREATLY resembling the last, but not so much expanded; the spire is rather more prominent, the concentric striæ are impressed, but as they are liable to be lost by

wear, they cannot be relied upon for discrimination ; the want of the spiral ridge in the umbilicus, is the most conspicuous character, and is constant.

Lent me from Barton by Miss Dent. It occurs also in France, but I do not know that it has been described. Were it not for the constant absence of the lesser spiral ridge in this, and its regular appearance in all the specimens of the Crag species, they might have been considered as varieties, but this character is so closely connected with that of the Genus, that it must surely be of importance enough to distinguish a species.

ACTEON. *Montfort—Leach,*

Tornatella Lamarck.

GEN. CHAR. A convoluted, elongated, uni-valve, with a projecting spire; aperture oblong, entire, with a sharp edged lip; columella furnished with a spiral callus or thick plait at its base; operculum oblong, corneous.

MOST of the species of Acteon are similar in form, but differing in proportion; they are also generally striated transversely, and often elegantly colored; the aperture is perfectly longitudinal, and above two thirds the length of the shell, acute-angular above, and rounded below, the edge thickening, and uniting with the base of the columella forms the callus or what is commonly called the single plait upon it; other plaits sometimes occur upon the columella; the inner lip is very thin, and applied close to the shell. *Voluta tornatilis* the type of the Genus is a British marine shell, the inhabitant of which forms deep furrows when traversing the sandy shores it loves to frequent.

ACTEON Noæ.

TAB. CCCLXXIV.

SPEC. CHAR. Oval, transversely striated, with one plait at the base of the columella; striæ equidistant, numerous, impressed, obscurely decussated, lip sulcated within.

THE only character except the want of color, by which this fossil can be distinguished from the recent Acteon

flammeus (*Voluta* of Linn.) is the sulcated lip, and this may possibly be only a sign of adolescence, and not be found when the lip acquires its greatest thickness.

A rare Crag fossil, found by the Rev. G. R. Leathes at Walton in Essex; it is extremely fragile.

BUCCINUM junceum.
TAB. CCCLXXV, f. 1.

SPEC. CHAR. Subturrited, reticulated; whorls rather swelled; base produced; aperture lanceolate, with a striated lip.

SYN. *Murex junceus*, *Brander*, 26.

SIX or seven whorls with rounded reticulated surfaces compose the elongated spire of this *Buccinum*; the striæ are elevated, sharp and uniform, except near the upper edges of the whorls, where, being more distant, they leave a small furrow; the aperture is long and narrow, acute angular above, notched, and from the produced form of the base, almost beaked below: the outer lip is sharp edged, with many deep striæ within it.

A well known common shell at Barton. It has also been found at Highgate, but I believe not near Paris.

BUCCINUM sulcatum.
TAB. CCCLXXV, f. 2.

SPEC. CHAR. Turrited, acute, transversely furrowed; whorls ventricose; aperture ovate; lip toothed within, thickened by age.

WHORLS seven or eight, ventricose, each bearing about seven linear furrows; the base is rather prominent, and slightly recurved, the lip is thickened in the last stage of growth, but not previously, so that no varices are formed upon the spire, its edge is sharp, and a little way within are about a dozen elongated teeth. The general surface is smooth.

From the Crag of Ramsholt, by favour of the Rev. G. R. Leathes.

BUCCINUM Mitrula.
TAB. CCCLXXV, f. 3.

SPEC. CHAR. Turrited, acute, costated; aperture elongated, obtuse above, lip sharp edged with a small rounded sinus in the upper part.

THE costæ 10 or 12 in number, are rather most prominent at the upper part of each whorl; the base is even, not much produced; the columella is straight; the lip is

nearly straight edged, except a small rounded sinus near its junction with the body of the shell, below this sinus there is internally a slight protuberance, the aperture is oblong, equally obtuse at each end.

In general form this so much resembles *B. juncius*, that one is induced to place them in the same Genus, although there is a sinus in the lip of this; but in other respects and in the straight form of the lip it differs from *Pleurotoma*, to which it might perhaps otherways be referred.

A pretty Crag fossil picked up by my communicative Friend, the Rev. G. R. Leathes.

The unhappy termination of Mr. Sowerby's long illness, prevented the appearance of the 66th number of Mineral Conchology, at the appointed time. It is to be hoped that the materials left in the hands of his Sons J. D. C. Sowerby, and C. E. Sowerby, will enable them to carry it on regularly in future.

No. 2, Mead Place, November, 1822.

SPIRIFER ambiguus.

TAB. CCCLXXVI.

SPEC. CHAR. Subpentangular, gibbose, smooth, with the middle elevated towards the front; beak produced, perforated; hinge line very short.

THE produced beak and three-sided front give this shell a five-angled contour, although the sides are rounded.

In general appearance it does not agree with most of the species of the Genus Spirifer, but approaches nearer to the smooth Terebratulæ; its having a perforated beak, and little or no hinge line, still further distinguish it; but the actual existence of spiral appendages seems to confirm it a Spirifer, unless its combining the characters of both Genera should render it advisable to construct a new Genus of it. But as the appendages within the Terebratulæ are very variable, it will be well to wait until more of them are known.

Obtained from decomposed Mountain Limestone, (Rotten-stone) found near Bakewell, and kindly presented to me some years ago, by Mr. White Watson. The shell is replaced by Silix, which has retained the form of it, although the stone is completely decomposed and reduced to a brown powder; the spiral appendages are extremely fragile.

SPIRIFER minimus.

TAB. CCCLXXVII.—*Fig. 1.*

SPEC. CHAR. Transversely oblong, gibbose, with 15 longitudinal ridges, the three central ones elevated.

RATHER rhomboidal with rounded angles, the ridges are rounded, close together, and smooth; the three elevated ones are less distinct from each other than the others; the long line of the hinge, the flat space, and triangular foramen between the pointed beaks are very conspicuous, but the appendages characteristic of the Genus Spirifer,

are not in the specimens, although they are hollow, and to all appearance perfect.

Found with the last in decomposed Limestone, from the general wreck of which they have escaped by being composed of silex.

—————
SPIRIFER Walcott.

TAB. CCCLXXVII.—Fig. 2.

SPEC. CHAR. Suborbicular, gibbose with one large, rounded, elevated fold in the middle, and four smaller ones on each side.

BEAK pointed, incurved, the hinge line is shorter than the width of the shell; both valves are equally gibbose and smooth, the smaller one is shorter than wide; the area between the beaks is rather rounded, but furnished with a triangular foramen.

Found many years ago by Walcott, at Camerton, about six miles and a half from Bath, on the road to Wells, and represented by him in his work upon the Petrifications found near Bath, *figs. 33*. Walcott observes of similar shells, "that those found on the upper Bristol road near Bath, are smaller; their shell thin; white; a triangular hole between the beak of the lower valve, and the hinge; and have the body *fig. 33. A. B.* within them; it consists of two hollow cones joined to each other by part of their base and to one of the valves, but not so close as to prevent the animal, or part of it, from retreating into them: the surfaces of them are beautifully covered with circular rows of small pyramids of spar." Thus it appears that he was the discoverer of the spiral appendages long before they were used as a generic character, although he did not clearly see their spiral form: he also observed the triangular foramen, and it is much to be regretted that he did not figure the shells as well as their contents, as they probably were a different species from the one before us.

The 3 upper figures are from a specimen in M. de la Beche's cabinet found in the Lias of Keynsham; the other two were given me by the Rev. Robert Plumtree, who collected them at Pyrton Passage, near Berkley, Gloucestershire; they are rather compressed.

CYPRÆA coccinelloides.

TAB. CCCLXXVIII.—*Fig. 1.*

SPEC. CHAR. Ovate, spheroidal, transversely striated; striæ numerous, acute, not interrupted; aperture slightly arched, not contracted in the middle.

STRONGLY resembling *Cypræa Coccinella*, (Lamarck Hist. Nat. VII. p. 404. *C. Europæa* Leach. *C. Pediculus* Linn.) but rounder, and distinguished by the lip which is more uniformly convex, and does not contract the middle part of the aperture: like that recent species, it is smooth when young; its size is that of a pea.

CYPRÆA retusa.

TAB. CCCLXXVIII.—*Fig. 2.*

SPEC. CHAR. Obovate, spheroidal, transversely striated; striæ elevated, uninterrupted, few, remote; aperture a little curved at the narrowest end.

READILY distinguished at first sight from the last, and indeed every other analogous species by the paucity of its striæ, which are seldom more than eight, assisted by its short, almost gibbose form: it is of the same size as *C. coccinelloides*.

CYPRÆA Avellana.

TAB. CCCLXXVIII.—*Fig. 3.*

SPEC. CHAR. Obovate, spheroidal, transversely striated; striæ numerous, remote, elevated, interrupted by a longitudinal sulcus; aperture a little curved at the narrowest end.

CONSIDERABLY larger than either of the preceding, being as big as a hazel nut; the thickened lip forms a slightly projecting margin; the striæ that cross it are rather

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sharp elevations, with flat spaces between them, many of them terminate before they reach the inner edge of the lip. There is a variety, if it be not a distinct species, about three-fourths the length, with blunter and closer elevations.

The Rev. G. R. Leathes has taken much pains to collect and distinguish the species of striated *Cyprææ*, that are to be found in the Suffolk Crag, and the plate before us contains some of the fruits of his labours : there may still exist two more species not clearly defined.

AURICULA pyramidalis.

TAB. CCCLXXIX.

SPEC. CHAR. Ovate, pointed, smooth; spire pyramidal; volutions rounded above, the last subcylindrical short; aperture half the length of the shell, with a sharp outer lip, and two plaits upon the columella.

A THICK rather clumsy formed shell, with a prominent base and small umbilicus; the plaits upon the columella do not project much, they are near together, the inner lip is rather thickened, the outer one not at all.

As the Genus *Auricula* is supposed to contain only land shells, it may be questioned whether the subject of this plate be properly arranged among them; but it agrees well with Lamarck's second division, formerly called by him *Conovulus*; and it is not unlikely that a formation of so late a date as the Crag appears to be, should contain land shells, since it is found to hold several marine species precisely like those of the present day, although land shells have not been hitherto suspected in it. The *Auricula incrassata*, and *A. turgida*, tab. 163. found in the Green Sand, ought in all probability, to be removed to another, perhaps a new, Genus. We first received this species from Mrs. Cobbold of Ipswich, so long ago as in 1812. (see fig. 2.) but could not be

satisfied with any place in the system for it; and even now we are not certain of the propriety of placing it among land shells, for the specimen (fig. 1.) has a hole in its side, such as is frequently bored by some marine animal; this is in the Rev. Mr. Leathe's collection.

Should Lamarck's second division contain principally marine shells, as some persons suppose, and not land ones as he states, his genus *Conovulus* should be again received, and the fossil before us referred to it: a change that will remove the difficulties above alluded to.

PLAGIOSTOMA Hoperi.

TAB. CCCLXXX.

SPEC. CHAR. Transversely ovate, oblique; valves convex, obscurely punctato-striated; striæ diverging, deepest upon the sides; anterior slope straight, concave.

SYN. *Plagiostoma Hoperi*, *Mantell Geol. of Sussex*, 204, *tab. 26, f. 2, 3, f. 15.*

NEARLY smooth between the longitudinal striæ, which are very commonly so obscure as not to be traced, except close upon the sides, or near the edge: they are marked with punctums in the same manner as *P. punctata*; the ears are unequal, not very prominent, they are striated.

Sent me long ago by G. A. Mantell Esq. from Lewes; it occurs also at Northfleet, and other parts of the Chalk range not rarely.

I fear that a single valve of this very distinct shell, although similar in form, has been confounded with *Dianchora lata*, *tab. 80.* and given rise to its being described as plain, instead of striated, which the figure shews it to be; the striæ indeed are deep, but close and regular, so that the surface has a smooth aspect.

PLAGIOSTOMA rusticum.

TAB. CCCLXXXI.

SPEC. CHAR. Transversely oblong, oblique, longitudinally sulcated; valves convex; sulci deep; ears obscure; anterior slope straight, convex along the middle.

ABOUT 25 deep irregularly disposed, and often curved furrows, give the surface of this shell an unfinished clumsy appearance; the spaces between the furrows are more or less flattened or convex, and are smooth; they are irregular in width, some specimens having them widest in the middle, others at the sides of the valves; the ears, especially those upon the anterior slope, are very short, and confounded with the edge of the shell; the beaks are slightly prominent, the length is about two thirds the width.

Found in clay mixed with sand, consisting of large green grains, upon Shotover Hill, near Oxford.

PLAGIOSTOMA læviusculum.

TAB. CCCLXXXII.

SPEC. CHAR. Transversely obovate, oblique, convex, longitudinally ribbed; ribs close, broad, irregular, very little elevated, convex; anterior slope straight, hollow; ears small, unequal.

A smooth even formed shell, distinguished by the slight elevation of its ribs, if the radiating risings can be allowed the name of ribs, and the total absence of any striae between them; the lines of growth are numerous, but very slightly marked; the shell is thin so that the edge is undulated.

Not uncommon in the Pisolite of Malton; it is one of the many very distinct species so improperly confounded with *P. rigidum* by the Authors of a Geological Survey of the Yorkshire Coast, who have besides indulged themselves in changing names, and several other liberties too palpably induced by error to merit particular notice.

G R Y P H Æ A Columba.

TAB. CCCLXXXIII.—*Fig. 1 and 2.*

SPEC. CHAR. Ovate rounded, expanded posteriorly, smooth; beak attenuated, incurved, oblique.

SYN. *Gryphæa columba*, *Lam. Hist. Nat. VI. pt. 1. 198.* *Knorr petr. Vol. III. tab. D. III. c.*

PERHAPS this is the smoothest species of *Gryphæa* known; except towards the margin, there is hardly a single sharp projecting line of growth to be found; the anterior lobe is small, but well defined; the left or upper valve is more or less square in form, and largely waved, its posterior edge is very thick, flattened, and striated near the hinge, every where else the edge is thin and sharp; the depth of the attached valve is about half its width; it is obtusely keelformed; the surface of attachment is very minute, at the point of the involute beak.

If we may judge by the characters of the stone this shell is preserved in, it belongs to some part of the Greensand formation contiguous to the Chalk: the only British specimen that I have ever seen, was given me many years ago by my lamented Friend Mr. Cunnington, who obtained it from Northamptonshire; it is represented in the lower figure. The upper figure is taken from a French specimen from Mans; it is in a much better state of preservation than the English one.

Fig. 2. is the variety *b* of Lamarek, with a striated beak, it is also from Mans; I have added it to shew the hinge which approaches that of *Chama* in appearance, since it has the rudiments of a tooth, and the hinge pit very much curved.

GRYPHÆA nana.

TAB. CCCLXXXIII.—*Fig. 3.*

SPEC. CHAR. Oblong ovate, rugged, gibbose,
 beak oblique, incurved; upper valve pointed,
 thick.



NOT much exceeding in size a common hazel nut; it is very variable in form, but always curved and longer than wide; its surface of attachment is sometimes very large, the hinge pit is narrow and much curved, as in the last species.

Very abundant in some parts of the Clay at Shotover, near Oxford, accompanied by *Ostrea Delta*, a *Trigonia*, and many other shells; it is probably characteristic of the stratum.

SIGARETUS, *Lamarck*.

GEN. CHAR. Shell univalved, internal, ear shaped, suborbicular; aperture dilated, entire, rounded, oblong, margin divided, inner lip thin; columella spirally curved.

A SMALL imperfect almost immersed spire, and a large expanded aperture, are common to *Stomatella*, *Haliotis*, and several other genera, from which *Sigaretus* is distinguished by the form of its thin inner lip applied close upon the spire, leaving a more or less conspicuous umbilicus in a slender columella, that is so united to the thick edge of the lip as to appear a continuation of it; a considerable portion of the spire is also visible within the aperture. The surface is often striated or reticulated, but has a smooth aspect indicative of its being covered by the animal. Only one fossil species appears to be known, while there are several recent ones.

SIGARETUS *canaliculatus*.

TAB: CCCLXXXIV.

SPEC. CHAR. Obovate, convex, longitudinally striated; spire pointed, its turns distinguished by a canal; umbilicus large.

STRONGLY resembling *S. concavus* of *Lamarck*, but much smaller, and distinguished besides by its umbilicus. The stia upon its surface are elevated, often undulated, and even decussated by the lines of growth: it is small and pointed.

An elegant, and I believe nondescript shell; Miss Salisbury first sent it from Hordwell in 1815; since that time I have received specimens from Miss Beminster, and especially the large one represented at the bottom of the plate; the same species also occurs in the neighbourhood of Paris and Bourdeaux.

NERITINA. *Lamarck.*

Clithon, Velates and *Theodoxis*. Montfort.

GEN. CHAR. A slender, semiglobose or oval shell, flat beneath, not umbilicate; aperture semicircular; columella lip flattened, with a sharp straightish edge; outer lip neither toothed, nor crenulated within; operculum furnished with a lateral process.

THE Genus *Nerita* as established by Linneus, contains many shells whose animals live in fresh water, besides such as inhabit the sea, and it has been discovered that teeth or small plaits inside their outer lips, are possessed exclusively by the latter; a circumstance that will serve, as well in fossil as in recent shells, to distinguish them by; the fresh water species are now classed under a distinct Genus, of which two fossil species are before us.

Neritina differs from *Nerita* very little in the general form of the shell; both genera have a peculiarly formed inner lip, that gives the aperture a semicircular form; and the operculum opens against it as a door upon a hinge. The *Neritinae* have a distinct coriaceous epidermis, and are often ornamented with black stripes spots or bands beneath it; the spire is very variable, sometimes being conspicuous and even very prominent; at others very small, and even concealed. The inner lip* of the aperture is often toothed; it is placed obliquely upon the base of the columella or axis of the spire. This axis, together with the inner part of the spire, and even a part of the lip is removed by the animal in proportion as it proceeds in the enlargement of its shell, whence it appears to have no columella. Like many fresh water shells, some of the species are liable to erosion, particularly at their apices, which are providently thickened to prevent injury to the animal. The recent species are very numerous, the fossil ones all occur in the formations above the London Clay.

* Sometimes called the columella by Lamarck, although he denies a columella to the *Neritacea*.

NERITINA *concava*.TAB. CCCLXXXV.—*Figs. 1 to 8.*

SPEC. CHAR. Obovate, with a prominent obtuse spire; upper part of each whorl concave, aperture semicircular; lip entire.

THE surface of this *Neritina* is elegantly marked with fine zigzag lines of a dark colour, that undulate so deeply as to touch each other at their angles, and thus form the resemblance of a net; the aperture is smaller, and the columella lip less flattened and blunter than in *N. fluvialilis*, the common recent English species, which it has often been taken for;* its markings are also generally much more minute.

A very abundant shell in some parts of the so called upper Marine Stratum of the Isle of Wight; it also occurs at Muddiford, whence the variety fig. 2. was sent me by Miss Beminster. Fig. 5. represents a mutilated specimen found at Highgate, and fig. 8. is remarkable for shewing two kinds of marking upon the same shell.

This species also occurs at Charlton, with the following, but rarely, and always in a bad state of preservation. The operculum is not known.

NERITINA *uniplicata*.TAB. CCCLXXXV.—*Figs. 9 and 10.*

SPEC. CHAR. Subglobose, with a concealed spire, and one plait upon the rather convex columella lip.

No variety of colour decorates this plain looking shell; the apex of the spire is indicated, in specimens that are not worn, only by a sunk point, from which a single curve runs to the aperture: worn individuals shew the turns of the spire; portions of the epidermis remain sometimes of an olive green colour.

Found abundantly in the uppermost stratum of gravel holding shells, above the bed of sand, between Charlton and Woolwich, accompanied by *Melanopsides*, *Cyclades*, *Ostreæ*, &c. being a mixture of marine and freshwater shells: it is also to be met with at Flumstead, and near New Cross, on the banks of the Canal above the London Clay.

* This species has a kind of chamber in it discoverable by removing the end of the spire, that does not occur in the fossil, or any other recent one that I have opened.

PLEUROTOMA priscus.

TAB. CCCLXXXVI.

SPEC. CHAR. Fusiform, turreted, smooth; base transversely sulcated; margins of the whorls striated; lip wing-shaped.

SYN. Murex priscus, *Brander*, 25 et 44. Pleurotoma clavicularis, *Lam. env. de Paris*, 69; *Hist. Nat. des Ann. sans vert.* 7, 98.

THE whorls are slightly convex and smooth, excepting two or three hollow lines, which are most conspicuous in young shells near their upper edges; the base is drawn out almost into a beak; it is blunt and strongly striated, the lip below the sinus is nearly semicircular.

Brander's figure of this shell is far from good, and that in the *Encyclopédie Méthodique* is worse. The former appears to have been overlooked by Lamarck, or he would not perhaps have changed the name.

Common at Hordwell, and near Paris.

 PLEUROTOMA fusiformis.
TAB. CCCLXXXVII.—*Fig.* 1.

SPEC. CHAR. Fusiform elongated, rough, with deep transverse striæ, and obscure longitudinal costæ; whorls subcarinated, with a striated band upon their upper parts; aperture lanceolate.

THE deep striæ leave between them ridges that are roughened, but not regularly crenulated by the lines of growth; the band near the top of each whorl is nearly smooth, but it has arched striæ upon it, following the sinus in the upper part of the lip.

Found at Highgate, but rarely; I have never seen it perfect.

PLEUROTOMA brevirostrum.

TAB. CCCLXXXVII.—*Fig. 2.*

SPEC. CHAR. Turreted, acute, costated, transversely striated; aperture obovate, with a defined beak of equal length; whorls ventricose.

A sharp elegant shell, well distinguished by the shortness of the aperture and beak together compared with the length of the spire; the striæ are strongest upon the middle of each whorl; the beak is slightly curved.

Picked up at Muddiford by Lady Burgoine, to whose kindness I am indebted for the specimen figured.

 PLEUROTOMA lævigata.
TAB. CCCLXXXVII.—*Fig. 3.*

SPEC. CHAR. Turreted, nearly smooth; spire subcostated; whorls ventricose, concave above; aperture elongated; beak produced.

EXCEPTING a few obscure transverse striæ and the lines of growth, this shell is smooth, the last whorl has no costæ; the length of the aperture and beak nearly equals that of the spire.

Highgate Hill has produced this species, but the individuals figured, were found along with the last at Muddiford, by Lady Burgoine.

OSTREA Bellovacina.

TAB. CCCLXXXVIII.—*Fig. 1 and 2.*

SPEC. CHAR. Thick, oblong, wedge-shaped, front rounded; lower valve convex, composed of undulating laminæ, the other flat and plain.

SYN. O. Bellovacina, *Lam. Annales du Mus. VIII. p. 159. XIV. t. 20. f. 1. Hist. Nat. VI. pt. 1, 218.*

As usual with irregular shells; there are hardly two specimens of this Oyster of the same form; it varies from nearly orbicular to wedged-shaped; generally however, having the beak produced with a straight line on each side of it; the depth of the hollow valve is seldom considerable, both valves are thick and strong, but not remarkably so for the size of the shell; and it appears to be of quick growth; the area to which the hinge ligament was attached, is somewhat elevated above the surface of the shell; in the hollow valve it is curved and pointed, and has a deep canal in the middle; the length is about 5 inches.

Many single valves of this Oyster are to be found scattered through the uppermost beds that contain fossil shells, in the Great Sandpit between Charlton and Woolwich, they are among gravel accompanied by Cyclades, Potamides, Neritæ, and Melanopsides in abundance and rarely by Mytili and Arcæ. It does not appear to me to be the same species as the Oyster found close to the Chalk at Reading, as some Geologists have supposed; neither am I aware that the same species is found in the upper Marine stratum on the Isle of Wight, to which the accompanying shells would seem rather to refer the stratum in which it occurs at Woolwich. There is a very peculiar circumstance to be observed in such specimens as have been in contact with pebbles; there are hollows worn deep in their substance, in which the pebbles are imbedded, frequently without cracking the shells, although sometimes the shell is cracked and bent over a large pebble, as if the mass of gravel had been at

some period subjected to a great degree of intestine motion while under so much confinement that the pebbles could not move from their situations, and thus protected the smaller shells that fell into the hollows between them, while they were wearing away such as came in contact with them. Some of the older shells are worm-eaten, but no *Serpula* or *Coraline* has been found attached to them.

OSTREA *edulina* ?

TAB. CCCLXXXVIII.—*Figs. 3 and 4.*

SPEC. CHAR. Suborbicular or obovate; lower valve rather concave, composed of undulating laminae; the other smooth and flat; beak pointed, curved.

Ostrea edulina? *Lam. Hist. Nat. 6. pt. 1. 218.*

A smaller and much lighter shell than the last, although often approaching it in form; the great smoothness of the flat valve and the want of straight lines on the sides of the beaks will serve as distinguishing marks; when several are grouped together, they are apt to be much elongated, and then come very near to *O. tener*, *Min. Con. 252*, of which however both valves are free from undulations.

Very abundant in beds and layers alternating with fresh water shells, among dark coloured clay, forming a thick stratum free from pebbles immediately below that in which the last species occurs in the Sand-pit near Woolwich.

It is very probable that several species are included under the name *edulina* by Lamarek of which this may be one; but it is doubtful and it will ever be difficult to ascertain the point, the shells themselves are so variable.

PATELLA striata.

TAB. CCCLXXXIX.

SPEC. CHAR. Oblong, irregularly conical, with numerous acute radii; umbo forward, sharp.



REMARKABLE for depth and a slight obliquity of form, the radii are slender, numerous, irregularly large and small, and interrupted by the lines of growth; the sides of the shell are often bent inwards, as if by pressure between the sides of a hole or crack in stone; in which case the length is double the width; young shells are nearly flat, they grow high as they encrease in size; and that sometimes without growing either longer or wider, thus acquiring a columnar form: the inside at the same time, is filled up towards the umbo. The apex is sharp, bent a little towards the front.

A single, but uncommonly large specimen of this Patella was found in 1819, at Stubbington, by Jas. Holloway Esq. in the same clay that produced the Cerithium Cornucopia. It is very abundant at Hauteville, in Normandy, but generally only half as large. I have received many specimens through the kindness of Mons.

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de Gerville from thence : some of them are so distorted that their openings are less in circumference than other parts. The specific name *striatus*, was given by M. de France, in a catalogue he returned to M. de Gerville of the shells sent him from the neighbourhood of Valognes.

SCALARIA subulata.

TAB. CCCXC.—*fig. 1.*

SPEC. CHAR. Turrated, subulate; volutions contiguous; costæ many, thick, reflected, the spaces between them smooth.

TEN or twelve thick, well defined costæ, that are broadest at their upper parts, decorate each of the otherways unornamented whorls of this Scalaria; these whorls are close together, although not positively united; there is no umbilicus nor cord around the base.

SCALARIA foliacea.

TAB. CCCXC.—*fig. 2.*

SPEC. CHAR. Turrated; volutions separate: costæ rather distant, slender, broad, leaf-like, reflected.

SYN. Sc. foliacea, *G. B. Sowerby, Genera of Shells, No. 11.*

So nearly does this resemble one of the recent species of Scalaria, that it requires to be closely examined to discover the difference, the ribs are then found to be thin, sharp-edged, and only bent back in the middle, not regularly reflected along their whole length; it has no cord around the base, as in some recent species, which resemble it in having thin costæ; neither has it an umbilicus.

SCALARIA minuta:

TAB. CCCXC.—*figs. 3 and 4.*

SPEC. CHAR. Turrated; whorls contiguous; costæ, about 20 to each whorl, thin, obtuse, slightly elevated.

THIS is less than half an inch long, with smooth whorls, a narrow lip to the aperture and no umbilicus, it strongly resembles Sc. Clathratulus, but the costæ in that species are more numerous and sharp.

Fig. 4 is a magnified representation.

These three species of *Scalaria*, were found in a distinct bed of Crag at Ramsholt by the Rev. G. R. Leathes; the *S. foliacea*, was also found at Woodhall in Suffolk, by the same Gentleman. The great resemblance they bear to recent species is remarkable, but is a character possessed by many of the Fossils found in the Crag; many also agree with those found in the London Clay, amongst them is *Sc. semicostata*,* (M. C. tab. 16) fragments of which have been met with, accompanying the shells before us.

* Probably *Sc. decusata* of Lamarck.

GRYPHÆA gigantea.

TAB. CCCXCI.

SPEC. CHAR. Orbicular, rather smooth; upper valve thin, concave; lower valve convex with a small, sharp, incurved beak; hinge small.

A large, regularly formed shell; the edges of the imbricated laminæ of the lesser valve, are but little elevated; they are even, and placed at regular intervals. The small hinge pit distinguishes this species from *G. dilatata*, tab. 149. The anterior lobe, is separated from the rest of the shell, by a small sinus in the edge of each of the laminæ: The length and breadth are nearly equal, the depth is about one fifth of the length.

In the description of *G. dilatata*, tab. 149, this shell has been unfortunately confounded with that species, owing to the want of such specimens as possessed the specific distinctions; it appears that the one before us, is confined to the inferior, or Iron shot Oolite, while variety α of the *dilatata* belongs to the Clunch Clay and others to the Kelloways Rock.

GRYPHÆA globosa.

TAB. CCCXCII.

SPEC. CHAR. Subglobose, oblique, smooth, thin; beak largely truncated; upper valve immersed, concave.

SYN. *Ostrea vespicularis*, *Lam. Hist. Nat. VI. pt. 1. p. 218.* *Cuvier and Brogniart, env. de Paris, ed. 1822, 383, tab. 3. fig. 5.*

Podopsis gryphæoides, *Lam. Hist. Nat. VI. pt. 1, 195.*

THE large surface by which this shell is generally attached entirely destroys the curved form of the beak, usually met with in a Gryphite; the free portion rises from the substance to which it is attached in a very bold curve almost forming a cup with a concave, immersed lid, but

with much obliquity and the anterior lobe strongly marked ; the sides of the straight hinge frequently have teeth, or crenulations, similar to those that often occur in common Oysters ; besides the principal muscular impression in each valve, there is a smaller one near the hinge, which is much more conspicuous than in any Oyster I have observed it in : this has not escaped the notice of the Artist who drew the excellent figures for Cuvier and Brogniart's Geology of the environs of Paris.

Found in Chalk wherever it occurs, and not confined to the upper beds. It is also met with in the Chalk Marl. Lamarck's unfortunate repetition of this species, under two genera has made it adviseable to give it an entirely new name ; the specific name *vessicularis*, too nearly resembles *vessiculosus*, which has been used elsewhere (see tab. 369) rather inadvertently, but it is to be hoped appropriately. Brogniart's quotation of *G. dilatata*, M. C. 149, it is hardly necessary to observe is quite erroneous, that species never occurs in Chalk.

Our specimens are mostly from Norwich, through the kindness of the Rev. G. R. Leathes ; this is the same place that furnished Smith with the specimens figured in his work upon Strata identified by Fossils.

The Genus *Podopsis*, to which Lamarck has referred this shell, was established by De France, and appears to include the same shells with *Dianchora* of Min. Conchology ; in fact his *Podopsis striata*, is the *Dianchora lata* of Min. Conch. tab. 80. which being taken from an inferior specimen, was probably overlooked ; the characters of the two Genera are of course the same : the shell before us having no opening in the beak cannot be a *Podopsis*.

PECTEN sulcatus.

TAB. CCCXCIII.—*Fig. 1.*

SPEC. CHAR. Obliquely orbicular, with 20 obscurely tripartite rays, the intermediate spaces longitudinally striated, the whole rough with minute scales; internally sulcated; ears nearly equal.

VALVES nearly equal, convex, shorter than wide, with 20 rounding rays; each ray is composed of about three scaly ridges, and between each ray are several lesser, but equally rough ridges, within are 20 furrows corresponding to the external rays; the margin is toothed.

A common Crag Fossil, generally known by the name of *P. opercularis*, although sufficiently distinct from the recent species so called; the internal furrows are a conspicuous character, besides which the striæ upon the ribs are sufficient to distinguish them. There is a species from New South Wales more nearly allied, but in it the spaces between the rays are flat, and transversely striated, but not scaly.

Very abundant in the loose Crag at Aldborough, but rather scarce in the more compact Crag of Sudbourn, and other parts of Suffolk.

PECTEN gracilis.

TAB. CCCXCIII.—*fig. 2.*

SPEC. CHAR. Orbicular, thin, convex, with many small, longitudinal ridges; concentrically striated; striæ close, elevated, sharp; ears unequal; margin entire.

LONGER than wide, every fourth ridge is rather more elevated than the rest, and has an opposed groove within the valve, that is much more conspicuous than those, which, on account of the thinness of the shell, are formed by the other ridges; the striæ are pretty uniform over the surface, and not divided into scales, they are however strongest near the margin.

Two specimens, but of the same valve found in the Crag near Ipswich, were formerly added to my cabinet of Fossils by Mrs. Cobbold, they are extremely fragile.

PECTEN striatus.

TAB. CCCXCIV.—*figs. 2, 3 and 4.*

SPEC. CHAR. Oval, convex; valves nearly equal; with numerous smooth or scaly ridges; within plain; margin entire; ears unequal, rather large.

THE width is five sixths of the length; the ridges are irregular, but nearly equal. In some specimens they have rather distant obtuse crenulations, or scales upon them; in others they are wholly smooth, perhaps from wear: the shell is rather thick and shews within it but slight signs of the ridges.

Found in the Crag at Holywells, by Mrs. Cobbold, and at Woodbridge by the Rev. Mr. Leathes: the specimens with scales upon the ridges, differ in no other respect from the smooth ones, and both are found of various sizes; it is possible the latter may have been worn before they were changed into Crag.

PECTEN nitidus.

TAB. CCCXCIV.—*fig. 1.*

SPEC. CHAR. Obovate, one valve nearly flat, with numerous, nearly smooth ridges, the interstices minutely striated transversely, the other valve convex with as many crenulated ridges; margin entire; ears nearly equal.

SYN. *Pecten nitida*, *Mantell Geol. Sussex, p. 202. tab. 26. f. 4 and 9.*

Pecten cretosus, and *P. arachnoides*, *De France, Brogniart and Cuvier Geo. de Paris 383 and 384. tab. 3. f. 7 and 8. ed. 1822.*

A rather broader shell than the last, much resembling it, but well distinguished by the fineness of its concentric striæ, the flatness of one valve, and thinness of both valves; the ridges upon the convex valve are decidedly crenulated or granulated, while those of the other are mostly smooth, a circumstance that has apparently led Mr. De France to make two species of them.

By no means a rare Shell in Chalk, but so excessively thin that it is seldom found perfect; the dissimilarity of the two valves is proved by specimens in which they still remain applied together, probably M. de France never met with a pair, or he would have observed this; the flatter valve is sometimes nearly as convex as the other.

TURBO moniliferus.

TAB. CCCXCV.—*fig. 1.*

SPEC. CHAR. Short, conical, transversely striated, umbilicated; whorls separated above by a canal, their edges granulated; umbilicus large, wrinkled.



THE length and breadth of this shell, are nearly equal; the base is rather conical; the striæ are prominent, simple upon the base, but granulated and less numerous upon the spire; the umbilicus is granulated within, the edge of it is undulated.

The large umbilicus would induce us to place this species under the Genus *Delphinula*, were the lips of the aperture separated from the preceding whorl: it is found replaced by *Calcedony*, in the Greensand of Blackdown in Wiltshire.

TURBO sculptus.

TAB. CCCXCV.—*fig. 2.*

SPEC. CHAR. Conical, with minute longitudinal striæ and deep transverse sulci; whorls rounded, separated above by a canal; umbilicus small; aperture sulcated within.

SYN. Turbo sulcatus, *Pilkington, Linn. Trans. VII. p. 118. tab. 11. fig. 9.*

VERY similar in form to *Cyclostoma elegans*: the aperture is obovate rather than round, thus it is not strictly a Turbo; it has not the reflected margin of a *Cyclostoma*, but has a small slightly recurved expansion near the umbilicus, similar to that part of the lip in *Scalaria*. The upper part of the aperture has an angle corresponding with the upper edges of the whorls; the length is greater than the width.

Not rare at Barton; I have received good specimens from several kind Friends. It has been necessary to change the specific name given by Mr. Pilkington, for it has already been twice used in the same Genus by Gmelin, &c.

The two shells before us do not, it must be owned, agree precisely with the characters of the Genus Turbo, as they are given by Lamarck, but the discrepancy is not sufficiently great to warrant the placing them in any other, they form a passage towards *Delphinula*, from which however the sculptus is quite distinct, and they are so nearly allied to each other, that it would be doing a violence to nature to separate them.

VOLUTA Athleta.

TAB. CCCXCVI.—*figs. 1, 2, and 3.*

SPEC. CHAR. Rhomboidal, ventricose, acute, crowned with large spreading spines; base obscurely sulcated; columella with 3 unequal folds; lip plain within.

SYN. Strombus Athleta, *Brander 66.*

A SHORTER and smoother shell than *V. Luctator*, from which it may also be distinguished in all ages by its large spreading spines, smooth and rather ventricose body, with irregular costæ; when full grown it is smaller than *Luctator*, but thicker in proportion; the edges of the whorls in young shells, have a few imperfect spines, besides those upon their upper parts. Middling sized specimens of this *Volute* are common at Barton; large ones like *fig. 3.* are scarce; I am indebted to the Rev. T. Cooke for the one there represented. It does not appear to be known in France.

VOLUTA depauperata.

TAB. CCCXCVI.—*fig. 4.*

SPEC. CHAR. Ovato-rhomboidal, acute, costated, crowned with one series of erect spines; base sulcated; columella with one fold; lip smooth within.

SYN. Strombus Luctator, *Brander 67.*

STRONGLY resembling *V. spinosa*, but furnished with only one row of spines around each whorl, and they are a little flattened; it has a few yellowish stripes across it, like the French specimens of *V. spinosa*.

First distinguished by Miss Beminster, to whom I am indebted for the specimen: it was found at Barton. We have but little doubt of the above *Synomina* being correct.

VOLUTA Luctator jun.

TAB. CCCXCVII.

SPEC. CHAR. Ovato-elongated, acute, costated, crowned with one row of large and another of small, short, acute, spines, transversely sulcated; columella with three or more folds; lip often plaited within, its edge crenulated.

SYN. Strombus dubius, *Brander* 63. V. Luctator *Min. Conch.* 115, *f.* 1.

A HANDSOME regularly formed shell, covered uniformly below the spines, with broadish flat furrows and minute longitudinal striæ, or lines of growth; the superior row of spines consists of small and irregular ones; the last whorl is not ventricose.

Very abundant at Barton: the only actual difference between the *Voluta dubia*, and the *Luctator* *fig.* 64. of *Brander*, appears to consist in the plaits within the lip; a series of specimens from the figures before us, to figure 1 of table 115. and even larger is easily obtained, in which most of the small and middle sized ones will be found to have plaited lips, while in the large ones the lips are smooth and thin, but even in these there are sometimes indications of plaits, especially at some distance within the edge, leaving the only character very equivocal. Although *Lamarck* quotes *Brander's* *S. Luctator*, his *V. musicalis* is a longer and quite different shell, a circumstance we were not aware of, when we figured the former. *Brander* himself, or *Solander*, has confounded *V. spinosa*, which *Lamarck* has properly separated, and *V. depauperata*, above described, with *Luctator*, although they are both more ventricose, and have no furrows upon the upper parts of their whorls; for the contrary reason the *V. spinosa* β . of *Min. Conch.* tab. 115. *fig.* 3. ought perhaps to be considered a species rather than a variety; there occur however intermediate forms.

VOLUTA ambigua.*

TAB. CCCXCIX.—*Fig. 1.*

SPEC. CHAR. Ovato-elongated, acute, costated, transversely sulcated; costæ angular, above; spire rough; columella with three plaits; lip plaited within, its edge granulated, aperture narrow above.

SYN. *Strombus ambiguus*, *Brander 69.*

RATHER longer shaped than the young of *V. Luctator*, in consequence of the narrowness of the aperture at the upper part; the spire is made rough by a row of small imperfect spines upon the upper edges of the whorls and the angles upon the tops of the costæ.

A distinct and easily recognized shell, although very like the last. It abounds in the Cliff at Barton. Brander's most excellent figure is from a younger individual than the one purposely chosen for the present table, and has consequently the parts sharper defined. It is not sufficiently clear that Lamarck's *V. bicorona* is the same species; I have never met with the true *V. ambigua* from France.

VOLUTA nodosa.

TAB. CCCXCIX.—*fig. 2.*

SPEC. CHAR. Ovate pointed, obscurely costated, transversely sulcated; spire with two rows of nodiform spines; columella with three folds; lip striated within.

THE very blunt short spines, deep and numerous sulci, and oval form at once distinguish this *Volute*.

Discovered above a twelvemonth ago, by Miss Beminster in the Barton Cliff; the specimen figured enriches the cabinet of the Rev. T. Cooke; one sent by Miss Beminster is not quite so ventricose; in its young state the knobs are more conspicuous, particularly the row of smaller ones upon the edges of the whorls.

* *Voluta ambigua* Miu. *Conch.* t. 115. 5. is *Murex suspensus* of Brander, see its *Sp. Char.* p. 137.

VOLUTA *geminata*.TAB. CCCXCVIII.—*fig. 1.*

SPEC. CHAR. Ovate, ventricose, pointed, costated; costæ terminated by two obtuse connected spines; columella with one large and several small plaits, curved.

REMARKABLY ventricose, with very prominent ribs; it differs from *Voluta Cithara* of Lamarck, in general form and size, but particularly in its fœtal state, in which it is very minute and pointed, as may be seen upon the apex of the spire.

Discovered by Charles Lyell, jun. Esq. in Clay pits at Lyndhurst, Hants. It also occurs in the neighbourhood of Paris, but does not appear to have been described.



VOLUTA *Lima*.
TAB. CCCXCVIII.—*fig. 2.*

SPEC. CHAR. Ovato elongated, acute, costated, and transversely striated; costæ numerous, dentato-crenated; upper edges of the whorls toothed; columella with three unequal folds; lip smooth within, its edge crenulated.

SYN. *Buccinum scabriculum*, *Brander*, 71.

BETWEEN the teeth upon the edges of the whorls and the upper ends of the costæ is generally a broadish, flat, or concave, space, and around the spire is a canal which separates the edges of the whorls.

Voluta crenulata of Lamarek is a much larger shell, and has no canal round the spire, in other respects it so nearly resembles this, that it is strange Lamarek should refer to Brander's *Murex suspensus*, rather than to his *Buccinum scabriculum*, as synonymous with it.

An extremely common shell at Barton. We are obliged to change Brander's name, not only because he has used the same for another shell, but because also they both differ from that to which Linneus applied the name, and to which Brander refers.

VOLUTA suspensa.

Vol. 2.—TAB. CXV.—*Fig. 5.*

SPEC. CHAR. Ovate, pointed, obscurely costated, transversely striated; spire with a broad canal around it bounded by an erect, flat, dentated crown; base produced.

SYN. *Murex suspensus*, *Brander*, 70.

THE striæ around the base are sharply elevated, the rest more distant and sunk except the one, at the top of the ribs which rises in minute sharp spines.

We are indebted to the Rev. T. Cooke, for a specimen of this rare Barton shell, that proves what we formerly called a monstrosity of *Voluta ambigua*, to be the *Murex suspensus* of Brander, but his figure is so small, that its characters are obscure. The above description was therefore necessary to complete the account of the Genus *Voluta*, and must consequently supply the place of that before given with the figure.

FUSUS errans.

TAB. CCCC.

SPEC. CHAR. Oblong-ovate, conical at both ends, transversely striated; whorls bicarinated; upper carina largest.

SYN. *Strombus errans*, *Brander*, 42.

BESIDES the principal carinæ, there are several lesser intermediate ones that do not materially interfere with the general outline; the transverse striæ are elegantly decussated by minute lines of growth, especially above the largest carina; the aperture is oblong, angular towards its upper part; the columella nearly straight; some specimens are less ventricose than others, but all of them have more than one keel, by which, and its size this species differs from *F. bifaciatus* (M. C. t. 228).

Not a very common production of Barton or Hordwell Ciffs; Miss Beminster has however liberally supplied us with a series.

J. Holloway Esq. has also found it at Stubbington, and sent me several individuals filled with Pyrites.

It appears to be unknown in France.

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MITRA, Lamarck.

GEN. CHAR. A turreted subfusiform univalved shell, with an acute spire, a notched but not chancelled base; and parrallel plaits, of which the lowest are smallest, upon the columella; inner lip of the aperture thin, connected with the columella.

THIS Genus is composed of shells, long ago recognized by Collectors as different from Volutes, and appears to be a very natural one, distinguished by the elongated subfusiform contour of its members. The plaits upon the columella form the essential character; but the pointed apex, upon which so much stress is laid by Lamarck, can hardly be admitted as a distinguishing mark, since we find it very serviceable as a specific distinction between Volutes, otherways very nearly related together, and wholly unlike Mitres (see *V. geminata*, t. 398.)

The recent species are often very elegantly colored, and variously ornamented with striae, tubercles, &c. they have a thin epidermis.

Fossil species are numerous abroad, but only one English species has been described; even that if we were willing to multiply Genera, might perhaps form with *M. monodonta*, a new Genus.

MITRA scabra.

TAB. CCCCI.

SPEC. CHAR. Ovato-fusiform, rough with decussating striæ; lip thickened, with one obtuse tooth upon its margin.

SYN. Buccinum scabricalum *Brander, f. 20.*

SHARP, elevated, transverse striæ, crossing many irregularly elevated undulations and lines of growth, render this a rough shell; the principal folds upon the columella are four, not very unequal in size; above them are two slender ones, which however are often wanting: the thick lip is remarkable, especially as it is so irregularly thickened, that the part opposite the two smallest plaits, is thinner than any other; and immediately below it is so thick as to form a kind of blunt tooth: in this it agrees with *Mitra monodonta* of Lamarck, a very similar but smooth fossil: the apex of the spire consists of two smooth whorls, and is nearly globular, being the form of the shell in the egg; *M. monodonta* has the same conformation. When young the lip is thin.

A common shell at Barton; the Rev. T. Cooke favored me with the use of a particularly perfect specimen, from which the larger figures are taken. It is very different from the *Voluta (Mitra) scabriculum* of Gmelin, to which Brander has referred.

TELLINA Branderi.

TAB. CCCCH.—*fig. 1.*

SPEC. CHAR. Obovate, depressed, smooth, with a small sinus on the anterior margin; beak rather prominent.

SYN. *Tellina bimaculata*, *Brander, f. 102.*

Not quite equilateral, the posterior side is longest, and also most regularly rounded; the marginal fold forms a slight sinus; it differs from the recent *T. bimaculata* in the form of the anterior side, which is rounded, not truncated, and in several particulars observable on comparison.

As I have only met with a single valve of this shell, I suppose it is rare. The Rev. G. Cooke, kindly sent it from Barton.

TELLINA filosa.

TAB. CCCCH.—*fig. 2.*

SPEC. CHAR. Obovate, depressed, transversely striated; anterior side angular; posterior rounded; striae elevated, acute, numerous, enlarged anteriorly.

A SLENDER Tellin covered with concentric striae resembling very fine threads; the marginal fold forms a slight elevation that ascends to the beak, and as the striae pass over this elevation, they are thickened, curved, and compressed; there is a slight truncation of the edge near the fold, but no sinus. This appears to be a species between *T. patellaris*, and *scalaroides* of Lamarck.

Found in the sandy Clay at Barton, by the Rev. T. Cooke, by no means common.

TELLINA ambigua.

TAB. CCCCHI.

SPEC. CHAR. Oval-elongated convex, obscurely sulcated; right valve thickest, curved, and with only one hinge tooth.

NEARLY twice as wide as long, rather unequalvalved; the right valve is more convex, and thicker than the other; both extremities are equally rounded, and the beaks are not prominent; the remote teeth are obscure in the right valve, but very prominent in the other: the marginal fold is very obscure, it may however, be traced in the left valve; the sulci are always deepest about the sides, but are sometimes almost obliterated.

In its general aspect, this much resembles a *Psam-mobia*, (tab. 342.) but the lateral teeth and sinus in the impression, distinguish it from that Genus; whether it be a genuine *Tellina*, may remain a doubt: Brander's fig. 93, may possibly be meant for it, but as it differs much in form, I would not venture to refer to it.

Sent by several Friends from Barton Cliff, where it must be common: it appears to be gregarious, and is mixed with an abundance of *Mya plana*, (tab. 76) Professor Sedgwick also found it in Colwell Bay, on the Isle of Wight.

AMMONITES Plicomphalus.

TAB. CCCCIV.

THIS figure represents the young state, or what amounts to the same thing, the inner whorls of an Ammonite formerly given at tab. 359, but has so different an appearance, that it would not be suspected to be the same, were they not found united in one specimen, which has been proved by breaking the one first figured; and shews the necessity of adding to the specific character that the front is, *in the young state transversely furrowed*. This specimen is also from Bolingbroke.

AMMONITES mutabilis.

TAB. CCCCV.

SPEC. CHAR. Depressed; outer whorls compressed, plain and smooth; inner whorls two thirds exposed, tuberculated, plicated; plicæ interrupted over the front; aperture ovato-sagittate.

IN the young state, the front of this Ammonite, has a narrow, flattened space around it, from which numerous very neat plicæ spread half way over the sides; next to these, a single row of compressed tubercles is placed, the inner margin of the whorl is smooth: when the shell is about two inches in diameter, the tubercles cease to be formed; but the plicæ continue until it is six inches over, when they also gradually disappear, the front becomes rounder, and the sides quite plain, and compressed rather obliquely towards the front, so as to give the aperture a blunted sagittate form; the septa are rather close, and sharply sinuated; the shell pearly; there are at distant intervals contractions in the whorls, that have been probably formed by an inflected or thickened lip, at successive periods of growth.

The figures represent a small individual shewing the ornamental part of the shell, and a portion of a large specimen, measuring ten inches in diameter, and of which the greatest thickness is an inch and an half; I am indebted to George Wier, Esq. for them, they were produced by the Clunch Clay near Horncastle.

There appears to be no regular rule amongst Ammonites for their change of form, some becoming more

globose, and others more compressed by age; but they generally lose some of the ornaments from their last whorls, and in their infant state are also smooth, or free from tubercles, bearing some analogy to the higher orders of the animal creation, whose middle ages are generally the most beautiful. No species perhaps undergoes a greater change than the one before us, wherefore it is named *mutabilis*:

AMMONITES *subarmatus*.

TAB. CCCCVII.—*fig.* 1.

SPEC. CHAR. Depressed, concave, ribed, inner whorls almost wholly exposed; ribs curved, often united in pairs by smooth spines; aperture transversely oblong, arched.

SYN. *Ammonites subarmatus*, *Young and Bird, Geol. of Yorks.* p. 250. t. 13. f. 3.*

UPON the last formed whorls of this shell, the spines disappear, and the ribs which in the former whorls are generally split before they pass over the front, are not so often divided; the spines continue nearly to the centre, they are hollow, and leave when the shell is removed, a blunt cast, but not a truncated tubercle as in the *A. fibulatus*; the whorls have convex sides and increase rather rapidly; they are contracted in some parts, in the same manner as the last.

It is probable that there are several species allied to this, but it will require numerous specimens of each to prove that they are not varieties: the *A. perarmatus*† of Young and Bird, is one thus doubtfully situated, but most probably it is a variety of the *subarmatus*.

Found at Whitby.

* It is hoped that the late Mr. Sowerby's veracity and credit, need no defence against the attacks and false surmises of the arrogant, the Authors of the Yorkshire Coast, had not been farther noticed, but that, when names are given to shells, their Publishers must be quoted, and where any merit exists, it should not be overlooked.

† We had not seen the *Geol. of the Yorkshire coast*, when *A. perarmatus*, tab. 352 was published.

AMMONITES fibulatus.

TAB. CCCCVII.—*fig. 2.*

SPEC. CHAR. Depressed, ribed; inner whorls almost wholly exposed; sides of the whorls flattened, their inner margins plain; ribs numerous, united in pairs by smooth spines; aperture oblong.

SYN. *Ammonites armatus?* *Young and Bird, Geol. of Yorkshire, p. 250, t. 13, f. 9.*

THE remarkable flatness of this shell, is increased by the spines filling up at intervals, the concave space around the whorls; there are now and then, ribs that pass over the front without uniting with spines, these ribs are more numerous in the latter whorls, and even alternate with the spines; each rib when it leaves the spine is found divided into two, so that there are a greater number passing over the front, than exist upon the sides.

Found at Whitby, where it is not of very rare occurrence. The smooth spines distinguish it well from *A. armatus* of Min. Conch. tab. 95. but like it they are composed of solid shell, and when broken off, leave a flat-ended tubercle, compared, together with the ribs, by Young and Bird, to a button and loop, whence its name.

AMMONITES *Smithi*.

TAB. CCCCVI.

SPEC. CHAR. Depressed, ribed, and keeled; inner whorls few, almost wholly exposed; ribs slightly curved; keel obtuse; sides flattened; aperture oblong.

A BEAUTIFUL pearly species that seldom acquires a diameter of two inches; the flatness of its last whorls, distinguish it, independently of size, from others similarly figured; in its infancy, (see fig. 1.) it is wholly plain and almost globose, with an umbilicus; as it grows, its ribs appear gradually in short risings near the umbilicus; the keel is next formed, and at length the whorls assume their flat shape, and the ribs their full extent; figs. 2, 3 and 4.

Occurs sparingly dispersed through the same stone as *A. planicostatus** (tab. 73,) and is mentioned at p. 168 of Vol. I.

This is named in honor of Mr. W. Smith, the Author of a Geological map of England, &c. whose discovery of the regular succession of the strata, and the means of distinguishing them by their organized contents, has laid the foundation for all our Geological knowledge of England.

I have taken this opportunity of adding a portion of the outer whorl of an old shell of *A. planicostatus*, (see fig. 6.) to shew that by age it acquires spines upon the sides of the flattened portion of each rib, a circumstance that ought to be noticed in the specific character.

Figs. 5, 6, and 7, are several states of *A. planicostatus*.

* So the name should have been spelt.

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CORRIGENDA.

We are indebted to Mr. Farey, for pointing out to us that several names given in the course of this Work, had been used before by other Authors; we therefore are obliged to alter them, which we propose to do as follows.

Cerithium Melanioides tab. 147 to be *Potamides politus*.

Trochus concavus tab. 181 — *T. angulatus*.

granulatus tab. 220 — *T. arenosus*.

sulcatus tab. 220 — *T. prominens*.

bicarinatus tab. 221 — *T. Tiara*.

ornatus tab. 221 — *T. Pallium*.

concavus tab. 272 — *T. Sedgwicki*.

Fusus acuminatus, tab. 274 fig. 1 to 3, should be *F. aciculatus*, and *Lamarck Env. de Paris*, 57, added to the Synonyma.

CORRIGENDA.

- Page 1, line 11, after flat, add (fig. 4.) and after hollow, add (fig. 3.)
- 1, line 8, from the bottom, "Vol. I." read "Vol. II."
- 2, line 5, from the bottom, "Lyme" read "Lime."
- 9, line 2, "SPEC." read "GEN."
- 10, line 12, "on the Isle of Wight" read "near Weymouth."
- 13, line, 1, "rugatus" read "rugata."
- 15, line 6, from the bottom, "Anomites semistriatus" read "Anomites semireticulatus."
- 15, line 17, for "connexion" read "connection."
- 21, line 4, from the bottom, "Breden near Derby" read "Ereodon Leicestershire."
- 39, line 4, from the bottom, "top" read "to."
- 46, line 1, "BULMIMUS" read "BULIMUS."
- 46, last line but one, after "Jas. Holloway" add "Esq."
- 48, line 13, "Melanioides" read "politum."
- 50, lines 2 and 5, from bottom, "Melanioides" read "politus."
- 63, line 4, from the bottom, add "?"
- 65, line 5, from the bottom, "27" read "7."
- 72, line 10, "the outside" read "on the outside."
- 77, line 6, "Ammonites" read "Nautilus."
- 78, line 16, "Maltor" read "Malton."
- 93, line 8, from the bottom, "vessiclosa" read "vesiculosa."
- 100, line 4, "Lent" read "Sent."
- 104, line 5, "juncius" read "junceum."
- 115, line 3, from the bottom, "stia" read "striae."
- 119, line 1, "priscus" read "prisca."
- 126, last line, "decustata" read "decussata."
- 127, line 10 from the bottom, "vessicularis" read "vesicularis."
- 127, line 9, from the bottom "218" read "219."
- 128, line 16, "vessiculosus" read "vesiculosa."
- To the description of *GRYPHÆA gigantea*, p. 127, tab. 391, the following paragraph should be added:

Good specimens of this large Gryphite have lately been furnished me, and have served for the figure before us, by our esteemed Friend, James Cleland, Esq. who obtained them from Church-down Hill Quarry, Gloucester; it varies in size from 2 to 10 inches in width, but constantly maintains its characteristic form: *Belemnites* and enormous individuals of *Pecten equivalvis*, tab. 136, are abundant with it.

Additional localities are inserted in Mr. Farcy's Supplementary Index; where also several corrections of the names of Places will be found

A
SUPPLEMENTARY,
OR STRATIGRAPHICAL INDEX
TO VOL. IV.

Arranging the SHELLS described therein, according to the several STRATA in which they were found imbedded, from the newest towards the oldest in the British Series.

Howland Street, April 21st, 1823.

GENTLEMEN,

ON presenting to you a continuation of those *Stratigraphical Indexes* to the Volumes of "Mineral Conchology," which I have been used to prepare for my highly valued and lamented Friend, your late Father, I cannot avoid expressing the great satisfaction I feel at seeing, how well the indefatigable and able Instructions of my departed Friend, and the large collection of Specimens and materials which he has left in your possession, is enabling you to continue, to support with credit and increasing usefulness, the important work in aid of British Geology, which Mr. Sowerby set on foot, more than ten years before his decease.

In your youthful energy and love of the subject, and in the zeal and abilities of your many kind Contributors, I see with pleasure an assurance, that "Mineral Conchology" will continue its progress, until at length, it embraces every species of Shell, which can in the meantime be found imbedded, in each one of the Strata of Britain;—when this shall be accomplished, and the rich stores of British Fossil Shells, thus classified, recorded and rendered comparable, shall have been compared by the Geologists of other countries, with the shells which the Strata thereof may entomb, then, I am of opinion, will Geological truth appear, and the last remains of visionary and wild Theories on the subject, entirely vanish; by which Theories, until Mr. Smith (in 1792) commenced his practical investigations, and mapping of the English Strata, the subject was obscured, and by which, unfortunately, many parts of it are yet disfigured, and the truths of nature concealed.

As an instance, I will beg to advert here, to the manner in which Writers still cling to the unfounded dogma of an age gone by, which asserted, that "our coal-measures exhibit only *fresh-water* and land productions!" in despite of the evidence, which Shells recorded in your pages, of the several Genera *Ammonites*, *Anomia*, *Cardita*, *Conularia*, *Euomphalus*, *Lingula*, *Mytilus*, *Orthocera*, *Pecten*, and *Terebratula* furnish, to the contrary of such assertion; which I know to be an unfounded one, from having seen fossil Shells, of probably four times as many Genera, esteemed *marine* ones, as are mentioned above, and very numerous Species of many of these, the individuals of which are innumerable scattered through the coal series, in particular districts, in the east of Sutherland and of Dumfries Counties, in particular: and I believe that such shells are in few Coal-districts wanting, if industriously sought after.

More than four years ago, on considering the Maps by *M. Halloy*, and by Messrs. *Curcier* and *Brongnart*, of the environs of Paris, it occurred to me, that the gypseous and other anomalous Strata, producing Bones of Quadrupeds, alleged *fresh-water* Shells, &c. in the vicinity, and southward of Paris, are referable to *unconformable patches of Strata, of a very modern era*, compared with the strata analogous to the London Clay and Deep-Well series, and the upper and lower Chalk, all of whose southern edges these anomalous strata locally cover. On considering also, soon afterwards, the Map and Sections of the Isle of Wight by *Mr. Webster*, I clearly perceived there, the same unconformableness (and have often since mentioned the same to my Friends:) and so with regard to the patch of strata, since alleged to contain *fresh-water* Shells, on and to the northward of Hordwell-cliff.

From what Mr. James D. C. Sowerby, has lately stated to me, I see reason also to think, that a small unconformable patch of these anomalous Strata (which I shall continue to call the *Cowes Rock*, because there, my departed Friend Mr. Sowerby *first* noticed and enriched his Cabinet, with the peculiar Shells of these strata) rests upon the edges of the London Deep-Well Strata, in the vicinity of Charlton near Woolwich: also, since compiling the stratigraphical Index to your third Volume, I have perceived, that the patch or patches of Crag-Marl in Essex, Suffolk and Norfolk, by lying upon the edges of the London Clay, and of its deep-well Strata, shews, that the *Crag* must be referred to comparatively *modern, unconformable strata*; but whether of the same, or a more antient or more recent era, than those of Paris, and the Isle of Wight &c. above mentioned, I pretend not to say, but for the present shall continue to distinguish them, and place the Crag the lowest.

I have been much pleased to see Messrs. Conybeare and Phillips* introducing a set of *Terms*, for denominating the ORDERS or greater Divisions of the British Strata, five in number, which, if generally adopted, would free us from the use of those mischievously theoretic terms and distinctions, *Primary, Transition, Flötz, independant Coal, Flötz-trap, Secondary, &c.* and rid us of the many futile disputes, to which they have given rise, and which they seem calculated to perpetuate in Geological writings: the *Orders* of Mr. Conybeare are accordingly introduced in the following Index.

As far as I could, I have availed myself of the excellent and cheap *County Geological Maps of Mr. Smith* (which are publishing by Mr. Cary, and sold separate) and of his Geological Table and Sections, and his other Publications, in ascertaining the stratigraphical places, from the Geographical places, of the several Shells described in this Volume; and have little attended to, many corrections which have, as appears to me, been rashly offered, and continue to be repeated or varied, almost monthly, as to the super-position or succession, and the Names, of some of the English Strata, and as to their courses across, or their detached appearances, in different parts of the country.

The number of *Species* of Shells named in the present Volume is 148, besides 4 varieties distinguished by Mr. Sowerby by β , but which nevertheless belong, to the *same strata* as their relative Shells marked *a*; in addition to which, I have been induced to propose the separation of 12 other varieties, partly on account of their belonging to *different Strata*; making thus 160 *Species* (or varieties) belonging as I believe to distinct Strata, described in the present Volume.

In the 46th, 52nd and 59th Volumes of the "Philosophical Magazine," Dr. Tilloch has done me the favor to insert *geographical Indexes*, to the three former Volumes of your *Min. Concl.* and in a few days I intend to forward to him, a similar Index for the present Volume; which will describe the local situation and the place in the Strata, of each Shell figured herein.

I beg to add

A continuation of, and additions to the TABLES in pages 243 of Vol. II. and 188 of Vol. III; particularizing such species of SHELLS, as are in the four Volumes of this Work, and in Mr. Smith's two unfinished Works on Fossil Shells, referred to more than one STRATUM; In the Index which follows, these multistratator SHELLS are distinguished by the Greek Letters α and β , unless otherwise mentioned below.

Genera.	Species.	No. of Species,	Vol.	Page.
		or Strat. Var.		
Ammonites	Grenoughi	2	II	71
	jugosa	2	I	207
	Parkinsoni, α , β & γ	3	IV	182
Dentalium	cylandricum	2	I	178

* In their "Outlines of the Geology of England and Wales," p. vi. &c.

Genera.	Species.	No. of Species, Vol. Page. or Strat. Var.
Gryphæa	columba	2 IV 113
	incurva, δ , ϵ , ζ , & η	7 II 23
Lima	gibbosa	3 II 129
	γ	2 IV 118
Nucula	similis	2 II 267
Patella	laevis	2 II 86
	striata	2 IV 123
Pinna	tetragona	2 IV9&10
Planorbis	hemistoma	2 II 91
Potamides	politus	2 II 109 & IV 50
Productus	lobatus	2 IV 16
	Martini	2 IV 15
Rostellaria	Parkinsoni, α , β , γ & δ	4 IV69&70
Terebratula	intermedia, ϵ & ζ	6 I 43
	resupinata	2 IV 25
Trochus	Anglicus, α β & γ	3 II 95
Unio	Listeri	4 II 123

I remain, Gentlemen, your obedient humble Servant,

JOHN FAREY.

To Messrs. James D. C. and Charles E. Sowerby.

SUPPLEMENTARY INDEX TO VOL. IV.

A Stratigraphical List of STRATA, SHELLS and PLACES;
BY MR. JOHN FAREY.

I. SUPERIOR ORDER of STRATA, according to *Mr. Conybeare*.
DILUVIA, or ancient water-moved ruins of Strata: Ante-Human Gravel; in low situations it is frequently covered by, and superficially mixed with *Alluvia*, or more recent Gravel.

Tab.

Axinus obscurus.....	314, 3 up.	Selby (in a Yellow Line Bolder?)
Pecten cinctus	371,	Horncastle, and Suffolk, (in under Oolite?)
Terebratula affinis	324, f. 2.	Horncastle, (in Derb. P. Lime?)
COWES ROCK; unconformable Strata, containing alledged <i>fresh-water</i> Shells: Headen Hill, top of Hordwell Cliff, &c.		
Bulimus costellatus	366,	Shalcombe.
ellipticus	337,	Shalcombe.
Corbula cuspidata	362, f. 4 to 6.	Colwell Bay, and White-Cliff Bay.
nitida	362, f. 1 to 3.	Colwell Bay, and White-Cliff Bay.
Limnea longi-scata	343,	Headen-Hill, & near Paris.
Mya? gregarea	363,	Calbourn, & Headen-Hill.
Potamides acutus	341, f. 2.	Isle of Wight.
? cinctus	340, f. 1.	Headen-Hill, & near Paris.
duplex	340, f. 3.	Headen-Hill.
? margaritaceus	339, f. 4.	Isle of Wight.
? plicatus.....	340, f. 2.	near Paris, & Isle of Wight.
ventricosus	341, f. 1.	near Paris, & Isle of Wight.
Psammobia solida	342,	Headen-Hill, & Isle of W.

CRAIG MARL; soft, irregular, unconformable Limestone; in E. parts of Essex, Suffolk and Norfolk: superficially mixed with diluvial gravel.

- Acteon Noë *t.* 374, Walton-le-Soken.
 Auricula pyramidalis 379, f. 1 and 2 Holywells and Suffolk.
 Buccinum mitrula 375, f. 3. Ramshalt.
 sulcatum 375, f. 2. Ramshalt.
 Corbula complanata 362, f. 7 and 8. Roydon-Green.
 Cypræa avellana 378, f. 3. Suffolk.
 coccinelloides 378, f. 1. Suffolk.
 retusa 378, f. 2. Suffolk.
 Mya arenaria 364, Holywells, and Norfolk.
 Natica patula 373, 3 *lo.* Holywells.
 Pecten gracilis 393, f. 2. Holywells.
 striatus 394, f. 2 to 4. Holywells.
 sulcatus 393, f. 1. Aldborough and Sudbourn.
 Scalaria foliacea 390, f. 2. Ramshalt and Woodhall.
 minuta 390, f. 3 and 4 Ramshalt.
 subulata 390, f. 1. Ramshalt.
- LONDON CLAY, upper, blue or Septarian Clay: the lower beds plastic, and mostly red and white mottled: Billericay, Maiden, Harwich, Barnet, &c. (on *Mr. Smith's Maps*, *colour'd, dun-blue*, and in his Geological Table, *numbered 1 and 2.*)
- Ampullaria ambulacrum 372, Hordwell, Muddyford and Stubbington.
 Ancilla subulata 333, Brambles-Chine, Christchurch, Grignon, Lyndhurst, and Isle of Wight.
 Astarte rugatus 316, Highgate.
 Axinus angulatus 315, White-conduit Ho. Tunnel, and Vauxhall Road.
 Buccinum juncum 375, f. 1. Barton and Highgate.
 Cancellaria evulsa 361, f. 2 to 4. Barton, Lyndhurst, and near Paris.
 læviuscula 361, f. 1. Barton, Highgate, Lyndhurst, & Normandy, N.E.
 quadrata 360, Barton.
 Cardium porulosum 346, f. 2. Barton, and near Paris.
 turgidum 346, f. 1. Barton.
 Chama squamosa 348, Barton, near Paris.
 Crassatella plicata 345, f. 2. Bartley-Lodge.
 sulcata 343, f. 1. Barton.
 Fusus errans 400, Barton, Hordwell and Stubbington.
 Mitra scabra 401, Barton.
 Murex argutus 344, Barton.
 Natica striata 373, 2 *up.* Barton, and France.
 Nantilus regalis 355, Hyde-park and White-conduit-Ho. Tunnels.
 Neritina concava α 385, f. 8. Highgate, and Muddyford.
 Patella striata α 389, Stubbington.
 Pinna affinis 313, f. 2. Bognor Rocks, & Highgate.
 arcuata 313, f. 3. Highgate.
 Pleurotoma brevisrostrum 387, f. 2. Muddyford.
 fusiformis 387, f. 1. Highgate.
 lævigata 387, f. 3. Highgate and Muddyford.
 prisca 386, Hordwell, & near Paris.
 Potamidés rigidus 338, f. 1 to 4. Barton.
 Pyruia nexilis 331, Barton, and Grignon.
 Rostellaria Parkinsoni β 349, f. 3 and 4. Bognor-Rocks, Harwich, and Highgate.
 3 *mid.*
 Sigaretus canaliculatus 384, Bourdeaux, Hordwell, & near Paris.
 Tellina ambigua 403, Barton, Colwell-Bay (Beach).

Tellina Branderi.....	t. 402, f. 1.	Barton.
filosa	402, f. 2.	Barton.
Trochus monilifer	367,	Barton, Hordwell, & near Paris.
Turbo sculptus	395, f. 2.	Barton.
Voluta ambigua*.....	397, f. 1.	Barton.
Athleta	396, f. 1 to 3.	Barton.
depanperata	396, f. 4.	Barton.
geminata	398, f. 1.	Lyndhurst, & near Paris.
lima	398, f. 2.	Barton.
Luctator jun.	397,	Barton.
nodosa	399, f. 2.	Barton.
suspensa*	(115, f. 5 and 3.)	Barton.
LONDON DEEP-WELL Strata; Loams, Sands and Nodules, mostly of Chert: Woolwich, Newbury, Ridge-Hill, &c. (<i>light brown</i> , No. 3 & 4.)		
Melanopsis fusiformis	332, f. 1 to 7.	Charlton (new), Courtagnon, Grignon, Hordwell (beach), New-Cross, Isle of Wight, and Woolwich S. W.
subulatus.....	332, f. 8.	Isle of Wight.
Neritina concava β	385, f. 1 to 7.	Charlton, and Isle of W.
uniplicata	385, f. 9 & 10.	Charlton N. E., Newcross, and Plumstead.
Ostrea bellovacina	388, f. 1 and 2.	Charlton N. E., and Woolwich.
edulina?	388, f. 3 and 4.	Charlton, & Woolwich, S.W.
Potamides concavus	339, f. 1 and 2.	Barton-Cliff (beach), and Headen-Hill.
politus α	339, f. 3 and 5, and 147, f. 6 and 7.	Plumstead-Heath.
Rostellaria Parkinsoni, α ..	349, f. 1 and 2.	Bray, S. E., Faversham, 3 <i>first</i> . Gunters-hill, & Reculvers.
II. SUPERMEDIAL ORDER OF STRATA.		
CHALK, upper, soft, flinty; Chiltern Hills, South and North Downs, Dunstable S.E. S. & S.W. &c. (mostly <i>light green</i> , No. 5.)		
Ammonites peramplus	357,	Eastbourne, and Lewes E.
..... ? (II. p. 57 & IV. S1.)		Dover, N.E.
Gryphæa globosa	392,	St. Giles's Gate, & Mendon.
Pecten nitidus ..	394, f. 1.	Brighton, near Lewes, and near Paris.
Plagiostoma Hoperi	380,	Lewes E. and Northfleet.
CHALK, lower, hard, grey, flintless; Hurlock, White Cawkstone, Firestone; Dunstable N.W, N. & N.E. &c. (<i>Deep green</i> , No. 5.)		
Ammonites Lewesiensis	358,	Dover S.W. and Lewes.
CHALK-MARL, Malm, or Blue Marl, earthy or coloured Chalk, red Cawkstone, Clunch, Firestone, &c.		Hockliffe S. Homesdale, &c. (<i>white</i> , No. 6.)
Ammonites dentatus	308,	Cambridge, Folkstone, and St. Pot.
lautus	309,	Cambridge, Folkstone, and St. Pot.
proboscideus	310, f. 4, & 5.	Cambridge, and Folkstone.
tuberculatus	310, f. 1 to 3.	Cambridge, and Folkstone.
Rostellaria Parkinsoni, γ	349, f. 5.	Folkstone, Hamsey, Middleham, Ranscomb, and Southbourne.

* The V. ambigua t. 115, f. 5. is now V. suspensa, see p. 135, Note, and p. 137.

- GREEN SAND, or Sandstone, chloritic? often micaceous Sand; Fullers' Earth; Leith-Hill, Nutfield, Blackdown, Haldon, &c. (very light blue or white, No. 6.)
- Gryphæa columba, α t. 383, f. 1 & 2. Mans W.
vesiculosa 369, Warminster.
- Ostrea carinata 365, Chute-farm, Folkstone
Town, France, Maestricht,
and Selbourn E.
Horningsham.
- Pecten asper 370, f. 1. Warminster.
obliquus..... 370, f. 2. Devizes N.
- Pinna tetragona α 313, f. 1. Blackdown.
- Rostellaria calcarata 349, f. 6 and 7 }
5 low. }
Parkinsoni δ 349, f. 5. } Blackdown, and Parham-
3rd in 2nd rank, } Park.
- Turbo moniliferus 395, f. 1. Blackdown.
- PORTLAND ROCK, or 4th Oolite, partly oolitic, in Sand and Marl; Kentish Rag Limestone; Aylesbury, Wardour, Swindon, Purbeck, &c. (Sand brownish red, Nos. 8 and 10, Limestone blue, No. 9.)
- Ammonites Brodiei 351, Portland-Isle.
Parkinsoni γ 307, f. 2. Shotover-hill.
- Astarte obovata 353, Sandown-Bay.
- Gryphæa sinuata 336, Adlington-Hills, Ashford,
Black-gang Chine, Folk-
stone, S. W. & Shanklin-
Chine.
- Nautilus radiatus 356, New-Malton E.
Plagiostoma rusticum 381, Shotover-hill.
- Sphæra corrugata 335, Sandown-Bay.
- OAKTREE CLAY, blue, with nodules of stony Marl, Selenite, pyritic Extr. Fos. bituminous Marl.....and Kimeridge Coal: Thame, Stan-
ford, &c. (greenish blue, No. 11.)
- Gryphæa nana 383, f. 3. Shotover-Hill
Pinna granulata 347, near Weymouth.
- CORAL RAG, and Pisolite, or 3rd Oolite; local in Woburn Sand; Wooton-Basset, Hedington, Pickering, &c. (orange, No. 12.)
- Ammonites perarmatus..... 352, New-Malton.
- Plagiostoma læviusculum..... 382, New-Malton.
- WOBURN SAND, ferruginous Car-Stone, Fuller's-Earth, siliceous Wood often in Green-Sand: Wavendon and Aspley Heaths, Little-Brick hill, &c. (brownish red, No. 13.)
- Ammonites plicomphalus 359 & 404, Bolingbroke N. E.
- CLUNCH CLAY, or Fen Clay; Blackmoor, Otmoor, &c.....beds of Clunch or dogger-stone? Wavendon, Fenny-Stratford, Oxford, &c.....
light purple, No. 14.
- Ammonites mutabilis..... 405, Braken-wood End.
- Gryphæa bullata..... 368, Braken-wood End.
- Pinna tetragona β 313, f. 1. near Parmá, and Sandfoot
Castle.
- ALUM SHALE, with Cement Balls, or Septaria (wrongly called Lias,) Jet, Selenite, Bones &c. Whitby, Titherton, Lyme-Regis E. &c.....
(dun purple, No. 15.)
- Ammonites Davœi..... 350, Lyme-Regis.
fibulatus..... 407, f. 2. Stowbrow, and nr. Whitby.
subarmatus 407, f. 1. near Whitby.
- KELLOWAYS STONE; in Canals S. E. of South-cerney, S. of Chippenham, and N. W. of Trowbridge, at Staiths, &c..... (dun purple, No. 15.)
- Ammonites Gulielmii..... 311, Kelloways-Bridge.
- CLAY ON UPPER OOLITE; stone-beds, corals &c: S and E. of Bath, Farley, Bradford, (Wilts.) &c. (very light yellow, No. 19.)

Terebratula coarctata t. 312, f. 1 to 4. Bath E., Bradford (Wilts.), Charterhouse-Hinton, Farley, Hampton-down, Kings-down, Pickwick W., Stoford, & Winsley.

FULLER'S EARTH STRATA, grey, lead-coloured and purple Clay; slippy Banks of Knolls N and S of Bath; Northleach, Northampton, N. of Stamford, &c (very light orange, No. 21.)

Gryphaea columba β 383, lo. Northamptonshire.
 Lutraria angustata 327, Nunney.
 Terebratula reticulata 312, f. 5 and 6. Frome S. W.

UNDER OOLITE, inferior, lower, bastard, or 1st Oolite: N. E. and S. of Bath, Dundry and Churchdown Hummocks, lower Costwold and Edge Hills, Uppingham, &c. (reddish orange, No. 22.)

Ammonites Parkinsoni α ... 370, f. 1, 3 & 4. Yeovil N.
 Gryphaea gigantea 391, Cherington (Carrington?), Churchdown-hill, Farley-Wick, and near Ilminster. (Horncastle & Suffolk. Dil.)

Pecten cinctus ... 371,

MARLSTONE, OVENSTONE, Marl, Mineral Springs, &c. Glastonbury, Cheltenham E., Banbury, Oakbam, Belvoir Castle, &c. (very light blue,* No. 24.)

Ammonites Smithi 406, & 73 }
 up. v. corn. } Marston-Magna (or Broad?)
 Terebratula fimbria 325, Charlton-Kings, and Cleeve.

BLUE LIAS; beddy, water-setting or Hydraulic Limestone; Watchet, Aberdriaw, Southam, Barrow, &c. (dun blue, No. 26.)

Ammonites Parkinsoni, β 307, (Brit. Min. t. 12) Keynsham.
 Spirifer Walcottii 377, f. 2. Bath W., Camerton, Keynsham, & Parton-Passage.

YELLOW LIMESTONE, buff, red-land, or Magnesian Limestone: popplestone, cornstone: Aberford, Ferry Hill, Sunderland, &c. (greenish blue, No. 29.)

Axius obscurus 314, 3 up. Garford Cliff, (Selby, Dil.)
 Productus horridus 319, f. 1. Derbyshire.
 humerosus 322, Breedon.

PONTEFRAC T ROCK, Sandstone, often soft. and loose Sand; Hardwick-Hall S W. Hooton-Roberts, Collingham, & &c. (greenish blue, † No. 29.)
 Axius? 314, lo. Kingsville-House, and Wentbridge N Hill.

III. MEDIAL ORDER of STRATA.

COAL-MEASURES, carboniferous Strata: Sandstones, Crowstones, Canks (or limestones), Shales, Binds, fire Clays, Coals, Iron stones, &c. Derbyshire, Yorkshire, Newcastle &c. (Indian Ink, No. 30.)

Anomia? (Vol. IV. p. 75.) Northwram.
 Pecten papyraceus: 351, Denholme-Gate, Elland, Idle S, Moor-Town, and Northwram.
? (Vol. IV. p. 75.) Northwram.
 Productus lobatus β 318, f. 6. Cumberland.
 Terebratula resupinata β 327, Alton (see Brit. Min. t. 155.)

* On Mr. Smith's Rutland and Leicester county Geological Maps (sold singly by Cary) he has distinguished the stoney parts of this assemblage of Strata, by a reddish brown colour.

† See Annals of Philosophy, 2nd series Vol. V. p. 275.

‡ On Mr. Smith's Yorkshire Geological Map, he has distinguished this Rock by a purplish red colour, and marked it a.

LIMESTONE SHALE, or great Shale, locally imbedding Gritstone and Shale Limestone, and thin Coals. (Derby Report I. p. 227.)

Productus concinnus.....	t. 318, f. 1.	Derbyshire, Richmond (York), and Well-houses Farm.
lobatus α	318, f. 2 to 5.	Arran-Isle, Derbyshire, and Well-houses Farm.
Martini β	317, f. 4.	Barney-River.
DERBYSHIRE-PEAK Limestone;		Under-coal, Metaliferous, Basaltic, or
Mountain* limestone:		Bristol, Much-Wenlock, Halkin, Aldstone, Kendal, &c. (<i>purple blue</i> No. 31.)
Productus antiquatus	317, f. 1 5&6.	Cloghran, Derbyshire, and Monyash.
comoides	329,	Llangefni S.
giganteus.....	320,	Bakewell, W. Buxton W (1st), and Yorkshire.
hemisphericus ...	328,	Mynydd-careg Wales.
latissimus.....	330,	Puffin-Isle, and Tyddyn-mawr Farm.
Martini α	317, f. 2 and 3.	Ashford (shale), Bakewell, (1st), Croom-hill (4th), King's-county, Limerick county, and Sutton.
personatus	321,	Derbyshire, and Kendal.
punctatus.....	323,	Black-Rock Cork, Buxton, and Chelmerton E. (3rd.)
sulcatus	319, f. 2.	Derbyshire.
Spirifer ambiguus	376,	Bakewell (shale) 1 $\frac{1}{2}$ m. W.
minimus	377, f. 1.	Bakewell, do.
Terebratula acuminata	324, f. 1.	Bakewell (1st), Blackrock Cork, Brassington (3rd), Buxton, Scalebar, and Thorpe, (4th).
affinis	324, f. 2.	Dudley N., and Malvern Hills, W. (Horncastle dilu.)
? imbricata	334, f. 3 & 4.	Castleton, and Settle.
? lineata	334, f. 1 & 2.	Castleton, and Hope.
resupinata, α ...	325,	Dove-dale (4th), Hucklow (1st), Stoney-Middleton (1st), and Tide-swell (3rd).

OLD-RED SANDSTONE, occurring rarely.

IV. SUBMEDIAL Order of STRATA.

COARSE-SLATE, STEASCHIST, ROOFING-SLATES, slaty LIMESTONE, &c.

V. INFERIOR Order of STRATA.

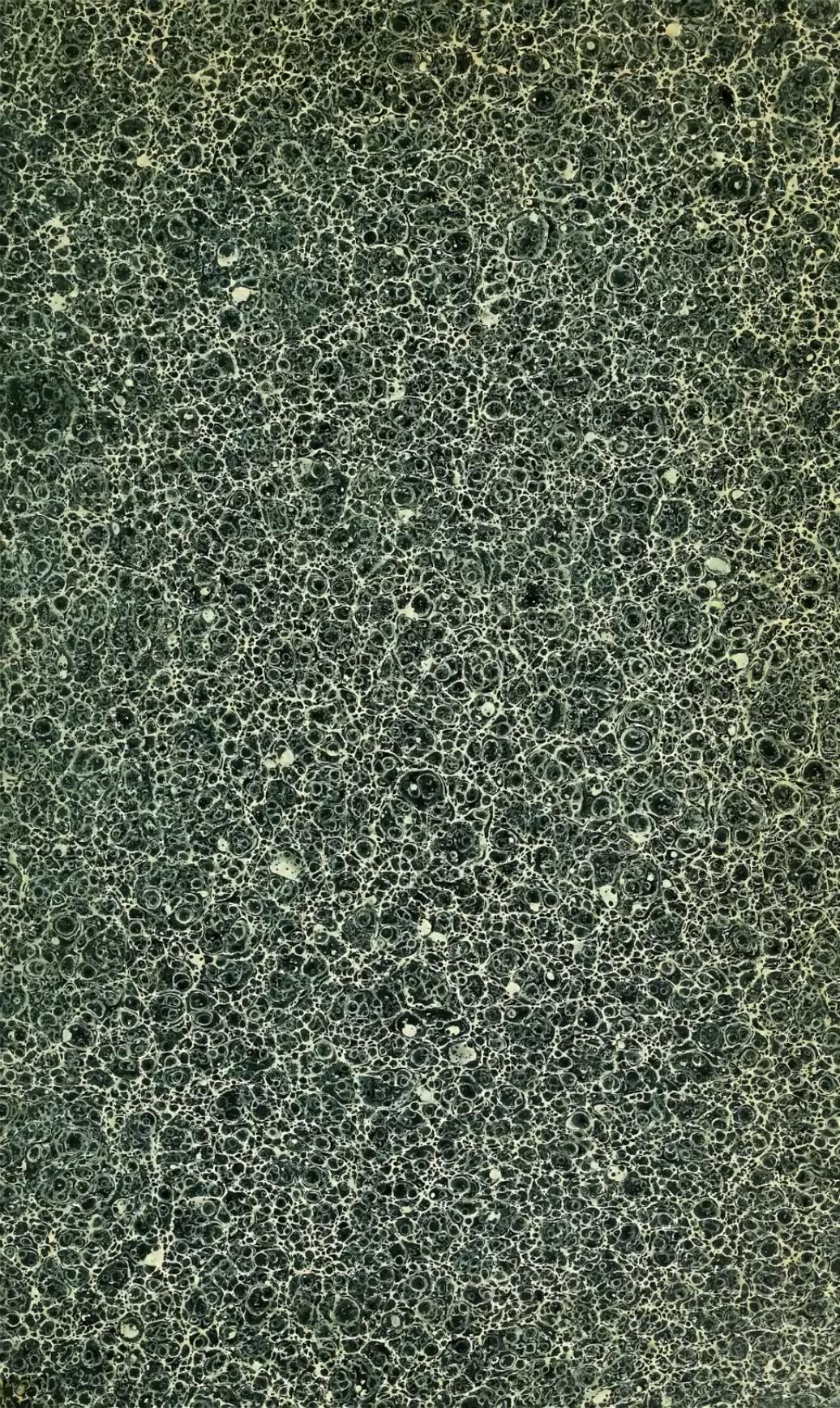
MICA-SLATE, GNEISS, GRANITE, &c.

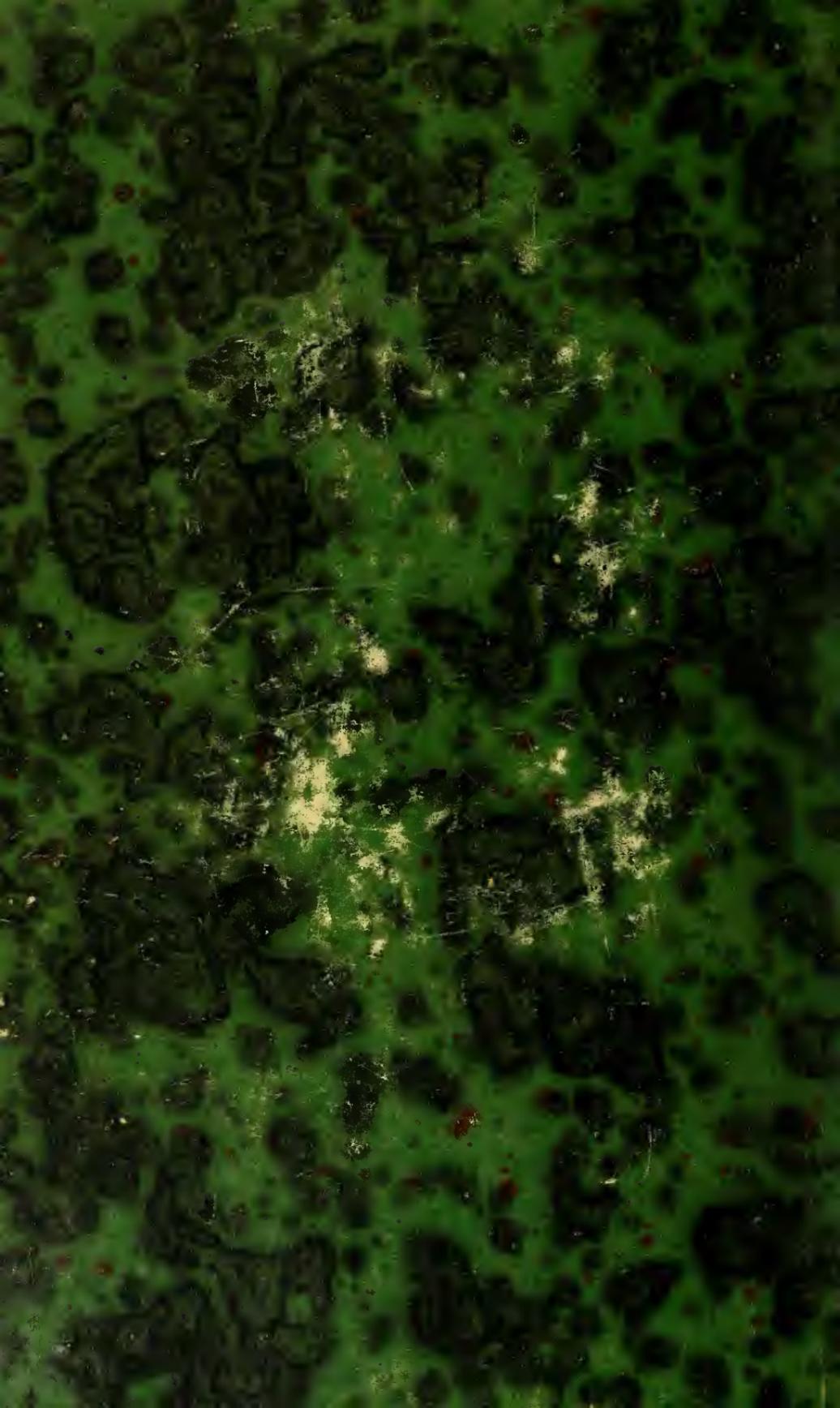
UNKNOWN STRATA, of vastly greater specific gravity than Granite.

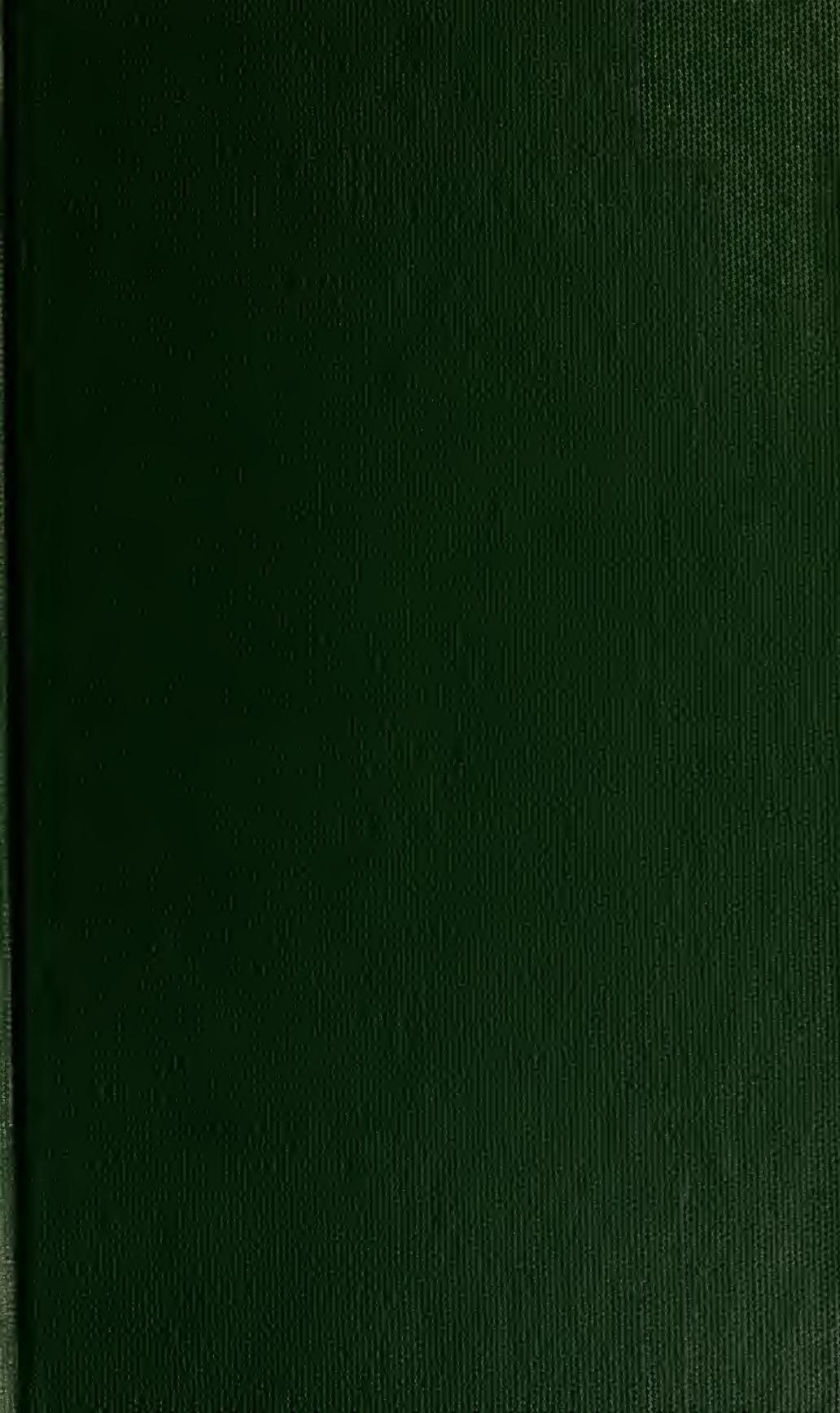
NOTE: I have been unable to place in the above List, *Patella striata*, β t. 389, for want of stratigraphical information: the same happened in previous volumes, as to *She'is* from Colomby, Colleville, and Valognes, all probably situated on the same strata as Hauteville, in the Medial order of Strata?

* This Rock would, with propriety be denominated the Valley Limestone of the Irish Bog-Districts; it sometimes forms Hills, but rarely if ever, is found in Mountains.









7-5

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THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN;
OR
COLOURED FIGURES AND DESCRIPTIONS

OF THOSE
REMAINS OF TESTACEOUS ANIMALS

OR
Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

BY JAMES SOWERBY, F.L.S. G.S. W.S.

HONORARY MEMBER OF THE PHYSICAL SOCIETY OF GÖTTINGEN,
OF THE SOCIETY OF JENA, &c.

CONTINUED BY
JAMES D. C. SOWERBY, F.L.S. &c.

Many, O Lord my God, are thy wonderful works which thou hast done ;
they cannot be reckoned up in order to thee : if I would declare and speak
of them, they are more than can be numbered.—PSALM xl. 5.

VOL. V.

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MDCCCXXV.

CRANIA, Retzius.

GEN. CHAR. An unequalvalved bivalve, slightly irregular, suborbicular; upper valve patelliform; lower valve attached, flattish; muscular impressions four; no hinge; animal without a byssus.

IN this Genus the thickness of the lower or attached valve is very variable, even in the same species it is sometimes so thin as to have been overlooked; nevertheless it is that valve which possesses the characters of the Genus in the most eminent degree; for, it is found to be attached, like the lower valve of *Ostrea*, by its own surface; to be wholly destitute of hinge, by which the other valve is united to it, either in the form of teeth that lock into each other, or of ligament upon the edge; to be marked with the impressions of four tendinous muscles, that unite it at once with the animal and the other valve; and to have a granulated inner surface, especially about the margin, which arises from its cellular, and not foliated structure, a structure possessed also by *Radiolites* and *Calceola*, which Lamarck has arranged with it under his family "Rudistes." Of the four muscular impressions, two are placed at a distance from each other, near the margin, which is generally almost straight between them; the others are towards the centre of the disk, and only separated from each other by an eminence in the lower valve, while they are more distant in the upper; the free or convex valve has a nearly central apex, is generally thin, and has the same granulated surface near the edge as the fixed valve has, but not in so remarkable a degree.

Vol. V. June 1823. L. 71.

Although some of the characters of the Animal to which this shell belongs, may resemble those of *Terebratula*, yet the different mode of its attaching its shell to marine substances, and the very different texture of the shell itself, (resembling in many respects the harder corals) seems a sufficient apology for Lamarck's placing it in another family, along with *Calceola*, &c. The strong resemblance of its upper valve to that of *Orbicula*, (a Genus in which the animal attaches itself by a byssus, or tendinous substance that passes through a fissure in the lower valve) has caused much confusion, which has been increased by Lamarck's forming a third Genus, (*Discina*) of a species of *Orbicula*; an error that has been pointed out and corrected by Mr. G. B. Sowerby, in the 13th Volume of the *Linn. Trans.*, and in his own work, under the respective Genera.

Only one recent species is known; it inhabits rocky shores and coral reefs, in temperate climates; several fossil species have been described.

CRANIA Parisiensis.

TAB. CCCCVIII.

SPEC. CHAR. Suborbicular; depressed; upper valve thin, obscurely granulato-spinose, smooth in the centre; lower valve thick, with the margin much elevated, and of a conspicuously cellular structure.

SYN. *Crania Parisiensis*, *De France Dict. des Sciences natur.*—*Lamarck Hist. Nat. VI. pt. 1, 259.* *Cuvier and Brogniart Geol. des env. de Paris, ed. 1822, p. 15, t. 3, f. 2.* *G. B. Sowerby Genera, plate of Craniæ, fig. 3.*

THE upper valve is smooth in the centre; its umbo is small, pointed, and a little eccentric; the margin descends over the elevated edge of the lower valve, is covered with short, depressed, scattered spines, and is rather rugged; the lower valve has a few obscure, diverging striæ upon its inner surface, it is attached by the whole of its outer surface, except what is covered by the margin of the other valve; a great part of it is composed of spherical cells, which are most conspicuous around the margin when uncovered, by the removal of the upper valve; the muscular impressions are very variable, sometimes they are hardly to be traced, at others they are very deep; the elevation between the central ones also varies, sometimes it is very prominent with the impressions raised along with it: when the impressions and elevation are distinctly marked, the general resemblance to the front of a human skull is very strong; (hence the generic name). The depth of the impressions seems to be the result of age, although not confined to

large shells, for some individuals, that appear to be of a more luxuriant growth than others, are thin in the middle.

Since this curious shell was discovered by M. DeFrance, attached to a fragment of an *Inoceramus** *Cuvieri*, it has been repeatedly sought for; at length Mr. G. B. Sowerby was fortunate enough to find the attached valve upon an *Echinus* in Chalk; its cellular structure was then noticed as a character by which to distinguish it from other attached shells, and numerous specimens have been met with upon *Echini*, *Inocerami*, and other shells found in Chalk, in various parts of England. The upper valve had still remained unknown, had it not been accidentally discovered almost concealed in chalk upon a dislocated *Echinus*, picked up at Brighton several years ago, by G. B. Snow, Esq.: this is shewn in the upper figure.

The lower figure shews three states of the attached valve, found upon an *Echinus* sent from Norfolk by the Rev. G. R. Leathes.

*This Generic name will probably be superseded.

PLICATULA pectinoides.

TAB. CCCCIX.—*fig.* 1.

SPEC. CHAR. Oblong, ovate, curved, gibbose when old; longitudinal ridges numerous, furnished with depressed spines; free valve externally concave.

SYN. *Placuna pectinoides*, *Lamarck Hist. Nat: VI. pt. 1, p. 224.*



By its curved form, projecting beaks, numerous longitudinal ridges, and concave upper valve, this *Plicatula* is easily recognized; the spines are not numerous, neither are they regular; they are always pressed close to the surface, and assist to form the ridges; it is depressed when young, but when old sometimes almost globose; the length is rarely two inches.

Collected in Clay, or Gault, below the Chalk Marl at Cambridge, by Professor Sedgwick; it also occurs in the same formation at Folkstone; the valves are filled either with Ironstone or Pyrites.

Lamarck having seen only imperfect hinges of this shell, from near Metz, has placed it in a Genus it does not at all resemble externally.

PLICATULA inflata.

TAB. CCCCIX.—*fig.* 2.

SPEC. CHAR. Suborbicular, gibbose, rather smooth, furnished with a few ridges and depressed spines; both valves convex.

SYN. *Plicatula spinosa*, *Mantell Geol. Sussex*, p. 129, t. 26, f. 13, 16 and 17.

THIS is probably the largest species of *Plicatula* known: the smooth surface, and the small number of the ridges, composed chiefly of depressed spines, suffice to distinguish it from the last, and the convexity of both valves will distinguish it from most Oysters.

Small specimens of this have been taken for *Plicatula spinosa* by Mr. Mantell, but it is a very distinct shell; it is found only in the lower beds of Chalk without flint, and that called sometimes Chalk Marl, but not in the Clay beneath.

The specimens figured, were kindly lent me by Professor Sedgwick; they are from the vicinity of Cambridge: I have others from Hamsey, by favour of Mr. Mantell.

MUREX quadratus.

TAB. CCCCX.—*fig. 1.*

SPEC. CHAR. Short conical, transversely striated and obscurely bicarinated; base produced; beak short; aperture sub-rhomboidal.

A FEW irregular lines of growth decussate the regularly elevated striæ upon the surface of this short, rhomboidal Murex; it has no costæ, and the sutures instead of being varicose, are only slightly marked.

Probably this is a rare shell; only one individual has fallen under our notice; it was considered as the young state of the following, with which it was found mixed, until the want of costæ proved it to be distinct.

This is a Blackdown Fossil; the shell is as usual replaced by Silex.

 MUREX Calcar.
TAB. CCCCX.—*fig. 2.*

SPEC. CHAR. Ovato-acuminated, transversely striated, costated; last whorl bicarinated; each suture supports two or three long, sharp spines; aperture round, with a long canal.

THE striæ upon the surface of this Shell are few, elevated, and partially granulated; the costæ upon the spire are numerous and sharp; on the last whorl they

are lost, or at least only appear in the form of tubercles upon the uppermost carina; the sutures are few, and hardly distinguishable, except by the spines they are furnished with; these spines are only two in number, except in some few specimens which have a third obscure carina, and such have three spines; the aperture is nearly round with a small angle at its upper part; the left lip is raised from the columella; the canal of the beak is almost covered over. Smith in his "Strata identified by organic Fossils," has figured this upon the Green Sand plate without a name; the name above given, was found attached to some specimens in a dealer's hands, but we know not upon what authority.

Found in the Green Sand of Blackdown.

MUREX alveolatus.

TAB. CCCCXI.—*fig. 2.*

SPEC. CHAR. Ovate acuminated; surface divided into square cells by many acute sutures that decussate 8 or 10 prominent carinæ; whorls ventricose, flattened above; aperture oval, the outer lip toothed within.

THE length is at least double the width; the uppermost carina is largest; the principal ones below it, alternately large and small, with still smaller ones between them; they are all rounded. The beak is a little curved, and contains an open umbilicus.

Found in the Crag of Suffolk and Norfolk by Mrs. Cobbold, and the Rev. G. R. Leathes; it seldom acquires an inch and an half in length.

MUREX defossus.

TAB. CCCCXI.—*fig. 1.*

SPEC. CHAR. Ovate acuminated, smooth; whorls ventricose, bearing many obtuse carinæ; sutures numerous, acute, linear; aperture elongated, with many lamelliform teeth within its outer lip.

SYN. Buccinum defossum, *Pilkington in Linn. Trans. VII. 117.*

BETWEEN the elevated edges of the sutures, the surface is smooth, but divided by many (12 or more upon the last whorl) transverse, rounded, alternately large and small elevations or keels, that do not by their various sizes destroy the round contour of the whorls; the outer lip is thickened internally, where it has many elongated, lamellar teeth; the inner lip is, when fully formed, relieved from the columella, and has one or two irregular plaits upon its upper part; the beak is rather short.

A species sent among others from Hordwell; its sutures are not generally varicose, the smoothness of the surface between them, gives it a neat appearance.

MUREX sexdentatus.

TAB. CCCCXI.—*fig. 3.*

SPEC. CHAR. Ovate acuminate, costated, longitudinally striated, transversely carinated; whorls convex; aperture elongated with 5 or 6 teeth within its outer lip.

Much resembling the last, but the whole surface is marked with elevated sharp striæ, that are more crowded, but hardly more prominent, upon the swelled sutures; the thickened outer lip has about 6 obtuse teeth within it, in place of the many lamellar ones of the *M. defossus*; the last whorl is also more conical, and the aperture squareish.

Brought from Colwell Bay, on the Isle of Wight, by Professor Sedgwick, who pointed it out as distinct from several other shells with which it had been confounded.

BUCCINUM labiatum.

TAB. CCCCXII.—*figs. 1 and 2.*

SPEC. CHAR. Ovate acuminate, costated, transversely striated; striæ numerous, large, elevated and rounded; whorls convex; aperture oblong; its outer lip enlarged in the middle, and striated within.

THE striæ upon the surface of this shell are almost prominent enough to be called carinæ; they are nearly close together, and alternately large and small; the lip is thin and sharp, it has a very obtuse sinus that occupies its upper half, the lower half being enlarged; the beak is rather wide, open and twisted; the costæ are numerous, long, and curved; the upper parts of the whorls are slightly concave.

Found at Plumstead by the Rev. H. Steinhauer in 1812; the Rev. Mr. Iremonger met with it on the Hampshire coast, and it has since been found in Colwell Bay on the Isle of Wight by Professor Sedgwick; it appears to abound wherever it occurs, and is probably characteristic of the so-called upper marine beds.

Fig. 1, is from a Hampshire specimen, and *Fig. 2*, one from the Isle of Wight.

BUCCINUM lavatum.

TAB. CCCCXII.—*figs. 3 and 4.*

SPEC. CHAR. Ovate acuminate, costated, furnished with many acute carinæ, and transversely striated; aperture oblong; lip crenulated at the edge, and striated within; whorls convex.

SYN. Buccinum lavatum, *Brander, f. 16.*

ALL the carinæ are sharp and equal; they are enlarged as they pass over the curved costæ; the striæ between them are minute, but very regular: these characters will distinguish this shell from the one just described, when the aperture is imperfect; when that is perfect, its notched edge without a sinus adds to the certainty.

Extremely abundant in the blue Clay of the Barton Cliff.

BUCCINUM *crispatum*.

TAB. CCCCXIII.

SPEC. CHAR. Ovate-acuminated, roughened by imbricated concave scales, placed upon numerous, close, transverse carinæ; whorls convex; lip subdentated; beak subcanaliculated.

SYN. *Purpura imbricata?* *Lam. Hist. Nat. VII. 557.* *P. Lapillus?* *Lam. env. de Paris, 36.*

BUCCINUM *Lapillus* of Linneus, of which the recent *Purpura imbricata* is commonly considered as only a rough variety, is so exactly like the more antient species before us, that it is difficult to point out any difference; they are all subject to much variation in the length of the spire, and size of the carinæ; still it seems that in all the varieties of the recent species, the last whorl bears a larger proportion to the spire, than it does in the corresponding varieties of the fossil; the latter has also a more contracted beak, and no flat space between the carinæ: in the recent species there is commonly one large and one small carina alternately, with flat spaces between them; but in the fossil the small carinæ encrease in number with age, so as constantly to fill the space between the larger ones.

Whether or not the above observations be sufficient to prove the Shell before us to be a distinct species, it is certainly desirable to have a distinguishing name for it as a fossil. The doubt attached to Lamarck's *Synonyma*, only arises from my not having seen an authentic specimen.

Very abundant in many parts of the Norfolk and Suffolk Crag.

Fig. 1 shews a rare very short variety; *fig. 2* has one of the carinæ very conspicuous; *fig. 3* the usual habit.

There is much difficulty and uncertainty in fixing the Genera of Shells formerly called *Buccina* and *Murices*; at present we have called the shells before us *Buccina*, but it may hereafter be necessary to separate them from that Genus, especially the first, the lip of which is like that of some species of the Genus *Fusus*, or *Cerithium*, and even approaches *Pleurotoma*.

BUCCINUM tetragonum.

TAB. CCCCXIV.—*fig. 1.*

SPEC. CHAR. Squareish, ovate, pointed, costated; costæ crossed by four large and several small ridges; aperture oblong; lip toothed within.

A THICK rather square rugged looking shell; the large ridges divide the surface between the costæ into cells, that are crossed by the smaller intermediate ridges: it is probably when perfect, covered with concave scales; their remains give it much the aspect of a Murex: the beak is short, and but slightly curved; the teeth in the lip are about seven, they are blunt.

But one specimen of this species is in Mr. Sowerby's cabinet; it was kindly placed there by Mrs. Cobbold, who found it near Ipswich.

BUCCINUM incrassatum.

TAB. CCCCXIV.—*fig. 2.*

SPEC. CHAR. Thick; ovate, pointed, rugged, with about five carinæ, the uppermost largest; aperture oval; lip obscurely furrowed within.

THE few nearly smooth, large, principal carinæ, with very slight indications of lesser ones between them, and the weight of this shell will always make it easily known: the obscure furrows in the lip form obtuse teeth between them, and are opposite the carinæ; the deep and distant lines of growth make the surface rugged.

An abundance of this very distinct species in all stages of growth, has been found by the Rev. G. R. Leathes in Suffolk, and a liberal supply sent for figuring.

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BUCCINUM desertum.

TAB. CCCCXV.—*fig. 1.*

SPEC. CHAR. Ovate oblong, costated, transversely striated; whorls contracted above by a rounded canal; lip striated within.

SYN. Buccinum desertum, *Brander, f. 15.*

IN general the costæ are very irrégular, they are numerous but not very prominent, and have several sharpish points upon their upper extremities, where they are crossed by the striæ; the upper part of each whorl is contracted by such a furrow as might be produced by tying a cord round it at a small distance from where it joins the spire; there is an obscure fold, at the base of the columella.

From Barton Cliff by favour of Miss Dent, and the Rev. T. Cooke.

BUCCINUM canaliculatum.

TAB. CCCCXV.—*fig. 2.*

SPEC. CHAR. Ovato-elongated, transversely striated; spire costated; whorls separated by a canal; lip thickened, sharp, dentato-striated within.

SYN. Buccinum desertum, *Brander, fig. 18 and 19?*

ABOUT twice as long as wide, but variable in its proportions; the canal around the spire is flat, with an elevated margin, and quite different from the canal in *B. desertum*. two or three of the last whorls are mostly free from costæ, but they have sometimes one or two that appear to be formed from a thickening of the lip at certain periods of growth; the beak is curved, the columella has no plait.

That this is the *B. desertum* of Brander, fig. 18, there appears but little doubt, although his figure is too short for the more common specimens. The thickened lip, and the consequent formation of two or three obscure varices upon the latter whorls, do not occur upon *B. desertum* just described: they tend to remove it from the same genus, but they are obscure and smooth; it resembles *Murex striatulum* of Lamarck, but there is no canal described about the spire of that fossil.

Very frequent at Muddiford and Barton, as the numerous specimens sent by several good Friends abundantly prove.

MUREX tricarinatus.

TAB. CCCCXVI.—*fig. 1.*

SPEC. CHAR. Ovate oblong, transversely striated; sutures in three rows, foliaceous, dentated, bearing one spine upon the upper part of each; aperture obovate; canal recurved.

SYN. Murex asper, *Brander, fig. 77, 78, 79, and 80.* Murex tricarinatus, *Lamarck Hist. Nat. VII. 177.*

BETWEEN each of the beautiful, plaited, leaf-like sutures, is an obtuse elevation or tubercle; the striæ are about seven, and elevated, corresponding with the plaits of the sutures; the lip is toothed within, the canaliculated spine that proceeds from its upper part varies in length: the French specimens which are besides often larger, have it generally very short; the sutures consist of many laminæ.

We are indebted to Miss Dent and Miss Tylee for the Barton specimens here figured.

MUREX bispinosus.

TAB. CCCCXVI.—*fig. 2.*

SPEC. CHAR. Ovate elongated, with three rows of foliaceous sutures, and two or three transverse ridges; sutures simple, bearing two concave spines to each whorl; canal nearly straight.

A LONGER formed shell than the last: the projecting part of each suture consists of a single smooth lamina applied against two canaliculated spines; the surface of the whorls is nearly smooth, without any elevation between the sutures.

Miss Dent favoured us with this new species in 1820: we have since received it from our kind Friend, the Rev. T. Cooke; it occurs sparingly at Barton, generally imperfect.

MUREX frondosus.

TAB. CCCCXVI.—*fig.* 3.

SPEC. CHAR. Ovate oblong; sutures in 8 or 9 rows, subspinose deeply plaited; transverse ridges numerous, rough; aperture obovate; canal straight.

SYN. Murex frondosus, *Lamarck env. de Paris*, 51. *Hist. Nat. VII.* 573.



THIS is probably Lamarck's var. β as the spaces between the sutures are simply rough, not scaly; the sutures are so deeply plaited, that their edges are formed into a series of almost tubular spines, this being repeated upon the several laminæ of which the sutures are composed, as in most part of the Murices, gives them a peculiarly crisp aspect; the canal is rather broad, and half covered.

The Barton specimens of this beautiful Murex, are large and well preserved, but scarce. Miss Beminster has supplied me with two or three; it has also been found at Highgate.

LUCINA, *Bruguières.*

GEN. CHAR. A more or less orbicular and inequilateral, equivalved, bivalve: two diverging teeth, of which one is bifid, and two remote teeth occur in the hinge; the ligament is external; two remote muscular impressions, the posterior one much elongated within the entire line of attachment of the mantle.



SEVERAL of the species of this genus are ornamented with elevated concentric lines or laminae: in some of them the teeth of the hinge are partly obliterated by age, in others the ligament is so deeply sunk, as to seem internal, but it is still visible from the outside; the posterior muscular impression, is curiously continued towards the middle of the valve, beyond the part where it joins the mark of the attached portion of Mantle. Were this character alone to be relied upon, we might, with Lamarck, admit into the Genus several shells without teeth about the hinge; but this plan appears not to be universally approved: it is distinguished from *Tellina* by the even margins of its valves.

There are several fossil species described by Lamarck but we have only met with one in England.

LUCINA divaricata.

TAB. CCCCXVII.

SPEC. CHAR. Orbicular, gibbose, marked with two sets of oblique arched striæ, and 3 or 4 deep lines of growth.

SYN. *Tellina divaricata*, *Linn.*

Lucina divaricata, *Lam. env. de Paris*,
244. *Hist. Nat. V.* 541.



THIS round and almost globose shell, is rendered very remarkable by two sets of hollow lines that converge towards each other, and meet upon the disk near the posterior side, at an obtuse angle; the shell is thick and glossy, inside it is commonly dull, and partially granulated.

So exactly do the fossil specimens agree with recent ones from the West Indies, that Lamarck considers them the same, and we see no reason to differ from him in opinion; they are both liable to some variation, especially in the fineness of the pattern: the recent specimens are white.

This pretty Hordwell fossil has been sometime in the collection: the addition of a very neat individual has lately been made by the Rev. T. Cooke.

It occurs also at Grignon and Bordeaux.

The large figures are from Bordeaux specimens.

MYA depressa.

TAB. CCCCXVIII.

SPEC. CHAR. Obovate, depressed, very slightly gaping, anterior side shortest; beaks prominent incurved; hinge line straight, depressed; ligament external, short.

SHELL thin, slightly undulated by numerous lines of growth; it has much the aspect of a *Tellina*, but although it has a bend in the front, it has not the sharp curve that characterizes *Tellina*. Many specimens have an external ligament preserved.

Figured from a specimen in Miss Benett's Cabinet from Weymouth. Miss Benett has also found it near Osmington, filled with indurated Clay that has by decomposition acquired a rust colour: Mr. Wier has met with it in the Clunch Clay, near Horncastle in Lincolnshire, and I have specimens very much crushed in similar Clay, from Shotover Hill, near Oxford, where it is accompanied with *Trigonia clavellata*, tab. 87: this *Trigonia*, besides some very remarkable varieties of *T. costata*, 85, has also been collected by Miss Benett near Weymouth, and helps to shew the similarity of the strata at the above-mentioned places.


 MYA gibbosa.
TAB. CCCCXIX.—*fig.* 1.

SPEC. CHAR. Obovate, transversely furrowed, gibbose; beaks prominent, incurved; posterior side very short; anterior side rather attenuated, gaping.

THIS differs from the last chiefly in its thickness and the narrow formed anterior side; it is nearly twice as thick in proportion as the *Mya depressa*.

We are indebted to the kindness of Miss Benett for specimens of this shell; they were picked up near Osmington with the rust-colored specimens above mentioned, in 1814.

MYA plicata.

TAB. CCCCXIX.—*fig. 3.*

SPEC. CHAR. Oblong, ventricose, straight, anteriorly gaping, truncated; posterior side very short, transversely plicated.

ABOUT twice as wide as long, nearly cylindrical; the whole surface is a little waved, but the posterior side near the beaks, is remarkably so.

Found in ferruginous Sand mixed with a few grains of green Sand, at Sandgate near Margate.

 MYA intermedia.
TAB. CCCCXIX.—*fig. 2.*

THIS may possibly be a distinct species, but I am inclined to represent it as a variety only, because the specimen formerly figured, (tab. 76.) is not so perfect, and may have been expanded by pressure.

Many specimens like the one before us, have been found in the Bognor Rocks with the external ligament remaining.

It is impossible to say positively to what Genus these and some other fossils referred to Mya rightly belong, as we cannot find the inner parts of the hinges. Several of them resemble Leach's Genus Thracia, in having an external ligament, but that Genus is included in Anatina among the Myaires by Lamarck, and even the Lutraria has a small external ligament, although they are both arranged in families, supposed to have only an internal one: thus the recent Genera do not appear to be sufficiently settled to refer the fossils to, if even we did know the whole of their hinges.

TAB. CCCCXX.

AMMONITES Catena.

SPEC. CHAR. Depressed, furnished with two rows of short tubercles upon each side; whorls 6 or 8 smooth, with flat sides, the inner ones exposed; front rather convex; aperture square.

So seldom is any more than the casts of the chambers of this shell found that its true form is scarcely known; these casts have, by the decay of their surfaces, lost so much that they hang loosely together, like the links of a chain: when less diminished, they are found adhering but with very slight traces of the shell remaining; it appears to be smooth, and to have no undulations or ribs excepting when very young: the tubercles are upon the inner and outer angles of the flat sides of the whorls; they are of a moderate size, conical, with rounded points, and are not truncated in the cast: the edges of the septa are very much, deeply and sharply sinuated; the front is slightly rounded, without any appearance of a keel.

A long known, and highly admired relic of the ancient world; the casts of the chambers hanging loosely together have an imposing appearance. It seems that this shell was first lined with a sparry crust, containing much Iron, and afterwards filled up with crystallized carbonate of Lime; the shell and ferriferous lining being very liable to decay, have generally disappeared, and left the remainder of the cast in detached portions. The most perfect specimen of this kind, is one in the possession of our valuable and scientific Friend, James

Clealand, Esq, there is also a very good one in the British Museum; the former is selected for a figure. I have one that exhibits a near approach to the external form of the shell, but would not make so handsome a figure; it has in one part a small portion even of the shell itself remaining; none of its joints are free: on one side of it are several young Oysters, and on the other, a full grown Oyster, (*Ostrea Delta*) they adhere so closely, that there does not appear to be space enough between them and the stony cast for any shell, it must have been thin, and is perhaps of such a texture as does not permit it to be readily distinguished from the Oyster; or we must conclude that the Ammonite was in a fossil state before the Oysters existed, but had not been removed far from its original station, before it was again buried to form along with the Oysters the index to another epocha. This is the species referred to at page 72 of Vol. IV. as resembling the *A. perarmatus*.

Found imbedded in sand in Marcham Field, near Abingdon, in Berkshire; parts sometimes occur that must have belonged to shells above a foot in diameter.

Casts of *A. perarmatus* tab. 352, in a similar loose state of preservation, are found accompanying the *A. catena*, and until lately, have been confounded with it: the ribs that connect the tubercles in pairs will distinguish them; such ribs being very rare upon the smaller spined *A. Catena*.

AMMONITES striatulus.

TAB. CCCCXXI.—*fig. 1.*

SPEC. CHAR. Discoid, carinated, radiated; sides of the whorls convex; the inner whorls exposed; radii numerous, slender, undulated; surface covered with minute striæ parallel to the radii; aperture elliptical.

THE whorls are about 6; their regularly convex sides, and numerous, small, twice curved ribs, and slightly relieved keel, give a symmetry to the general contour that is not easily recollected: the diameter is nearly four times the length of the aperture; the cast differs from the outer surface only in wanting the fine striæ, or lines of growth, from which the name is taken.

Found imbedded in a marly Limestone nodule, accompanied with a portion of some fossil bone, on the coast in Robin Hoods Bay by Mr. Crawford of Scarborough.

AMMONITES subradiatus.

TAB. CCCCXXI.—*fig. 2.*

SPEC. CHAR. Lenticular, umbilicated, carinated, and radiated; radii twice curved, obscure excepting near the margin, where they are bifid; umbilicus small; keel entire; aperture sagittate.

THE edge of this lenticular Ammonite is rather obtuse, and the carina not much relieved; the sides are nearly smooth, for the curved radii are very obscure excepting near the edge after they have become forked or divided, as some of them are, into three or even four short ribs; the thickness is about one fifth of the diameter.

Found several years ago on the road from Bath to Bristol; it has been broken out of a mass of the Ironshot Oolite; no other specimen has reached our Cabinet.

TAB. CCCCXXI.—*fig. 3.*AMMONITES *cristatus*.

SPEC. CHAR. Lenticular, flattened, carinated; keel thin, deeply notched; inner whorls concealed.

SYN. *Ammonites cristatus*, *Defrance, MSS.*



THE thin deeply notched keel of this Ammonite distinguishes it from every other.

Found near Weymouth by Mr. Bryer, who kindly placed it in Mr. Sowerby's collection many years ago; it is a cast in Pyrites; similar specimens have been found on Mount Jura as I learn from M. Defrance's collection.

VENUS transversa.

TAB. CCCCXXII.—*fig. 1.*

SPEC. CHAR. Transversely ovate, elongated, gibbose, nearly smooth; posterior side small, rather pointed; shell thin.

THE transversely elongated form of this Venus, (*Cytherea* of Lamarck) distinguishes it well from the several varieties of *V. incrassata* (tab. 155.) found at Barton and upon the Isle of Wight; in shape it is between *Cythereæ nitidula* and *lævigata* of Lamarck; it is rougher than either of them; its thin shell is strongly marked by lines of growth; the lunette is large, ovate and pointed.

Found in the Barton Cliff by Miss Beminster.

 VENUS lineolata.
TAB. CCCCXXII.—*fig. 2.*

SPEC. CHAR. Obovate, gibbose, marked with numerous, minute, transverse striæ.

SYN. *Venus rotundata*, Brander, *fig. 91. excl. Syn. and fig. 93.*

A NEAT little shell, the striæ are so fine as to require a glass for their manifestation, but they are so deep that they may be felt with the finger nail; the lunette is of a moderate size.

This is not *V. rotundata* of Linneus, but there is hardly any doubt of its being Brander's *fig. 91.* his *fig. 93* which Solander has referred to the same name, is surely distinct: it has been mentioned in our description of *Tellina ambigua* (tab. 403.) to which it is more nearly related.

Presented by the Rev. T. Cooke, who found it sparingly at Barton.

VENUS elegans.

TAB. CCCCXXII.—*fig. 3.*

SPEC. CHAR. Ovate, convex, transversely sulcated; lunette ovate; the spaces between the sulci rounded and shining.

SYN. Venus gallina, *Brander fig. 90, excl. Syn. Linn. et forte fig. 94.* Cytherea elegans, *Lamarck env. de Paris, 232.*

A RATHER depressed shining shell precisely like the *Cy. ericinoides* of Lamarck (*Hist. Nat. Vol. V. p. 581.*) but considerably smaller; it is probably therefore his *C. elegans*, although it is too ovate to agree with his description; it agrees better with his figure in the *Annales du Museum*: the sulci upon its surface are few, deep, sharp at their bases with rounded edges; the posterior side is small, a very little rounder than the other; the lunette is also small; the beaks are but slightly prominent.

One of the less common, although not a scarce Barton Fossil. What Brander's *fig. 94* is, must still remain a question; it must be a badly chosen view, if it be from a variety of this species.

VENUS? pectenifera.

TAB. CCCCXXII.—*fig. 4.*

SPEC. CHAR. Transversely oblong, carinated; surface longitudinally sulcated, and supporting a few erect lamellæ, commencing at the keel; anterior side smooth, truncated.

THIS elegant shell has about four erect, rather thick lamellæ, that rise from the keel which defines the smooth anterior side, and curve over the rest of the disk; they are striated upon their lower sides, so as to resemble combs.

So rare is this species, that only a single valve has been found at Barton, although it has been particularly sought after for several years: the hinge teeth are broken away, so that the Genus is left doubtful; it has much the appearance of a *Crassatella*.

From the valuable collection of Lord Fitzharris.

FUSUS regularis.

TAB. CCCCXXIII.—*fig. 1.*

SYN. *Murex regularis* of *Tab. 187. f. 2.* *Murex antiquus*, *Brander f. 74. sed non Linn.*

THE small specimens of this species figured formerly, were not suspected to belong to Brander's *M. antiquus*, but a series presented by the Rev. T. Cooke, several of which agree exactly with Brander's figure and description, prove that they are the same.

The three species figured upon the same plate, (tab. 187.) and called *Murices*, certainly belong to the Genus *Fusus*, as it is at present established by Lamarck; they are all remarkable for the square shape of the elevated lines that cross them, and are not met with abroad.

 FUSUS complanatus.
TAB. CCCCXXIII.—*figs. 2 and 3.*

SPEC. CHAR. Ovato-fusiform, pointed, costated, and transversely striated; superior edges of the whorls elevated and pressed upon the spire; striæ contiguous; columella curved:

THERE are two varieties of this *Fusus*, one of them has the costæ much more prominent than the other; in both the obtuse, slightly elevated ridges between the striæ give the surfaces a uniformity of character by which the species is well distinguished. The beak is shorter than the spire, and a little expanded; there is no appearance of a fold upon the columella, by which it is distinguished from several nearly allied French species.

Both varieties were found plentifully at Highgate, while the road through the Hill was in progress.

Fig. 3, represents the costated variety.

FUSUS Lima.

TAB. CCCCXXIII.—*fig.* 4.

SPEC. CHAR. Ovato-fusiform, pointed, carinated; upper edges of the whorls elevated and pressed upon the spire; carinæ many, acute, the central ones decussated by small sharp costæ; lines of growth acute.



UPON the upper parts of the whorls, the carinæ are mere striæ decussated by the lines of growth; in the middle they are sharp, and so much elevated that they almost form spines where they are intersected by the small acute ribs; upon the lower parts of the shell, they are prominent, sharp and entire: in other respects this agrees with the last species.

We have met with but one specimen of this neat shell, it came from Barton.

Fusus rugosus of Lamarck is intermediate in form between this and *Fusus rugosus* of Min. Conch. tab. 274, but quite distinct from either; Lamarck has erroneously quoted Brander's *Murex porrectus*, and we have been accordingly misled; of course Brander's name must be restored. Lamarck's *F. rugosus* does not occur in England.

NERITA globosa.

TAB. CCCCXXIV.—*fig.* 1.

SPEC. CHAR. Subglobose, transversely sulcated; spire apparent; one tooth upon the inner lip; outer lip plain within.

THREE or four black bands and a few rows of oblong spots decorate the surface: the outer lip is rather thin and void of crenulations; the inner lip is narrow, with only one very obtuse tooth near its upper end; within the aperture near its lower part, is a conspicuous lamelliform tooth that regulates the opening of the operculum by confining the appendage that moves between it and the lip: the spire is not prominent.

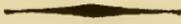
The only circumstance in the form of this shell that induces us to determine it to be a *Nerita*, is the sulcated surface in which it agrees with many recent marine Shells, that have like it, no teeth or crenulations on the outer lip, but are still called *Neritæ*; being a fossil and much corroded, it may have lost its epidermis, although some colour remains.

This unique specimen was lent us by the Rev. T. Cooke, who has taken much pains to fill up our list of Hampshire shells: it contained two valves of *Corbula Pisum* (tab. 209.) an intimation of its marine origin.

NERITA aperta.

TAB. CCCCXXIV.—*fig. 2, 3 and 4.*

SPEC. CHAR. Sub-hemispherical, smooth; spire visible, depressed; aperture orbicular, expanded; inner lip obscurely crenated, bearing one large tooth.



A THICKENING of the outer lip a little within its sharp edge, together with its general form not being produced in the middle as in many Neritinæ, seem to warrant the placing this as a Nerita. In most specimens the surface is marked with acutely zigzag brown lines of width equal with the white between them: but one individual has a black ground, with oval white spots. (See fig. 4.)

Professor Sedgwick discovered this in Colwell Bay, on the Isle of Wight; from his specimens we have taken figures 3 and 4, while fig. 2 is from a Barton example that we have just received from our kind friend Miss Salisbury. The Isle of Wight specimens are often much corroded.

ANOMIA; LINN.

GEN. CHAR. An irregular bivalved Shell: with a foramen in the flatter valve that allows the passage of a bony appendage by which the Animal is attached to marine substances; beaks none or very short.

ALL the species of this genus have one valve nearly flat, and exactly conforming to the surface it is applied to and where it is fixed by the bony appendage terminating one of the muscles that is united to the other valve: this appendage is often termed an operculum; it exactly closes the hole in the valve it pervades, which can never be opened by the animal, since the convex valve is the only moveable one: the hinge is a small ligament contained within the beak of the convex valve, and attaching the margin of the other to it. The convex valve alone may be known by three approximating muscular impressions nearly in the centre of it.

This Genus is so easily recognized, that it is remarkable Linneus should have comprehended the modern Genus *Terebratula* with it. It is unfortunately named.

ANOMIA striata.

SPEC. CHAR. Suborbicular, convex, when old contracted towards the beak; longitudinally striated.

SYN. Anomia Ehippium, *Auctorum.*

THE fine striæ that cover this fossil are very conspicuous in the French specimens, and are alone sufficient to determine it a distinct species: in the young state these striæ are not easily discoverable, it may then be readily taken for *A. Squamula*, but the foramen does not extend to the edge of the valve as in that species.

A single valve of this remarkable shell is now and then found at Barton; figs. 2, 4 and 5 are from that place, two of them through the kindness of the Rev. T. Cooke.

The small individuals fig. 1, were attached to *Pinna affinis*, (tab. 313.) and the group fig. 3 to a *Pectunculus*, both in the Sandstone of Bognor Rocks. It is not rare in several parts of France.

DOLIUM, *Lamarck.*

GEN. CHAR. A thin, subglobose, univalved shell, transversely banded; spire short; aperture longitudinal with a notched base, and crenated or waved sharp lip.

THE shells that compose this genus have, from their general resemblance to each other, been long considered as a peculiar tribe; we are indebted to Lamarck for their separation from Buccinum, to which Linnæus referred them. They have usually a subglobose form, although some are elongated and ventricose; the columella is generally curved, and has a small, sometimes open umbilicus; the base is very slightly produced and truncated, so as to form a sinus, but not a beak to the large aperture; they have a thin horny epidermis, that when perfect conceals a marbled or spotted surface, whose colors are but few, and not brilliant. The transverse bands are answered by furrows within the shell, and hence the lip is crenated or undulated through its whole length.

The species are marine and not numerous, only one and that an uncertain one, has been found in a fossil state.

1823 S. 74.

DOLIUM HODOSUM.

TAB. CCCCXXVI. and CCCCXXVII.

SPEC. CHAR. Obovate, ventricose, ornamented with transverse rows of knobs.

SYN. Cast of a species of *Dolium*? *Mantell Geol. Sussex*, 196.

IN consequence of the imperfections of the only remains we have of this extraordinary fossil, we can give but short details of its form. It is about four fifths of its length wide, the spire is very short and consists of only two or three turns; it is marked with a few transverse, prominent, rounded bands, and a few longitudinal striæ; the bands upon the body of the shell are divided into obtuse, not much elevated but large knobs, that are but badly preserved; the base and part of the columella are lost with the surrounding Chalk, that has been broken away; there is no vestige of the shell itself, and the cast probably exhibits its inner surface only.

Soon after the discovery of this noble specimen, in Clayton Pit by R. Weeks Esq. of Hurstperpoint in Sussex, it was kindly lent to Mr. Sowerby; it would have been figured before, but hopes were entertained of finding specimens to illustrate such parts as are here wanting, no other has however occurred.

TAB. CCCCXXVIII.—*figs 1 and 2.*CIRRUS *perspectivus.*

SPEC. CHAR. Obtusely conical, spirally striated; umbilicus deep, exposing one third of each whorl; aperture transversely oblong.

SYN. *Cirrus perspectivus*, *Mantell Geol. Sussex*, p. 194. *tab. 18. f. 12 and 21.*

NOT quite so high as wide, with a flattish base, in the centre of which is an acute conical umbilicus; the internal portion of each whorl is regularly convex; the outer rather squared; there is no canal around the spire; the inner surface is pearly.

Not uncommon in the upper Chalk of Sussex, Kent, Wiltshire &c. it is also found, but rarely, in the lower Chalk; the place of the shell is often supplied by a green steatitic substance, that retains the cast of the external striated surface. The specimen (*fig. 1.*) shewing the internal pearly portion, is from Northfleet; the other was among a number sent from Wiltshire by the late Mr. Cunnington.

 CIRRUS *depressus.*
TAB. CCCCXXVIII.—*fig. 3.*

SPEC. CHAR. Subdiscord, concentrically striated; umbilicus wide, exposing a small portion of each whorl; an angular canal runs round the spire; aperture obtusely angular.

SYN. *Cirrus depressus*. *Mantell Geol. Sussex*, p. 195. *t. 18. f. 18 and 22.*

THE short spire and the canal around it, produced by the prominent upper parts of the whorls, distinguish this from the last, it is nevertheless possible that they may be only varieties.

Nearly as common as the *C. perspectivus* in the same situations, we have received it with a similar green coating from Wiltshire; the specimen figured is from Bridgwick in Sussex, through the kindness of Gideon Mantell, Esq.

CIRRUS rotundatus.

TAB. CCCCXXIX.—*figs. 1 and 2.*

SPEC. CHAR. Conical, nearly smooth; whorls convex; umbilicus large; aperture round.

VERY nearly related to *Cirrus acutus*, t. 141. but the upper portion of each whorl is not flattened as in that species, and it has a general bluntness or roundness of contour by which it is distinguished at first sight; the surface is marked with fine lines of growth.

Found in the Limestone of the Lead Measures near Settle in Yorkshire.

 CIRRUS carinatus.
TAB. CCCCXXIX.—*figs. 3 and 4.*

SPEC. CHAR. Discoid, smooth? whorls few, ventricose, obtusely carinated, convex below; umbilicus large; aperture transverse, obovate.

BUT little can be said of this fossil since we know only the cast of the inside; its spire is quite depressed, and the whorls almost separated from each other; the umbilicus is deep as well as wide.

Sent from Lakehampton Hill near Cheltenham, by our scientific Friend Miss E. Warne.

The genera *Cirrus* and *Euomphalus* merge into each other, they are distinct from *Delphinula*.

MITRA parva.

TAB. CCCCXXX.—*fig* 1.

SPEC. CHAR. Ovate fusiform, short, transversely sulcated; upper edges of the whorls defined, entire; aperture elongated, lip plaited within; four plaits upon the columella.

ONLY a quarter of an inch long, and one-eighth wide; the whorls are slightly convex, and smooth and shining between the sulci; the upper sulcus is deeper than the others, and so produces a margin to the whorls; the plaits within the lip reach nearly to the edge which is sharp.



MITRA pumila.

TAB. CCCCXXX.—*fig*. 2.

SPEC. CHAR. Ovate fusiform, short, transversely sulcated; upper edges of the whorls defined, crenated; sulci decussated by longitudinal costæ; aperture elongated; lip plaited within; four plaits upon the columella.

IN every thing excepting the longitudinal costæ, this agrees exactly with the last: these costæ are numerous, not much elevated, and slightly curved; they divide the sulci into regular square cells, and give a rough aspect to the shell.

Many specimens of both the above Mitres have come to our hands through various channels from Barton Cliff. Amongst them we do not find any intermediate varieties.

It does not appear that either of them has been previously described.

Mitra graniformis is the nearest given by Lamarck ; it is longer and wants the transverse sulci. *Voluta obsoleta* of Brocchi has a similarly ornamented surface but it is much longer and sharper in form, and has but three plaits upon the columella.

TAB. CCCCXXXI.

TRIGONIA elongata. (*var. T. costata?*)

SPEC. CHAR. Elongated gibbose subtriangular; anterior side obtuse, transversely costated; posterior side separated from the anterior by a crenulated carina, bicarinated, longitudinally striated, striæ granulated.

SYN. *Trigonia costata* (b.) *Lam. Hist. Nat. VI. pt. 1. p. 64.*

MUCH doubt is experienced upon examining a number of specimens of this *Trigonia*, they vary so considerably in length, or rather in the inclination the hinge line and costæ bear upon the large carina, and also in the form of this carina; and we are strongly inclined to believe with Lamarck that it is only a variety of *Trigonia costata* (*Min. Conch. t. 35.*) The costæ are rounded and prominent, they are rarely connected with the carina, but they are more often separated from it by a furrow. The carina is sometimes broad and low, sometimes it is elevated moderately, and at others it is very prominent and thin; it is always more or less crenated. The anterior side has two lesser carinæ, of which that nearest to the hinge is the most elevated; between them are many strongly crenulated ridges. The beaks are elegantly incurved.

Two of the figures (1 and 2) upon this Plate are from specimens found at Radipole, near Weymouth and selected from among several in the possession of our very kind Friend Miss Benett; at first sight they seem very distinct from the *T. costata* of the Ironshot or in-

ferior Oolite and their different locality would have confirmed us in the idea, did not that species also occur in the blue Clay Cliff beyond the Old Castle near Weymouth; they are also both found together in the opposite Kingdom at a place called Vaches noires near Honfleur.

Fig. 3. represents a small specimen from France, and in Mr. G. B. Sowerby's work upon Genera is a figure of the *T. costata* from near Weymouth, taken from one of Miss Benett's specimens.

There is an unfortunate circumstance attending the Generic name *Trigonia*; it has long been applied to a genus of Plants, and still remains in Wildenow's *Spec. Plantarum*, a circumstance that has been hitherto overlooked, and the name has become so familiar to Conchologists that we are unwilling to change it; otherwise we should recommend *Lyridon* as a substitute from the resemblance of the lines upon the teeth about the hinge to the strings of a harp.

PILEOLUS, G. B. Sowerby.

GEN. CHAR. Shell conical, with a subcentral, upright vertex; base concave, with a thin margin and tumid centre; aperture small, within the margin of the base, sublateral, semilunar, its outer lip prominent, the inner one crenulated; spire internal, very short.



THE form of the upper surfaces of the shells of this Genus is similar to that of *Patella*, for it is a short cone, from the apex of which there are sometimes diverging striæ or ridges; the base also resembles *Patella*, in as much as that it has a thin or sharp edge. Within this edge is seen the transverse aperture leading to a very short spire, that is wholly included within the cone, and nearly fills it up in the form of a cushion. The aperture is slightly curved and narrow, with parallel lips, and rounded extremities; the lips are separated, that nearest the centre is crenulated. We suspect the spire is reversed.

The wholly internal spire, and the prominent outer lip of the aperture, independent of the margin of the base, are characters not possessed by any other genus of involute shells. There are several points of resemblance

between this and *Neritina Schmidelliana*; *Neritina Altavillensis* * has also been pointed out as very analogous, but both these differ in those particulars, and also in having an oblique apex.

This Genus was pointed out by the Rev. George Cookson, and has been established by Mr. G. B. Sowerby, in his *Genera of Shells*, where it is first described. It is only known in a fossil state, among the organized remains of a former Ocean, thus differing in situation from the *Neritinæ* above alluded to.

*Would it not be adviseable to adopt the Genus "*Velates*," proposed by Montfort, for these two shells, since they differ in many respects from the other *Neritinæ*?

PILEOLUS plicatus.

TAB. CCCCXXXII.—*fig. 1 to 4.*

SPEC. CHAR: Obtusely conical, with diverging ridges extending to the edge; margin irregularly crenated; the centre of the base divided.

SYN. *Pileolus plicatus*, *G. B. Sowerby's Genera.*

THERE is an elevated margin to the flat cushion like centre of this species, and this centre is moreover divided into two parts by a slight sulcus that does not occur in the following; the height is not much less than the diameter of the base; the inner lip is strongly crenulated.

Found along with the following, but rare. *Fig. 4*, is magnified.



PILEOLUS lævis.

TAB. CCCCXXXII.—*fig. 5 to 8.*

SPEC. CHAR. Shell rather flat, smooth, with an entire margin.

SYN. *Pileolus lævis*, *G. B. Sowerby's Genera.*

MORE depressed in form than the preceding; the central portion of the base is convex, not circumscribed with a margin, nor divided as in *P. plicatus*; the inner lip is obscurely crenated; the upper surface is nearly smooth in general, but sometimes it has irregular indistinct furrows; in a word, the general plainness and flatness of its contour distinguishes it from the *P. plicatus*, *Fig. 8* is a magnified representation.

This and the preceding have been long noticed by the Rev. George Cookson, whose diligent hands collected them along with several other very remarkable new shells out of a kind of Oolite, beneath the Bradford Clay at Ancliff, and also at Charter House, Hinton, in Somersetshire. The specimens kindly supplied by him have been represented in the plate employed both in my Brother's *Genera of Shells*, and in this Work.

TURBO conicus.

TAB. CCCCXXXIII.—*fig. 1.*

SPEC. CHAR. Ovato-conical, acute, umbilicated, transversely striated; whorls very convex; base rounded.

THE whorls, six in number, are so convex that they are almost depressed upon their upper parts; that last formed is considerably larger than the preceding ones; the apex is remarkably acute; the striæ are small and very numerous. In its general form this shell much resembles the *Turbo tenebrosus* of our shores, but differs in being sharply striated, and also in having an umbilicus which does not commonly occur in the Genus *Turbo*. There are several recent Foreign species somewhat resembling it, but they want the umbilicus and have much less ventricose whorls. Not unfrequently met with, replaced by *Silex*, in the Green-sand Formation.

 TURBO rotundatus.
TAB. CCCCXXXIII.—*fig. 2.*

SPEC. CHAR. Ovate, subglobose, pointed, umbilicated, smooth; aperture rather pointed above, large.

A smooth roundness of contour characterizes this shell; the aperture is equal to half the length of it, and is longer than wide; the spire is short and pointed.

Found with the above at Blackdown, but more rare.

The elongated form of the aperture in this species and the umbilicus together, present a considerable analogy to those fossils of the London Clay formation that have

been referred to the Genus *Ampullaria*, although they strongly resemble in their general habit, and are found in the same places as the fossil *Naticæ*, such as *A. acuta*, and *A. acuminata*; the want of a callus upon the columellar lip, however distinguishes them all from the genuine *Naticæ*, and it seems desirable to establish a distinct Generic name to arrange them under. On the other hand, the shell before us is so closely related to its companion, which may perhaps hereafter be separated from *Turbo*, that it appears advisable at present to keep them together as links that may serve to connect two apparently very distant Genera, the *Turbo* and *Natica*. We are of course totally unacquainted with the habits of these animals, but judge from their associates that they were inhabitants of Salt-water.

MUREX Peruvianus.

TAB. CCCCXXXIV.—*fig.* 1.

SPEC. CHAR. Subfusiform, ventricose, smooth, with 15 thin costæ; beak a little recurved.

THE length of this Murex is about twice its width; the costæ are formed at the sutures; they are imperfectly raised into erect lamellæ, and each whorl has about 15; the beak is long and narrow.

Where the surface of this crag shell is most perfect, there are strong indications of erect lamellæ upon the sutures, but in general it is so much decayed that there are only obtuse costæ in their places. It strongly resembles Murex Bamffius, but has not so many sutures. The recent Murex Peruvianus of the Encyclopédie Méthodique (Murex Magellanicus b. Lam.) when worn differs in no other respect than size, we are of course obliged to consider them the same; the existence of fossil shells in the Crag, similar to recent species, has before been exemplified in several instances, and shews that part of the Crag, at least, is of very recent formation, if not alluvial.

A rare shell found at Woodbridge by Mrs. Cobbold.

MUREX tortuosus.

TAB. CCCCXXXIV.—*fig. 2.*

SPEC. CHAR. Turreted, subfusiform, largely cancellated; varies in three tortuose rows, with two or three knobs between each; whorls ventricose; beak contracted.

THE three rows of foliaceous sutures, are so much curved round the spire, as to produce the appearance of four; they continue along the beak where they are very broad; the three transverse ridges, upon the middle and lower parts of the whorls, are equal and not very prominent; the fourth, near the upper part of the whorl, is large and divided into two or three tubercles between each varix, which tubercles extend over one or two of the inferior ridges.

All the specimens of this shell we have met with are very much worn; it is very rare. We are indebted to Mrs. Cobbold's generosity for a finer specimen than remains in her own cabinet.

TEREBRATULA elongata.

TAB. CCCCXXXV.—*figs. 1 and 2.*

SPEC. CHAR. Oval, convex, smooth; margin even; beak incurved.

VERY slightly rhomboidal, the valves are equally and regularly convex; its length at once distinguishes it from *T. carnea*, tab. 15.

Fig 2. exhibits the appendages to the hinge.

Common in the soft Chalk about Norwich.

TEREBRATULA sphæroidalis.

TAB. CCCCXXXV.—*fig. 3.*

SPEC. CHAR. A depressed sphæroid, with a slightly produced beak.

THE surface of this clumsy shell is quite smooth, and the edges of its valves even.

Found at Dundry by G. W. Braikenridge Esq.

TEREBRATULA bullata.

TAB. CCCCXXXV.—*fig. 4.*

SPEC. CHAR. Orbicular, ventricose, with a produced and incurved beak; front indented; depth greater than its width.

A REMARKABLY ventricose species; from its indented front there proceeds a little way towards the beaks, an obscure furrow in each valve, the edges retain a regular

level; in some states of preservation, the worn surface is minutely punctated, but this is seldom observable. It is distinguished from the globose variety of *T. digona* t. 96. by the narrowness of its front.

Collected in abundance at Nunney, near Frome, by the Rev. J. Ireland; it has also been found at Bridport.



TEREBRATULA emarginata.

TAB. CCCCXXXV.—*fig. 6.*

SPEC. CHAR. Subrhomboidal; the lesser valve nearly flat, the other convex; front defined by two angles or emarginate; edge becoming blunt by age.

THE inequality of the valves is a good character to distinguish this species by. When young the projections at the extremities of the short angular front, and which resemble those in *T. digona*, are hardly observable while in old individuals with almost flat borders, they are very conspicuous; the perforated beak has a decurved keel upon each side of it.

A rather uncommon *Terebratula*, discovered at Nunney near Frome, along with several others, by the Rev. J. Ireland.

TEREBRATULA globata.

TAB. CCCCXXXVI.—*fig. 1.*

SPEC. CHAR. Subglobose; front elevated with two obtuse folds, and slightly produced; surface often minutely punctated.

A DOUBLE sinus is formed in the lesser valve to receive the elevated front of the other, whose angles are obtuse; in the young state, as is usual throughout the genus, the folds or sinuses are less conspicuous; the whole surface is minutely and elegantly punctated; in most specimens the punctums are very conspicuous, but in some, whose surfaces have not been at all worn, they are indistinct; and when the outer coat is worn away, they are seen to unite into undulating lines: they result from the peculiar tissue of the shell, such are often to be met with in other species but not generally so near to the surface. The lower valve is regularly convex, with hardly any furrows leading from the sinuses in the front; the other valve has two slightly prominent ridges, that go a little way towards its centre.

Rather common at Nunney, near Frome; the Rev. J. Ireland has kindly supplied specimens.

TEREBRATULA perovalis.

TAB. CCCCXXXVI.—*figs. 2 and 3.*

SPEC. CHAR. Ovate, convex, with two elevated sinuses at the front, which is depressed between them; beak incurved.

THE two valves are equally convex and smooth; the margin obtuse; the sinuses produce three very obtuse ridges, two in the upper valve, and one in the front of

the lower ; the regular oval form rather pointed at the beak end is characteristic, and distinguishes it constantly from *T. buplicata* α (tab. 90.) of which three views are given in tab. 437 figs. 2 and 3 for comparison.

Fig. 2 is a young shell, it is rather shorter, as usual, than the full grown one fig. 3. They are from Dundry, by favour of G. W. Braikenridge, Esq.

TEREBRATULA maxilata.

TAB. CCCCXXXVI.—*fig.* 4.

SPEC. CHAR. Subquadrangular, convex ; two acute rising sinuses in the front, and one obtuse sinus on each side ; three conspicuous furrows in the upper, and two in the lower valve ; front rounded.

WELL distinguished from *T. intermedia* t. 15. by the depth of the sinuses, and consequent furrows which extend at least half way to the beak ; in some specimens the two central ridges between the furrows are very prominent, and approach more nearly together than in the specimen figured, such shells are also generally longer shaped ; it is always smaller than the *T. intermedia*. A front view of the sharply sinuated edge, reminds us of the closed jaws of a carnivorous animal, whence the specific name.

Sent from Nunney by our good Friend the Rev. J. Ireland ; the longer variety we have from Farley.

TEREBRATULA Sella.

TAB. CCCCXXXVII.—*fig. 1.*

SPEC. CHAR. Subquadrangular, convex; front considerably elevated, narrow, emarginated when old; sides depressed, slightly rounded.

WHEN young this shell is rather trigonal in consequence of the length of the sides and roundness of the front; as it grows older it becomes squarer, the front being more produced as well as more elevated; the beak is very slightly curved; the length and breadth are nearly equal; the edges always sharp.

A characteristic shell of the Kentish Rag Stone; a series of specimens were collected in the celebrated quarries of that stone at Chart, near Ashford, in Kent, by A. Power, Esq. several years ago. I have it also from Sandgate, where a mass of Stone was found by Mr. Goodhall, containing several full sized individuals, one of which contained crystallized Quartz. The specimen figured was said to come from Hythe.

TEREBRATULA obtusa.

TAB. CCCCXXXVII.—*fig. 4.*

SPEC. CHAR. Suborbicular, rather depressed; front broad, elevated; edge obtuse.

THE lesser valve is rather wider than long; but the projection of the beak of the other valve makes that longer than wide; their surfaces are equally and regularly convex, except near the edges, where they are rather suddenly bent so as to produce a squarish margin.

I have only seen one individual of this Terebratula; it was sent from Cambridge along with many specimens of *T. biplicata*, one of which has been figured upon Tab. 90.

TAB. CCCCXXXVII.—*figs. 2 and 3.*

These are representations of a young and a full grown specimen of *T. biplicata*, in views that appeared necessary to point out the difference between it and *T. perovalis*, and also between it and the shells formerly con-

sidered as varieties of it, but which differ in several points, almost, if not quite, enough for them to be considered as forming a distinct species.

The surface of the casts of these specimens is very distinctly punctated; they are from Cambridge; I have others also from Limerick by favour of S. Wright, Esq.

TEREBRATULA *obesa*.

TAB. CCCXXXVIII.—*fig. 1.*

SPEC. CHAR. Ovate, gibbose, front elevated considerably, with a slight broad sinus in the middle; beaked valve regularly convex to the edge; beak incurved, short.

A LARGE gibbose shell, rather more obtuse at the front; the lesser valve is depressed a little on each side of the elevated front, and also, near the edge, into the central sinus, otherwise both valves are very regularly convex; the width and depth are each about two thirds of the length; the beak has no keels upon its sides.

From Chalk, at Norton Bevant, near Warminster. It very strongly resembles *Anomia ampulla* of Brocchi, p. 446. but that not being a Chalk-fossil is probably distinct; I have not seen a specimen.

TEREBRATULA *bucculenta*.

TAB. CCCXXXVIII.—*fig. 2.*

SPEC. CHAR. Rather square, with rounded sides, convex; front produced, truncated, very slightly elevated; beak short.

THE valves of the *Terebratula* are nearly equal, thin edges almost level, and not sinuated; the front is so produced as to give the sides an inflated appearance, like the cheeks of a Fox; the length and breadth are nearly equal; the surface smooth.

Sent from the neighbourhood of Malton; it has much the aspect of some Green-sand fossils, but is not siliceous. I know not what stratum it comes from. Its characters are very conspicuous.

MYTILUS edentulus.

TAB. CCCCXXXIX. *fig. 1.*

SPEC. CHAR. Elongated, smooth; disk obtusely keelshaped; beak sharp; posterior side nearly straight; no tooth in the hinge.

VERY nearly of the same form as the common Mussel, but the beak end is deeper, much more keel-shaped, and a little curved; the sides are almost parallel; the front is rounded, and obtuse; the hinge line straight.

A small siliceous cast from Blackdown.



MYTILUS lanceolatus.

TAB. CCCCXXXIX.—*fig. 2.*

SPEC. CHAR. Lanceolate, slightly curved, smooth; disk, keel-formed; posterior side flat; beaks acute.

A VERY elegantly formed shell; the anterior side is a regular sweep from the beaks to the front without any angle marking the termination of the hinge; within each beak is one very long lamellar tooth.

A siliceous cast found at Blackdown: it enriches the Cabinet of L. W. Dillwyn, Esq. and appears to be very rare, as only one specimen has been found.

MYTILUS *sublævis*.TAB. CCCCXXXIX.—*fig. 3.*

SPEC. CHAR. Oblong triangular; rather curved; disk obscurely keelshaped; front straightish; beaks acute; lines of growth rather prominent.



THE beaks of this are more pointed than those of the common Mussel; it is also flatter towards the front and anterior side; the hinge line is straight, half the length of the shell.

Very imperfect specimens occur in the Cornbrash limestone at Felmarsham.

INOCERAMUS.

GEN. CHAR. A free, more or less inequilateral, irregular, bivalve; hinge a marginal, sub-cylindrical, transversely sulcated callus, supporting a ligament; beaks conspicuous, at one end of the hinge.

SHELL longitudinal, more or less gibbose, sometimes nearly equalvalved; but sometimes with very unequally elongated beaks; the anterior side is more or less produced, and supports the straight hinge callus upon its edge; the posterior side is sometimes lobed, at other times flat or convex; the hinge consists of a more or less cylindrical callus, produced by a rapid and very considerable increase in the thickness of the shell at its edge; it is concave on one side, and transversely sulcated to receive the ligament; it is the same in both valves; there is no opening for the passage of a byssus; the shell consists of closely pressed laminæ, composed of perpendicular fibres; the edges of these laminæ form concentric lines upon the surface, but are not prominent; some species have a lining of pearl. In all, the shell is very thin at and around the beaks, but becomes very thick at the edges, near the hinge, and towards the front.

This Genus may be divided into two sections, the first containing the species with short beaks, and nearly equal valves; the second those with elongated beaks and unequal valves.

Nine years have elapsed since my lamented Father, in a paper read before the Linnean Society in 1814, made known the characters by which this Genus formerly referred to *Patella*, and afterwards, in consequence of its fibrous structure, to *Pinna*, might be recognized; but in consequence of that paper not being printed until 1823, much uncertainty has existed, and several misrepresen-

tations been published ;* the Genus has, however, been uniformly admitted as distinct. Its great resemblance to *Crenatula*, has sometimes induced me to think that it ought to be joined with that Genus ; but a close comparison of the hinges in many specimens of different species, all of which are wholly destitute of the spoon-like processes characteristic of *Crenatula*, joined with a consideration of its prominent beaks and gibbose form, has confirmed my Father's opinion, and proved the accuracy of his judgment. Brongniart not knowing which species was the type of this Genus, and thinking the very prominent, unequal beaks of the two species belonging to the second section, a sufficient reason to distinguish them from it, has placed it in a newly formed Genus, which he has called *Catillus* ; but he probably was not sufficiently acquainted with the hinges of the species he still retains as *Inocerami*, to perceive their resemblance to the type. As to the Genus *Perna*, its species are of a much more foliated structure, and have a considerable sinus for the passage of the byssus ; it is, therefore, readily distinguished.

The name *Inoceramus*, from ι (fibra) and $\kappa\epsilon\rho\alpha\mu\iota\omicron\varsigma$ (testa) is justly objected to by scholars, as an improperly formed word, and not expressive of "fibrous shell" which it was intended to signify ; it therefore ought to be changed, but it has been in use so long, that it has become general ; and, if I were even inclined to act the part of an innovator, to do so would, I think, only be adding to the confusion already existing in consequence of Brongniart's naming the type of the Genus, *Catillus*, a name not applicable to the whole of the species.

This Genus occurs in many strata from the Mountain Limestone to the Chalk.

* See Mr. Mantell's observation upon the knowledge of the structure of this shell, page 212. and compare it with the paper in *Linn. Trans.* Vol. XIII. page 455, &c.

INOCERAMUS Cuvieri.

TAB. CCCCXLI.—*fig. 1.*

SPEC. CHAR. Obovate, curved, convex, with transverse, distant, obtuse waves; posterior side concave, with a small lobe near the beak; beaks very short, acute.

SYN. *Inoceramus Cuvieri.* *Linn. Trans. v. XIII. p. 457.* *Mantell Geol. Sussex, 213?*
Catillus Cuvieri, Cuvier and Brogniart Geol. de Paris, ed. 1822. p. 386.

THIS gigantic species of *Inoceramus* is the first that has been defined; it is supposed to acquire, sometimes, four or five feet in length; it is very irregular in form, but is generally one third longer than wide, and not very deep; it is curved towards the posterior side, in which is a small, rounded, nearly smooth lobe; the beaks are not all raised from the hinge, so they cannot be called reflexed or curved, but they are sharp. The edges of the laminæ composing the shell, or lines of growth, are placed at regular distances; between them the surface is smooth; it has a long hinge line.

It is extremely difficult to distinguish the species of the Genus before us; they are not merely variable in form, but so brittle, that fragments only are commonly found. The general flatness, and nearly circular disposition of the lines of growth will, however, go far towards pointing out the present species; the small posterior lobe, and short depressed beaks complete its characters. In consequence of the posterior lobe not being mentioned, and of some other differences in the specific character

given by Mr. Mantell, I have been obliged to add query to his quotation: it is probable that his *I. latus* is a flat variety only, for some specimens of *J. Cuvieri* are without waves for a considerable extent, and then have several large ones.

Common in Chalk every where. The specimen figured, is the same given in the Linnean Transactions; it was picked up in a Chalk Pit near Royston by Mr. Sowerby, and is the most perfect yet known. Fragments attached to, or imbedded in Flints, and casts of large portions in Flint are not rare among alluvial gravel.

INOCERAMUS Brongniarti.

TAB. CCCCXLI.—*figs. 2 and 3.*

SPEC. CHAR. Oblong, gibbose, with large transverse undulations; anterior side angular, lobed; posterior side, flat, truncated and smooth; beaks small, curved and pointed.

SYN. *Inoceramus Brongniarti*, *Mantell p. 214, No. 85.* *I. Lamarekii*, *Mantell, tab. 27. fig. 1. and p. 214. no. 84 in part.*

WELL distinguished by the flat, broad, cordate form of the posterior side, upon the borders of which the lines of growth and larger waves that occupy the other part of the shell are completely lost; each valve is nearly as deep as it is wide; its length is rather less than twice its width.

If we may judge from the fragment of a hinge that is here figured, and which, from the flatness of the posterior side, seems to be of the same species with the small example; this is as gigantic a shell as the last,

but much deeper. The flat side and the want of longitudinal furrows shew that it is not *I. Lamarckii* of Parkinson, in the Geological Trans. v. V. p. 55. with which, according to his figure, Mr. Mantell has however confounded it. It agrees better with the description of Mantell's *I. Brongiarti*, but not well with his figure of that species.

In Chalk, not uncommon.

The hinges here figured, serve well to illustrate the Generic characters.

INOCERAMUS cordiformis.

TAB. CCCCXL.

SPEC. CHAR. Equalvalved, heartshaped, transversely and interruptedly waved; beaks large, incurved; anterior side angular.

THE posterior side of this shell is not defined; but rises gradually from a hollow beneath the incurved beaks; the transverse waves are very high, and irregularly interrupted; the width and depth are equal and but little exceeded by the length. The general form reminds us of *Isocardia Cor*, only that the hinge line being produced, gives an angular form to the anterior side.

The figure is taken from a remarkably fine specimen, filled with Flint, that was found at Gravesend.

INOCERAMUS mytiloides.

TAB. CCCCXLII.

SPEC. CHAR. Equalvalved, elongated, depressed, with slight, irregular waves; convex and obtuse towards the beaks, hinge line oblique; anterior side produced; beaks short.

SYN. *Inoceramus mytilloides*, *Mantell p.* 215.
t. 28. *f.* 2.



A SMOOTH, slightly waved surface, elongated form, and brownish pink colour, constantly distinguish this species; the beak end is remarkably blunt, although the beaks themselves terminate in a sharp point.

Peculiar to the lower Chalk; it occurs in Wiltshire, Sussex, &c. This is the species Miss Benett has been successful in clearing the hinges of, after the suggestion of Mr. Sowerby, as mentioned in the Linnean Society's Transactions. The large figure is from a specimen in Miss Benett's Cabinet.

CRENATULA.—*Lamarck.*

GEN. CHAR. A subequalvalved, bivalve, flatish, lamellose, rather irregular; hinge lateral, linear, internally marginal, crenulated; crenulæ arranged in a series, callous, spoonformed, receiving a disjointed Ligament.

THE recent species of this Genus are flat shells, and composed of Lamellæ, of a distinctly fibrous structure, which do not project beyond the surface, but mark upon it numerous, sharp lines much resembling those upon *Inoceramus*; the hinge contains the characters in which it differs, it consists of a number of spoonlike processes, some of which, near the beaks, are placed close together, while others are distant, they receive detached portions of the ligament, and are not supported upon a distinct callus that, after being bent, extends beyond the beaks as in *Inoceramus*; those processes that are united together near the beaks, have still a furrow between the edges of their upper hollow sides, to which no ligament is attached; this sulcus does not exist in *Inoceramus*, where one continued crenulated groove in each valve appears constructed to receive an undivided ligament; in *Crenatula* there is no great disproportion of thickness between the shell, about the beaks and margin. *Perna* is distinguished from both the above mentioned Genera, by having a sinus for the passage of a byssus.

For other particulars my Brother's work upon Genera may be consulted; the above are sufficient to discriminate fossils by.

CRENATULA *ventricosa*.

TAB. CCCCXLIII.

SPEC. CHAR. Ovate, elongated, ventricoso-carinated; posterior side impressed; beaks pointed.



EACH valve approaches towards keelshaped in consequence of its great depth and the flatness of the posterior side, which is also nearly straight; near the beaks the posterior edges are a little produced, but not enough to form a lobe; the front is rounded as well as the anterior side; hinge line short.

There are but 5 or 6 crenulæ of the hinge remaining in the specimens before us, but they are perfect enough to shew the characters of *Crenatula*, although the shell is much more gibbose than any known recent species. The one figured came from Husband Bosworth; it was lent Mr. Sowerby by the Rev. W. D. Conybeare: at one end of it is a young individual. Another specimen from Bennall or Barnall Wood, near Gloucester, shews the internal pearly coat; it was presented by Miss Warne

TEREBRATULA triquetra.

TAB. CCCCXLV.—*fig. 1.*

SPEC. CHAR. Suborbicular with a produced, incurved beak; valves equally convex; front slightly indented; beak obtusely keel-shaped; with carina on each side.

THE length and breadth of the upper valve are equal; the edge is level and sharp, and not much thickened by age; the indentation in the front produces a slight concavity of the surface, that extends more or less from the edges, interrupting the regular convexity of both valves; the larger valve is besides obtusely keelshaped near the beak, which has also a sharp ridge upon each side of it, whence the perforation is triangular; the surface is remarkably smooth.

Found at Felmarsham by Miss Ludlow.

TEREBRATULA indentata.

TAB. CCCCXLV.—*fig. 2.*

SPEC. CHAR. Elliptical, smooth, more or less gibbose; valves equally convex; front deeply notched; beak small, much incurved.

IN the young state this Terebratula, like many others, shews but slight signs of the marginal notch; when full grown the notch is deep and obtuse-angular; broad furrows extend from it about one third the length into each valve; its length is nearly twice its width.

Found abundantly in a dark greenish grey limestone at Banbury, and several other places. The two sides are not always equal.

TEREBRATULA Sacculus.

TAB. CCCCXLVI.—*fig. 1.*

SPEC. CHAR. Obovate, gibbose, with a deep channel along the larger valve; front indented.

SYN. Conchiliolites Anomites Sacculus. *Martin Pet. Derb. tab. 46, figs. 1 and 2.*

A SMALL almost globose shell, well distinguished by the broad and deep furrow, that divides the larger valve into two lobes; the other valve has also, near its edge, a con-

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cave space, in the middle of which is a slight elevation proceeding from a minute sinus in the edge of it.

From the Derbyshire Limestone; the specimen figured formerly belonged to Mr. Martin, who says the species is common, particularly at Eyem and Middleton; we have it also from near Matlock, on the road from Derby.

TEREBRATULA hastata.

TAB. CCCCXLVI.—*figs. 2 and 3.*

SPEC. CHAR. Elliptical, subrhomboidal, rather depressed; front truncated and indented; edges sharp.

Var. β , Small, blunt edged, and obovate. Fig. 3.

VALVES nearly equal, not very convex, rather concave near the indented front edge; the width is about two thirds of the length. The variety β is always smaller, shorter, and deeper; its small valve is also less concave towards the front.

The large figure represents a specimen from Limerick, presented by S. Wright, Esq. the smaller one, another from near Dublin. I have also seen another from Bristol. Fig. 3 is the small variety, sent by Mr. Moore from the neighbourhood of Dublin. All come from the black Limestone.

TEREBRATULA cornuta.

TAB. CCCCXLVI.—*fig. 4.*

SPEC. CHAR. Short, convex, with blunt edges, four lobed; the two middle lobes produced, the others very short.

IRREGULARLY five sided; the two sides that meet at the beak are convex, the others concave, the front very deeply so; the lateral lobes are rather obscure, the others, obtusely pointed, and forming ridges that diverge from near the centre of the valves, in each or which they are equal; the beak is short, incurved, and has a sharp keel on each side of it; the surface is smooth and shining. One of the prominent lobes is often less produced than the other, a resemblance is then formed to the unequally elongated horns of a snail, whence the name.

From the coarse Limestone of Ilminster, by the kindness of E. Strangeways, Esq.

CUCULLÆA elongata.

TAB. CCCCXLVII.—*fig. 1.*

SPEC. CHAR. Elongated, subcylindrical, finely striated; anteriorly pointed; posterior side very short.

NEARLY three times as wide as long; the valves are so deep as when closed to form an irregular cylinder; the beaks are small, incurved, and distant from the anterior extremity; the striæ longitudinal and very fine.

Collected at Cross Hands by the Rev. Mr. Steinhauer; the shells appear to have been found in the soft parts of the Limestone, as they are empty.

CUCULLÆA costellata.

TAB. CCCCXLVII.—*fig. 2.*

SPEC. CHAR. Transversely oblong, gibbose, longitudinally striated; anterior lobe wing-shaped, ribbed; posterior side rounded, ribbed; beaks incurved, distant from each other.

THE general outline of this shell is an oblique parallelogram, twice as long as wide, placed transversely; the striæ are sometimes distant, at others very numerous, and slightly decussated by the lines of growth; each extremity is distinguished by 3 or 4 small, sharp, rugged ribs, the anterior ones have strong elevated striæ between them; the anterior side or lobe is distinguished by the keel-like termination of the central portion of the surface.

Siliceous casts of this neat shell are not unfrequent at Blackdown; it is also found at Collumpton, in Devonshire.

CUCULLÆA minuta.

TAB. CCCXLVII.—*fig. 3.*

SPEC. CHAR. Elongated-ovate, convex, striated, anteriorly submucronated; anterior lobe small, separated by a keel; beaks nearly close.

RATHER more than twice as wide as long, and smallest at the extremities; the ridge that defines the anterior lobe forms a projecting angle upon the margin; the anterior side is very obliquely truncated; the valves are rather flat.

Found along with a great number of small and even minute shells, among which are the Pileoli (tab. 432.) in limestone at Ancliff, by the Rev. George Cookson. Many of the shells that accompany it appear at first sight to be the young of larger species, but upon a careful examination they will perhaps prove as distinct as the one before us.

CUCULLÆA rudis.

TAB. CCCXLVII.—*fig. 4.*

SPEC. CHAR. Transversely oblong, convex, rugged and longitudinally ribbed; beaks incurved, nearly close together; anterior lobe not defined.

LARGE rugose ridges occupy both sides of this shell, the middle is deeply striated; the anterior side is not distinguishable from the middle portion of the valve.

A very imperfect specimen, but the only one we have seen; it is in the Rev. Mr. Cookson's suite of Shells found in the limestone at Ancliff. We are happy to have it in our power thus to acknowledge our thankfulness for the loan of the whole collection for examination; it is very remarkable for the great number of species of Shells, Corals and Crinoidea it contains.

AMMONITES *Planorbis*.

TAB. CCCXLVIII.

SPEC. CHAR. Discoid, smooth; whorls three or four, two thirds exposed.



FEW shells are more plain in their appearance than this unornamented Ammonite, for its situation and analogy to the following leave no doubt of its being an Ammonite, although we have not met with the septæ. It is always found so much flattened that little can be added to the specific description, for its thickness and the form of the whorl cannot be ascertained; we can only see that the whorls encrease rather rapidly in diameter, that they have no radii or tubercles, and that the striæ of growth are very fine. The inside pearly coat is nearly all that is preserved, and that is sometimes very highly iridescent.

Not of very rare occurrence in a kind of slaty Clay belonging to the Lyas beds, at Watchet. Fig. 1 is from that locality.

Fig. 2 is taken from, a high coloured individual said to be from Lincolnshire, placed in Mr. Sowerby's cabinet, by the Rev. R. B. Franciss.

AMMONITES *Johnstonii*.TAB. CCCCXLIX.—*fig. 1.*

SPEC. CHAR. Discoid; whorls 6 or 8 two thirds exposed, with numerous, short, straight *costæ* upon the exposed parts; front plain.

THE numerous, very short, rounded, ribs or rather perhaps elongated tubercles, do not reach quite across the exposed parts of the whorls; they are not to be found upon two or three of the central whorls which however may be distinguished from those of the last species by their proportionally slow increase in size.

Like the last, this species is only found very much compressed and deprived of its external coats; the pearl that remains is excessively brilliant, and full of color.

—————Johnstone, Esq. has kindly lent me the splendid specimen here figured; it was fortunately extracted from the slaty beds of Lyas Clay, at Watchet without injury. Several other Ammonites occur in the same place, that probably belong to species found in other parts of the Lyas range, but they are so flattened it is difficult to recognize them.

AMMONITES *parvus*.TAB. CCCCXLIX.—*fig. 2.*

SPEC. CHAR. Discoid; surface marked with diverging, undulating *striæ*; inner whorls exposed; front rounded; aperture oval.

FOUR or five volutions almost wholly exposed, and but gradually enlarging, constitute this little Ammonite; the *striæ* are elevated, obtuse and numerous, they reach over the front; the aperture occupies one third of the longest diameter.

Casts of this shell composed of Pyrites have been in Mr. Sowerby's Museum ever since 1806 without decomposing; they were found at the depth of 80 feet in a newly sunk well at Tunbridge.

EUOMPHALUS *funatus*.TAB. CCCCL.—*figs. 1 and 2.*

SPEC. CHAR. Conical, very short; ornamented with many spiral threads united by more numerous transverse lines; umbilicus rather small.

IN many respects this resembles *E. discors* (tab. 52.) but is easily distinguished by the involute threads upon its under surface, and the slight elevation of the transverse lines, which are very regular and close, and do not give it the rough appearance that characterizes the upper surface of that species.

Fig. 2 represents an apparently water worn specimen, in which the spiral ridges only remain; it serves to shew the general form of the short spire.

From Dudley, in the possession of ——— Johnstone, Esq. of the Hotwells, Bristol.

EUOMPHALUS *coronatus*.TAB. CCCCL.—*fig. 3.*

SPEC. CHAR. Discoid, flat above, with broad flat, pointed spines around its edge; concave beneath.

A VERY small, flat shell; the upper part of each whorl is flat, the lower rounded; along the middle is a row of

flat delta-formed spines that are a little turned upwards: the flat portions of all the whorls are arranged in the same plain, so that the spire is not at all elevated; young shells are slightly undulated upon the surface.

From Ancliff, in the Rev. George Cookson's cabinet. This species seems to unite the Genera *Enomphalus* and *Delphinula*.

ASTARTE trigonalis.

TAB. CCCCXLIV.—*fig* 1.

SPEC. CHAR. Cordato-triangular, depressed, transversely sulcated; beak pointed; anterior side separated by an angle, smooth.



THE posterior edge is concave near the projecting beak, and rounded into the front; the sulci are numerous, not deep, they terminate at a ridge that defines the anterior side; just before this ridge, the surface is rather concave; the shell is thick.

Not being able to clear away the stone from the inside of the only specimen that we have met with of this curious shell, it is not without some doubts that it is referred to the Genus *Astarte*, but its external form agrees well with several species of that Genus.

It is one of the treasures which Mr. Johnstone has kindly allowed to travel from his Cabinet.

It was found at Dundry.

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ASTARTE orbicularis.

TAB. CCCCXLIV.—*figs. 2 and 3.*

SPEC. CHAR. Lenticular, with many concentric, reflected lamellæ upon its surface; edge smooth.

VERY nearly orbicular; there is a slightly projecting angle at the end of the straight hinge line; the concentric lamellæ are not very much elevated, they are very numerous.

A minute shell, found with the following in the same stone that produces the Pileopsis, at Ancliff.

The larger figures are magnified.



ASTARTE pumila.

TAB. CCCCXLIV.—*figs. 4, 5 and 6.*

SPEC. CHAR. Obliquely obovate, slightly convex, with numerous concentric ridges; edge crenated within.

THE posterior side of this shell is very small with a semicircular edge; the anterior side is produced, and obtuse; the ridges are narrow, slightly elevated, and equal to the spaces between them; by age the shell becomes longer than wide; the edge is strongly crenulated within.

Fig. 4, shews an old individual; fig. 5, a middle sized one; fig. 6, is an enlarged representation of the insides of the valves.

Found at Ancliffe by the Rev. George Cookson.

PINNA granulata.

TAB. CCCXLVII.

SPEC. CHAR. Broad, nearly equilateral, convex, obscurely decussated, with a small elevation in the centre of each division ; anterior side rounded.



A BROAD shell, particularly thick about the anterior side and edge ; there is a rounded longitudinal elevation towards the posterior side which makes some fragments resemble those of a *Mytilus* ; the length of the specimen figured is $8\frac{1}{2}$ inches, the width 6.

Some time ago I was shewn fragments of this shell from the Kimmeridge Clay, near Weymouth, and mistook them for parts of *Mytilus amplus*, (*M. Con. t. 27.*) which by the bye is surely a *Pinna*, by Prof. Sedgwick. The specimen figured being much more perfect has set me right I trust : it is in the cabinet of Mr. De la Beche, who obtained it at Weymouth.

CHAMA squamosa.

TAB. CCCXLVIII.

SPEC. CHAR. Attached by the right valve; nearly orbicular, subglobose, imbricated; lamellæ undivided, somewhat erect, anteriorly produced, and adpressed; posterior part of the right valve obsoletely costated; left valve rather convex; smooth within.

SYN. Chama squamosa. *Brander, 86 and 87.*

DISTINGUISHABLE from Chama lamellosa of Lamarck, who has referred to Brander for his shell, by its undivided and not even lobed lamellæ.

In the section to which this species belongs the right valve is the largest and the one attached to foreign substances: by considering this the two sections of the genus made by Lamarck will be as readily recognised, as by observing whether the beaks turn to the right or the left hand, and the definition become more intelligible.

Extremely common at Barton, where perfect pairs are often found: it seldom exceeds in size the specimens figured; it is consequently a smaller shell than *C. lamellosa*: I have small individuals from some part of France; I think the neighbourhood of Paris; it is however rare in that country.

AMMONITES *læviusculus*.TAB. CCCCLI.—*figs. 1 and 2.*

SPEC. CHAR. Discoid, carinated, umbilicated, obscurely radiated; carina distinct; radii waved, alternately long and short, slightly elevated; umbilicus small, exposing parts of the inner whorls; aperture sagittate.



ONE half of the diameter of the shell is occupied by the aperture, a third of the other half by the umbilicus, in full grown individuals; in young ones the umbilicus is larger. The front is obtuse with a large prominent keel in the middle of it; the sides are rather convex marked with waved, elevated radii, that are broader and less conspicuous on the outer whorls of the full grown shells. In young shells the aperture is oblong, rather square; as the shell grows older, the aperture becomes longer, more deeply notched by the preceding whorl, and narrower towards the front.

Found in the inferior or Ironshot Oolite, at Dundry by G. W. Braikenridge, Esq. to whose liberality we are indebted for a series of specimens.

AMMONITES *corrugatus*.TAB. CCCCLI.—*fig. 3.*

SPEC. CHAR. Discoid, carinated and umbilicated, strongly radiated; carina distinct; radii waved, sometimes furcated, elevated; umbilicus broad, exposing parts of the inner whorls; aperture obovate; front obtuse.

RESEMBLING the last, but thicker, with more prominent radii, and a broader front.

From Dundry, with the *A. læviusculus*.

AMMONITES *varicosus*.TAB. CCCCLI.—*figs. 4 and 5.*

SPEC. CHAR. Depressed, costated; inner volutions exposed; carinated when young, and furnished with an irregular row of tubercles upon the inner edges of the whorls; costæ curved, large, obtuse, in old shells crossing the front; carina distinct; aperture oblong.

IN the very young state this Ammonite like many others, appears to be nearly plain, but has a distinct carina; as it grows older, a series of crescent shaped, nearly close ribs appear on each side of the keel, and a few small tubercles arise upon the inner edges of the

whorls; by degrees the ribs that are formed are long enough to join the tubercles, and the keel gradually becomes smaller until the ribs are no longer divided by it; lastly, the keel entirely disappears, and the ribs become large, broad and blunt. The aperture is about one third of the diameter of the shell in length; sometimes two ribs join one tubercle.

Casts of this variable Ammonite are by no means rare in the Sandstone of Blackdown; the space once occupied by the shell itself, which appears to have been thin, is filled by nearly transparent silex, that has, partly in consequence of its tenuity, a slightly pearly lustre, and forms an elegant petrification. The difference between the young and old shells is so great, that they are generally taken for distinct species, but the centre of the old shell often shews the form of the young one.

AMMONITES *Turneri*.

TAB. CCCCLII.

SPEC. CHAR. Depressed, radiated, carinated, a furrow on each side of the keel; inner whorls exposed; radii numerous, equal, curved towards the front; aperture oblong, quadrangular.

VOLUTIONS about five, the inner ones almost wholly exposed; the radii are almost straight until they are rather suddenly bent towards the front; the aperture is less than one third of the diameter of the last whorl in length.

The more exposed whorls, squareish aperture, and differently curved radii, distinguish this from *A. Brookii*, *tab.* 190. to which it bears a strong resemblance.

The upper figure represents a cast in Pyrites among Clay from Wymondham Abbey; it is probably out of an alluvial bed. We are indebted to our kind Friend, the celebrated Botanist, Dawson Turner, Esq. for it. The lower figure is from a very much compressed specimen, in which the shell remains imbedded in a slaty clay. Found at Watchet, where this species does not appear to be very common.

AMMONITES rotiformis.

TAB. CCCCLIII.

SPEC. CHAR. Depressed, ribbed, carinated, a furrow upon each side of the keel; inner whorls exposed, many; ribs many, strong, each terminating in a tubercle; aperture nearly square.

THE sides of this Ammonite are very slightly concave, the front is flat with a sunk keel; the ribs rising in knobs just as they reach the front, give the whorls a very square aspect; the ribs and the hollows between them, are nearly equal; the aperture occupies only one sixth of the diameter of the shell, and is very little longer than wide.

From the Lyas, near Yeovil; the specimen is very rugged, about seven inches in diameter; the figure is diminished.

AMMONITES multicostata.

TAB. CCCCLIV.

SPEC. CHAR. Depressed, costated, carinated, a furrow on each side of the keel; inner whorls exposed, few; ribs strong, sharp, numerous, with a tubercle near the end of each; aperture oblong.

MUCH resembling the last, but not so flat; the ribs differ in form; they are more extended over the front and bent forwards from the depressed tubercle nearly to the furrow; the length of the aperture is more than one fourth of the diameter of the last whorl; the sides are not so remarkably flat, as in the *A. rotiformis*.

The figure is diminished from an individual 14 inches in diameter, and between 3 and 4 inches thick, found in Lyas near Bath.

ACTEON cuspidatus.

TAB. CCCCLV.—*fig. 1.*

SPEC. CHAR. Subcylindrical, smooth; spire immersed, cuspidated; one plait upon the columella.

THIS shell is nearly cylindrical, but it is a little contracted towards the base; the upper end is truncated with a small portion of the acute spire in its centre; the aperture extends the whole length of the shell, except this small part of the spire; the columella has a sharp spiral edge, and one distinct plait above it. The aperture spreads a little, but is not notched at the base.

So novel is the contour of this little shell, that it is with difficulty compared to any before known; it agrees, however, with the essential characters of Acteon, but differs in general form, and in having a plain surface; it comes nearer in shape to Volvaria, but that has a truncated or notched base, and crenated lip to the aperture, besides several plaits upon the columella. It has been proposed to form a new Genus of it, to be called *Cylindrites*, but the following species having a conical spire, connects it with Acteon Noæ, (tab. 374.)

Figured from the Rev. George Cookson's Collection of Fossils found at Ancliffe. Fig. 1. A. is magnified.

ACTEON *Acutus*.TAB. CCCCLV.—*fig. 2.*

SPEC. CHAR. Subcylindrical, smooth; spire conical, acute; one plait upon the columella.



GENERALLY smaller, and not so perfectly cylindrical as the preceding, because the spire is not so much concealed, and because it is more tapered towards the base; the aperture occupies about three fourths of the whole length.

Small specimens of this do not at first sight appear much related to the *A. cuspidatus*, they are so much more pointed at both ends, but an examination of the columella, and form of the aperture, soon point out their connection. They occur together at Ancliffe.

TELLINA striatula.

TAB. CCCCLVI.—*fig. 1.*

SPEC. CHAR. Transversely elliptico-lanceolate, convex, smooth; anterior part shortest, longitudinally striated; striæ obscure.

THE width of this neatly formed Tellina, is above twice the length; the anterior portion is somewhat attenuated, and has a very slight elevation upon its surface that extends from the beak to the edge, it is truncated; the bend of the shell is inconsiderable; the striæ are hardly to be discovered in some specimens, they so soon wear off, and extend only a small distance from the anterior extremity.

Siliceous casts occur now and then in the Green Sand of Blackdown.

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TELLINA inæqualis.

TAB. CCCCLVI.—*fig. 2.*

SPEC. CHAR. Oval, convex, smooth; anterior extremity obtuse, its surface finely striated from the beak; posterior side largest, rounded.



A SMOOTH, obtuse, unequal sided shell, whose width is to its length as 3 to 2: the lateral curve is very gentle, and the elevation upon the anterior side, which distinguishes it from the central portion, is slight. The striæ are sometimes very obscure.

Found in the Green Sand of Blackdown.

ORTHOcera paradoxica.

TAB. CCCCLVII.

SPEC. CHAR. Lanceolate, curved, three angled, with a flat front, and convex sides; aperture an equilateral triangle; siphuncle nearly central.

ALTHOUGH this shell is called an Orthocera, it is in many particulars very different from any other known species, and approaches to a Nautilus by its curvature; but there is no impression, or any other mark about its inner edge, of a preceding whorl; the edges of the nearly flat front project a little, so that it appears concave; the other sides are convex but not similar, the greatest curvature being near the inner edge upon one of them, and in the middle upon the other: if we can depend upon the indications of the specimen, the aperture has a deep sinus in the edge of each of its sides, and the front.

It would perhaps have been proper to constitute a new genus of this very remarkable fossil, to be placed between Nautilus and Orthocera, but experience has shewn us how dangerous it is to form genera from such characters as fossils possess, especially when fragments only are preserved, and we have not the whole tribe before us. We know of only a short portion of the shell before us; one end of it is but half as wide as the other, and the curvature not more than the sixth part of a circle; therefore if it be an involute shell, the inner whorls must be very slender, or the outer one must have receded from them with a much less degree of curvature than they

possess. The Genus *Spirula* is perhaps the nearest approach among recent shells to such a form as this fossil might possibly have had when perfect: in the present state of our knowledge of its form, however, it would seem to be a rather bold assertion to declare them of the same Genus.

The specimen is a cast in Mountain Limestone filled with Calcareous Spar, found in Ireland, and presented in 1819 by Dr. Ogilby, and is augmented in value by his disinterested kindness.

NAUTILUS expansus.

TAB. CCCCLVIII.—*fig.* 1.

SPEC. CHAR. Subglobose, umbilicated, finely striated; umbilicus small; sides of the aperture expanded.



A SMALL Nautilus with sharp curved striæ following the lines of growth; the aperture is so much expanded laterally with the columella, as to make the axis considerably longer than the diameter; the umbilicus is small and nearly cylindrical: the septa cross the striæ, and are nearly straight edged at the front.

Found at Hamsey, by G. A. Mantell, Esq. whose assiduity in collecting and describing, and liberality in supplying specimens has added much to our knowledge of the Chalk and Chalk-marl fossils. This shell bears some resemblance to the young of *Am. elegans*, tab. 116, but I think can hardly have been mistaken for it. The specimen in our Museum, is a cast in Chalk-marl.

NAUTILUS biangulatus.

TAB. CCCCLVIII.—*fig. 2.*

SPEC. CHAR. Discoid, subglobose, with a large umbilicus, and a keel upon each side.



THE inner whorls of this Nautilus are half exposed, for each following whorl covers the preceding one as far as the keel upon its side, the front is rounded; the aperture is transversely elliptical, with the extremities angular in young, but obtuse, in old shells; its width equals two thirds of the diameter of the last whorl.

Occurs in the Mountain Limestone near Bristol; the specimens are in the Collection of the Rev. Dr. Beke, Dean of Bristol.

PRODUCTA fimbriata.

TAB. CCCCLIX.—*fig* 1.

SPEC. CHAR. Hemispherical, with 6 or 8 transverse, crenated, spinous? furrows; beak rather produced.

SOMEWHAT resembling *Producta punctata* t. 323, but the furrows are more distant, and are crossed by ridges that seem to have been the bases of spines, arranged in the form of a fringe; the length is greater than the width, and about double the depth; the lesser valve is concave, with sharper and more numerous, but otherways similar markings, to the larger.

The specimen lined with Calcareous-spar, from the Limestone of Derbyshire, is preserved in the Collection of Charles Stokes, Esq.

 PRODUCTA plicatilis.
TAB. CCCCLIX.—*fig* 2.

SPEC. CHAR. Transversely oblong, convex above, depressed in the middle, longitudinally striated and transversely wrinkled, spinose; front smooth.

THE transverse rugæ are numerous and equal, they only appear upon the upper part of each valve; the descending front is even and smooth; the spines are few, scattered over the surface; the hinge line occupies the whole width of the shell.

A very neat well defined species rarely found in the Limestone of Derbyshire. We are equally obliged to Mr. Stokes for the opportunity of figuring this, as the preceding specimen.

PRODUCTA depressa.

TAB. CCCCLIX.—*fig. 3.*

SPEC. CHAR. Nearly semicircular, depressed, corrugated, longitudinally striated; upper portion convex near the beak, concave near the margin; front abruptly descending.

SYN. Producta depressa, *Sowerby's Genera.*

THE numerous striæ and concave space around the margin of the upper part, are the distinguishing characters of this species; the front although it descends suddenly, is not very deep; the hinge line is long, and the sides so expanded near it as almost to form ears; it has no spines.

The four views before us of this Producta, will serve to illustrate the Genus further than any previously given in this work; those of the inside shew the muscular impressions, with the processes near the hinge in the upper valve, and the crenulated hinge line in the other, which has also two elevations bounding the cicatrices of the muscles; they are all taken from two masses of Dudley Limestone, but are grouped together so as to occupy less space, and the essential parts made rather conspicuous.

I know of no other species in the Dudley Limestone, neither is this found in any other place.

ACTEON crenatus.

TAB. CCCCLX.—*fig. 1.*

SPEC. CHAR. Ovate, elongated, transversely striated, columella minutely crenated.

A SLIGHTLY ventricose, rather pointed, and elongated shell; the aperture is very narrow above, the outer lip sharp, the columella without a plait but neatly crenated, which is a very remarkable circumstance.

Found in the London Clay of Barton Cliff.

ACTEON striatus.

TAB. CCCCLX.—*fig. 2.*

SPEC. CHAR. Ovate, acute, transversely striated, columella without a plait; striæ not punctated.

VERY regularly ovate with a pointed spire; the striæ are most conspicuous about the base, upon the middle they are nearly lost; they are in no part divided into punctums; the columella is strong, but does not appear to have any real plait upon it, nor has it a sulcus, but is simply spiral; the aperture is ovate, pointed above, and occupies more than half the length of the shell.

Strongly resembling *Auricula sulcata* of Lamarck, (which according to his own principles, he ought to have removed to his genus *Tornatella*, *Acteon* of Montfort) but smoother and more ventricose; its columella also differs: *Tornatella ventricosa* of De France's MSS. is, I believe, also different, although nearly akin to it.

A Crag fossil, in the Cabinet of Mrs. Cobbold.

ACTEON elongatus.

TAB. CCCCLX.—*fig. 3.*

SPEC. CHAR. Elongated, obtuse, transversely striated; the last whorl nearly cylindrical, aperture short, narrow above; lip expanded.

ABOUT the size and shape of a common oat, but more obtuse; it has about five whorls, the last of which is very large; the striæ are difficultly seen upon the spire and upper part of the last whorl; the columella has no plait.

Found at Barton, and presented by the Rev. T. Cooke.

The three middle figures upon this plate, are all magnified representations.

SPIRIFER rotundatus.

TAB. CCCCLXI.—*fig.* 1.

SPEC. CHAR. Transversely obovate, gibbose, longitudinally sulcated; the middle of the lesser valve elevated, convex, smooth; beaks approximating; hinge line less than the width of the shell.



IN many respects this resembles the *Spirifer pinguis*, tab. 171, but it is less rounded, and the elevated central portion is not divided as in that species by a sulcus; the corresponding cavity in the other valve has several obscure lines along it, and no central division, neither is the general aspect of the shell so gibbose; its edges are more acute.

By no means rare in the Black Limestone of Ireland, where the shells are much incorporated with the stone, and often distorted without appearing cracked. We were favoured with the specimen figured by S. Wright, Esq. of Cork, who obtained it in Limerick.

SPIRIFER *cuspidatus*, var.

TAB. CCCCLXI.—*fig.* 1.



THIS is only a dwarf variety of *S. cuspidatus* of tab. 120, with a shorter beak to the larger valve, and sharper sulci upon the sides: it has by some been thought distinct, I therefore have deemed it worth a figure.

Found near Bristol; it enriches the Cabinet of the Rev. Dr. Beeke.

SANGUINOLARIA compressa.

TAB. CCCCLXII.

SPEC. CHAR. Compressed, twice as wide as long, rather smooth; anterior side largest with a rounded truncation; two obscure elevated rays proceed from each beak.



A TRANSVERSELY oblong, flattish shell, whose anterior half is nearly square, and the other rounded, with an angle upon the upper part of its margin distant from the beaks; the rays are convex externally; there are two simple teeth in each valve placed nearly close together, and diverging a little; the shell is thin.

This shell may serve to connect the genera Solen, Sanguinolaria and Psammobia together: it belongs strictly to Azor of Leach, a genus that may probably be generally adopted at some not very distant period.

Found in Barton Cliff, accompanied by Murex Bartonensis, presented by Miss Beminster.

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NERITA spirata.

TAB. CCCCLXIII.—*figs. 1 and 2.*

SPEC. CHAR. Semiglobose, smooth; spire small, partly immersed; upper parts of the whorls flat, when old, concave; aperture transversely oval.

A SMOOTH ventricose Nerite, rapidly expanding towards the aperture; the lines of growth are sometimes rather conspicuous upon the flat parts of the whorls, in other parts they are very slight: I have not seen the columella.

Occurs in the mountain Limestone. Fig. 1, is from a specimen presented by the Rev. Robert Plumtree; it was found in Gloucestershire, and fig. 2, a small individual, from Derbyshire: it has also been found near Bristol, the Dean of Bristol having obtained a specimen in that neighbourhood.

NERITA minuta.

TAB. CCCCLXIII.—*fig. 3 and 4.*

SPEC. CHAR. Hemispherical, smooth; spire indistinct; aperture oval; columellar lip not toothed.

VERY small and smooth; length not one line; the entire edge of the columella makes it a doubtful Nerite.

Produced by the Oolite of Ancliff, along with the next. Figured from the Cabinet of the Rev. George Cookson; fig. 3 is magnified.

NERITA costata.

TAB. CCCCLXIII.—*figs. 5 and 6.*

SPEC. CHAR. Hemispherical; spire conspicuous, impressed; whorls transversely costated; costæ thin, sharp, numerous; aperture expanded, orbicular; columellar lip prominent, obtuse.



RATHER shorter, but otherwise resembling the many ridged harp in miniature; its whorls are separated by an imperfect canal; the left lip is produced, and almost divided by an obscure sinus into two blunt teeth.

Presented by the Rev. G. Cookson; it is one of the most elegant productions of the Ancliff Oolite.

Figures 6 are two enlarged views.

BULLA Linn. &c.

GEN. CHAR. An ovato-globose, convoluted univalved shell; columella none; spire not produced; aperture as long as as the shell; its external margin sharp.

IN general form the shells of this Genus vary from cylindrical to obovate; they are usually thin, sometimes almost membranaceous, and fragile; the want of a columella, and the thin edge of the aperture distinguish the species of this Genus as it is now defined by Lamarck, from several that were associated with them by Linnæus, such as the *Ovulæ*, &c. and also from the *Volvariæ*. In some species there is a thickening of the inner lip of the aperture that much resembles a columella, but this is never plaited; and such as have it may perhaps hereafter form a distinct Genus.

The animal to which the shell is attached, is remarkable for having no antennæ, and for the foot being laterally expanded so as to be used in the way of fins to swim with; the mantle does not include the shell.

 BULLA convoluta.

TAB. CCCCLXIV.—*fig. 1.*

SPEC. CHAR. Very cylindrical, smooth; aperture linear, expanded a little way from the base; vertex obtuse, perforated.

SYN. *Bulla convoluta Brocchi, p. 277. tab. 1. fig. 7.*

LENGTH two and a half times the width; the superior extremity is broad, or rather the upper part of the whorls is, as it were truncated, the spire being sunk deeply into its centre.

Found in Crag, by the Rev. G. R. Leathes. It does not appear to be so strictly cylindrical as required by the description given by Brocchi, but agrees well with his figure.

BULLA constricta.

TAB. CCCCLXIV.—*fig* 2.

SPEC. CHAR. Subcylindrical, contracted in the middle; vertex truncated, perforated; base obscurely striated; aperture linear, expanded at the base.

THREE times as long as wide; the superior flattened part of the whorl is not so broad as in the last, the aperture is also more linear, except near the base, where it is very wide.

Sent from Barton, by the Rev. Mr. Bingley.



BULLA elliptica.

TAB. CCCCLXIV.—*fig*. 6.

SPEC. CHAR. Elliptical, elongated, transversely striated; vertex perforated; aperture widest at the base.

THE form of this Bulla is a very regular ellipsis, the two extremities being equally rounded; the length is two and a half times the breadth; the striæ are very fine, rather most distant near the base.

Not unfrequent at Barton, varying from one to three lines in length.

BULLA attenuata.

TAB. CCCCLXIV.—*fig. 3.*

SPEC. CHAR. Elliptical, transversely striated; superior portion elongated, truncated, perforated; aperture curved, widest towards the base; striæ distant in the middle.



ABOUT twice as long as wide; the striæ upon the upper elongated portion are close and deep; those on the middle of the whorl, slight and distant; upon the base they are numerous, but not very strong.

Figured from a specimen from Hordwell, in the Collection of Miss Bennet; a small specimen has also been sent by Miss Beminster.

BULLA *filosa*.TAB. CCCCLXIV.—*fig. 4.*

This is a mutilated specimen of a large Bulla, that is very finely striated; we propose to name it BULLA FILOSA, and regret much that we have never met with a specimen, from which a Specific Character can be drawn up: its numerous striæ and expanded lip, distinguish it from B. attenuata.

BULLA acuminata.

TAB. CCCCLXIV.—*fig.* 5.

SPEC. CHAR. Cylindrical, transversely striated ;
vertex acuminated ; aperture linear.



THREE and a half times as long as wide ; at first sight much resembling the *Volvaria*, but the base of the aperture is more expanded, and it has no plaits : the striæ are not dotted, they are obscure near the middle of the whorl ; the superior edge of the aperture is produced to a point.

Sent from Hordwell or Barton by Miss Beminster.

AURICULA *ventricosa*.TAB. CCCCLXV.—*fig.* 1.

SPEC. CHAR. Subovate, inflated, transversely striated; spire short pointed, base notched; three sharp plaits upon the columella; left lip callous, a thick border upon the right lip.



THIS is the largest of several species of shells, resembling *Auricula ringens* of Lamarck, all of which are fossil; it is distinguished from *A. ringens* by its smooth outer lip, and from *A. turgida*, M. C. t. 163, by its callus upon the inner lip, and a third plait; the length does not exceed the breadth.

Forwarded from the Crag near Ipswich, by our kind correspondent Mrs. Cobbold; it appears to be a very rare shell, the Rev. G. R. Leathes having found only one individual; there is a species found at Bordeaux, resembling this in every thing but size; it is but little larger than the *ringens*.

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AURICULA buccinea.

TAB. CCCCLXV.—*fig.* 2.

SPEC. CHAR. Subovate, inflated, smooth; spire short, acute; base notched; three sharp plaits upon the columella; left lip callous; right lip with a thick border.

SYN. *Voluta buccinea*, *Brocchi*, 319. *t.* 4. *f.* 9.

DISTINGUISHED from *A. turgida*, M: C. 163, and other similar shells by the regularity of its form, smooth surface, short spire, and plain outer lip. The upper plait in the aperture is partly concealed by the callus upon the left lip, and the lower is the spiral edge of the columella; the length and breadth are in the proportion of 3 to 2, nearly.

Collected in the Crag, at Ramsholt, by the Rev. G. R. Leathes.

The shells upon this plate with their analogous species, agree so exactly with Lamarck's *Auricula ringens*, that they must be included in the same Genus; but the notch at the base of the aperture perfectly distinguishes them from that under which Lamarck has placed them. Brocchi has referred his *Voluta buccinea*, with two other very different shells to *Marginella*, but without sufficient reason. They have strong claims to be united under the Genus *Nassa*, and are somewhat related to *Columbella*; whether it will be necessary upon a revision of the fossils in this work, to create a new Generic division for their reception, is at present a question. They are in all probability marine reliquia.

SAXICAVA. *Lamarck.*

GEN. CHAR. A transverse, inequilateral, bivalved shell; anterior extremity gaping; hinge with an external ligament, and only rudiments of teeth.

THE shells of this Genus inhabit holes in stone, not of their own making, to the size of which they are obliged to conform, consequently they are often much distorted and rugged: the muscular impressions are strong, and the attachment of the mantle is marked by a row of irregular cicatrices, of which the central one is larger than the others; the tubes of the animal are long and projecting.

SAXICAVA *rugosa.*

TAB. CCCCLXVI.

SPEC. CHAR. Ovate, gibbose, rugged, both extremities blunt, upon the disk of the anterior side are sometimes two rows of irregular short spines.

SYN. *Mytilus rugosus*, *Linn. Pennant, &c.*
Biapholius rugosus, *Leach, MSS.* *Saxicava rugosa*, *Lamarck Hist. Nat. V. 501.*

Var. spinosa, *Solen minutus*, *Linn. &c. Lam. Hist. Nat. V. 453.* *Biapholius spinosus*, *Leach MSS.*

HOWEVER rugged the individuals of this common species may be, there is generally an angular ridge that marks the anterior side*; between this and the upper edge are sometimes two rows of concave, irregular spines; at

*That is, the side from which the tubes are protruded; we are aware that some Authors consider this posterior, but we think it best not to change the term in this part of the work.

other times only two very obscure ribs, and often no indication of either : the young state of the spinous variety has been referred to the Genus Solen, and it is very remarkable that Lamarck should not have discovered its relation to *Saxicava rugosa*.

The specimens before us are from the Suffolk Crag, they were collected by the Rev. G. R. Leaths, and have all the visible characters of genuine Crag Fossils, but they agree in form with the recent species, and Mrs. Cobbold has sent us a small specimen which she found amongst others in holes in *Septaria*, immediately below the Crag at Holywells, which would lead us to suspect them to be of comparatively modern extraction. The middle figures have some remains of the spines belonging to the variety.

MYOCONCHA.

GEN. CHAR. A very unequal sided, but equal-valved, oblique bivalve; hinge with an external ligament, and one elongated, oblique tooth in the left valve; beaks close to the posterior extremity; no sinus in the impression of the mantle.

A VERY remarkable Genus, in general form resembling *Modiola*, but bearing a close affinity to *Astarte* (*Crassina Danmoniensis* Lam.) and the *Conchæ* generally of Lamarck. The support of its hinge Ligament* is very prominent; it has no lateral teeth; the posterior side or lobe is almost wanting; the surface has no ribs; the three last characters distinguish it from *Cardita*, the impression of the posterior muscle is deep.

Only one species is known. The Generic name implies its resemblance in form to a Mouse or Muscle, together with its affinity above alluded to.

 MYOCONCHA *crassa*.

TAB. CCCCLXVII.

SPEC. CHAR.

SHELL ovate, slightly curved, pointed at one end, convex, nearly smooth, thick in substance: in the young state there are 3 or 4 longitudinal elevated striæ, crossed

* I propose to call this part the *fulcrum*, in place of a term generally considered objectionable, and also because it may apply to the same part whether it be elevated or not.

by lines of growth: it is twice as long as wide, and not remarkably deep. The ligament is seated in a deep and wide groove.

Only two specimens of this curious shell, which forms an osculent Genus, have fallen under our notice; the one a young individual presented by G. W. Braikenridge, Esq. the other apparently full grown, purchased by Mr. G. B. Sowerby; they are both from Dundry, near Bristol, and were imbedded in the Ironshot Oolite.

OSTREA solitaria.

TAB. CCCCLXVIII.—*fig. 1.*

SPEC. CHAR. Obovate, plaited; one valve flatish; plaits deep, sharp, rugged and branched; beaks short.

A FLATTER, broader, and less curved shell than *O. gregarea*, (tab. 111.) it has also fewer plaits, and is not so commonly found in groups: it is sometimes curved, as one of the figures shews, but in that case it becomes broader rather than longer:

We are indebted for the use of the specimens figured to Miss Benett, who obtained them of a Dealer at Weymouth, near which place they were picked up.



OSTREA macroptera.

TAB. CCCCLXVIII.—*figs. 2 and 3.*

SPEC. CHAR. Falciform depressed, with a large rectangular ear or wing within the curve; plaited; margin deeply toothed; one valve attached by a great part of its surface.

THE large wing-like lobe within the curved side of this Oyster, gives it a very striking appearance. The valves are nearly flat except towards the margin, where they are very deeply plaited, and the edges of course largely

and sharply toothed ; the hinge pit (or fulcrum) is broad and curved. The attached valve extends in branching processes upon the surface it is upon.

In the description of *Gryphæa sinuata* mention is made of this "bilobed" Oyster, adhering to a specimen of that shell from Folkstone ; there are three attached valves upon that specimen, one of which is represented at fig. 2. of the plate before us.

Fig. 3. shews the other valve, probably from the same locality.

We regret that the Oyster from the Isle of Wight, mentioned in the same place, is not perfect enough to determine whether it be the same species ; some differences are observable, and we have not been so fortunate as to meet with another specimen.

BELLEROPHON Montfort.

GEN. CHAR. An involute, univalved shell; nearly spherical; the last whorl enclosing the others; aperture arched, terminated by the extremities of the transverse columella, (or axis), and furnished with a sinus in the centre of its outer edge.

IN general form the shells of this genus resemble the Nautili, but they have no septa; the two sides, if they may be so called that are indicated by the extremities of the axis, are nearly similar, in which particular they are distinguished from Ovula, Bulla, and most other involute Genera; they are sometimes umbilicated; the front edge of the aperture has a sinus in it, from which, in most species a band runs round the whorl, and forms a kind of keel; as this keel is very variable in size, the presence of it is not considered as essential to the Genus, but will serve to divide it into two sections by; the *first* without; the *second*, with a central band.

Had not M. DeFrance ascertained from a specimen formerly belonging to De Montfort, that his Bellerophon was not a chambered shell,* the Genus would probably have long remained without being recognized, although several species are far from being of rare occurrence in the older Limestone rocks; it is not unlikely that De Montfort was misled in his generic character, by imperfect specimens of Nautilus biangulatus,† t. 458. f. 2, which he might consider as portions of the same species, as it occurs in the same limestone.

Ellipsolites ovatus, t. 37, belongs to this Genus.

* Annales des Sciences Naturelles Vol. I. p. 264.

Zoological Journal, No. 2. p. 223.

† I have just received specimens of this from Ireland, several inches in diameter, and also learnt that it was a mistake to give Bristol as the locality of the specimen figured, it also came from Ireland.

The following species probably belong to the 1st Section.

BELLEROPHON *apertus*.

TAB. CCCCLXIX.—*fig. 1.*

SPEC. CHAR. Nearly spheroidal, without a band? inner whorls concealed, axis solid; sides of the aperture expanded.

THE sinus in the front of the aperture, and the expanded sides are conspicuous in full grown individuals of this species, which are from two to four inches in diameter; as we have but little more than casts of the inside, the cast of the shell itself continuing no farther than two or three of the innermost whorls, we are not positive of the nonexistence of a band; the surface seems to be smooth, and the shell is very thick, so that the cast appears to be umbilicated, and shews the inner whorls: the front is rather prominent, and forms a kind of depressed and dilated keel around the whorl; the extremities of the aperture are rather square.

The specimens just described were found in Limestone at Carlingford, in the County of Louth, and presented by Samuel Wright, Esq. of Cork: they consist of compact Limestone, with many minute crystals of Carbonate of Lime, and a few of Sulphate of Barytes scattered over them. We have seen a large one from Settle in Yorkshire.

We have specimens of an analogous shell from Kendal, another from Ireland, and a third from Bristol, all of which seem to be really umbilicated; that from Ireland, has the cast of the outer surface of the shell, and is quite smooth: we wish to see more specimens of these before figuring them.

BELLEROPHON *Cornu-Arietis*.

TAB. CCCCLXIX.—*fig. 2.*

SPEC. CHAR. Rather compressed; whorls few, rapidly enlarging, carinated near the aperture; aperture expanded; shell very thick; sinus large and angular.

THE expanded lip of the aperture of this species is divided by the sinus into two rounded lobes; we know not whether the shell is umbilicated or not, as we possess only casts of the inside; the shell appears to be 3-8ths of an inch thick in some parts; the inner whorls are very small.

Found in a brownish limestone, near Kendal, in Westmoreland; the space formerly occupied by the shell, is partly filled with white calcareous Spar.

SECTION 2nd, with a central band.

To this section the species mentioned by Montfort belong.

 BELLEROPHON HIULCUS.
TAB. CCCCLXX.—*fig 1.*

SPEC. CHAR. Globose, expanded, closely striated; central band flat, broad, defined; axis perforated.

SYN. Conchyliolithus Nautilites hiulus, *Martin Pet. Derb.* tab. 40. f. 1. and perhaps *fig. 2. Syst. Arrangement to tab. 1 of ditto, p. 15. var. a? b.*

Cose, sharp, elevated striæ that pass obliquely from the central flat band to the axis, distinguish this species, which is moreover wider than any other; the sinus in front is deep, and leaves arched striæ upon the band, as it is filled by the growth of the shell; the sides of the band are defined by sharp depressed lines; it is nearly the eighth of an inch wide.

Our specimen is from Derbyshire, but without examining both of Martin's specimens, we are not certain that they are one species; his *fig. 2.* or variety *a.* approaches to our *fig. 4.*

 BELLEROPHON tenuifascia.
TAB. CCCCLXX.—*figs. 2 and 3.*

SPEC. CHAR. Sphærical, umbilicated, finely striated; band linear, elevated.

SYN. Conch. Naut. hiulus, var. *c.* *Martin Pet. Derb. Syst. Arrang. p. 15.*

A MORE sphærical shell than the last, with much finer and more numerous striæ; it has also a larger umbilicus, and a very narrow elevated thread like band.

Found in Derbyshire (*fig. 3.*) at Scaleber, near Settle in Yorkshire, (*fig. 2.*) and near Kendal, sometimes three inches in diameter. It is evidently the third variety of *C. N. hiuleus* of Martin, which he has not figured.

BELLEROPHON *costatus*,TAB. CCCCLXX.—*fig.* 4.

SPEC. CHAR. Globöse, expanded, subcarinated, with slender sharp ribs diverging from the undefined band; axis perforated.

SYN. *Parkinson Org. Rem. Vol. p. 3, 141, t. 10, f. 6 and 7.*



THE carinated form, sharp ribs and undefined but broad convex band, distinguish this; the aperture is wide and much arched, and the sinus in it deep, leaving bent striæ upon the band.

We have but one specimen of this, probably from Derbyshire. Parkinson seems to consider it the same as Martin's *hiulcus*, and it may possibly be his *fig. 2*, and *var. a.* but he describes the band as flat.

PECTUNCULUS variabilis.

TAB. CCCCLXXI.

SPEC. CHAR. Obliquely suborbicular, rather convex, finely striated longitudinally, becoming smooth or sulcated by wear; teeth of the hinge and lines upon the area of the ligament, numerous; beaks short nearly, close.

SYN. *P. pulvinatus* var. *Taurinensis*. *Mem. sur. les Terrains de Sédiment sup. du Vicentin, par Brongniart. p. 77, t. 3. f. 16.*

This *Pectunculus* varies perhaps more frequently than any other species in the proportion of its length to its breadth, and in its obliquity; sometimes it is even longer than wide, but it is always longer and more oblique than *P. pilosus*, and has a more regularly curved edge. It is nearly like *P. pulvinatus*, but is never so convex, and is distinguished at first sight; neither will it agree with the description of *P. Cor.* given by Lamarck. The hinge teeth are generally numerous, but are liable to be obliterated by the area of the ligament, so that in old shells but a few remain on each side: the beaks are not oblique. When young and not worn, it is covered with very fine longitudinal striæ, these soon wear away, and leave the surface smooth; by decay the internal ribbed structure, common to shells that have teeth in their margins, is displayed, with a strong resemblance to longitudinal sulci.

Not having been able to refer this well known English Crag shell to any of Lamarck's or Brocchi's species, I have been obliged to give it a new name. It may possibly have been considered by Lamarck as a variety of his *P. Cor* but this wants proof. His *P. obovatus* I believe occurs in the Suffolk Crag, but specimens alone can decide.

Very common from half an inch to three inches or more long, in many of the Crag pits of Norfolk, Suffolk, and Essex; Parkinson refers it to the recent *P. Glycimeris*.

PECTUNCULUS brevirostris.

TAB. CCCCLXXII.—*fig.* 1.

SPEC. CHAR. Transversely obovate, rather oblique, and inequilateral, convex, obscurely costated, concentrically striated; hinge line rather straight; beaks short, not oblique; hinge teeth few.

THERE is a slight elevation of the surface along the anterior side from the beak to the edge, where it produces a gentle projection, and a little below this is the greatest length of the shell; the costæ are convex, but so little elevated as to be hardly discoverable in some parts: some specimens have elevated lines between them, but possibly they are the effect of wear; the teeth of the hinge are few, and very oblique; below the area of the ligament, it is more inequilateral, less convex, and not so square as *P. pulvinatus* of Lamarck.

An abundant and well known shell in the Bognor Rocks; I have never observed any variation of consequence in its form; it wants the heartshaped space described by Brocchi in his *Arca insubrica*, and has shorter beaks.

 PECTUNCULUS sublævis.
TAB. CCCCLXXII.—*fig.* 4.

SPEC. CHAR. Transversely obovate, æquilateral, rather gibbose, with many slightly elevated ribs; beaks short, nearly close; sides smooth.

BOTH the sides of this shell are nearly destitute of ribs; there is a depressed space upon the anterior, which bounds a convex surface near that extremity of the hinge; the large hinge teeth occupy a regular arch below the area for the ligament, which area is small; the teeth upon the edge of the shell, are small and regular.

Found in loose yellow sand at Blackdown, where the substance of the shell is replaced by *Silex*.

PECTUNCULUS umbonatus.

TAB. CCCCLXXII.—*fig. 3.*And TAB. CLVI.—*figs. 2, 3 and 4.*

SPEC. CHAR. Orbicular, gibbose, nearly æquilateral, longitudinally striated and obscurely costated; beaks prominent, obliquely curved, a lobe on the anterior side.

THIS is the same shell given as a *Cardium* at page 128 of Vol. II. because the hinge had not then been seen. It is distinguished from *P. sublævis* just described, by the prominent beaks, and smaller number of its ribs; the teeth are large in proportion to the shell, from which circumstance it should seem to be the *Pectunculus* mentioned as found in the Whetstone-pits by Parkinson, Vol. III, p. 169. I am indebted to Mr. Goodhall for specimens shewing the hinge. It occurs both at Hall-down and Blackdown.

PECTUNCULUS scalaris.

TAB. CCCCLXXII.—*fig. 2.*

SPEC. CHAR. Obovate, convex, longitudinally ribbed, ribs narrow, sharp; area of the ligament short, projecting at the extremities, with a triangular pit in its centre; margin irregularly toothed.

EXTERNALLY this is marked exactly in the same way as *P. costatus*,* (tab. 27, fig. 2,) the transverse lines between the ribs resembling the steps of a rope ladder. The length exceeding considerably the breadth, the granulated rather than toothed margin, and the triangular pit in the hinge, are strong marks of distinction that cannot easily be overlooked; the teeth of the hinge are long and sharp, like those of *Nucula*, to which genus the hinge altogether bears a strong resemblance: the hinge of *Arca aurita* of Brocchi is similar.

Sent by Miss Beminster from Hordwell; it has often been confounded with Brander's *Arca deleta*.

* This is *Arca deleta* of Brander, consequently it should have been called *Pectunculus deletus*.

PECTUNCULUS minimus.

TAB. CCCCLXII.—*fig. 5.*

SPEC. CHAR. Orbicular, convex, smooth; hinge-line straight, prominent at the extremities; margin not toothed.

VERY nearly æquilateral, and almost as long as wide; the hinge teeth are but 4 or 5 on each side; the want of teeth within the margin is connected with the plain surface.

Found at Ancliff by the Rev. Mr. Cookson. It seldom exceeds a quarter of an inch in length.

PECTUNCULUS oblongus.

TAB. CCCCLXXI.—*fig. 6.*

SPEC. CHAR. Transversely oblong, inequilateral, rather convex, smooth; sides obliquely truncated; margin not toothed.

IN one or two remarkable characters this resembles the last, but it is less convex, and much broader; its size is nearly the same.

Sent from Ancliff with the last.

ARCA quadrisulcata.

TAB. CCCCLXXIII.—*fig. 1.*

SPEC. CHAR. Twice as wide as long, convex, longitudinally striated; anterior side truncated, defined by a keel, and marked by four deep furrows; posterior side small, rounded; marginal sinus large.

THE sinus in the margin of this fossil shows it to be an Arca, although it is otherways so badly preserved that its teeth cannot be discovered, and it might be taken for a Cucullæa: the four ribs between the furrows on the anterior side are a good character to distinguish the species by; the longitudinal striæ are crossed by the lines of growth, and give the surface a rugged appearance.

Found in the Pisolite of Malton.

ARCA cancellata.

TAB. CCCCLXXIII.—*fig. 2.*

SPEC. CHAR. Twice as wide as long, convex, longitudinally and transversely sulcated; anterior side defined by a keel, truncated; posterior side rounded; marginal sinus short but deep; beaks nearly close.

SYN. Conch. Arcites cancellatus. *Martin Pet. Derby. pl. 44. fig. 7.*

THE front and back are parallel; the anterior side has many sulci of an equal depth with those upon the rest of the surface: in other respects it much resembles the last.

From the Derbyshire Limestone, apparently the same specimen that was figured by Mr. Martin.

ARCA pulchra.

TAB. CCCCLXXIII.—*fig. 3.*

SPEC. CHAR. Transversely ovate-elongated, depressed, finely striated, anterior side rather impressed, obliquely truncated; beaks close.

NEARLY twice as wide as long; the striæ are very uniform and close together; the valves are rather flat in the middle.

Drawn from the Rev. Mr. Cookson's collection of Ancliff fossils. Although there is hardly any appearance of a sinus in the margin, this is placed as an Arca because it has no transverse elongated teeth in the hinge, those nearest the extremities being longitudinal: it is however one of the links that unite the two Genera.

ARCA duplicata

TAB. CCCCLXXIV.—*fig. 1.*

SPEC. CHAR. Transversely ovate-elongated, convex, longitudinally ribbed; ribs sulcated along the middle; margin toothed; beaks close.

REMARKABLE for having doubled or forked ribs; the surface is convex without any ridge distinguishing the anterior side; the sinus in the edge is obscure.

Sent from Hordwell by several friends.

ARCA depressa.

TAB. CCCCLXXIV.—*fig. 2.*

SPEC. CHAR. Elongated transversely, depressed, marked with elevated and crenulated striæ; extremities rounded; marginal sinus obscure.

THE rounded extremities, or rather sides, and distant elevated striæ decussated by the lines of growth, distinguish this Arca; the striæ are very distant upon the anterior side, and appear like small knotted threads.

Very much mutilated specimens of this shell were picked up in 1821, among the oysters in the clay above the sand, in the pits near Woolwich: it is unfortunate that none more perfect have come to hand, as I am not certain that its flattened form may not result from pressure entirely.

ARCA tumida.

TAB. CCCCLXXIV.—*fig. 3.*

SPEC. CHAR. Transversely elongated, gibbose, costated? anterior side pointed; marginal sinus short, deep; beaks distant.

ABOVE twice as wide as long; the depth of each valve nearly equals its length; the beaks are very near the posterior extremity; there is an obtuse ridge runs from the beak to the anterior angle. As the specimens are only casts of the inside, the surface cannot be described; but there are indications of rather distant furrows with ribs between them upon some individuals.

Occurs plentifully in the Magnesian Limestone of Tunstal Hill, near Sunderland.

NUCULA Palmæ.

TAB. CCCCLXXV.—*fig. 1.*

SPEC. CHAR. Transversely elongated, very convex, shining; extremities rounded, equal; beaks nearly central.

ALMOST cylindrical with rounded ends; the lines of growth are sharply but irregularly marked, otherways the surface is smooth, shining and regularly convex. The beaks are partly broken away, but a compensation is made for their loss by the exposure of the hinge teeth.

This is probably a very rare shell; it is from Mr. Martin's collection of Derbyshire fossils, although not figured by him.



NUCULA variabilis.

TAB. CCCCLXXV.—*fig. 2.*

SPEC. CHAR. Transversely oval, elongated, sometimes oblique, rather depressed, smooth; beaks near one end.

THE form of this shell is very variable; it is sometimes very oblique; but the beaks are constantly near the posterior extremity, which is generally rather less rounded than the other; the greatest depth of the valves is near the beaks; the lunette is neither impressed nor conspicuous.

An elegant and very distinct Nucula, although somewhat related to *N. similis* (M. C. 192), which is very different in form.

From the Ancliff collection. The small figures are of the natural size.

NUCULA impressa.

TAB. CCCCLXXV.—*fig. 3.*

SPEC. CHAR. Transversely oval, depressed, smooth ;
beaks near one extremity ; lunette deeply
sunk, convex, elongated ; edges entire.

THE deep lunette, and margin regularly curved, except
where the lunette makes it straight, sufficiently distin-
guish this species.

A silicized fossil from Blackdown.


 NUCULA antiquata.
TAB. CCCCLXXV.—*fig. 4.*

SPEC. CHAR. Triangular, rounded, gibbose, an-
tiquated, longitudinally striated ; lunette heart-
shaped, sunk ; margin toothed.

A MORE gibbose shell than most of the analogous Nu-
culæ : it is rendered very uneven by its irregular mode
of growth ; the beaks are incurved and close together.

From Blackdown, cast in Silix.


 NUCULA Ovum.
TAB. CCCCLXXVI.—*fig. 1.*

SPEC. CHAR. Transversely obovate, ventricose,
smooth, anteriorly pointed.

ABOUT the size of a wren's egg ; nearly as deep as
long ; the posterior extremity is regularly rounded, the
other drawn out in a short point.

Presented by our kind friend the Right Hon. the

Marchioness of Bath, who obtained it from the Alum-works of Lord Dundas, near Whitby. The stone in which the shells are imbedded is very hard.

NUCULA claviformis.

TAB. CCCCLXXVI.—*fig. 2.*

SPEC. CHAR. Ventricose, concentrically sulcated; anterior side rounded; posterior much produced, attenuated; upon the posterior slope is a broad concave area, bounded by two ridges that run from the beaks to the anterior extremity; sulci fine.

FULL twice as wide as long; the attenuated extremity is curved a little upwards and truncated; upon its upper part is a broad space rather concave and bounded by two obtuse ridges.

The specimen figured is from Northamptonshire: it has also been met with in rounded masses of gray Limestone in the alluvial deposits so common in many parts of Norfolk and Suffolk.

NUCULA Lacryma.

TAB. CCCCLXXVI.—*fig. 3.*

SPEC. CHAR. Ovate, gibbose, smooth; anterior side produced, pointed, convex above; posterior side rounded.

ABOUT twice as wide as long, much resembling the last in form, but not sulcated, and otherways distinguished by the shape of the produced portion. The size and

form resembling a drop of water when it commences its fall has given rise to its name.

One of the minute productions of the Ancliff Limestone. Two of the figures are magnified.

NUCULA mucronata.

TAB. CCCCLXXVI.—*fig. 4.*

SPEC. CHAR. Subrhomboidal, rounded, convex, concentrically sulcated, anteriorly mucronated.

TWO-THIRDS as long as wide, very minute; the anterior side is drawn out in the form of a flattened spine, and is distinguished from the other portion of the shell by being suddenly flatter.

Found at Ancliff. The lower figures are enlarged.

NUCULA angulata.

TAB. CCCCLXXVI.—*fig. 5.*

SPEC. CHAR. Rhomboidal, concentrically striated; most convex near the beaks; front rounded.

BOTH sides of this shell are angular, and the lines from their extremities to the beaks are nearly straight and equal; it is about half as wide again as it is long; the striæ upon its surface are regular fine sulci, and not very conspicuous.

There are several similar species found in strata corresponding with the London Clay; but all that I have met with differ in form and the depth of their sulci.

An uncommon Blackdown fossil. Magnified figures are given below that of the natural size.

BUCCINUM elegans.

TAB. CCCCLXXVII.—*fig. 1.*

SPEC. CHAR. Conical, acuminate; whorls ventricose, ornamented with nine or ten sharp elevated striæ that rise over numerous rounded costæ; aperture nearly round, toothed within.

A PRETTY sharp-pointed Buccinum; the costæ although small are so much elevated and so much larger than the lines that pass over them, that they do not lose their form or appear divided.

Named and presented by the Rev. G. R. Leathes, who found it in the Suffolk Crag.

BUCCINUM propinquum.

TAB. CCCCLXXVII.—*fig. 2.*

SPEC. CHAR. Ovate, pointed, longitudinally costated; costæ divided into tubercles by many transverse sulci, the uppermost of which is very broad; aperture obovate.

A SHELL very nearly resembling *B. granulatum* of M. C. tab. 110, but it is more ovate and commonly larger; the upper tubercle of each row is distant from the others, and so a kind of crown is formed upon each whorl; the lip does not appear to be toothed within.

We know of no recent species that exactly resembles this, although there are several that approach very near to it; one in particular might be thought the same, had

it not a very thick columellar lip and two rows of tubercles around the edges of the whorls.

Named in MSS. by the Rev. G. R. Leathes, to whom also we are obliged for the discrimination of the species. It is more rare than the *B. granulatum* among Crag in the same localities.

BUCCINUM labiosum.

TAB. CCCCLXXVII.—*fig. 3.*

SPEC. CHAR. Ovate, pointed, straightish on the sides, transversely sulcated; columellar lip broad and relieved; aperture oblong pointed above.

A VERY distinct small shell; the volutions are rather flattened on their sides, especially the last one; the sulci are ten or twelve upon each whorl, and rather broad; the whorls are slightly separated from each other at their upper edges.

Discovered and named by the same gentleman as the last, along with which it is found.

TAB. CCCCLXXVII.—*fig. 4.*

THIS Figure represents a less elongated variety of *Buccinum sulcatum*, that might easily be taken for a species: it is smoothened by wear, but we are assured by Mr. Leathes, who sent it us, that it is the same species as our *fig. 2* of *Tab. 375.*

OVULA.

GEN. CHAR. A more or less ovate and gibbose convoluted univalved shell; the spire concealed (or rather none); aperture longitudinal, elongated, narrowest at its upper part; the extremities more or less produced, notched; inner lip toothless; outer lip thickened, incurved.

A GENUS well distinguished from *Bulla*, under which Linnæus had placed its species. It approaches so near to *Cypræa*, that most conchological authors notice its resemblance; but unlike that genus its species are rarely of more than one colour externally, and never variegated. The whole of the outer surface of the shell is when full-grown covered with an enamel-like coat, which is in fact a continuation of the columellar lip: hence that lip (which is itself in other shells only a production of the lining) appears to be wanting: as this coat generally marks the distance the mantle of the animal is able to reach, it is supposed that the animal of an *Ovula* has a mantle constructed so as to inclose the whole shell, and bipartite, as in *Cypræa*, which has a similar coat. The genus is known by the incurved thickened outer lip of the aperture, opposite to the ventricose smooth body of the shell, instead of to a row of teeth or obtuse laminæ as in *Cypræa*; some species have a single plait upon the upper part of the columella. The surface is seldom or never furrowed.

OVULA Leathesi.

TAB. CCCCLXXVIII.

SPEC. CHAR. Elliptical, elongated, rather ventricose in the middle, smooth; a large plait upon the columella.



NEARLY twice as long as wide, rather contracted towards the extremities, but hardly to be called beaked: the lip is smooth, very thick, and rather flattened; the body of the shell has a slight concavity opposed to the lower part of the lip, and near its upper extremity it has a thick curved plait. There is a slight indication of a ridge across the back, which may have been reduced by wear.

This Ovula appears to hold an intermediate place between *O. passerinalis* (a fossil species from the Placentine, *Lam. Hist. Nat.* vii. 371.) and the *O. Spelta*, approaching nearest to the former, which is however described as much more ventricose. The specimen figured is from the rich cabinet of Crag fossils in the possession of the Rev. G. R. Leathes, who obtained it at Walton; it is so rare that only a fragment besides has been found.

So well known are the researches of the liberal possessor of this curious shell, that no apology appears necessary for commemorating his name.

NATICA cirriformis.

TAB. CCCCLXXIX.—*fig. 1.*

SPEC. CHAR. Globose ; whorls slightly compressed laterally, spire conspicuous ; umbilicus large, deep, open ; columellar lip thick with a sinus in the middle ; aperture small, oblong.

THE body of this shell is by no means so ventricose as in many species of the Genus ; the spire is rather short, consisting of about four whorls : the principal character is the large umbilicus in which the whorls may be distinctly seen up to the very apex : it contains no spiral ridge ; but the thick columellar lip that in some species bends over the umbilicus, is as it were cut away in the middle to leave it open.

A rare species found in the Suffolk Crag by Mrs. Cobbold, whose valuable collection contains the specimen figured.

 NATICA hemiclausula.
TAB. CCCCLXXIX.—*fig. 2.*

SPEC. CHAR. Subglobose ; spire small, conical, pointed ; umbilicus half closed by the superior part of the columellar lip ; aperture oval.

SHELL longer than wide, with a pointed indistinct spire and produced base ; the columellar lip is thick and half covers a moderate-sized umbilicus, in which is no spiral ridge.

Not an uncommon Crag fossil : it occurs near Ipswich, at Woodbridge, Bramerton, and in several other parts of Suffolk and Norfolk, as specimens, received through the favour of Mrs. Cobbold, Messrs. Turner and Hooker, and the Rev. G. R. Leathes, demonstrate : it has also been sent from Placentia, named *Nerita helicina* of Brocchi ; but it neither agrees with his figure nor description, and we presume has not been distinguished by any specific appellation.

NATICA sigaretina.

TAB. CCCCLXXIX.—fig. 3.

SPEC. CHAR. Much depressed; umbilicus large, filled with a lenticular callus.

SYN. *Natica sigaretina*. *De France*, MSS.

SPIRE small and indistinct, almost concealed by the last whorl; the aperture is ovate, curved and pointed above: an oval compressed callus fills the umbilicus; but as the shell increases the callus rises faster than it fills the hollow, so that a portion is generally open for a small depth.

From a mass of Sandy Marl belonging to the London Clay; but found among alluvium in Suffolk, by Dawson Turner, Esq. many years ago: the same species has been presented by Mons. De France, named as above, found near Bordeaux.

 TAB. CCCCLXXIX.—fig. 4.

THIS Figure represents a magnificent specimen of *Natica glaucinoides* of M. C. tab. 5. It is from the Suffolk Crag, and belongs to the Rev. G. R. Leathes, to whose kindness we are much indebted.

The same species is often found smaller at Bramerton and in other parts of the Norfolk and Suffolk Crag, it is probably the *Nerita helicina* of Brocchi, 297, tab. 1, f. 10.

CLAVAGELLA Lamarck.

GEN. CHAR. A bivalve whose valves are contained within a shelly vagina, with the surface of which one of them only is incorporated; vagina claviform, furnished with tubes about its larger end.

UNTIL the recent species of this Genus was discovered *, there remained some room to doubt the fact of one of the valves of the shell being united to the shelly tube, a want of symmetry that is very difficult to admit without good evidence, and to which we know of nothing analogous. The two Genera of the same family between which this would naturally arrange, are *Aspergillum* (commonly called the Watering-pot) and *Gastrochœna*, which probably includes all the *Fistulanæ* of Lamarck that really have shelly tubes, and do not belong to *Teredo*: the first of these has two equal valves, both so united to the tube as to form part of it, the latter has both the valves loose and also equal; thus the circumstance of one valve being attached is very remarkable. The form of the valves in *Clavagella* and also in *Aspergillum* is somewhat like those of *Mya*: the two Genera, however, differ in the tube, that of *Aspergillum* having besides a fringe of tubes a number of simple perforations in a convex disk, which do not exist in *Clavagella*: in most of the species of *Clavagella* the small tubes are irregularly scattered over the larger end of the principal tube or vagina, but in one they are in a circle and regularly branched; this species consequently leads to *Aspergillum*. Most of the species require to be attached to some solid body for their support, or are imbedded in porous stones: some, however, seem to be free, and not one probably is capable of boring a hole for itself, as all the *Gastrochœnæ* and the *Fistulanæ* do.

We have shortened the Generic Character in consequence of its being too precise a description of one species, but trust it is still sufficient to exclude every other Genus.

* See Sowerby's Genera of Shells, "Clavagella aperta."

CLAVAGELLA coronata.

TAB. CCCCLXXX.

SPEC. CHAR. Vagina elongated, crowned with dichotomously branched tubes, around a sulcated disk; free.

SYN. *Clavagella coronata*, *Deshayes, Coquilles Fossiles de Paris*. 8, t. 5. fig. 9 & 10.

TUBE or Vagina very gradually attenuated, at its larger extremity suddenly contracted, and then expanded into about eight regularly branched lesser tubes, arranged in two sets on the sides of a small disk that is divided in the middle by a furrow: the branches are at least thrice dichotomous; the sulcus that divides the two sets has a branch that descends the side of the vagina in which the free valve lies: the valves are oblong, widely gaping, with large pointed beaks, waved by lines of growth, and both pearly within, thus differing from the tube which is in no other part pearly.

Casts of this shell in a soft sand-stone, brought to England in ballast from the Tagus, were exhibited to the Linnean Society, by the late Mr. Sowerby, before the Genus to which *Deshayes* has referred it was known: they were accompanied by several other unknown shells, and by some known in the London Clay. Two views (*fig. 2* and *3*), one showing the beaks of both valves (*fig. 3.*), are added for illustration to this plate. The principal figure is taken from a specimen certainly English, but as the label is lost, I am unable to ascertain whether from *Hordwell*, *Barton*, or *Muddiford*: the branches were until lately much concealed by the clay, and the specimen not much valued.

Both this and the *Tagus* examples serve to show that the tube was not attached, (except possibly by the branches), for they are closely surrounded by other loose fossils: the shells about this are *Corbula Pisum*, *Strombus Bartonensis* (*Murex M. C.*), *Volutæ*, and many others common in the London Clay. There are no remains of wood about it, by which the tubes of *Teredines* are generally surrounded.

NAUTILUS globatus.

TAB. CCCCLXXXI.

SPEC. CHAR. Subglobose, smooth, umbilicated; whorls few, inner ones concealed, rather flattened on the front, rapidly increasing; umbilicus deep, with an angular margin; aperture very wide, arched, with a deep sinus in the front.

THE thickness and diameter of this Nautilus are nearly equal, the sinus formed in the aperture by the preceding whorl is small, because the whorls increase rapidly in size; the lip is divided into two rounded lobes by a deep and wide sinus, the septa are rather numerous.

Many specimens of this fossil lately received from Cork, where it abounds in the Black-Rock, have proved it to be a Nautilus, and that it was a mistake to refer it to Bellerophon as I have done at p. 108, where a specimen is mentioned. It is sometimes six inches in diameter.

 NAUTILUS multicarinatus.
TAB. CCCCLXXXII.—*fig.* 1 and 2.

SPEC. CHAR. Discoid, subglobose; inner whorls half exposed in a large deep umbilicus; edge of the umbilicus angular; front compressed, with several carinæ on each side the middle.

THE sides of the whorls of this Nautilus are very narrow and concave; the front, which is broad, has in its middle a concave band, on each side of which are four sharp ridges besides the one that bounds the side: it is probable that these ridges diminish in number as the shell advances, for the larger specimen (*fig.* 2.) has but two in place of four, and these even are lost near the aperture.

Found rarely in the Black-Rock at Cork.

NAUTILUS cariniferus.

TAB. CCCCLXXXII.—*fig. 3 and 4.*

SPEC. CHAR. Discoid, subglobose ; inner whorls half exposed in a large umbilicus ; a keel in the middle of each side, and two ridges between it and the flattened front.



IN general form this resembles *Nautilus biangulatus* (*tab. 458, fig. 2.*) ; but in addition to the angles which characterize that, it has on each side of a broad flat front two ridges or lesser keels ; in this it approaches *N. multica rinatus*, but that has a narrow concave area in place of the principal keel upon the side. The lesser keels in *N. cariniferus* disappear as it advances in growth ; it may possibly therefore be only a variety of *N. biangulatus* : the specimens with keels are however much larger than the specimen figured. All the three species appear to have a deep sinus in the lip.

The great works going on in Cork Harbour have occasioned an immense display of the fossils of the Black-Rock, among which the shell before us is one of the less common.

FISSURELLA, Bruguières.

GEN. CHAR. Shell obliquely conical, in no part spiral, with an oblong aperture in the vertex, and an oval base.



THIS GENUS of shells, so nearly resembling *Patella*, is well distinguished from it by the perforated vertex through which the branchiæ are supplied with a current of water. Many of the species have diverging rays upon their surface, and crenated edges; others are smooth: some are without colour; others variously ornamented with red, brown, &c. The vertex is inclined towards the head of the animal, and has within it a kind of fringed ring, formed by the thickening of the edge of the perforation. As this part varies in form and colour in the different species, it is often of service in forming specific characters. The animal differs from that of *Patella*, in having the branchiæ situated in an appropriate cavity, and not around the mantle.

FISSURELLA græca.

TAB. CCCCLXXXIII.

SPEC. CHAR. Ovate, oblong, convex, radiated; radii decussated by elevated lines, and thickened at the intersections; perforation small, elongated; margin of the base crenulated.

SYN. *Patella græca* Linn. &c, Brocchi, 2. 259. *Fissurella græca*, Lam. Syst. 6. p. 2, 11. *Deshayes*, *Coquilles Foss.* 2. p. 19. t. 2. fig. 7, 8, and 9.

THERE is a considerable degree of variation to be observed in the number and proportion of the rays upon the shell: but in general they are in sets, composed of one large and two small ones; and between each set is a still larger ray. The base is arched and ovate, with the anterior portion smallest. The surface is frequently antiquated, especially in the fossil specimens, which have also smaller and more numerous rays than the generality of recent ones; but the latter are subject to much variation, as observed above.

Found in the Crag of Ipswich, many years ago, by our valued friend the late Mrs. Cobbold, whose assiduity in collecting Crag shells, and generosity in bestowing them, have been so often proved in the course of this work, that every lover of science must join us in lamenting her loss, even if she had not possessed other high qualifications for which she was esteemed by all who knew her.

The Rev. G. R. Leathes has also furnished us with specimens.

PATELLA lata.

TAB. CCCCLXXXIV.—*fig.* I.

SPEC. CHAR. Obovate, depressed, nearly smooth, radiated; radii about 30, distant, rounded; apex very excentric.



NOT much longer than wide, very shallow, and rather irregular; the apex is placed at about one third the length of the base from the anterior edge. The radii are strongest and most distant upon the posterior portion.

This is probably one of the rarest productions of the Stonesfield slate: it was lately in the possession of Mr. G. Humphries. The portion that is broken off from the upper part, discloses something within that has the appearance of a section of the cup-like appendage of a Calyptræa; but as the apex is regular and not oblique, and this appearance is very imperfect, it does not seem sufficient evidence of its not being a Patella: it would be fortunate to find a specimen showing the under surface, but in this the shell adheres too closely to the stone to allow any hopes of being able to remove it. A view of the muscular impression would decide it to be a Patella.

PATELLA ancyloides.

TAB. CCCCLXXXIV.—*fig. 2.*

SPEC. CHAR. Convex, smooth; apex spiral; base oval.

A SMALL shell, without any strongly marked character except the decidedly spiral apex, which being turned to one side makes it resemble the *Ancylus fluviatilis*; but it is more depressed, and from the shells that accompany it, we would judge it to be marine; the apex is very much inclined towards the anterior edge.

Found with the following and many other minute organic remains at Ancliff, by the Rev. G. Cookson.

The larger figure is magnified.



PATELLA nanus.

TAB. CCCCLXXXIV.—*fig. 3.*

SPEC. CHAR. Obliquely smooth; base oval; apex obtuse.

VERY simple and regular in form, and perfectly smooth: the apex is placed about half way between the centre and the anterior edge; the ends are equally obtuse.

From Ancliff with the last.

One figure is enlarged.

CYPRIS, Müller, &c.

(Cl. Crustacea. Sect. Branchiopoda.)

GEN. CHAR. Animal inclosed within two oblong crustaceous shells; antennæ two, straight, simple, terminated by a brush of hairs; one eye; four legs; the head concealed; tail small.



MINUTE crustaceous animals, whose body is inclosed within a pair of shell-like valves, and which possess the characters above given, form this genus. It is distinguished from one or two analogous ones, which were arranged with it under *Monoculus* by Linnæus, chiefly by the oblong form of the shells, the simple antennæ, and the number of the legs. In the nearest genus (*Cytherina*) the legs are eight, and the antennæ are pilose for their whole length; there is no tail; and the shells are more distinctly reniform. The *Cytherina* is an inhabitant of the sea, while *Cypris* has only been found in fresh-water.

CYPRIS Faba?

TAB. CCCCLXXXV.

SPEC. CHAR. Shells oblong-ovate, convex, slightly sinuated in the front, one folded over the other, minutely punctated.

SYN. *Cypris fêve*, *Cypris Faba*, *Desmaret, Nouv. Bull. des Sciences, année 1813, p. 259. pl. 4. no. 8.* *Hist. nat. des Crustacés fossiles, 141. t. 11. f. 8.* *Dr. Fitton* "On the strata below the chalk," &c. *Annals of Phil. new series, 8. 365, &c.*

IN length about one tenth of an inch, and about half as wide; one end (the superior?) is rather broader and blunter than the other; the front is nearly straight, a very slight sinus being formed by the folding of one valve over the other; at one extremity of this fold there is a small projection, like the radicle in a bean; the back is rounded with a longitudinal furrow separating the valves; the surface is minutely punctated, the substance rather coriaceous, but brittle and very thin.

This minute fossil is mentioned in the description of Tab. 31, as occurring in the Petworth marble; but as it

does not strictly come within the province of the Conchologist, it has not as yet been otherways noticed in this work: its strong resemblance to a bivalve shell, and its importance as a distinguishing mark of particular strata, have been inducements to the introduction of it. In England it is found only in the Tetsworth or Weald Clay and the sands below it, either in layers in the slaty clay of the upper part of that formation, or dispersed in the limestones and grit which occur in it. In France it has been referred to the 2d fresh-water formation above the chalk, and is accompanied by *Paludinæ* and *Cyrenæ*, as in England;—is it not possible that the places in France where it has appeared, have not been enough examined, and that if they were fully traced, they would prove to belong to a formation analogous to the Tetsworth clay? for this fossil is not found above the chalk any where near London or Paris. Professor Sedgwick was the first person who noticed it in the Isle of Wight*. It has lately been discovered by Dr. Fitton, to whose liberality we are indebted for specimens from each of the localities;—at Hollington near Hastings, where it occurs in sand-stone along with a small *Paludina* and a *Cyrena*; in the Isle of Wight, either dispersed sparingly through light-brown compact clay at Grange Chine, or in slaty clay † (like the figure) in Sandown Bay, Chalk Bay,

* Annals of Phil., new series. Vol. 3. p. 335.

† This Clay also occurs in Sussex.

and other parts ; and south of Punfield in Swanage Bay, in slaty clay, like that in the Isle of Wight, and accompanied, although sparingly, with similar shells. The localities given for the *Cypris* in France are Puy-en-Velay along with gypsum, under lava and over clay, resting upon granite, here it is accompanied by *Planorbis* and *Cyclostomæ* ; the Gypsum quarries of Aix in Provence along with *Paludinæ* and *Cyrenæ* ; and near Vichy in the department of l'Allier *.

Although there is a marine animal nearly allied to *Cypris*, and perhaps not positively to be distinguished except when recent, yet the occurrence of the fossil before us, in a series of localities always in company with fresh-water genera, justifies the name which we, as well as the French authors, have adopted.

The same anomaly occurs in the series of fresh-water strata (from the top of the Portland rock to the bottom of the green sand) which contains the *Cypris* that is met with above the London clay ; that is, thin layers or beds of oysters close to fresh-water shells ; and it will probably be a long time before this fact is explained. This fresh-water formation is an older one than is generally admitted, but it is not the oldest ; for the bituminous coal series contains strata of fresh-water shells, besides others in which are found marine reliquiæ.

* Cuvier & Brongniart, *Descript. Geol. des Env. de Paris.* pp. 260, 261, 301.

BUCCINUM Dalei.

TAB. CCCCLXXXVI.—*figs. 1 and 2.*

SPEC. CHAR. Ovate, smooth, or slightly sulcated, thick; whorls very convex above; apex of the spire obtuse.

var. (α) ventricose, rarely sulcated. (*fig. 1.*)

var. (β) elongated, more or less sulcated. (*fig. 2.*)

THE rounded form of the upper portions of the whorls and obtuse apex are characters that distinguish this Buccinum at first sight; the sulci are numerous and close, but seldom extend to the last whorl; generally they are only to be discovered near the apex. The beak, from which a ridge winds up the columella, is short, rather wide, and has a more or less recurved edge; the shell is thick but very rarely, antiquated.

This very distinct shell was first received from our lamented friend Mrs. Cobbold, in 1812; since which time the Rev. Mr. Leathes has kindly supplied us with a series showing the two varieties: it is named by him B. Dalei, to commemorate the labours of Dale, who appears to have been almost the first person that took notice of the Suffolk Crag fossils.

1839. S. 84.

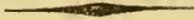
BUCCINUM tenerum.

TAB. CCCCLXXXVI.—*figs. 3 and 4.*

SPEC. CHAR. Ovate, acute, thin, coarsely striated; spire undulated; beak antiquated; whorls convex.

DISTINGUISHED from *Buccinum undatum* by the largeness of the striæ, the evenness of the last whorls, and by the imbricated arched remains of the edges of the successively formed beaks, and sometimes even the whole of the earlier formed lips; the whorls are also more convex, and the shell much thinner: in their general aspect the two species much resemble each other.

Met with abundantly in many parts of the Crag; but from the thinness and fragile state of the shell, large specimens can very rarely be removed from the spot upon which they are found. We are indebted to Mrs. Cobbold, the Rev. Mr. Leathes, and Mr. W. Phillips, for many specimens.



BUCCINUM unilineatum.

TAB. CCCCLXXXVI.—*figs. 5 and 6.*

SPEC. CHAR. Elongated, acute, finely striated; sides straight; beak pointed; a single furrow near the upper edge of each whorl.

A MINUTE shell, whose last whorl is rather ventricose; the aperture is narrow, pointed at both ends; the single impressed line that runs round the spire near the upper parts of the whorls is remarkable; the rest of the surface is very finely striated.

One of the many small shells that occur in the Limestone of Ancliff.

Fig. 6 is augmented to three times the natural length.

VOLVARIA, Lamarck.

GEN. CHAR. Shell cylindrical, convoluted; spire almost hidden; aperture as long as the shell, narrow, widest towards the truncated base; outer lip denticulated; columella plaited.

THE principal characters of this Genus, as limited by Mr. G. B. Sowerby, are, the plaited columella, the striated surface, the truncated base, and the thin edge of the outer lip: by its convoluted form and short spire it is related to *Bulla*; the plaits upon the columella form a resemblance to *Marginella*; but its nearest affinity is to *Acteon* (*Tornatella*, Lam.), from which its concealed spire, numerous plaits, and truncated base distinguish it. The Genus, as established by Lamarck, contains several recent species, which Mr. G. B. Sowerby has justly observed are more naturally related to *Marginella*, from which however they differ in some characters. The striated surface, from whence arises the denticulated edge of the lip, is important as a generic character, because it indicates the presence of an epidermis, and that the shell was never enveloped in the mantle of its inhabitant; and thus marks a decided distance between it and the recent shells Lamarck has arranged with it.

VOLVARIA acutiuscula.

TAB. CCCCLXXXVII.

SPEC. CHAR. Nearly cylindrical, with a pointed apex; spire concealed; striæ numerous, composed of squarish punctums; plaits upon the columella variable.

SYN. V. acutiuscula, G. B. Sowerby's *Genera of Shells* (*Genus Volvaria*, fig. 3).

WELL distinguished from both the French species by the aperture being so prolonged beyond the apex of the spire as to conceal it within a small pit; it is also less cylindrical, being a little contracted towards both extremities; the plaits upon the columella are usually about four, but often irregular in size as well as variable in number.

This pretty shell has hitherto only been found in Barton Cliff: we are indebted to several friends for specimens: it does not appear to be rare. It is rendered more interesting by the reflection, that it is very nearly, but not precisely, like its congeners found near Paris: similar facts, we have reason to believe, will prove of more frequent occurrence than has been suspected.

OSTREA læviuscula.

TAB. CCCCLXXXVIII.—*fig. 1.*

SPEC. CHAR. Depressed, rounded, triangular; surface obscurely imbricated, smooth; beak acute; scales distant.

VERY similar to the *O. edulis*, but smoother: the beak is pointed and turned backward; the lower valve is not ribbed, but very smooth; in the specimen figured it is attached by nearly its whole surface to what appears to be a fragment of a large *Pinna*, and the edges are elevated.

From the upper beds of the Lyas Clay at

OSTREA obscura.

TAB. CCCCLXXXVIII.—*fig. 2.*

SPEC. CHAR. Oblong, uneven, small; lower valve very deep, the other flat; beak curved.

A DIMINUTIVE species of Oyster (much resembling *Gryphæa nana*, tab. 383): its small size, oblong form, and deep valve are, when taken collectively, sufficient to distinguish it from every other: in some specimens the hinge pit is so much produced and curved as to prove that they are not young shells.

The Ancliff Limestone, so celebrated for pigmy shells, contains an abundance of these little oysters, associated with so many other genera that a description of them alone would almost form an introduction to a system of Marine Shells.

OSTREA costata.

TAB. CCCCLXXXVIII.—*fig. 3.*

SPEC. CHAR. Orbicular; lower valve deep, ribbed; ribs numerous, branched; upper valve flat, with an undulated margin.

BRANCHING, rounded ribs upon the under surface define this neat little Oyster. It is one of the miniature productions of the Ancliff Limestone.

OSTREA dorsata.

TAB. CCCCLXXXIX.—*figs. 1 and 2.*

SPEC. CHAR. Convex, subimbricated; upper valve marked with numerous, longitudinal, branched striæ; inner margin toothed.

SYN. *Ostrea dorsata*, *Deshayes*.

THE convexity of the upper valve of this Oyster appears to have given rise to the name *dorsata*; but the form varies much, according to the form of the substance to which it is attached: the numerous longitudinal impressed striæ are its peculiar character, and we know of no other fossil Oyster so marked: we have seen a very flat recent one, of a purple brown colour, attached by a large surface, with similar striæ.

Fig. 1 represents a single valve from Hordwell: it is the only one that has fallen under our observation.

Fig. 2 is an individual from France: it has a ridge along it produced by its having been attached to the stem of an *Encrinus*, and was sent us with the name of *dorsata* by Mons. *Deshayes*.

OSTREA semiplana.

TAB. CCCCLXXXIX.—*fig. 3.*

SPEC. CHAR. Oval, depressed, largely undulated; in the middle flat; attachment small.

SYN. *Ostrea*, No. 74, *Mantell*, *Geol. Suss. p. 207. t. 25. f. 4.*

ONE of those Oysters that prefer thin cylindrical subjects for their support, and from which they spread out like leaves: it approaches the plicated division of the Genus by the largeness of its undulations; but they are not angular, and the edge is not deeply sinuated by them.

Although not abundant, this seems to be a generally diffused fossil of the upper Chalk; Mr. *Mantell* obtained it near *Lewes*. Our specimens are from *Norfolk*; the larger, from a chalk-pit close to *Norwich* belonging to Mr. *Barnes*, was found at the depth of forty feet.

VENERICARDIA chamæformis.

TAB. CCCCXC.—*fig. 1.*

SPEC. CHAR. Convex, orbicular, with rather produced beaks ; ribs rugged, distant, about 14 ; hinge large.

A TRIFLE longer than wide, with the beaks a little curved so as to approach heart-shaped ; the spaces between the ribs are flat, and serve, with the produced beaks, to distinguish this from the following.

It is named by Mr. Leathes from its similarity in form to Chama arcinella.



VENERICARDIA orbicularis.

TAB. CCCCXC.—*fig. 2.*

SPEC. CHAR. Orbicular, rather convex, concentrically striated ; ribs about 16, not close, crenated ; hinge small.

GENERALLY smaller than the last, and perfectly orbicular ; the hinge teeth are shorter and thicker, and the ribs more distant than in the following.

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VENERICARDIA *scalaris*.TAB. CCCCXC.—*fig. 3.*

SPEC. CHAR. Orbicular, subtriangular, depressed ; longitudinal sulci about 20, linear ; concentrically striated, hinge teeth long and thin.



THE ribs (if they can be so called) are very flat and close together, they are so regularly crenated by the concentric striæ as strongly to resemble a rope ladder ; the rather triangular form and general flatness at once distinguish this from both the preceding, in whatever state of preservation it may be met with. They all have toothed edges, but the number of teeth in this is greater than in either of the others.

We are indebted to the Rev. G. R. Leathes for the use of a series of specimens, consisting of above 100, by which these three shells were proved to be distinct species ; they are all of them liable to lose their external surfaces by decay ; but even when thus rendered imperfect, the characters above given will be found to distinguish them. They are equally abundant in the Suffolk and Norfolk Crag.

ISOCARDIA concentrica.

TAB. CCCCXCI.—*fig.* 1.

SPEC. CHAR. Transversely elongate, heart-shaped, concentrically sulcated ; shell thin.



THE depth and length are nearly equal, and considerably less than the width ; the general form is a nearly regular oval, rendered heart-shaped by the projecting, neatly incurved beaks ; the sulci are numerous, not deep, they extend the whole width, and gradually become more distant as they approach the edge ; the surface, excepting that it is thus sulcated, is smooth and regular.

This handsome fossil is found in the Cornbrash Limestone at Bulwick, in Northamptonshire. We are indebted to John Hogg, Esq., of Leeds, for the knowledge of it.

ISOCARDIA oblonga.

TAB. CCCCXCI.—*fig. 2.*

SPEC. CHAR. Oblong, anteriorly expanded, smooth; posterior side very small, the beaks curved into it; hinge line nearly straight.

THIS is a transversely oblong shell, whose margin is four-sided, the side beneath the beaks is very short and much curved, the others long, and approaching to straight; it is very gibbose towards the beaks; the shell is very thin.

Found rather sparingly in the Black Rock, near Dublin, from two to four inches wide. It is a boldly formed fossil, and the specimens are generally very regular and well defined; none, however, have been met with that show enough of the hinge to prove by it that they belong to the genus *Isocardia*;—the same observation will also apply to the *I. concentrica*;—it is only by their general form that we are led to arrange them both under that genus, the thinness of their shells is rather an objection.

An *Isocardia* exactly resembling the *Cor* is met with in the Crag, and we have the cast of another very similar in Limestone; but neither, perfect enough for figuring.

PERNA quadrata.

TAB. CCCCXCII.

SPEC. CHAR. Quadrilateral, one side shorter than the other three; valves gibbose, unequal, the shorter side very concave, bounded by two obtuse carinæ; beaks prominent.



A REMARKABLY square and convex Perna: the crenatures in the hinge line, which fills one of the sides, are few and large. The shell, to judge from the remaining portion of the spar that filled the space it once occupied, was very thick, and so concave on the side beneath the beaks as to form there a heart-shaped cavity, bounded by ridges that curve gently along the beaks: in the centre of this cavity it is probable the byssus passed: the beak of the larger valve projects a good deal, the other is shorter; they are both pointed, and nearly straight.

This is little more than a cast in compact Limestone containing a little Mica; but as the characters are very conspicuous, and as it is probable the outside will not easily be detached from the stone when other specimens are found, we have not thought it necessary to postpone the figure.

It is from the Cornbrash at Bulwick, and was found by John Hogg, Esq.

SPIRIFER lineatus.

TAB. CCCCXCIII.—*figs. 1 and 2.*

SPEC. CHAR. Gibbose, covered with numerous diverging sharp striæ; front semicircular, elevated in the middle; from the elevation of the front a convex band proceeds to the beak; hinge line long and straight; beaks rather distant.

THE width is nearly double the length; where the surface is perfectly preserved, the elevated striæ are found to be minutely granulated; the beaks are curved and approach nearly together, the space between them is rounded, and has a large triangular foramen; the hinge line does not extend quite the whole width of the shell.

Found in the Dudley Limestone. Fig. 2 is from a specimen collected by Charles Stokes, Esq.


 SPIRIFER attenuatus.
TAB. CCCCXCIII. *figs. 3, 4 and 5.*

SPEC. CHAR. Convex, covered with numerous linear furrows, which increase in number towards the margin; front rounded, elevated in the middle, from each side of the elevation a deep furrow proceeds to the beak; sides produced, pointed; hinge line long, straight; space between the beaks flat, with nearly parallel edges.

THE furrows upon the surface of this shell form between them thin branched ribs: in many specimens the elevated part of the front is not followed by a corresponding elevation along the surface, although the other valve is concave in that direction; the width is nearly three times the length in some specimens, others are less attenuated laterally.

Produced by the Black Limestone near Dublin.

SPIRIFER bisulcatus.

TAB. CCCCXCIV.—*figs. 1 and 2.*

SPEC. CHAR. Semicircular, gibbose, longitudinally sulcated, elevated in the middle, a deep furrow on each side the elevation; hinge line long, straight; beaks close.

BUT little wider than long. The furrows are about 30; two of them near the middle are much deeper than the rest, and the space between them is convex in some specimens, but flat in others (see *fig. 2*), the space between the beaks is very long, flat, and has nearly parallel sides in consequence of the edges of it upon the deeper valve being reflected.

From near Dublin.



SPIRIFER distans.

TAB. CCCCXCIV.—*fig. 3.*

SPEC. CHAR. Semicircular, gibbose; sides sulcated longitudinally; front elevated, elevation extending to the beaks, concave along the middle; beaks incurved, distant, the space between them curved, triangular.

TEN or twelve furrows occupy the sides of this shell, the elevated part along the middle has no furrows; the length is about two-thirds of the width.

Much resembling the last, and also from Dublin.

TEREBRATULA acuminata.

TAB. CCCCXCV.

var. sulcata. (*fig. 1.*) var. plicata. (*fig. 3.*)



UPON a comparison of several Irish and Derbyshire specimens of *Terebratula acuminata* with many similar to those before us, we have observed that the species is liable to much variation in form, but is not generally so blunt nor so strongly sulcated as the handsome variety represented in *fig. 1.* We are also able to confirm our suspicions that *fig. 1* of Pl. 246 of the *Encyclopédie Méthodique* is undoubtedly a representation of one of the varieties, and has been erroneously quoted by Lamarck as *Terebratula spirifera* (*Spirifer cuspidatus* M.C. 120), a totally different shell. The variety with from 3 to 5 plaits in the margin of the sinus is generally small, but sometimes twice as big as the figure.

We have been induced to give figures, to show the near approach of these varieties to the following species. The specimen (*fig. 1*) is in the rich collection of Charles Stokes, Esq.: it is from the Mountain Limestone tract about Clitheroe in Lancashire. The other variety (*fig. 3*) is common in Ireland, and also occurs near Clitheroe.

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TEREBRATULA cordiformis.

TAB. CCCCXCV.—*figs. 2 and 4.*

SPEC. CHAR. Heart-shaped, front much elevated with a deep sinus in the margin; sides rather convex, sharp-edged; middle ornamented with several acute furrows reaching almost to the beaks.

THIS differs from the last in being much more tumid in the middle, and in having 3 or more sharp angular furrows extending from the middle of the large marginal sinus almost to the beaks: it is very variable in magnitude.

Found in the Mountain Limestone of Ireland, but not plentiful.



TEREBRATULA reniformis.

TAB. CCCCXCVI.—*figs. 1, 2, 3, and 4.*

SPEC. CHAR. Reniform, middle furnished with three or four longitudinal rounded ridges, terminated by acute plaits in the much elevated margin of the front; sides inflated below the entire edges.

A MUCH rounded, almost two-lobed, inflated and more or less depressed shell. The form of the ridges and intermediate furrows is very remarkable, being rounded, while the corresponding notches in the margin are acute-angular: the peculiar form of the sides of the beaked valve, which are inflated so as to hang below the edges, will distinguish all the varieties of this species.

Very abundant in the Mountain Limestone of Dublin and Cork.

TEREBRATULA *platyloba*.TAB. CCCCXCVI.—*figs. 5 and 6.*

SPEC. CHAR. Transversely obovate, depressed; front elevated, with several acute plaits in the middle of the sinus; sides with one or two obscure plaits upon their edges.

ALMOST twice as wide as long, and much depressed; several obtuse ribs proceed from the plaits in the edge of the front to a greater or less distance towards the beaks in various individuals: they are not much elevated. The sinus in the front almost divides it into two lobes.

The only specimens I have seen of this species are from Clitheroe: they enrich the collection of Charles Stokes, Esq., to whose liberality I am much indebted.


 TEREBRATULA *Pugnus*.

TAB. CCCCXCVII.

SPEC. CHAR. Obovato-deltoid, rather depressed; front much elevated, with from four to six plaits in the middle of the sinus; sides convex, with several plaits upon their edges.

SYN. Conch. Anomites *Pugnus*. *Martin, Pet. Derb. Pl. 22, figs. 4 and 5.* *Syst. Arr. P. 13.*

FROM the marginal plaits in the middle of the sinus a few furrows generally extend some way into the shell, and sometimes reach nearly to the beaks; otherwise the

surface is convex and smooth, as in the several species just described ; from all of which, except *T. platyloba*, (which is known by its flatness,) it is distinguished by the lateral plaits.

All the figures are of specimens from Ireland, except fig. 6, which is taken from one found in Derbyshire.

Were it not that we possess the individual specimen Mr. Martin figured, we should, notwithstanding the accuracy of his figure, have been in some doubt regarding its identity with the species before us ; but we find its blunt form to arise from distortion, caused by several very evident fractures. *Terebratula lateralis* M. C. (tab. 83, f. 1,) is probably a variety of *T. Pugnus*, although it have only three plaits : however, the difficulty of distinguishing which are species, and which are varieties, is so great in this variable division of *Terebratulæ*, that I cannot speak positively. Figs. 3, 4, and 5, upon the present plate, are very nearly related to *T. platyloba* upon the last plate, and seem to point out that as a variety only of *T. Pugnus*. The number of plaits, the form and general aspect even, is so inconstant, that out of several hundred specimens hardly two can be found alike. Those with lateral plaits are the most variable, and might perhaps be divided into more species ; but it would be difficult to assign the boundaries. On the other hand, the *T. inflata* is in general recognised immediately by its form.

In the *Encyclopédie Méthodique* (tab. 245, figs. 6 and 7) are figures of a *Terebratula* with lateral but no central plaits. Can this be a variety of either of the Irish species ?

PYRULA *Greenwoodii*.

TAB. CCCCXCVIII.

SPEC. CHAR. Pyriform with a short produced spire, reticulated with scattered elevated striæ; beak pointed; shell thin.



A NEAT shell, considerably longer than *P. nexilis* (tab. 331), and its striæ are not so much elevated, so that it is recognised at first sight as a distinct species.

For this hitherto undiscovered fossil, which is the more interesting as it belongs to a genus consisting of but a small number of species, we are indebted to Mrs. Greenwood, by whose name we have distinguished it, acknowledging the zeal with which she has made an interesting collection of Hampshire fossils, in which this forms an ornament, and the kindness with which she has opened it to our examination.

TURRITELLA muricata.

TAB. CCCCXCIX.—*figs.* 1 and 2.

SPEC. CHAR. Subulate, transversely striated; striæ elevated into spines upon numerous small, arched costæ.



LESS than an inch long; the upper edge of each whorl is flattened; the small spines with which the spire is roughened are most prominent upon the edges of the whorls: the convex base is free from spines, and the striæ upon it are much elevated and sharp.

We are indebted to Thomas Meade, Esq. for the means of exhibiting this elegant little shell. The group, which forms one of the many rare specimens contained in his rich cabinet, was found at Steeple Ashton: it contains also portions of *Turbo muricatus* (tab. 240, f. 4), and of an unfigured *Murex*.

We have another specimen in the same kind of Clay as the following, and also from Robinhood's Bay: this is accompanied by *T. muricatus*, indicating a contemporary formation with that of Steeple Ashton.

TURRITELLA cingenda.

TAB. CCCCXCIX.—*fig. 3.*

SPEC. CHAR. Subulate, transversely striated; sides of the whorls rather concave, upon their lower edges is a crenated band.



THE upper part of the spire is slightly ribbed, but the ribs or waves are gradually lost; the striæ are fine and impressed, they are closer in the middle of each whorl; the base is flat with a round (and in the young shell, crenated) edge, which produces the band around the spire.

Found in shaley Clay in Robinhood's Bay near Scarborough, by Mr. Bean, who has kindly lent us a number of interesting fossils from that neighbourhood.

AMMONITES *Humphriesianus*.TAB. D.—*fig. 1.*

SPEC. CHAR. Discoid, thick, radiated, inner whorls exposed ; front rounded, radii large, numerous, rising into a tubercle on each side the whorl, where they branch into three ; aperture arched, oblong.



COMPOSED of about 4 or 5 whorls, which are almost wholly exposed, more especially the outer ones ; the radii are straight, gradually rising towards a conical tubercle, which in the outer whorls occupies about the middle of each side, and is distant from the suture, but in the inner ones is placed close to the suture that separates the turns : the inner whorls have a much flatter front than the outer, whence their sections are quadrangular, whilst the aperture of a large shell is almost lunate.

The two specimens figured of this Ammonite are from the stock of Mr. George Humphries. They were marked *Sherborne*, and appear to come from the Ironshot or inferior Oolite : the larger one is only a polished half. The same species occurs abundantly at Bayeux in Normandy of a brighter colour.

AMMONITES contractus.

TAB. D.—*fig. 2.*

SPEC. CHAR. Subglobose, umbilicated, radiated; radii rising into tubercles upon the border of the umbilicus, then dividing into three or four branches that pass over the much rounded front; aperture oblong, arched.



A SPECIES ornamented exactly like the last, but so globose that the inner whorls are almost concealed, the sides of the shell appearing as if contracted together to form a deep umbilicus.

Found at Dundry: now in the collection of the Rev. Dr. Beeke, whose favours we have before had several occasions to acknowledge.

AMMONITES *Listeri*.TAB. DI.—*fig. 1.*

SPEC. CHAR. Subdiscoid, inner whorls partly concealed; front convex, broad, crossed by numerous small ribs; sides inversely conical, ribbed; ribs terminated by tubercles.

SYN. Conch. Naut. *Ammonites Listeri*. *Martin, Pet. Derb. Pl. 35, f. 3.*

THIS elegant fossil is a miniature representation of *A. Blagdeni* (tab. 201): its thickness almost equals its diameter, which seldom exceeds an inch and a half: at rather distant intervals annular depressions are to be observed upon the cast of the inside, which indicate that the edge of the aperture was thickened at certain periods of its growth.

Martin says this shell is found in most of the Limestone tracts in his vicinity, particularly near Eyem and Middleton. We have received it from a stratum of Shale belonging to the Coal series, and referred by Mr. Farey to his third Coal*: it occurs in nodules of either Limestone or Iron-pyrites. In the latter substance it often happens that only casts of the outside remain, consisting of two spirally ornamented cones placed with their apices nearly in contact: such are represented in *British Mineralogy* (tab. 455), and probably came from Whitley-wood mine near Sheffield. The specimens now figured are those

* See Derbyshire Report, p. 214.

which the Rev. Mr. Steinhauer collected, along with *Pecten papyraceus** (tab. 354), about two miles and a half north of Halifax, on the road to Bradford, where the Limestone balls are sufficiently abundant to repay the expense of burning. The stratum of Shale that contains them extends northward beyond Bradford to Idle, in the neighbourhood of Calverly and Farsley near Horseforth. The stratum may be thus traced from Middleton to near Leeds, and perhaps further. We expect at some future period to see an account of this district from the pen of E. S. George, Esq., who has examined it particularly, and traced the *Pecten papyraceus* (that seems to accompany *Am. Listeri*) through a long course.

AMMONITES longispinus.

TAB. DI.—fig. 2.

SPEC. CHAR. Discoid, thick, with two concentric rows of spines upon each side; whorls few, half exposed, front round.

A NEARLY plain shell, consisting of two or three whorls with long spiniform tubercles on each side: the aperture would be orbicular were it not rather deeply indented by the preceding whorl; the greatest length of the aperture is about 3-5ths of the diameter of the shell.

Found near Weymouth. A considerable portion of the pearly shell remains mingled with sparry Carbonate of Lime, and filled with indurated Marl, and a little Iron-pyrites.

* *Anomia Pecten Gmel.* 3342. *Pectinites membranaceus*, &c. *Lister, Anim. Angl.* 243. t. 9. f. 49.

TEREBRATULA *lata*.TAB. DII.—*fig. 1.*

SPEC. CHAR. Transversely oblong, convex, regularly plaited ; front elevated ; the perforated valve flattest, with a produced beak ; plaits 40.

FORTY regular neat plaits, ten or twelve of which are raised with the front, cover the surface of this pretty Terebratula ; it would be twice as wide as long were not the beak produced beyond that proportion.

Found in the green Sand. We have specimens, through the kindness of Mrs. Gent, from the Devizes Canal ; of C. W. Loscombe, Esq., from near Sidmouth ; and of H. H. Goodhall, Esq., from Farringdon in Berkshire : the one from the last place is coloured with ochre, and empty ; the others are nearly white, and filled with stone.

TEREBRATULA *depressa*.TAB. DII.—*fig. 2.*

SPEC. CHAR. Triangular, depressed, regularly plaited ; front elevated ; lateral angles rounded ; beaks produced ; plaits 20.

WHEN so young that the front is hardly elevated, this shell is almost orbicular ; in which circumstance it differs from the last, the proportions of which do not vary much by age : the plaits are sharp, about eight of them are raised with the front.

Found at Farringdon by H. H. Goodhall, Esq.

TEREBRATULA nuciformis.

TAB. DII.—fig. 3.

SPEC. CHAR. Transversely oblong, globose, regularly plaited; front elevated; beak produced; plaits 30, rounded.

SMALLER than a hazel-nut. The edges of the plaits are rounded, and near the front often have a sunk line upon them. The specimens being empty, show the arched processes from the hinge neatly preserved.

Found near Farringdon by Mr. Sowerby in 1809, in a pit called a gravel pit rendered remarkable by a great number of cup-shaped fossils, which Mr. S. proposed to call *Spongia pezizoides* (see Brit. Mineralogy, tab. 482, and Linn. Trans. x. 405).

 TEREBRATULA acuta.

TAB. DII.—fig. 4.

SPEC. CHAR. Transversely oblong, gibbose, largely plaited; front elevated with 6 plaits, of which the lateral ones are the largest; beak slightly produced; plaits 20, sharp.

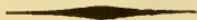
THE strong resemblance of this to the others before us is very striking; but the sharpness of the plaits, and the size of those especially that bound the elevated front, although variable, will distinguish it; the beak is also smaller and more curved.

Presented by Miss E. Warne, who obtained a good series from ochraceous Limestone at Cleeve Hill near Cheltenham in 1820.

TEREBRATULA plicatella.

TAB. DIII.—fig. 1.

SPEC. CHAR. Subglobose, rather square, plaited; front elevated; beak small, with a broad oblong concave space on each side; plaits 40, rounded.



TEN or twelve of the plaits rise gradually with the front; the descending sides are rather straight, which, with the flattish spaces on each side of the beak, give the whole a squarish outline: the plaits are often branched near the beaks, so that they were less numerous in the young shell.

Upon plate 244 of the *Encycl. Méthodique* (fig. 2) is represented a *Terebratula* * that much resembles the one before us; but it has a much less number of plaits, and is in this respect more like the following: they all have the remarkable space on the sides of the beaks.

The cabinet of H. T. De la Beche, Esq. is enriched with this probably scarce fossil: it is from the inferior Oolite at Chideock near Bridport.

* Lamarck *Hist. Nat.* vi. Part I. 253, refers to this as *T. tetraëdra*, considering it the same as *T. tetraëdra* of *Min. Con.* t. 83, f. 4, which he also quotes; but which is a totally different shell.

TEREBRATULA serrata.

TAB. DIII.—*fig. 2.*

SPEC. CHAR. Rounded, triangular, convex with a blunt margin, largely plaited ; beak small, with a large nearly flat space on each side of it ; plaits sharp, about 11, of which 5 are a little raised in the front.



THIS is more depressed than the shell above referred to in the Encyclopédie, but in other respects much like it. Can it be a young individual of the same species ?

From the same collection as the last : found in Lys at Lyme Regis.

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CORRECTIONS AND OBSERVATIONS.

Page 4, note, *for besuperseded, read be superseded.*

5, line 3, *after curved, add depressed.*

22, last line but 3, *for catena, read Catena*

26, line 23, *for pectenifera, read pectinifera.*

31, last line but 1, *for comprehended, read combined.*

32, after the name, *add TAB. CCCCXXV.*

OBS.—The specific name of *ANOMIA striata* must be changed, *striata* having been before employed for a recent species: we propose *lineata* as the name for the fossil.

36, line 13, *for Figs. 3 and 4, read Fig. 3.*

39, line 9, add *Encl. Méth. t. 258, f. 2.*

50, line 8, *for 6, read 5.*

54, line 9 from the bottom, *for of the, read of this.*

54, *for thin, read their.*

63, line 10 from bottom, *for credulated groove, read crenulated groove.*

64*, tab. 444. The figures upon the plate are incorrect: *for 2, read 5; for 3, read 6; for 5, read 2; for 6, read 3.*

72, last line but 1, *for Enomphalus, read Euomphalus.*

84, last line but 2, *for Bristol, read Dublin.*

90, line 2, *for 1, read 2.*

90, last line but 1, *for Bristol, read Dublin.*

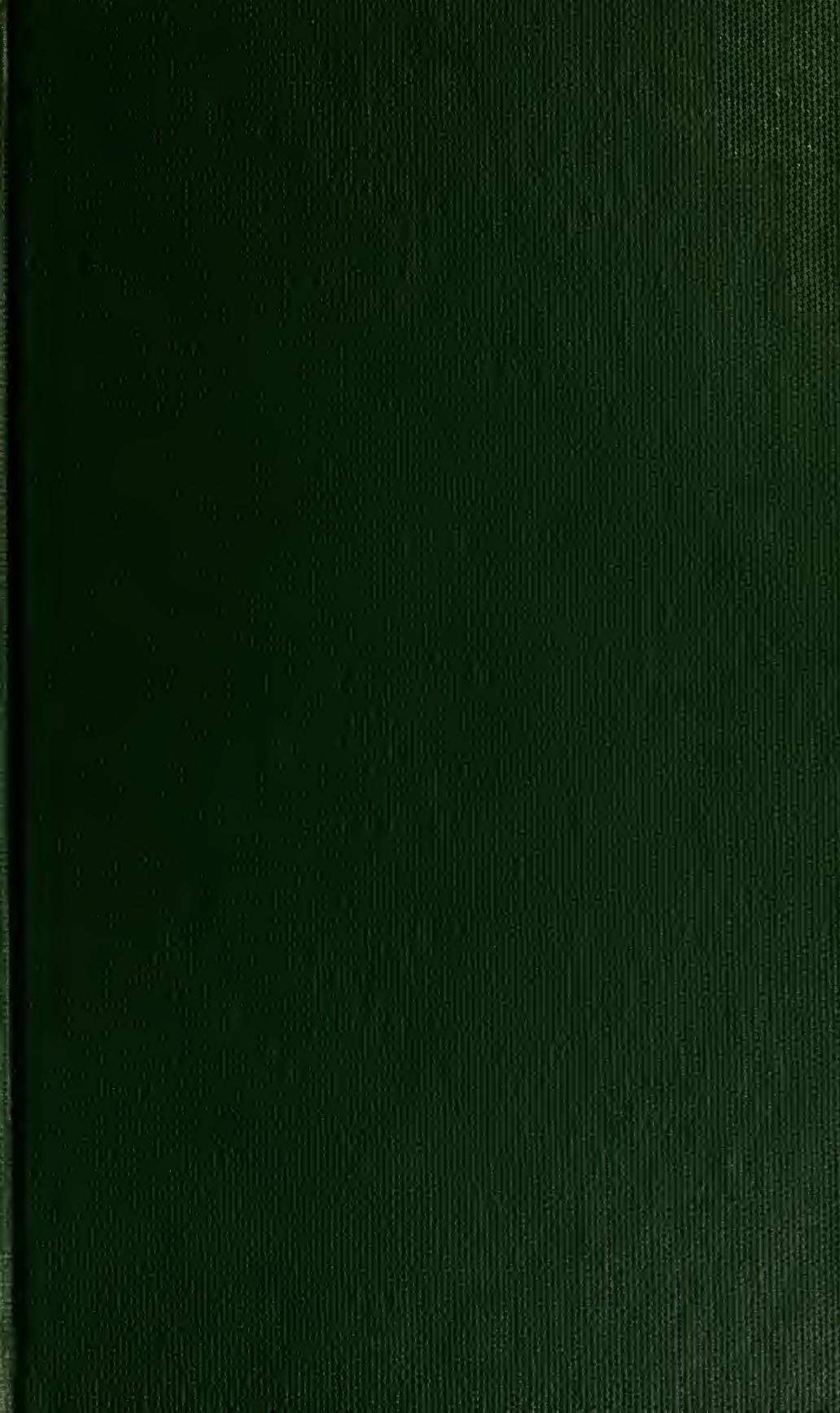
109, line 10, *for tab. read vol.*

114, line 3, *for CCCCLXII, read CCCCLXXII.*

114, line 14, *for CCCCLXXI, read CCCCLXXII.*

129. OBS.—The fossils described as coming from *Cork* are many of them from *near Dublin*, out of a mixed collection.—The same species are found at both places.

134, line 13, *for nanus, read Nanus.*



7-5

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9

THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN;
OR
COLOURED FIGURES AND DESCRIPTIONS

OF THOSE

REMAINS OF TESTACEOUS ANIMALS

OR

Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

By JAMES SOWERBY, F.L.S. G.S. W.S.

HONORARY MEMBER OF THE PHYSICAL SOCIETY OF GÖTTINGEN,
OF THE SOCIETY OF JENA, &c.

CONTINUED BY

JAMES D. C. SOWERBY, F.L.S. Z.S. &c.

Many, O Lord my God, are thy wonderful works which thou hast done ;
they cannot be reckoned up in order to thee : if I would declare and speak
of them, they are more than can be numbered.—PSALM xl. 5.

VOL. VI.

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6m MDCCCXXIX.

1521

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rostrata	537 f.1&2	71	antiquus	594 f.3—5	190
striatula	536 f.3—5	69	batava		29
truncata	537 f. 3	71	compressus ..	594 f. 2	189
variabilis...	576 f.2—5	148	cordiformis..	595 f. 1	191
Thetis major	513 f.1—4	20	Pictorum....		29
minor	513 f.5&6	21	porrectus ..	594 f. 1	189
Trigonia angulata..	508 f. 1	9	Solandri	517	29
cuspidata ..	507 f.4&5	8	Venus caperata	518 f. 1	31
imbricata ..	507 f.2&3	8	Faba	567 f. 3	129
nodosa	507 f. 1	7	ovalis	567 f.1&2	129
Pullus	508 f.2&3	10	parva	518 f.4—6	32
rugosa.....		117	Vermetus bogno- } riensis }	596 f.1—3	194
spectabilis ..	544	183	concinuus ..	596 f. 5	195
Turbo obtusus	551 f. 2	97	polygonalis..	596 f. 6	196
Terebra		110	tumidus	596 f. 4	195
Tiara	551 f. 1	97	Vermicularia } (Vermetus) }		193
Turritella abbreviata	565 f. 2	125	Vermilia.....	198, 200, 225	
costata.....	565 f. 4	126	Vivipara.....		11
excavata } (concava) }	..565 f. 5	126			
granulata ..	565 f. 1	125			

CORRECTIONS AND OBSERVATIONS.

- Page 5, last line, *for Oxford, read Kimmeridge.*
 6, et seq. **Obs.** Ancliffe is otherwise called Hanckley, it is in the parish of Westwood in Wiltshire.
 17, line 19 et passim, *for Lyas, read Lias.*
 34, to *EMARGINULA scalaris, add fig. 4.*
 41, line 15 et passim, *for Melanea, read Melania.*
 51, line 18, *for carinatus, read carinata.*
 63, *add a comma after ANCYLUS.*
 69, line 5, *after numerous, add granulated.*
 line 9, *add the striæ become smooth by age.*
 93, line 1, *for lævigatus, read Selliguius. Add SYN. A. Selliguius? Cuvier & Brongniart Env. de Paris, 394 t. 7. f. 1.*
Obs.—Our fossil is between *A. Selliguius* and *A. Beudanti* of Brongniart: the latter is not uncommon at Folkstone, and varies much,—may they not all be one species?
 102, last line but 1, }
 108, last line but 2, } *for Brambury, read Braambury.*
 157, line 1, *for priscus, read prisca.*
 166, line 1, *for tetrammata, read tetrammatus.*
 185, last line but 1, *dele lower beds of.*
Obs.—It appears that the *Baculites Faujasii* is from the upper Chalk.
 191, line 5 from the bottom, *for renders, read render.*
 193, line 13, *for Trachelepodons, read Trachelipodous.*
 213, line 4 from the bottom, *for priscus, read prisca.*
 226, *for TURRITELLA concava, read TURRITELLA excavata, and add SYN. Cerithium excavatum, Cuvier & Brongniart, Env. de Paris, 399, t. 9. f. 10.*
Obs.—We had published this as a *Turritella* before we observed that Brongniart had given it as a *Cerithium*: we retain our generic name, which Brongniart seems inclined to think may be right.

PACHYMYA*.

GEN. CHAR. Shell bivalved, transversely elongated, very thick, sub-bilobate, with the beaks near the anterior † extremity. Ligament partly immersed, attached to prominent processes or fulcra.



A STRONG analogy exists between this genus and Modiola, evinced by the position of the beaks, the elongated form of the valves, and the partial separation of the anterior portion into an imperfect lobe. But a closer inspection shows that it is rather related to Cypricardia and several other genera which have a comparatively short ligament, and that, fixed upon a strong prominent part of the shell within the edge, not linear and affixed to narrow edges, as in most of those thin shells that are allied to Mytilus. The great thickness of the valves, their depth, and the ridge that crosses them obliquely, help to distinguish this from other genera, independently of the hinge teeth, which we regret not having seen.

It is probable that several fossils hitherto described as Modiolæ will, when better known, prove to belong to this genus.

* From $\pi\alpha\chi\upsilon\delta\varsigma$ (*crassus*) and Mya, another genus which this resembles.

† We purpose in this volume to use the terms *anterior* and *posterior* in their correct sense, as pointed out by the situation of the mouth of the animal.

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PACHYMYA Gigas.

TAB. DIV. and DV.

SPEC. CHAR.....



A GIBBOSE heavy shell, above twice as wide as long; the thickness also exceeds the length. It is slightly curved, with parallel edges. The anterior extremity is small, rounded; the posterior, rather truncated: they are both close. The valves are rendered obliquely boat-shaped by a ridge that runs from the beaks to the lower extremity of the posterior edge; the surface is smooth except towards the margin, where it is formed of the imbricated edges of laminæ.

We are indebted to the zeal and kindness of H. T. De la Beche, Esq. for the opportunity of representing this extraordinary shell: it is from the Chalk with quartzose grains at Dowlands, the lowest part of the Chalk formation in the vicinity of Lyme Regis.

The generic name suggested by Mr. De la Beche expresses a slight resemblance which the shell has to some species of the Linnean genus *Mya*.

ORBICULA Lamarck.

(Discina, *Lamarck.*)

GEN. CHAR*. “Bivalve, inequivalve, nearly orbicular, compressed, fixed; upper valve patelliform, with 4 internal muscular impressions, two rather large and approximating near the centre, and two smaller and more distant, placed near the posterior margin. Lower valve flat, with corresponding muscular impressions and a rather obtuse process placed at the inner end of a fissure near the centre. Hinge none.”

“THE animal has two ciliated arms or tentacula, and adheres by a muscle or ligament which passes through the fissure.”

Little can be added to the above detailed Gen. Character. The shells that compose the genus are thin and rather coriaceous. The animals contained in them are analogous to those of *Terebratulæ* and other Branchiopoda; but the foot or byssus, instead of passing through the beak of one valve as in *Terebratula*, and being inclosed in a tube, passes through the disk and spreads immediately upon the stone it is attached to.

Two recent species are known; they are described, in the thirteenth volume of the *Linnean Transactions*, by my brother: and we have now the pleasure of adding three fossil ones, two of them from the collection purchased by him from the late Mr. G. Humphries, whose merits and penetration have unfortunately been rendered of little service to the scientific world.

* *Trans. Linn. Soc.* vol. 13. p. 466.

ORBICULA reflexa.

TAB. DVI.—*fig. 1.*

SPEC. CHAR. Shell subelliptical, most pointed towards the back, polished ; upper valve rather convex, with the vertex near the posterior margin ; lower valve flat with a nearly central vertex, the margin reflected ; sinus for the byssus large, elongated.

SYN. *Orbicula reflexa.* *G. B. Sowerby, Zoological Journal, v. 2. p. 321.*



ALTHOUGH a great part of the lower valve is flat, yet the portion behind the focus or apex is concave, being gradually bent inwards towards the sinus, which extends from the focus to the margin, and terminates where that begins to be reflected. The upper valve covers the reflected edge of the lower, in the same way that the upper valve covers or incloses the other in the genus *Producta*. Both valves are smooth and very thin ; and, the lower especially, beautifully marked with concentric lines and zones of a light colour : they seem to have contained a large portion of animal matter, and are very fragile, easily dividing into very thin, translucent laminæ. We cannot discover any traces of impressions of muscles or ligaments, yet we do not doubt the propriety of placing this species in the same genus with the recent ones.

A number of these curious shells were found in one or two broken Clay Ironstone nodules, buried,—with

many hundred unknown shells and numerous marks of a scientific mind,—in Mr. Humphries's collection, which had been for many years unopened when my brother purchased it and disclosed its riches. It is remarkable that both valves should always be found, and no substance accompanying them to which they may have been attached: but this is partly accounted for by the nature of the attachment, which would fail upon the death of the animal, and by the elastic texture of the valves, which, as one is inclosed in or grasped by the other, would still hold together. We know of but one other specimen; it is a single individual attached to *Nucula Ovum*: both are filled with indurated clay. It is in the cabinet of John Hogg, jun., Esq., who obtained it near Whitby, from the Alum Clay.

ORBICULA Humphriesiana.

TAB. DVI.—*fig. 2.*

SPEC. CHAR. Conical, orbicular, marked with diverging striæ; apex elevated, rather excentric, obtuse.

MUCH resembling the *O. norvegica*; but it is a higher and more regular cone, is more deeply striated, and thicker. We do not know the lower valve.

Found attached to *Ostrea deltoidea* (M. C. 111.) in Mr. Humphries's collection, with a label marked "Collinson's Sale, at Langford's." We suspect it to come from the Oxford Clay at Shotover Hill.

ORBICULA granulata.

TAB. DVI.—*figs. 3 and 4.*

SPEC. CHAR. Conical, orbicular, marked with granulated radii; apex elevated.



A MORE elevated and regular cone than even the last: but the sides are rather rounded; the diverging lines are elevated, and rendered granular by the lines of growth. We have not seen the other valve.

This shell had passed for a Patella, but its orbicular form gave rise to some doubts: and we now venture to place it under the genus Orbicula, in consequence of its strong resemblance to the last species.

From the Ancliffe Oolite in the collection of the Rev. G. Cookson.

Fig. 4 is an enlarged view.

TRIGONIA nodosa.

TAB. DVII.—*fig. 1.*

SPEC. CHAR. Obovate, depressed; anterior part covered with rows of large knobs, a portion of the posterior part plain; superior edge straight.



A LARGE rather depressed species: two or three rows of slightly elevated tubercles extend from the beaks towards the posterior margin, which is truncated irregularly: from that row of tubercles which passes over the disk, 8 or 10 others extend obliquely over the whole of the anterior portion. Much resembling *T. dædalea* (M. C. 88.); but it is larger, and the tubercles are less numerous, and do not cover the posterior portion. Casts of the insides have been preserved in Mr. Sowerby's Museum since 1815: they were found in the Green-sand at Hythe in Kent.

TRIGONIA imbricata.

TAB. DVII.—*figs. 2 and 3.*

SPEC. CHAR. Transversely oblong, depressed ; with 5 or 6 concentric, dentated, subimbricated keels upon the rounded anterior side ; posterior side obliquely truncated, ribbed.

THE carinæ upon the surface of this little shell resemble terraces one above the other ; each is divided into 4 or 5 angular lobes.

Imperfect specimens of this Trigonía occur in the Rev. Mr. Cookson's collection of Ancliffe fossils.

Fig. 3 is enlarged.



TRIGONIA cuspidata.

TAB. DVII.—*figs. 4 and 5.*

SPEC. CHAR. Obovate, depressed, ribbed ; posterior side truncated, its lower angle pointed ; ribs concentric, with projecting angles where they pass unto the posterior side.

A DELICATE, slender shell. It has, in place of the keel (which in several other species runs from the beak to the lower angle of the posterior edge), only produced angles of the ribs, the last of which forms a strong point at the lower extremity of the truncation. The hinge teeth are unusually long.

From the Ancliffe Oolite, with the last.

Fig. 5. a magnified representation.

TRIGONIA angulata.

TAB. DVIII.—*fig. 1.*

SPEC. CHAR. Transversely elongated, convex ; posterior side produced, truncated, transversely striated, bounded by a crenulated line ; the remainder ornamented with nodose ridges bent at right angles as they pass over the middle.

SYN. *Trigonia clavellata* var. *Min. Conch. t. 87. lower figures. Vol. i. p. 197.*



UPON the posterior side are not only transverse striæ, but there is generally a crenulated ridge in the middle of it ; the crenulations upon this and also upon the bounding lines are often elevated into small spines. The curvature, like the letter S, of the concentric ridges, which are sometimes divided into distinct tubercles, and at other times continuous, is a strong and constant character. The portion above the anterior side (corresponding with the lunette in other shells, but very large in this) is smooth. The breadth seldom exceeds an inch and a half.

An excellent specimen lately lent us by our good friend Thomas Meade, Esq. has shown this to be a distinct species, which the imperfect specimens formerly figured were not sufficient for. It is from Brewham near Nunney. The accompanying shells are *Astarte elegans* (M. C. 137.), an unpublished one, resembling a *Tellina*, and, at the back of the mass, fragments of a smooth *Pecten*.

TRIGONIA Pullus.

TAB. DVIII.—*figs. 2 and 3.*

SPEC. CHAR. Obovato-triangular, with transverse smooth ribs; posterior side obliquely truncated, marked with several crenulated ridges and bounded by a strong crenulated keel; lunette large, regularly striated across.



THIS so nearly resembles *T. costata* (M. C. tab. 85.), that it is doubtful whether it may not be the young state: the only marked difference, except size, is the regular somewhat curved set of elevated lines that cross the lunette at right angles with the edge of the shell, in place of irregular lines of growth; the form is not quite so angular, and the ridge that separates the posterior side projects beyond the edge.

I am not acquainted with the locality of the specimen fig. 2, but it is evidently from the same kind of stone as the smaller ones, fig. 3, which are from Ancliffe.



There is in the Green-sandstone at Hythe in Kent, a *Trigonia* much resembling *T. costata*; but the specimens that have come into our hands are too imperfect to describe, or even to distinguish: it appears to have fewer ribs.

PALUDINA elongata.

(Gen. Vivipara, Vol. i. p. 75.)

TAB. DIX.—*figs.* 1 and 2.

SPEC. CHAR. Ovato-lanceolate, smooth; volutions 5, convex; aperture elongated.

WELL distinguished from the other species of Paludina by its great length, which equals twice the diameter: it resembles the recent species common in fresh water every where (*Helix tentaculata* Linn.), but is larger and even longer in proportion than that is.

When *Vivipara Fluviorum* (*Paludina vivipara* of Lamarck) was published in *Mineral Conchology*, it was not known that fresh-water formations were to be found below the Chalk; nevertheless the probability of one was pointed out by that shell. The existence of several species of Paludina, of bivalved shells belonging to the fresh-water genus *Cyrena*, and of *Cypris*, in the strata between the Green-sand and the Portland Rock, indicate this range to be of fresh-water origin. (See Dr. Fitton's paper in the *Ann. of Phil.* vol. viii. N. S. p. 379; and *Mineral Conchology*, vol. v. p. 138. tab. 485. *Cypris*.)

Dr. Fitton has favoured us with specimens out of the Weald Clay, in hard ferruginous clay ("Clay-Ironstone"), from Compton Grange Chine in the Isle of Wight. Most generally only the cast of the shells remains, but in that selected for representation the shell is preserved (fig. 2.): it is accompanied with *Cyrena* and *Cypris*. The same shell also occurs less perfect in laminated Clay and in "irregular concretional masses of hard calcareous grit:" in the latter the shells are often filled with sulphate of barytes.

We have taken fig. 1. from a mass of Limestone, upon the surface of which the shells are tolerably perfect, although within they appear to be crushed (a cir-

cumstance that, however curious and difficult to account for, is not uncommon), and from some detached individuals that were collected at East Peckham in Kent by J. B. Dorient, Esq. Although we cannot detect the *Cypris* among these, we suppose they come from the beds of Limestone subordinate to the Weald Clay: some fragments of the fibrous carbonate of lime resembling "Curl" mentioned by Dr. Fitton (p. 374, note) occur with them.

PALUDINA carinifera.

TAB. DIX.—*fig.* 3.

SPEC. CHAR. Ovato-conical, smooth; volutions 4, convex, the upper two bounded by a linear keel at the lower edge.

Not much longer than wide, and rather blunt; the thread that runs round the sutures of the two upper whorls is a strong character.

From one of the upper beds of Purbeck Limestone. In the interior of the mass the shells are more completely crushed than in that from East Peckham just mentioned: it contains fragments of some bivalve.

The insulated figure is taken from parts of several individuals.

In the Sandstone at Hollington near Hastings, and in other parts of the Hastings Sands, there occurs a *Paludina* of nearly the same proportions as the one before us; but as we have only seen casts, we cannot determine the species.

GERVILLIA, Defrance.

GEN. CHAR. An unequal-valved, unequal-sided bivalve, oblique, much elongated; beaks near the anterior extremity; hinge long; divided into several pits, and furnished with many, more or less lamelliform, teeth; one muscular impression in each valve.



A GENUS nearly related to *Perna*. The species upon which it is founded has nearly parallel edges; but several others that possess the same characters in the hinge, are ovate, and more or less taper towards the extremities. The hinge consists in a long transverse area, containing 3 or more shallow hollows destined to receive the ligament; about the inner edge of this area are a number of irregular interlocking lamellar teeth, varying in their direction and size in different parts of the same hinge and in different species; those placed towards the anterior extremity are, in the type of the genus, small and longitudinal; the others long and transverse: in other species they are all either oblique or transverse. The casts of the typical species indicate a shell that gapes at one if not at both extremities; the other species are close. The shell in all is thick, and probably consists chiefly of pearl.

Mons. Defrance established this genus in the *Dictionnaire des Sciences Naturelles*, from casts discovered by Mons. de Gerville,—in commemoration of whom he has named it, and thus done honour to a Naturalist whose zeal and urbanity justly merit it.—Other species have been added to it by Mons. Eudes-Deslonchamps, in consequence of the resemblance in their hinges. Hereafter these will form at least a sub-genus.

1826. 6. 2. 83.

GERVILLIA solenoides.

TAB. DX.—*figs.* 1 to 4.

SPEC. CHAR. Transversely much elongated, depressed, smooth; edges parallel; anterior extremity truncated, open; teeth of the hinge numerous, variously disposed.

SYN. Gervillie solénoïde. *Defrance, Dict. des Scienc. Nat. v. 18. p. 503. cahier 16. pl. 18. f. 4.*

Gervillia solenoides. *Eudes-Deslonchamps, Mem. de la Soc. Linn. du Calvados, 1824. p. 129.*

A LONG, narrow, slightly curved shell; the hinge contains about four depressions for the reception of the ligament: the teeth within are irregular and linear; those on the anterior extremity are most elevated and placed perpendicular to the hinge line; the others are in the same direction with it, and often curved: the anterior extremity appears to be open, perhaps for a byssus; the other we have not seen. The shell is at least eight times as wide as it is long.

Many imperfect casts of this extremely curious shell were collected in 1818 at Shanklin Chine in the Isle of Wight by my father, in the lowest ferruginous beds of the Green-sand (fig. 2. and 3.); and immediately identified with casts from Normandy, which he had received from his highly valued correspondent Mons. de Gerville. The discovery of the same fossil, with a portion of the shell preserved (fig. 1.), in the lowest beds of Green-sand near Lyme Regis, by H. T. De la Beche, Esq., has induced me to figure it; and for illustration I have added two figures taken from specimens picked up at Fresville by Mons. de Gerville (fig. 4.). Many of the fossils which accompany the same rock with this in Normandy, are unknown in any English stratum; others correspond with those of the Green-sand; and some with Chalk fossils,—a circumstance that may give rise to much speculation.

GERVILLIA ? acuta.

TAB. DX.—*fig. 5.*

SPEC. CHAR. Ovate-lanceolate, oblique, narrow, depressed, slightly curved ; anterior extremity acute ; teeth in the hinge variously disposed.



EXTERNALLY this shell exhibits a few lines of growth ; it is comparatively thin : its width (the longest measure from the two extremities) is four times its length ; the anterior portion is rather remarkably attenuated, the other extremity is rounded. Found in a calcareous sand-stone at Collyweston, by the late Lady Wilson. We have not been able to ascertain whether this have any hollows in the area of the hinge destined for the ligament, as that part is not visible in the specimen, although there are four or five casts of the inside, and one or two of the outside upon it. The thinness of the shell would lead us to think it an *Avicula*, were not the teeth so large, and differently placed.

GERVILLIA aviculoides.

(Perna aviculoides. *Min. Conch.* tab. 66.)

TAB. DXI.

SPEC. CHAR.* Obliquely ovato-lanceolate, curved ; both extremities pointed ; hinge line nearly half the length of the shell ; hinge teeth few, similarly disposed. Distinguished from *G. pernoides* of Mons. Deslonchamps above quoted, by its more pointed form.



AT the request of several friends, and for the purpose of further illustrating this species, we have given a second plate of it. It belongs to that division of the genus in which the lamellar teeth of the hinge are all nearly in the same direction. Fig. 1. is from a remarkably fine specimen in the cabinet of our kind friend J. Vine, Esq. It exhibits the opposite valve to those figured on tab. 66. Fig. 2. is a portion of the hinge with two lamellæ. Fig. 3. shows a front view of both valves, in which their difference is seen, one having a shallow furrow along it, which the other wants. These three specimens are from the Shanklin Sand. Fig. 4. is a cast of the inside, picked up on Shotover Hill, Oxford ; it shows the muscular impression and several of the points of attachment of the mantle. Fig. 5. the cast of the hinge nearly perfect, taken out of one of the same masses that produced the *Gervillia solenoides*. Similar casts are met with in Parham Park, but not, I believe, accompanied with the *G. solenoides*. They are mentioned by Mr. Mantell (p. 74. n. 17.). Mr. De la Beche has found the same species in the lowest strata of Green-sand near Lyme. Hence it should appear that it is a constant attendant upon that formation.

* This will supply the place of the one formerly given.

AVICULA lanceolata.

TAB. DXII.—*fig. 1.*

SPEC. CHAR. Transversely linear-lanceolate, compressed ; posterior wing large, obtuse-angled ; anterior wing minute, pointed.



SIX times as wide as long, very flat ; the beaks are very near the anterior extremity ; the posterior extremity is narrow and blunt ; the posterior wing extends about one third the width of the shell : it is in no part distinct, but runs along the superior edge ; its two edges, one of which is a continuation of the hinge line, meet at a very obtuse angle.

A very remarkably formed shell (if in fact it be a shell) strongly resembling the external bony appendages to the abdominal fins of several fishes : the manner in which the pair is displayed strongly favours this resemblance, and is by no means common among fossil shells.

Figured from a specimen in the cabinet of H. T. De la Beche, Esq., who found it in the Blue-Lyas of Lyme Regis, Dorsetshire.

The shell is imposed upon a plate consisting of perpendicular fibres, of grey carbonate of lime, imbedded between the laminæ of the slaty clay that composes a great part of the Lyas stratum. It is accompanied by a small Pecten.

AVICULA ovata.

TAB. DXII.—*fig. 2.*

SPEC. CHAR. Transversely ovate, convex ; posterior side elongated, blunt ; hinge line long, forming part of the posterior wing, which is not distinct.



A SLIGHTLY curved shell, much approaching in form to a *Gervillia* ; the hinge line occupies more than half the width of the shell : the wings do not project beyond it, but are rectangular, and raised upon the upper edge of the shell ; the beaks are rather prominent.

This may easily be taken for a short variety of *Gervillia acuta* (tab. 510.): but we can detect no indications of lamellar teeth or cavities in the hinge. It is a species that connects the two genera.

A very abundant shell in the Stonesfield Slate.

THETIS *.

GEN. CHAR. An equivalved subequilateral bivalve ; more or less orbicular, and convex ; ligament marginal ; 3 or 4 small acuminate teeth about the hinge ; the line of attachment of the mantle ? has a deep sinus extending nearly to the beak ; muscular impressions rounded, small, distant from the hinge. Ligament external.



THIS genus bears some resemblance to *Mactra* ; but the ligament is not internal, nor are there any remote teeth. It also comes near to *Tellina*, but its margin is not curved laterally. The shell is thin, with small incurved beaks : the leading feature is a line within, which, taking an irregular sweep from the anterior muscular impression over the middle of the valve, turns suddenly up, almost to the beak, then bends down again in a nearly parallel direction for some distance, and at last proceeds to the posterior impression. This line has much the appearance of the mark formed by the attachment of the mantle ; but the sinus in it is so remarkably directed that we are led to doubt, more especially as we have only observed fossil examples. There is no lunette or other external mark, the surface being nearly smooth and plain. The teeth about the hinge are unequal : the two interior ones are largest, conical, and slightly curved ; the other two, if there be more than one, are small.

The fossils composing this genus have been referred to *Venus*, but are totally distinct.

* The elegant symmetry in the form of the shells of this genus render it worthy of the name of this beautiful Sea Nymph.

THETIS major.

TAB. DXIII.—*figs. 1. to 4.*

SPEC. CHAR. Convex, orbicular ; posterior edge rather angular ; beaks small.



OFTEN two inches wide, and nearly as much long ; extremely thin : the surface is plain and smooth, except numerous longitudinal rows of very minute rising punctums, probably epidermis : the beaks are small, sharp, and curved close together.

The size and a less degree of convexity are almost the only points in which this differs from the following. The most perfect specimens we have met with, were collected at Blackdown, in 1812, by Miss E. Hill ; they are siliceous casts imbedded in Sandstone, and do not appear to have undergone any violence, as they are regular and precisely similar in shape. (See fig. 1.) The same species is very abundant in the soft micaceous Sandstone near Devizes, where there are only casts, which, in common with the other fossils of that place, are much and variously distorted (figs. 2. 3. & 4.). For these we are under obligations to Miss Gent. It occurs also at Earlstoke.

THETIS minor.

TAB. DXIII.—*figs. 5 and 6.*

SPEC. CHAR. Gibbose, wider than long ; posterior edge rounded.

SYN. Venus. *Mantell, Geol. of Sussex, p. 73. no. 12.*



GENERALLY about an inch wide, but sometimes nearly an inch and a half: it is more convex and has larger beaks than the preceding species ; the surface has the same kind of punctums, but they are very seldom to be traced in the circumstances under which the individuals are commonly presented to us.

An immense number of very perfect casts of this neat shell occur in the hard ferruginous masses of the lower Green-sand at Parham Park in Sussex, and Shanklin Chine in the Isle of Wight. Specimens from the former spot have long been in Mr. Sowerby's Museum, where they were deposited by G. Mantell, Esq. ; those from the latter place (fig. 6.) were collected by my father himself, in 1818. H. T. De la Beche Esq. has also discovered it in the lowest Green-sand near Lyme Regis, where the earthy matter of the shell still remains (fig. 5.) ; but the shells

are often much distorted. They are in all these places accompanied by various other shells, especially by *Trigonia aliformis* and two unpublished species of *Rostellaria*, which, as far as the very imperfect fragments hitherto obtained will indicate, are nearer allied to the *R. Pes Pelicani*, than they are to *R. Parkinsoni*.

Since the Plate was engraved, we have met with a beautiful white individual of this species, from Blackdown, in which the short, cylindrical, external ligament is very neatly cast in *Silex*.

AMMONITES Taylori.

TAB. DXIV.—*fig. 1.*

SPEC. CHAR. Discoid, radiated ; inner whorls exposed ; radii about 12, with one large spiniform tubercle upon each side of the front, and one or two slight elevations on the rounded sides of the whorls ; aperture nearly round.



APERTURE rather transverse, not quite one-third of the diameter of the shell long : there are about three whorls ; the inner ones are small, but almost wholly exposed to view.

Found in a water-worn mass of indurated Clay approaching Ironstone, and containing Blende, in Hap-pisbury Cliff, where it was probably alluvial.

For the use of the specimen I am indebted to R. Taylor, Esq., of Norwich, whose assiduity in collecting and drawing the fossils of the Cotswold Hills, and other Geological researches, have induced me to yield to friendly inclinations in commemorating his name.

AMMONITES Hippocastanum.

TAB. DXIV.—*fig. 2.*

SPEC. CHAR. Gibbose, umbilicated, radiated, spinose; inner whorls almost concealed; radii ten or more, unequal, much elevated, each furnished with three tubercles upon the front, and most of them with two obtuse spines upon each side; aperture transversely obovate.



DISTINGUISHED from *A. rhotomagensis* by the convexity of the sides of the whorls, the small number and thickness of the radii, and the size of the spiniform tubercles; the thickness equals two-thirds of the diameter at least.

At first sight this fossil has a very striking appearance, although upon examination it is found to be very nearly allied to the following.

The specimen is in the cabinet of H. T. De la Beche, Esq., who discovered it at Dowlands, in the same Chalk (replete with large grains of Quartz and Green-sand,) which produced the *Pachymya* (tab. 504.). We have a small specimen from near Rouën, also containing particles of Green-sand, but no conspicuous grains of Quartz. We have named it from its resemblance to the thorny capsule of the Horse-chestnut.

AMMONITES rhotomagensis.

TAB. DXV.

SPEC. CHAR. Discoid, radiated, umbilicated ; inner whorls partly concealed ; radii about 20, furnished with three short tubercles upon the front, and two more or less elevated upon each side ; whorls thick, with flattish sides ; aperture oblong.

SYN. Am. rhotomagensis. *Cuv. & Brongn. Env. de Paris, p. 83. t. 6. f. 2.*

Am. sussexiensis. *Mantell, Geol. of Sussex, p. 114. t. 20. f. 2. and t. 21. fig. 10.*



IN the centre of the rounded front of this Ammonite is a row of tubercles, one placed upon each rib ; on each side of this is another similar row : these, together with the flattened sides and wide umbilicus, are the distinguishing characters ; the other two rows of tubercles are very variable, the outer one often rising into obtuse spines. When these tubercles are inconspicuous, it bears a strong resemblance to *A. Man-*

telli (tab. 176.); when they are large it comes still nearer to *A. Hippocastanum*, which may possibly be only a remarkable variety of it. Mr. Mantell observes, “it varies from a few inches to a foot in diameter.”

Very abundant, but less so than *A. varians* (tab. 55.), in the lowest Chalk and Chalk Marl of Sussex, Wiltshire, &c., as at Hamsey, Bidcomb, and Rouën.

It is an unfortunate circumstance that two names should have been given to this Ammonite from its localities, and proves the impropriety of such names for fossils;—we retain that which we suppose to be the oldest.

ISOCARDIA similis.

TAB. DXVI.—*fig. 1.*

SPEC. CHAR. Transversely rather oblong, ventricose, slightly flattened; anterior side small, turned a little up; edge of the base nearly straight.

A LARGE strong shell, which differs from the recent *Isocardia Cor* only in having a straighter edge to the base, a larger anterior side, and a slight flatness of the middle of the disk. The base line being straight, makes it rather wider than long.

Found at Sandgate near Margate, in the upper Greensand. It consists of the original calcareous matter of the shell somewhat loosened in its texture.



ISOCARDIA Cor ?

TAB. DXVI.—*fig. 2.*

FROM the small fragments that are sometimes found of an *Isocardia* in the Suffolk Crag, we are able to draw no other conclusion, than that they belong to the same spe-

cies which still inhabits the sea; but until nearly whole individuals are met with, it would not be just to speak too positively: for although several other of the Crag shells correspond with recent species, we must not be too hasty in supposing shells from distant parts to have been mixed accidentally with the Crag. Most, if not all the other shells that agree with recent ones, are such as may still be found on the neighbouring shores; while the nearest habitat of the Chama Cor is the Irish coast.

There are found near Verona, and in other places abroad, casts in limestone of an *Isocardia* resembling the Cor, but more ventricose, shorter, and smaller. Such probably occur in England, perhaps even at Heddington in Oxfordshire (see Plott's Oxfordshire, page 127); but we have not met with any specimen of which we know the locality. We propose to call it *I. ventricosa*.

UNIO Solandri.

TAB. DXVII.

SPEC. CHAR. Transversely oblong-ovate, slightly arched, rather compressed, thin; both extremities obtuse; beaks small, rugose; hinge slender.

SYN. *Mya Pictorum*. *Brander*, 95?



EXACTLY twice as wide as long; the posterior extremity is rather square and more compressed than the other; the superior and inferior edges are parallel and a little arched; the beaks are slightly waved or rugose.

This beautifully pearly shell resembles the *Unio batava* of Lamarck, but is more compressed: it differs from *U. Pictorum* of the same author in the square form of the posterior extremity, and from both in being a little curved. It appears from the cast that the muscular impressions are not deep, and there is only a small space left for the hinge, the teeth of which we have not been able to extricate; the general contour of the shell, its rugose umbones, and brilliant pearl are so characteristic of the genus *Unio*, that even if the hinge were

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never to be seen, no one would doubt the propriety of referring it to it : added to this, it occurs among decidedly fresh-water shells, such as *Paludina lenta* (M. C. t. 31.) in sandy clay in the lower freshwater formation of Hordwell.

Brander's fig. 95. does not accord in form with the shell before us : but as he has referred it to *Mya Pictorum* of Linnæus, and as we know of no other shell found at Hordwell at all resembling it, it is probable that his figure was taken from a specimen so mutilated as to give a very different idea of the shell, to that he had formed by observing a number of individuals. The shells themselves are exceedingly fragile, and the earth they are imbedded in so loose, that it is not often a cast can be preserved tolerably entire ; so that his specimen might be much broken before it was drawn*.

We are indebted to the zeal and perseverance of our kind friend Charles Lyell, jun., Esq. for the knowledge of this *Unio*, which we consider a valuable addition to the list of freshwater fossils. It occurs in abundance, but it required much care to save two or three specimens.

The several fossils formerly published as *Uniones* require reconsidering before they can be established in the situation assigned them ; for they present characters and occur under circumstances not compatible with the habits of that genus, or not fully explained:

* The only way to keep the shells is to soak them in gum-water soon after they are picked up, first drying them carefully.

VENUS caperata.

TAB. DXVIII.—*fig. 1.*

SPEC. CHAR. Orbicular, rather depressed, covered with small, rounded, concentric ridges; lunette cordiform, inconspicuous.



A NEARLY lenticular shell, but rather most gibbose near the umbones; the concentric ridges are numerous, sharply defined, rounded, and equal to the spaces between them. The hinge has a large tooth under the lunette in one valve, and in the other a laminated tooth within the posterior slope, besides those under the beaks. These teeth occur also in other species, and will serve, if not to distinguish a genus, to characterize a section.

Found replaced by siliceous on Blackdown many years ago by Miss Hill: the same has lately been observed by Mr. De la Beche in the vicinity of Lyme, along with the *Gervillia* (tab. 510.), in the lowest beds of the Greensand, where, although not only the earthy part of the shell but also the fibrous portion of the ligament are still remaining in a firm stone, the individuals are frequently as much distorted as the casts of shells generally are in the loose sand near Devizes.

Figs. 1. and 3. represent Blackdown specimens; and fig. 2. is from a distorted one in the cabinet of H. T. De la Beche, Esq.—it shows a portion of the ligament.

VENUS parva.

TAB. DXVIII.—*figs.* 4, 5 and 6.

SPEC. CHAR. Transversely obovate, rather convex, smooth; lunette narrow.



THIS species is very nearly orbicular; its form is so simple that it is not easy to describe how it differs from shells of other genera with which it is associated, although an accurate eye will readily observe it even when its hinge is not discoverable,—the degree of its convexity and evenness of its surface are the most obvious marks of distinction; it is less convex, and has besides a larger hinge than *Thetis minor* (tab. 513.), but is more convex and smoother than another shell (probably a *Lucina*) that also occurs with it. The hinge, as far as can be learnt from casts, is similar to that of *V. caperata* above described. Abundant in the lower beds of Green-sand at Parham Park*, Shanklin Chine, and near Lyme.

* By accident, the only specimens of the ferruginous stone from Parham Park containing casts of *Gervillia solenoides* (tab. 510.) had been mislaid; and in consequence it was observed on page 16, that in Parham Park, *Gervillia aviculoides* (tab. 511.) is “not accompanied with the *G. solenoides*.”

EMARGINULA ? s. FISSURELLA ? clathrata.

TAB. DXIX.—*fig. 1.*

SPEC. CHAR. An elevated curved cone ; sides coarsely reticulated ; longitudinal ribs about six on each side, and one central, which is split more than half way down from the apex ; base oval ; apex bent almost down to the base.



THIS little shell has the general form of *Fissurella reticulata*, but is more curved : it is however in all probability generically distinct, for we have not met with a specimen that has a notch in the margin ; on the contrary, the central rib is split for a considerable distance from the apex ; but as this does not appear to be perforated, but is acute, the propriety of referring the species to *Emarginula* is doubtful.

EMARGINULA *tricarinata*.TAB. DXIX.—*fig. 2.*

SPEC. CHAR. Conical, with the apex bent down ; surface marked with three principal and several lesser ribs, the spaces between them nearly smooth ; base oblong.

THE three ribs upon the posterior portion of this *Emarginula* are very prominent ; the middle one is divided by the marginal fissure, which gradually filling up as the shell grows, leaves a striated surface in the centre of it.

EMARGINULA *scalaris*.TAB. DXIX.—*fig. 3.*

SPEC. CHAR. Conical, ribbed ; apex excentric ; ribs many, connected by numerous cross lines ; base obovate.

ALMOST upright, the apex being very little bent forward ; the ribs are equal, and the central one divided into two by the fissure in the margin.

These are all from the Ancliffe Oolite. They all so much resemble each other, and are so small, that although there might be some doubts respecting the genus of the first, it did not seem desirable to place them upon separate plates.

ASTARTE striata.

TAB. DXX.—*fig. 1.*

SPEC. CHAR. Lenticular, transversely striated; lunette ovate, flat, deeply sunk, shell thick.

A VERY round shell, with small close beaks, and very numerous, regular, rounded furrows, or impressed striæ; the edge is obtuse, and probably entire.

Drawn from a Chalcedony cast sent me from Blackdown.



ASTARTE orbicularis.

TAB. DXX.—*fig. 2.*

SPEC. CHAR. Lenticular, rather gibbose, concentrically furrowed; furrows small; posterior surface plaited with an angle at its edge; lunette elongated, very deep.

THE convexity of this shell is rather greatest towards the beaks; the lunette is deeply sunk, and composed of two planes that meet at an acute angle in its middle; the shell is very thick, and has elongated crenulations within its edge.

Our specimens are from the Hampton Quarry near Bath: the shells are replaced by crystallized carbonate of lime, which has also retained the impression of the external ligament: they are imbedded in Oolite.

ASTARTE imbricata.

TAB. DXXI.—*fig. 1.*

SPEC. CHAR. Cordate, orbicular, largely imbricated, convex; tooth in the left valve beneath the lunette small; lunette elongated, flat; hinge line arched; edge finely crenulated.

THE surface is marked with about eight ridges one above the other, in the manner of tiles: these may possibly be exposed by wear, but their small number is remarkable.



ASTARTE nitida.

TAB. DXXI.—*fig. 2.*

SPEC. CHAR. Transversely obovate, angular above, rather depressed, minutely sulcated near the beaks, the rest even; beaks pointed; lunette lanceolate; edge crenated.

SOMEWHAT variable in form, the beaks being more produced and nearer to one side in some specimens than in others: all the varieties agree in being minutely and neatly sulcated around the beaks, while the rest of the surface is smooth and even; the whole surface is regularly convex.

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ASTARTE bipartita.

TAB. DXXI.—*fig. 3.*

SPEC. CHAR. Obcordate, gibbose; six or eight large undulations upon a flat space near the beak, the rest of the surface even; beaks acute; edge toothed.

THE peculiar character of this shell is, that part of its surface is much flatter than the rest, and upon this portion are a few concentric waves, the rest of the surface being even and convex; the whole often appears distorted. In some specimens the two parts are not so distinctly marked: such are readily distinguishable from the last species by the size of the undulations, and the large, short, concave and smooth lunette.

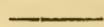


ASTARTE oblonga.

TAB. DXXI.—*fig. 4.*

SPEC. CHAR. Transversely oblong, convex; surface largely waved; beaks small; lunette cordate, pointed, concave; edge crenated.

MORE depressed, much wider, and differently formed about the beaks than the last, the young state of which it might be supposed to resemble; the beaks are not very prominent.



These four species of *Astarte* occur rather abundantly in the Suffolk Crag: the first and last appear to be the least common.

AMPULLARIA nobilis.

TAB DXXII.—*fig.* 1.

SPEC. CHAR. Subglobose, smooth; spire conical, composed of a few convex whorls; base very convex, not umbilicate; aperture elliptical, sublunate, pointed above.



A MAGNIFICENT although a simple formed fossil: there is a boldness in its contour that renders it handsome, and at the same time gives it a character very different from fossils in general. The shell does not appear to have been thick: it was externally slightly waved in the direction of the lines of growth; the spire is pointed, composed of about five whorls, and occupying one third the length of the shell: the aperture appears to be perfectly longitudinal, and equals half the entire length.

One of the products of that only recently explored mine of fossil shells, the Black Rock of Queen's County in Ireland. The substance of the shell is partly converted into calcareous spar, but principally almost incorporated with the black limestone.

AMPULLARIA helicoides.

TAB DXXII.—*fig. 2.*

SPEC. CHAR. Almost discoid, smooth ; spire very short, blunt ; whorls nearly blended, round ; base umbilicated ; aperture oblong.



A PECULIARLY obtuse-looking shell, whose diameter is nearly double its length ; the whorls are convex, but the sutures between them are not sharply defined ; the umbilicus is of a moderate size ; the aperture is longitudinal as in the last, it approaches much towards circular, with an indentation in its upper half made by the preceding whorl. Some individuals have an obscure band round the outer whorl.

Not very unfrequent in the black fœtid limestone of Ireland. The oval specimen, fig. 3. is, I believe, from near Cork ; the other from Queen's County.

These two species are referred to the genus *Ampullaria*, until another generic name is proposed under which to arrange them, along with such other fossil shells as we have recommended should be separated from that genus, to which Mons. Lamarck had with some hesitation referred them, and which do not belong to the neighbouring genus *Natica*. See vol. 4, p. 97.

MELANOPSIS *carinata*.TAB. DXXIII.—*fig. 1.*

SPEC. CHAR. Ovate, acuminate, with a sharp carina wound about the spire.



RATHER more than twice as long as wide, smooth; the last whorl flattened upon the sides, and sometimes having an obscure carina near its upper edge besides that projection of the edge which higher up the spire forms a sharp, spiral keel; the aperture is elongated, its upper part rendered even linear by the large callus upon the inner lip.

Found abundantly in a light greenish clay in a well near Newport, Isle of Wight, by Mr. Sowerby, in 1818, accompanied by *Potamides ventricosus* (tab. 341. fig. 1.), a new subulate *Melanea*, and various other fresh-water shells. It also occurs in a similar clay, and accompanied by the same shells, from Hampstead Cliff to Cowes, and among the fresh-water series on the opposite Cliffs of Hampshire, as we learn by specimens collected by the Rev. Professor Sedgwick and Charles Lyell, jun. Esq. It is also sparingly found at Headon Hill.

MELANOPSIS brevis.

TAB. DXXIII.—*fig. 2.*

SPEC. CHAR. Ovate, pointed, short; whorls ventricose, contracted in their upper parts; aperture oval; inner lip thick; callus not very prominent.



MUCH resembling several species of *Buccinum*: the convexity of its volutions is peculiar for a *Melanopsis*. Its width is about two-thirds its length; the inner lip is of nearly an equal thickness throughout, affording a strong contrast to the species above described.

Picked up rather plentifully upon the Hampshire coast by the Rev. Professor Sedgwick. It has probably fallen from the fresh-water series near Hordwell.

SOLARIUM canaliculatum.

TAB. DXXIV.—fig. 1.

SPEC. CHAR. Convex, ornamented on both sides with granulated unequal lines ; edge prominent, crenated ; umbilicus furrowed and crenated within ; aperture round.

SYN. Turbo. *Brunder, figs. 7 & 8.*

Solarium canaliculatum. *Lamarck, Env. de Paris, 104. Lam. Hist. Nat. 7. p. 5.*

Trochus canaliculatus. *Brocchi, vol. 2. 359.*

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THERE are three very distinct varieties of this Solarium. The English one, with only a few granulated ridges on the upper side, and the margin slightly prominent but relieved by a furrow on each side of it. The French variety, which has one prominent row of granules and many very minute rows on the upper side, the margin much produced and very finely crenated. And the Italian variety, of which the upper surface is beautifully ornamented with many rows of conspicuous granules ; the margin very much produced, deflected, solid ; and so sharply crenated as to be almost dentated. In this variety the crenulations within the umbilicus are also very sharp and pointed.—The actual aperture is round in all the varieties, and the characters above mentioned are liable to some variation.

Very abundant in the Clay at Barton Cliff.

SOLARIUM plicatum.

TAB. DXXIV.—*fig. 2.*

SPEC. CHAR. Convex, wrinkled, concentrically sulcated ; umbilicus bounded by a more or less projecting crenated ridge ; aperture round.

SYN. Solarium plicatum. *Lamarck, Env. de Paris, 104. Hist. Nat. v. 7. p. 5.*



THE sulci that cross the wrinkled surface of this shell are very narrow and deep upon the upper surface, but broader and unequal beneath ; they vary in number, but are generally 3 or 4 above, and 5 or 6 beneath : the crenulated keel that projects into the umbilicus, sometimes half closes it, at others it leaves it more open, especially in the French variety, whose umbilicus is very wide and open.

Equally abundant as the last at Barton.

FUSUS alveolatus.

TAB. DXXV.—*fig. 1.*

SPEC. CHAR. Turreted; volutions ornamented with two spiral obtuse carinæ, crossed by thick ribs; beak half cylindrical, ribbed.

THREE rows of nearly square pits or cells are formed upon each whorl by the crossing of the carinæ and ribs; the last whorl exhibits several more carinæ, which gradually diminish in size as they proceed upon the beak: aperture round, with an elongation into the beak.

Found in the Suffolk Crag by Mrs. Cobbold and the Rev. G. R. Leathes: it is very scarce.



FUSUS cancellatus.

TAB. DXXV.—*fig. 2.*

SPEC. CHAR. Lanceolate, acute, covered with acute decussating ridges, with short spines at the points of their intersection; volutions ventricose; aperture oblong, produced into a short beak.

FOUR or five spiral rows of cells appear upon each whorl, bounded by sharp divisions and short spines at their angles; the spire is nearly twice as long as the aperture, which is rather contracted at its upper part.

From the very rich cabinet of Suffolk and Norfolk Crag fossils, from which the Rev. G. R. Leathes has long and liberally supplied us.

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GASTROCHÆNA Spengler.

GEN. CHAR. An inequilateral equivalved bivalve, with the anterior margin obliquely truncated and gaping; the hinge-line straight, without a tooth, inclosed in a shelly sheath.



THE animal to which the shell above described belongs, perforates calcareous stones, corals or shells, by some solvent power, most probably not by wearing or scraping a hole, as *Pholas* and *Teredo* do; and lines the hollows more or less completely with shelly matter; or it forms itself a sheath of the same substance in sand or other loose or soft materials, some of which it unites to its fabric for its protection, as it is only in part covered by the two valves, which moreover are very slender. This sheath or case is commonly ovate, and of such a size and form as to hold the valves easily, with the posterior part so produced into a tube as to contain the two united tubes of the animal, its extremity being flattened and partially

divided by two opposite ridges, so as to fit very close when the animal is distended, and prevent the introduction of foreign substances. A tube very similar is formed by the *Teredo*, and some *Lithodomi* deposit calcareous earth about the openings of their cells, apparently for the same purpose. The two valves of the shell are thin, obliquely elongated, with the beaks near the anterior extremity; the oblique truncation of the anterior margin leaves a large space between the edges of the valves for the passage of the foot: the posterior portion is large, oval, and its edges towards the back more or less gaping.

We are indebted to the accurate observer Spengler, for the establishment of this very natural genus; and if Bruguière had never proposed the genus *Fistulana*, Conchologists would not have had to encounter the mass of confusion created by Lamarck, but have found good places for all the shells he has crowded into it, by the adoption only of *Gastrochæna*, in addition to the genera before formed. The genus *Fistulana*, as given by Lamarck, has gradually been deprived of nearly all its species; only one is retained by my brother, who has given an able account of this dismemberment. M. Deshayes on the other hand, only deprives it of all the species that do not belong to *Gastrochæna*, which genus

he would lay aside, substituting *Fistulana* for it, notwithstanding Spengler's priority and acknowledged accurate definition. To this plan we cannot subscribe.



GASTROCHÆNA *tortuosa*.

TAB. DXXVI.—*fig. 1.*

SPEC. CHAR. Obliquely lanceolate, twisted.

THE longest diameter is four times the united depths of the two valves, or above three times the length; the hinge line is straight, the remainder of the shell twisted almost one turn: the sinus in the edge for the passage of the foot is elongated, acute towards the front; the whole surface nearly smooth.

Occurs in a dark brown clayey sandstone much stained with iron, in the Cliffs of Robin-Hood's Bay, near Scarborough. The specimen is in the collection of Mr. Bean of that place: it consists of one valve placed upon the surface of the stone, without any indication of the tube that once inclosed it.

GASTROCHÆNA contorta.

TAB. DXXVI.—*fig. 2.*

SPEC. CHAR. Sheath clavate, bent nearly at a right angle: valves ovate-elongated, marked with very slender striæ; the sinus between them wide, oval, pointed.

SYN. *Fistulana contorta.* *Deshayes Cocquilles Fossiles, v. 1. p. 16. pl. 1. fig. 24, 25, & 27. Mém. de la Société d'Hist. Nat. v. 1. pt. 2. p. 251. n. 3. pl. 15. f. 4.*

THIS species exhibits all the characters of the genus, forming a sheath that is more or less imbedded in other shells; and the aperture of which, produced and often bent, is partially divided by two opposite ridges: the general form of the valves, especially the width of their anterior extremities, and the fine striæ upon their surface, distinguish it from other species. The form of the sheath depends so much upon its situation, that it is not safe to lay any stress upon it as a specific character: we admit it, however, as it has been employed by Mons. Deshayes.

By no means unfrequent in other fossil shells of contemporary formation with those of the London Clay. The specimens figured are from Barton. From the larger size of some empty sheaths which are upon the same specimens, we suppose the shells are sometimes much larger than those figured.

The five large figures are magnified representations. At letter *a* is seen the external portion of a sheath.

CYCLAS pulcher.

TAB. DXXVII.—*fig. 1.*

SPEC. CHAR. Suborbicular, convex, smooth, slender; posteriorly truncated; one sharp-edged and two bifid teeth near the beaks in each valve; lateral teeth plain, obtuse.

A THIN shell in proportion to its size, which much exceeds that of any other British species; the angular form of its posterior portion is a conspicuous character.

This species belongs to Lamarck's Genus *Cyrena*; but as we have much doubt of that being a natural division, we do not at present adopt it.

A discovery, for which we are indebted to the unwearied research of Professor Sedgwick, who found it in abundance on the shore opposite Hampstead Cliff, Isle of Wight, at low water, in a stiff clay, accompanied by a small *Cyclas*, a striated *Mytilus*, *Potamides ventricosus*, (t. 341. f. 1.) *Melanopsis carinatus*, several small univalves, and a *Serpula*,—all together forming a curious mixture of apparently marine and fresh-water shells.

CYCLAS medius.

TAB. DXXVII.—*fig. 2.*

SPEC. CHAR. Transversely obovate, depressed, thick, smooth; anterior side small; posterior rather pointed; one tooth near the beaks in each valve.

SYN. *Cyrena media*. *Annals of Phil. New Series*, vol. 8. p. 376, 378, 379.

INTERMEDIATE between *Cyclas obovatus* and *C. cuneiformis*, (tab. 162.) being flatter and thinner than the first,

but thicker and less pointed than the last: the hinge also appears to differ, as I have only been able to detect one central tooth in each valve; but the clayey stone is so hard, that it is difficult to clear the hinge.

This fossil occurs in various parts of the Weald Clay and Hastings Sands, both in Sussex and on the Isle of Wight. See Dr. Fitton's paper in the *Annals of Philosophy* above quoted. The specimen figured consists of indurated clay, and was collected at Chart.

CYCLAS membranaceus.

TAB DXXVII.—fig. 3.

SPEC. CHAR. Transversely obovate, depressed, smooth, very thin; anterior side small, posterior rather pointed.

SYN. *Cyrena membranacea*. *Annals of Philosophy, Second Series, vol. 8. p. 376.*

VERY much resembling the last, but it is extremely thin.

Occurs in slaty clay, accompanied by two other bivalves and two univalves, which for the present are named *Melania attenuata* and *M. tricarinata*, but which are so much compressed and broken that they cannot be well defined.

Found at Punfield by Dr. Fitton, in the Weald Clay.

LIMNEA maxima.

TAB. DXXVIII.—*fig. 1.*

SPEC. CHAR. Ovate-elongated, rather obtuse; whorls about 6, slightly convex; aperture narrow, occupying less than half the length of the shell.

READILY distinguished by the bluntness of its outline and the large proportion which the spire bears to the whole shell. The columella appears to be thin.

The Rev. Professor Sedgwick was so fortunate as to discover this large species of *Limnea* in the Stone Quarries at Binstead near Ride, in the Isle of Wight, this spring (1826). The specimens have lost almost all the exterior crust of the shell, the interior only adhering to the cast.



LIMNEA columellaris.

TAB. DXXVIII.—*fig. 2.*

SPEC. CHAR. Ovate-pointed; spire short; whorls about 5, convex; aperture wide, above half the length of the shell; columella much twisted and very thick.

No other *Limnea* has so remarkable a columella: it is further distinguishable from most other species by the roundness of the whorls and shortness of the spire.

Collected in the Hordwell Cliff by Charles Lyell, Esq. during a careful examination of the Freshwater Strata there,—the valuable results of which we expect shortly to see published; it is accompanied by *Planorbis rotundatus* of Brongniart.

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LIMNEA pyramidalis.

TAB. DXXVIII.—fig. 3.

SPEC. CHAR. Ovate-acute ; whorls convex ; aperture half as long as the shell, dilated ; columella plait (or callus) obscurely divided.

SYN. *Lymnæa pyramidalis*. *Brard, Ann. du Mus. tom. 15. pl. 24. f. 1 & 2. Deshayes, tom. 2, 95. pl. 10. f. 14 & 15.*



A DEGREE of symmetrical elegance in the form of this species is perceived at first sight: it arises from the slight convexity of the whorls, the pyramidal form of the spire, and the proportions of its parts. The plait, or rather callus, upon the columella has a shallow furrow in the middle, but it is not very conspicuous.

Occurs at Headon Hill in the Isle of Wight. Our specimens agree well with Mons. Deshayes's figures, but are shorter than Brard's. We trust Deshayes was acquainted with Brard's shell, as we follow his authority.

NAUTILUS excavatus.

TAB. DXXIX.—*fig. 1.*

SPEC. CHAR. Nearly globose, smooth; sides excavated by a very large conical umbilicus.

THE whorls of this Nautilus increase very rapidly: they are so wide that they would produce a spherical form, were it not for the large umbilicus which occupies nearly half the diameter of the shell. The front of the aperture is arched; the sides straight, converging towards the preceding whorl; the siphuncle nearly central.

From the collection of the late Mr. G. Humphries; most probably from Dorsetshire. It seems to have been taken from the Inferior Oolite.

 NAUTILUS hexagonus.
TAB. DXXIX.—*fig. 2.*

SPEC. CHAR. Short cylindrical; sides depressed, conical; front broad, straight; umbilicus small; aperture sagittate, truncated; siphuncle nearest the inner edge of the septum.

IN this species the septa are rather numerous and not much curved: its most remarkable character is the straightness of the lines that bound a section of it in the plane of the aperture, which section being an elongated hexagon has suggested the name.

Far from rare in the Calciferous Grit at Shotover, Abingdon, &c.—the specimen figured was from the former place. It is in the cabinet of H. H. Goodhall, Esq. Sometimes the shell is decayed, when the casts of the cells become loose, and may be separated like those of Ammonites Catena, tab. 420, along with which they are found.

NAUTILUS polygonalis.

TAB. DXXX.

SPEC. CHAR. Sphæroidal, compressed, smooth; columella prominent; umbilicus very small; aperture arcuate, above half the diameter of the shell, long; septa distant; siphuncle near the outer edge of the septum, composed of a number of straight tubes.



THE thickness of this is about two-thirds of its diameter: it has a large aperture, the reflected extremities of which nearly close the umbilicus; the septa are distant, very concave, and but slightly curved at their edges; the siphuncle consists of a number of straight tubes, each projecting a little behind the septum it pierces to join the preceding tube. The whole series appears to be disjointed; the polygon formed by it in the section has suggested the specific name.

Probably from Dorsetshire. The only specimens we have met with were in the immense and various collection of the late Mr. G. Humphries, along with specimens of *N. lineatus* tab. 41, marked from that county. The stone attached to the specimens resembles the Inferior Oolite.

In *N. lineatus*, (which this nearly resembles,) the septa are numerous, the siphuncle central and curved, and the columella solid.

MYA? *angustata*.

TAB. DXXXI.—*fig. 1.*

SPEC. CHAR. Valves unequal; transversely elongated, thin, antiquated, irregularly compressed; extremities obtuse, gaping; lower edge of the lesser (right) valve concave.



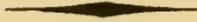
Two or even sometimes three times as wide as long, uneven, and sometimes curved; the umbones are much nearest to the anterior extremity; they are small, and not eroded: the hinge resembles those of *Myæ plana* and *subangulata*, tab. 76; but that it belongs to the same genus as the *Mya labiosa* is doubtful.

Newly discovered by Professor Sedgwick in Colville Bay, Isle of Wight, along with *Mytili*, *Ostreæ*, and some shells sometimes referred to fresh water, in a bed of Sand and Clay evidently belonging to that mixture generally called the Upper Marine Formation.

MYA Pullus.

TAB. DXXXI.—*fig. 2.*

SPEC. CHAR. Transversely ovate and striated, compressed; anterior side largest; posterior side rather pointed.



A SMALL slender shell about half as wide as long; it is strongly marked by lines of growth, and therefore appears to be a full-grown shell.

Drawn from a specimen found in Crag at Butley, in Suffolk, and which is in the late Mrs. Cobbold's collection. It is said to be the only one met with. It is possible it may be the young of *M. arenaria* tab. 364; but the difference of form and the roughness of its surface militate against that idea.

MYTILUS affinis.

TAB. DXXXII.—*fig. 1.*

SPEC. CHAR. Obliquely oblong, carinated, smooth ; sides parallel, straight ; the posterior arched in the young shell ; hinge without teeth, its anterior margin reflected.



VERY similar in shape and proportion to the common Mussel, or rather *M. pellucidus*, but more decidedly carinated ; the extremity of the hinge within the beaks is reflected, and has no appearance of teeth ; the posterior surface is not quite flat, but is convex near the beaks, a little approaching the genus *Modiola*. It differs in the same way from *M. Antiquorum* (tab. 275.), as it does from *M. pellucidus* ;—it is remarkably pearly.

Found in Colville Bay, Isle of Wight, by Professor Sedgwick, along with *Mya angustata*, *Potamides ventricosus*, &c. in Sand and Sandy Clay.

MYTILUS Brardii.

TAB. DXXXII.—*fig. 2.*

SPEC. CHAR. Convex, straight, pear-shaped, elongated; beaks acute, terminal (within each beak a plate is extended to the opposite edge for the support of a tendon, and within that is a flat angular process).

SYN. *Mytilus Brardii.* Faujas, *Ann. du Mus.* 8. t. 58. f. 11 & 12? Brongn. *Ter. du Vicentin.* 78. t. 6. f. 14?* Basterot, *Mem. de la Soc. d'Hist. Nat.* 2. Part 1, 78.

A RATHER variable shell, its surface being generally convex with an approach to keel-shaped near the pointed beaks. Specimens from Dax are often sharply keeled for nearly half their length, and the rest is antiquated. The plate which extends across the cavity within each beak, bears a small muscular impression, analogous to that upon the surface near the beak in most other Mussels. The only other species that has a similar support for the attachment of the smaller muscle or tendon, whichever it may be, is the Freshwater one, *M. polymorphus*, found in the Danube and most of the rivers in the north of Europe, and lately in the Commercial Docks and Surry Canal, near London; and a small one often brought from the coasts of Africa (*M. murinus?* of Gmel.). The former is well distinguished by its curved very deep keel-shaped valves, and by having in general an irregular thin septum within and parallel to the

* The figures given by Faujas and Brongniart are both unsatisfactory.

plate above mentioned, but quite detached from it. The second species so nearly resembles the fossil, that we can point out no difference; they are both liable to the same variations of form, are of the same size, and both possess within the hinge the same kind of flat angular process; a process that is attached in part to the line that supports the hinge cartilage, and in part to the before-mentioned plate, from which it descends obliquely into the cavity of the valve. This appendage is regular and constant, and therefore should appear to be connected with the form of the animal; whereas the second septum in *M. polymorphus*, does not always occur; and when it does, it is irregular and seems to be the effect of disease or over-luxuriant growth.

This very interesting shell is abundant at Dax and Mérignac, and probably in several other parts of the Continent: but it was reserved for Charles Lyell, Esq. jun. to discover it in England. He found it in the extensive bed of White Sand connected with the Lower Freshwater (or rather perhaps the so called Upper Marine) Formation, in the Hordwell Cliff. It is accompanied by *Mya plana* (tab. 76.) in profusion, a *Potamides* like *margaritaceus* (tab. 339. f. 4.) a little *Melanea*? (*Bulimus conicus*? Brard), and, what is most curious, a small *Serpula*. We have therefore either a mixture of Marine and Freshwater shells in a bed hitherto thought by us to contain only Freshwater ones, or we are mistaken in drawing conclusions from analogy without sufficient examination. The *Mya plana* certainly resembles the *Mya labiosa* (a recent Freshwater species) more than it does any known Marine one: but it is slenderer, and the beaks are not eroded as in most Freshwater shells. The *Potamides* is an ambiguous genus. What we call a *Melanea*, and which Brard has referred to *Bulimus*, greatly resembles some species of *Phasianella*. The marks of distinction are small; as we are ignorant of the operculum, or if it ever had one. The *Mytilus* resembles more closely the African species, than that from the Danube; but the African species may be washed from the rivers down to the coast, or, like that from the Danube and the Wolga, it may be capable of living in

both fresh and salt water. All these shells still leave us, therefore, in doubt. But what does the *Serpula* prove? No *Serpula* is known to live in fresh water, and the one we have along with these *Mussels* is too tender to have been removed far; so if the other shells belong to fresh water, they must have been brought down by a river into the sea; but they are extremely well preserved, and many as tender as the *Serpula*, which makes us rather incline to the opinion that they are all Marine, at least those which occur in the same stratum.

That river shells should be washed down to the coast and mix with marine ones is probable: even large masses or islands, consisting of decayed vegetable matter with the shelly remains of animals that lived in lakes, may by floods be carried into rivers, and by them down to the sea, and be deposited upon the ordinary sediment in the bed of the ocean. The analogy of the various shells in the formations we allude to, rather favours this hypothesis. We leave it to geologists to compare a number of facts, respecting situation and many other circumstances, to determine the question.

ANCYLUS Müller.

GEN. CHAR. Shell slender, patelliform, obliquely conical; apex rather acute, turned back; aperture oval, with an entire edge.



A GENUS of small almost minute shells resembling *Patella*, but differing in the form and direction of the apex, which takes a position indicating an incipient spire, and is not turned forward as in *Patella*. The recent species have a membranous epidermis. The animal resembles that of *Limnea*, living in fresh water, and breathing air, and is consequently very different from that of *Patella*; it is attached to the shell along an involute line open on one side.

Two recent species and two fossil ones are all that have hitherto been published. We now add a third fossil, which, although small, illustrates the genus well, and is consequently a valuable acquisition.

ANCYLUS elegans.

TAB. DXXXIII.

SPEC. CHAR. Convex, subconical ; aperture longitudinally obovate ; apex oblique, eccentric, near the narrowest part of the aperture.



THE aperture is exactly intermediate in form between that of the two recent species. Considering the aperture as the base, it is narrowest towards the back : the apex is far from central, and is bent down towards one side. With a high power, minute striæ are seen descending from the apex ; the height is nearly equal to half the greatest diameter of the aperture.

Found along with *Mya subangulata* (probably only a young state of *M. plana*), *Melanopsis brevis*, tab. 523, and *Paludina lenta*, tab. 31, in a dark gray Sand immediately under the white Sand at Hordwell, in which *Mytilus Brardii* occurs. We are indebted to the generosity of Charles Lyell, Esq., jun. for the specimens ; no one else appears to have found it.

LUTRARIA ? striata.

TAB. DXXXIV.—*fig. 1.*

SPEC. CHAR. Transversely oval, compressed, concentrically striated; posterior side smallest, rather pointed, gaping; umbones prominent.



A SMALL shell, about two-thirds as long as wide: the superior margin of the posterior side is rather produced and turned outwards; the surface is marked by numerous concentric striæ.

Found in the Greensand near Lyme Regis, by H. T. De la Beche, Esq., in whose cabinet the specimen is preserved. The shell is almost lost, only a film of powder remaining upon the surface of the cast.

This and the two following fossils are very similar to some recent species of the genus *Anatina*,—a genus with the limits of which we are not sufficiently acquainted to be able to arrange shells under it, without the help of the hinge, in the form of which the principal difference from *Lutraria* rests*.

* In many of the species, and perhaps in all, if the genus were confined within its proper limits, there is a loose appendage to the hinge.

LUTRARIA? carinifera.

TAB. DXXXIV.—*fig. 2.*

SPEC. CHAR. Transversely oval, elongated, convex, longitudinally striated; posterior side smooth, bounded by an obtuse carina, truncated, its edge straight.

ABOUT twice as wide as long: the surface is largely undulated; the longitudinal striæ do not cover much more than the anterior half of the valves, and even there are lost near the edge.

A curious shell, the produce of the Lower Chalk at Dowlands. Drawn from a specimen in the cabinet of H. T. De la Beche, Esq.



LUTRARIA? oblata.

TAB. DXXXIV.—*fig. 3.*

SPEC. CHAR. Compressed, transversely oval, with obtuse extremities slightly bent; umbones prominent.

A SMOOTH but rather antiquated shell, nearly twice as wide as long: it has a small carina near the superior margin of the posterior side. The shell is curved towards the right valve; it has a deep sinus in the impression, left by the edge of the mantle, and has more the general aspect of *Lutraria* than of *Anatina*; but we cannot decide to which genus it belongs. The shell is pearly, which is rather a character of *Anatina* than *Lutraria*.

Discovered in the Sandstone of Bognor Rocks, and now in the possession of — Thrupp, Esq.

TEREBRATULA Flabellula.

TAB. DXXXV.—*fig. 1.*

SPEC. CHAR. Depressed, plaited ; plaits about 16, simple, rounded ; lesser valve transversely obovate ; larger valve with a straight rectangular projecting beak.

A SMALL species, with only a triangular aperture to the beak : the front is even ; that is, no part of its margin is elevated.

From the Ancliffe Oolite.



TEREBRATULA furcata.

TAB. DXXXV.—*fig. 2.*

SPEC. CHAR. Nearly orbicular, plaited ; plaits rounded, about 9, forked when full-grown ; the larger valve most convex, its beak large, curved.

ABOUT the same size as the last. When young, the plaits are simple and the sides angular : when old, the plaits are forked and the sides round ; the front is even, the beak has a circular aperture.

Common at Ancliffe.

TEREBRATULA orbicularis.

TAB. DXXXV.—*fig. 3.*

SPEC. CHAR. Uniformly convex, plaited ; plaits angular, simple, about 15 ; lesser valve orbicular, the other with a large curved beak.

ALTHOUGH at first sight the plaits upon this shell appear simple, yet they are sometimes forked near their commencement : it is therefore possible that the species last described may be only the young of this.

From the Lias at Weston near Bath. The surface is minutely punctated.



TEREBRATULA oblonga.

TAB. DXXXV.—*fig. 4, 5 & 6.*

SPEC. CHAR. Oblong, gibbose, plaited ; plaits 16 or more, forked, their edges rounded ; beaks large, broad, slightly incurved.

HALF as long again as wide : the hinge is rather broad, which makes the beak large : the front is even, and the aperture of the beak round.

Occurs in the Greensand. Figs. 4 & 5, are from specimens presented to our collection by H. H. Goodhall, Esq. They are from the ferruginous bed of the Greensand at Farringdon. Fig. 6. is from a specimen picked up at Sandgate in Kent.

TEREBRATULA hemisphærica.

TAB. DXXXVI.—*fig. 1.*

SPEC. CHAR. Hemisphærical with a produced incurved beak, longitudinally striated; striæ very numerous.

THE lesser valve of this is nearly flat; it is a little undulated: the striæ are in fact minute plaits, and give a finely toothed margin to the valves, which is otherwise even.

Found at Ancliffe. We are indebted to the cabinet of the Rev. G. Cookson for it.

TEREBRATULA rigida.

TAB. DXXXVI.—*fig. 2.*

SPEC. CHAR. Orbicular, plaited; plaits granulated, increasing in number towards the margin; lesser valve nearly flat, the other convex, with a small beak.

A WELL-DEFINED species, with an even front and small circular aperture in the beak.

Only one specimen of this little shell has come within our observation: it was found in the Chalk near Norwich.

TEREBRATULA striatula.

TAB. DXXXVI.—*figs. 3, 4 & 5.*

SPEC. CHAR. Imperfectly bilobate, compressed, longitudinally ovate and striated; front truncated, sometimes with a sinus; striæ granulated, repeatedly forked.

SYN. *Terebratula striatula.* *Mantell, Geol. Sussex, p. 131. tab. 25. figs. 7, 8, & 12.*

BOTH valves of this *Terebratula* have generally a longitudinal depression near the front, although some spe-

cimens do not possess it in the smaller valve; the beak of the other valve is large but short, its circular aperture reaches to the beak of the small valve; the front is even. The length varies so much, that some specimens are nearly orbicular.

Frequent in the Chalk. Mr. Mantell obtained his specimens from the gray Chalk Marl at Hamsey. Although they are larger than those before us, we see no reason for thinking them distinct. It occurs also in the Greensand below, and in the Clay above, the Chalk. We have a small specimen from Horningsham; and numerous pyritous casts of both the long and short varieties, some with the shell remaining, from Southend and the Isle of Sheppy on the opposite shore, through the kindness of the Rev. Mr. G. Hope, and Mr. Fremby. It also occurs at Dax, as we are taught by specimens given us by Dr. Grateloup, who has named it *T. aquensis*.

Figs. 3 & 4. represent the long variety taken out of Chalk in Sussex. Fig. 5. shows the short variety:—one specimen is out of Chalk, the other is a cast in Pyrites from Southend.

TEREBRATULA Pisum.

TAB. DXXXVI.—*figs.* 6 & 7.

SPEC. CHAR. Suborbicular, rather square, thick, depressed, plaited; plaits numerous, simple, sometimes granulated; front slightly elevated, beak small, incurved.

IN some specimens of this *Terebratula* the plaits are neatly granulated, in others they are quite smooth. Without some other character we could not consider them as belonging to different species. The front is elevated in only one or two of the largest specimens.

Presented long ago by G. A. Mantell, Esq. who collected the specimens in the Marl-pit at Hamsey in Sussex.

TEREBRATULA rostrata.

TAB. DXXXVII.—*figs. 1 & 2.*

SPEC. CHAR. Suborbicular, gibbose, plaited; plaits many, rounded; beak large produced, slightly incurved, pointed; front slightly elevated.

UNTIL nearly full-grown the elevation of the front in this species is scarcely perceptible, and then it is not very regular. The inner surface of the beak is more convex than is common; the plaits amount to nearly 30.

Sent from Sussex many years ago by G. A. Mantell, Esq. probably found in the same marl-pit, at Hamsey, as the *T. Pisum*. Fig. 2. exhibits a distorted specimen.

TEREBRATULA truncata.

TAB. DXXXVII.—*fig. 3.*

SPEC. CHAR. Semicircular, plaited; plaits sharp, from 9 to 20, some of them forked; front elevated with from 1 to 5 plaits; hinge line straight, equal to the width of the shell; lesser valve nearly flat, the other subconical with a large straight beak which is flat in the front.

A LARGE round aperture in the beak and an extended hinge line give this fossil a peculiar truncate appearance; and, together with the large often antiquated plaits, render it easily distinguishable. Were it not for the aperture in the beak and the internal structure, which is fortunately well preserved, it might be taken for a *Spirifer*.

Hitherto only found at Farringdon. The specimens are furnished by H. H. Goodhall, Esq. and Gerrard E. Smith, Esq., two gentlemen who derive much gratification from the pursuit of Fossil Shells:—to the former, geologists have long and frequently been indebted.

TEREBRATULA Gibbsiana.

TAB. DXXXVII.—*fig. 4.*

SPEC. CHAR. Suborbicular, rather triangular, ventricose, plaited plaits numerous, rounded, simple; front much elevated with about 10 or 12 plaits, flattened; beak small, incurved, pointed; small valve most convex.

THE length and breadth of this are equal without including the beak; it is therefore a much longer shell than *T. lata*, tab. 502, which it greatly resembles.

Found in Greensand near Folkstone, in 1813, by Mr. Gibbs, an ingenious veteran collector well known to conchologists a few years back.



TEREBRATULA Mantelliana.

TAB. DXXXVII.—*fig. 5.*

SPEC. CHAR. Transversely obovate, gibbose, plaited; plaits 16, sharp; front elevated with 4 to 6 plaits; beak prominent but small.

ABOUT one-fourth wider than long; the plaits are large and simple; the front considerably elevated; the beak is incurved and has a circular aperture.

Abundant in the marl-pits at Hamsey, where it was collected by G. A. Mantell, Esq. in 1813.

NUMMULARIA.

NUMMULITES, Lamarck.

GEN. CHAR. A lenticular, involute, chambered, univalved shell, with similar sides; whorls closely embracing each other and penetrated by small columns; septa convex near their fronts, leaving a fissure between each of them and the front of the preceding whorl; their sides narrow, variously curved, extending to the axis.

NOTWITHSTANDING the introduction of several distinctions not noticed by Lamarck, and other modifications of the generic character for the purpose of accuracy and of distinguishing Nummulites from other exuviæ of supposed Cephalopodous Mollusca, we have not been able to exclude Lamarck's genus Lenticulites, the species of which only differ in general form or trivial characters from Nummulites: in fact, the two characters which Lamarck points out to distinguish the Lenticulites by, both exist in Nummulites, but have been overlooked: the small fissure between the edge of each septum and the margin of the preceding whorl has not before been noticed; it occurs both in the Nummulites and Lenticulites of Lamarck, and so do the small columns that penetrate from one side to the other parallel to the axis, and sometimes form protuberances upon the surface. The whorls appear to be completed at various periods of growth by three or four chambers gradually diminishing from the centre, until the last extends only to the

edge of the preceding whorl, and this chamber, being closed by a convex septum without any continuing margin, is not readily distinguishable in species which have very small chambers in proportion to their diameter, as most of the established Nummulites have : this and the ordinary imperfection of the specimens have together misled Authors ; it is a character easily traced in *Lenticulites planulata*.

The Nummulariæ are supposed to belong to the same division of the Order Cephalopoda as *Nautilus*, *Spirula*, &c. It is considered, with much probability, that they were enveloped entirely by their animals, because they have no large chamber for their lodgement. Several if not all the genera of minute chambered shells have probably been similarly situated, and agree also in the want of the siphuncle and in having convex septa. Hence they will form a natural group, near to, but distinct from, *Nautilus*, *Belemnites*, &c.

Nummulites were by the ancients thought to be petrified lentils. A species found in Egypt near some of the pyramids is so spoken of by Strabo. Several species are apparently united by Gmelin under the genus *Nautilus*, with the specific name *Helicites* (page 3371), which is given to them by Guettard. Bruguières named the genus *Camerina* (Encl. Méthodique) ; but Lamarck has justly retained the old name. We adopt *Nummularia* in preference to *Nummulites* because some of the species we include are recent.

Nautilus Comptoni, tab. 121, belongs to this genus.

NUMMULARIA *lævigata*.TAB. DXXXVIII.—*fig. 1.*

SPEC. CHAR. Lenticular, smooth, rather convex on both sides; edge narrow; whorls about 12.

SYN. *Nummulites lævigata*. *Lam. Env. de Paris*, 172. *Hist. Nat.* 7. 629. *Parkinson, Org. Rem.* 3. 152 & 158. *tab. 10 f. 13 & 14.* *Mantell, Geol. of Sussex*, p. 269.

THE volutions in this species are very much compressed laterally; they amount to about 12: the surface is smooth, except a few rising punctums where the columns that penetrate it, or a harder substance than the rest of the shell, terminate; the sides are most convex in the centre, and are besides irregularly a little waved; the edge is blunt, and finely striated; the shell is composed of perpendicular fibres with a semitransparent coat both within and externally; when partially filled with spar, the fissure at the inner edge of the septum is not easily distinguishable.

J. Holloway, Esq. first discovered this fossil in England, and forwarded specimens from Stubbington Cliff to Mr. Parkinson. The same gentleman soon afterwards met with it in Bricklesom Bay, Sussex, and very liberally supplied the specimens that have served for this illustration. It has also been found in various parts of the Continent.

A section of one of the chambers,—to show the fissure behind the septum, the texture of the shell, and the striated margin,—is shown magnified.

NUMMULARIA elegans.

TAB. DXXXVIII.—fig. 2.

SPEC. CHAR. Compressed, smooth; whorls about 6; septa gently curved from the axis, numerous; aperture rather prominent.

THIS differs from the last in being smaller, in having fewer whorls, which increase more rapidly, and in the regular curvature of the septa. When young, it is very smooth and regularly lenticular. The large figure shows several series of diminishing chambers, as mentioned in the observations upon the genus.

A siliceous stone occurs at Emsworth, near Chichester, that contains among other shells an abundance of these Nummulites filled also with silex; the other shells are too imperfect to ascertain in our specimens.

It is an intermediate species between *Lenticulina* and Nummulites of Lamarck.

NUMMULARIA variolaria.

TAB. DXXXVIII.—fig. 3.

SPEC. CHAR. Very convex, minute, smooth; edge obtuse, whorls 4 or 5, with about 20 septa * forming rays near the margin.

SYN. *Lenticulites variolaria*. *Lam. Env. de Paris*, 168. *Hist. Nat.* 7. 619.

NOT above a line in diameter, variable in thickness, but always having an obtuse edge; the septa are more or less distinguishable upon the surface, according as the surface is more or less worn or opaque.

Found associated in large numbers, sometimes imbedded in Pyrites, in the lower part of the London Clay, at Stubbington, by J. Holloway, Esq. many years ago.

All the figures but the one in the middle are magnified.

When the outer whorl is so worn off as to leave a portion of the septa, we believe this has been described as another species called *Lenticulites radians*.

* *N. Comptoni*, tab. 121, has only one or two whorls and about eight septa, and is one of the most remote species from Nummularia of Authors.

AMMONITES Benettianus.

TAB. DXXXIX.

SPEC. CHAR. Subglobose, with two rows of 20 large tubercles around the front, and one row composed of half the number upon each side; whorls few, crossed by large obtuse radii that connect the tubercles, the inner ones partly exposed; aperture transversely oblong.

NINE or ten large conical tubercles compose the row on each side, while double that number fill the other two rows; the transverse rays are more conspicuous as well as more numerous between the rows of knobs than upon the inner sides of the whorls, and are quite lost upon the narrow space over the siphunculus. In the very young shell the aperture is round, and the tubercles are not formed; as it advances in growth the aperture becomes wider, and the tubercles rise from the ribs and are soon very prominent, those upon the sides being always the largest: the tubercles are conical, obtuse, not at all approaching to cylindrical as in *A. proboscideus* t. 310; it is also a larger shell.

Found among Clay, mixed with green-sand, that is used for making tiles at Crockerton, near Warminster. The shell remains much decomposed and very soft, filled with hard black marl mixed with Pyrites. It was accompanied by *Am. Monile* t. 117, *Am. dentatus* t. 308, and fossil wood penetrated by *Teredines*. The shells are in the same state as similar ones found at Folkstone, where the same bed occurs; but the wood resembles that of Highgate: a species of *Ampullaria* also occurs in the same Clay, similar to an unnamed one found cast in silex at Blackdown.

For the knowledge and use of the specimens of this Ammonite we are indebted to the zeal of Miss Etheldred Bennett, whose labours in the pursuit of geological information have been as useful as they have been incessant.

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AMMONITES denarius.

TAB. DXL.—*fig. 1.*

SPEC. CHAR. Discoid with a flat edge, a row of about 10 tubercles on each side, and thirty curved radii abruptly terminating near the front; whorls few, partly exposed; aperture oblong.

A RATHER compressed shell: the tubercles are conical, obtuse; each of them is joined to two rays, and there is generally a third ray between each; none of the rays extend past the tubercles towards the centre; they are all nearly equal, and a very little enlarged just before they terminate upon the front.

Distinguished from *A. lautus*, *tuberculatus*, and several of the same division of the genus, by the blunt and low termination of the rays upon the front, and several minor characters. In the young state the aperture is longer than wide, and the tubercles only a little elevated.

Found on Blackdown, by H. H. Goodhall, Esq., in whose cabinet the larger specimen is preserved. The shell is cast in silex.

 AMMONITES spinosus.
TAB. DXL.—*fig. 2.*

SPEC. CHAR. Discoid, radiated; whorls few, furnished, when young, with four rows of strong spines, which disappear by age; radii numerous, forked, almost lost on the front; inner whorls exposed; aperture nearly round.

THERE are about 20 spines in each row, each connected at its base with two or three rays; they are gradually shorter after the shell has acquired an inch in diameter, and at length disappear: the radii are sharp but irregular.

This is a remarkable instance of the change of ornament that Ammonites undergo as they increase in size, but still in unison with many others; for it is very usual for Ammonites to become nearly plain when they have attained their full growth, and many are equally smooth in their youngest state.

Casts in Pyrites are met with near Weymouth, and also in Clay at Braunston, as I learn from Miss Baker.

PECTEN *obsoletus*.

TAB. DXLI.

SPEC. CHAR. Equivalved ; ears very unequal ; surface finely striated, striæ obliquely diverging. *Ostrea obsoleta* et *O. lævis*. *Maton and Racket*, *Trans. Linn. Soc.* 7. 100.

-
- var. α . *glabra* ; surface plain, sometime sulcated near the edge ; rarely marked with 4 or 5 ribs. *Figs.* 1, 2, 3, 4.
- var. β . *sulcata* : with many radiating sulci or deep striæ, surface often elevated in 4 or 5 broad ribs. *Figs.* 5, 6, 7.
- var. γ . *costata* ; surface elevated with from 7 to 10 obscure ribs ; either plain or sulcated. *Fig.* 8.
-

WE have here grouped together a number of shells whose common characters are an equality and slight convexity of the valves, very small posterior ears, and minute arched striæ diverging obliquely from an imaginary line drawn along the middle of each valve. We have divided them into three varieties ; but the characters that have been selected to distinguish them are often so combined, that many more divisions might have been made,—a proof that they all belong to one species. The ears in all are alike strongly striated. Individuals of each variety occasionally occur with the margin for some breadth bent perpendicular to the surface (*figs.* 2, 3, 6 & 7) : this circumstance is not so frequent ; nor are the ribs, when they occur, so strongly marked in the recent as in the fossil subjects ; otherwise there is not the shadow of a difference between them.

Found abundantly in the Crag of Norfolk and Suffolk, by Mrs. Cobbold, the Rev. G. R. Leathes, &c. To the latter friend I am obliged for the use of the extensive series that has displayed the varieties so completely.

This species resembles several upon plate 205 ; but they are a thicker shell, are more coarsely striated, and have larger posterior ears.

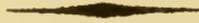
PECTEN annulatus.

TAB. DXLII.—*fig. 1.*

SPEC. CHAR. Orbicular, convex; numerous, thin, erect, concentric laminae and fine longitudinal striae ornament the surface, passing over the large ears.

LENGTH about $2\frac{1}{2}$ inches, which is rather more than the width; the concentric laminae are about a line apart. Except that it is much less gibbose, it strongly resembles *P. cinctus* t. 371.

Communicated by the Rev. T. O. Marsh, who collected it out of the Cornbrash Limestone at Felmersham. The anterior ear is probably reduced in size by fracture, as it is much injured.



PECTEN Princeps.

TAB. DXLII.—*fig. 2.*

SPEC. CHAR. Orbicular, compressed; decorated with 90 rounded nearly equal radii surmounted with erect concave scales; ears large, unequal, squamose; valves equal.

NEARLY orbicular, but rather wider than long: the scales upon the ribs are large and distant, chiefly upon the left valve; but as there are rudiments upon the right also, that probably had them when the shell was entire.

A handsome rare Crag fossil, found at Ramsholt. It ornaments the collection of the Rev. G. R. Leathes.

PECTEN vimineus.

TAB. DXLIII.—*figs. 1 & 2.*

SPEC. CHAR. CONVEX, rather longer than wide, concentrically striated; ribs about 20, prominent, closely beset with thick elevated scales, which are less numerous upon the left valve; ears nearly equal.

SYN. *P. varius.* *Geol. Survey of the Yorkshire Coast, p. 233. t. 9. fig. 9. excl. Syn.*



A FEW of the ribs are obscurely tripartite towards the edge, the rest are very round and (especially upon the left valve where they resemble rods of wire) much elevated. About 2 inches wide and $2\frac{1}{2}$ long. It differs from the recent *P. varius* in the number and size of the ribs, the thickness of the scales, and the disposition of the striæ between the ribs. Some specimens have small ribs between the principal ones.

Plentiful in, and indeed characteristic of, the Oolitic Limestone of Malton. It also occurs at Ely, and in Gloucestershire.

PECTEN vagans.

TAB. DXLIII.—*figs. 3, 4, & 5.*

SPEC. CHAR. Rather convex, a little longer than wide ; ribs 11, large, convex, decorated with large erect concave scales that are very close upon the right but distant upon the left valve ; ears nearly equal, crossed by large scales.

SYN. *P. sulcatus.* *Geol. Survey of the Yorkshire Coast, p. 233. t. 9. fig. 3. excl. Syn.*



SELDOM above an inch and a quarter wide. It differs from the last by having only half the number of ribs, and in not having the regular concentric striæ which appear between the ribs in that. When young the ribs are but a little raised, although the scales are then large : a few obscure rays sometimes appear between the ribs.

This is one of those few shells which occur in several strata : it is found in Clay belonging to the Oolite near Bath (fig. 5.) ; in the Bath or Great Oolite at Hampton, Gloucestershire, and Bradford, Wiltshire ; above the Oolite at Ancliffe ; in the Cornbrash at Chatley (figs. 3, & 4.), and in the Oolite Limestone at Malton.

TRIGONIA spectabilis.

TAB. DXLIV.

SPEC. CHAR. Suborbicular, rather elongated, convex, nearly smooth, ornamented with about seven bent rows of large round tubercles upon the anterior side, and a few small ones scattered over the posterior side ; one row of compressed tubercles upon the posterior slope.



BOTH the anterior and posterior slopes are straight, and meet in a right angle at the beak : there is a slight longitudinal rather square elevation of the surface, that divides it into two nearly equal parts ; on one side of this the rows of partly connected tubercles end, on the other are the scattered small ones. This seems to be distinct from *Trigonia nodosa* t. 507. f. 1, as it is more completely covered with knobs and is of a shorter shape.

A very handsome cast in *Silex* imbedded in Sandstone, found at Blackdown. It is one of the many rare fossils that enrich the cabinet of H. H. Goodhall, Esq. It is so well displayed that I was delighted with the opportunity of figuring it, although the surface is so delicate that it has not been possible to do it justice.

PHOLADOMYA. *G. B. Sowerby.*

GEN. CHAR. A transverse thin subhyaline ventricose shell; the posterior portion short, rounded; the anterior more or less elongated and gaping: the hinge composed of an elongated subtrigonal foveola, and a marginal plate in each valve with a rather short external ligament; the muscular impressions two, indistinct; the sinus in the impression of the mantle large; the umbones approximated.

THE thin shells of this genus have generally several oblique ribs or rows of gentle elevations upon the surface, with corresponding hollows within. The inner surface is pearly.

Until the discovery of a recent species from the island of Tortola induced my brother to establish this extremely natural genus, the fossils belonging to it were scattered in various genera, to none of which they had any good claim to be united.

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The following fossils, published in this work under other names, belong to the genus *Pholadomya* :

<i>Cardita producta</i>	tab. 197, fig. 1.
<i>obtusa</i>	ib. 2.
<i>lirata</i>	ib. 3.
<i>deltoidea</i>	ib. 4.
<i>margaritacea</i>	297.
<i>Lutraria lirata</i> *	225.
<i>ovalis</i>	226.
<i>ambigua</i>	227.
<i>angustata</i>	327.

* This name it is proposed to change for *fidicula*.

PHOLADOMYA Murchisoni.

TAB. DXLV.

SPEC. CHAR. Oval, with large beaks; the anterior side short; six or seven prominent, obtuse, knotted ribs ornament the middle.



A STRAIGHT shell, whose sides are smooth and free from ribs; the ribs near its anterior side are much the largest.

The present secretary of the Geological Society, Roderick Impey Murchison, Esq., influenced by a highly praiseworthy zeal for the advancement of geology, last summer (1826) visited the remote district of Brora in Sutherlandshire, where coal has been worked for some years. His valuable observations are presented to the Geological Society, and his collection of fossils, among which are several new ones, liberally offered for the use of "Mineral Conchology": no apology is therefore necessary for naming a shell after such a friend.

The shell before us is the same as was brought from Brora by Mr. Farey, and figured along with *Pholadomya* (*Cardita*) *margaritacea* upon t. 297, at fig. 4: but more perfect specimens have enabled us to define the species, although they are often much and variously compressed.

Brought by Mr. Murchison from Brora, along with several new fossil shells hereafter to be figured, and the exact position of which will be described by him in the Paper (now in preparation for the Geological Society) upon the Brora Coal Field and other contemporaneous formations in the north of Scotland.

Fig. 1 & 2. from the roof of the coal.

Fig. 3. is from a ledge of rocks opposite the Old Salt Pans.

PHOLADOMYA acuticostata.

TAB. DXLVI.—*figs. 1 & 2.*

SPEC. CHAR. Oval-elongated ; with four or five large keel-shaped ribs upon the very short anterior side, and many gradually lessening ones over the middle of the shell.

WELL distinguished even when much broken, by the large sharp ribs upon the anterior extremity. It is the smallest species we know of, the nearest like it is *P. angustata*, t. 327.

Brought from Brora by our valued and much-to-be-lamented friend, John Farey, sen. Esq. along with the last species. It occurs in the stratum immediately upon the coal.

Fig. 2. is from an impression in the limestone slate of Stonesfield, and seems to belong to the same species.



PHOLADOMYA æqualis.

TAB. DXLVI.—*fig. 3.*

SPEC. CHAR. Oval, straight ; with six or eight equal slightly elevated ridges over the middle.

THE two sides of this species are more nearly equal than those of others ; both are very obtuse.

Found near Weymouth in clay replete with oolitic grains ; the shell is preserved stained by iron.

GRYPHÆA Maccullochii.

TAB. DXLVII.—*figs. 1, 2, & 3.*

SPEC. CHAR. Obovate, oblique, gibbose; beak produced, much incurved; posterior lobe more or less distinct; the front rather angular.



INTERMEDIATE between *Gryphæa dilatata*, t. 149. and *G. incurva*, t. 112; it also bears some resemblance to *G. bullata*, t. 368. in its young state; but as it is much shorter than the first, so it is longer than either of the latter, and much thicker than the last in all stages of growth. The division of its surface into two lobes is very variable.

Collected in Pabba, Scalpa, Carsaig in Mull, and several other places, by R. I. Murchison, Esq. and named by him after the eminent geologist Dr. Macculloch, who first noticed the beds in which this fossil is contained. See a Description of the Western Islands, vol. i. pages 296, 320, and 562.—It is much to be regretted that the fossils there mentioned are not more fully described, especially since two species of *Gryphite* are alluded to.

This *Gryphæa* is also found in England, and belongs probably to the Lias beds; but I have only met with specimens from Braunston in Northamptonshire, where they were found, in what is called a gravel-pit, by Miss Baker, from whose collection *figs. 1. and 2.* are drawn.

Fig. 3. represents a small one from Pabba.

GRYPHÆA minuta.

TAB. DXLVII.—*fig. 4.*

SPEC. CHAR. Orbicular, gibbose ; beak spiral ;
lobe obscure.



A MINUTE species with a thin shell and closely pressed
and much curved beak.

Found, rather rarely, among numerous other minute
fossils, at Ancliffe, by the Rev. Geo. Cookson.

SANGUINOLARIA undulata.

TAB. DXLVIII.—*figs. 1 & 2.*

SPEC. CHAR. Three times as wide as long, transversely undulated, convex; anteriorly rounded, posteriorly subtruncate, gaping a little; fulcra prominent.



A SHELL in general form much resembling some species of the Linnæan genus *Mya*; but its great width and the external situation of the ligament, pointed out by the fulcra, indicate an approach to the Linnæan genus *Solen*, of which *Sanguinolaria* is a portion.

The undulations of its surface are peculiar; they gradually disappear upon the posterior portion: the shell is thin and smooth, internally a little pearly.

One of the most remarkable fossils collected by R. I. Murchison, Esq. in the district of Brora. It occurs in the peculiar bed that forms the roof of the coal, consisting of argillaceous limestone of a soft texture and gray colour in the pits where coal is now worked (fig. 1.), but hard and of a red-brown in the rocks opposite the Old Salt Pans (fig. 2.). The fossils that accompany this will be fully detailed in Mr. Murchison's forthcoming Paper.

SANGUINOLARIA gibbosa.

TAB. DXLVIII.—*fig. 3.*

SPEC. CHAR. Three times as wide as long, gibbose, smooth ; sides rather acuminate, a little gaping.



A THIN smooth unio-like shell, which from some slight resemblance to the last is placed provisionally in the same genus.

Occurs in the mountain Limestone of Queen's County, Ireland.

AMMONITES *lævigatus*.TAB. DXLIX.—*fig. 1.*

SPEC. CHAR. Discoid, smooth; inner whorls nearly concealed; margin obtuse; aperture very narrow.



ONE of the very few Ammonites that have no rays nor undulations upon the surface. The edge is so round as to form a much elongated oval aperture, which is rendered sagittate by the deep impression of the preceding whorl; the volutions are few, and expand rapidly.

Found along with *A. Benettianus*, and several other fossils similar to those that occur in the marl at Folkstone, at Crockerton near Warminster, by Miss E. Bennett, whose magnificent collection of fossils it helps to enrich. We are also indebted to Dr. Fitton for specimens found at Cheriton near Sandgate, Kent, in clay used for making tiles. They are casts in pyrites.

AMMONITES Gowerianus.

TAB. DXLIX.—*fig. 2.*

SPEC. CHAR. Compressed, radiated, with a spine upon each ray where it divides into three or four; front rounded; whorls convex, the inner ones half exposed, showing the row of spines; aperture nearly orbicular.



THE radii upon this beautiful shell commence close to the inner edge of the whorl: they are numerous, prominent and sharp over almost half the side, there each is generally furnished with a large sharp spine, at the base of which it divides into three or more, prominent, obtuse, ring-shaped ridges that pass over the rounded front; the length of the aperture occupies nearly one-third of the diameter of the disk. Its edge, which we have observed in only one specimen, is thin and gently sinuated near its inner termination. The spines disappear by degrees towards the aperture.

From the roof of the Coal at Brora. It is named, at the request of my friend Mr. Murchison (to whom we are indebted for the specimen), in honour of the noble family in whose estates the district of Brora is situated.

AMMONITES Murchisonæ.

TAB. DL.

SPEC. CHAR. Discoid, carinated, when young radiated ; whorls flattened, their inner edges obliquely truncated, the front rounded ; the inner whorls partly exposed ; radii obtuse waved, usually forked, not passing on to the front.



ONE of the many Ammonites that lose the rays or undulations as they increase in size ; and in which the innermost whorls, or those that probably existed in the egg, are also smooth : the radii are curved, irregular in their degree of elevation, and continue until the shell is about two inches in diameter, after which the whorls are almost suddenly plain, or only marked by lines of growth ; the truncature of the inner margin of the whorl produces a concave surface ; the form of the aperture is half an ellipsis, its sides are slightly projecting lobes ; the keel is very slightly prominent ; it contains, as usual, the siphuncle, which is strongly marked by the dark colour of the spar by which it is replaced.

Broken out of a calcareous nodule composed of compacted Ammonites and other fossils, at the base of a cliff

of micaceous sandstone east of Holme, near Portree, Isle of Skye, by Mrs. Murchison, after whom I have named it, as a just tribute for the ardour with which she has pursued the study of Fossil Conchology, the pleasing effects of which those who are so happy as to be acquainted with her know how to appreciate.

TURBO Tiara.

TAB. DLI.—*fig. 1.*

SPEC. CHAR. Short, conical ; whorls few, flattened upon the sides, crowned by large, rather obliquely elongated elevations ; base convex, umbilicated.

A large handsome shell, whose characters are remarkable and easily defined : the elevations around the spire are about twenty upon each whorl, the very young shell is free from them.

Produced by the Mountain Limestone near Preston. The specimens are borrowed from the collection of Mr. Gilbertson.


 TURBO obtusus.
TAB. DLI.—*fig. 2.*

SPEC. CHAR. Short, conical, obtuse, transversely striated ; sides straight ; base convex ; striæ numerous.

A regularly conical shell, with a solid convex base and rounded edge. The striæ exceed twelve upon each whorl ; they are crossed by fine lines of growth.

Found at Ancliffe, seldom so large as the specimen figured.

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CARDIUM decussatum.

TAB. DLII.—*fig. 1.*

SPEC. CHAR. Cordiform, antiquated, longitudinally ribbed; anterior margin rounded; posterior side a broad area raised in the middle; length and breadth nearly equal.

SYN. Cardium? decussatum. *Mantell, Geol. Suss. p. 126. t. 25. f. 3.*



THE form of the posterior side of this Cardium is precisely like that of *C. cardissa*; the keel, however, by which it is bounded is obtuse; the anterior side is much more prominent; it is conical with a rounded margin. The beaks are elegantly incurved.

For this rare production of the Chalk Marl we are indebted to the intelligent author of the *Geology of Sussex*: the specimen is from a pit at Hamsey; the one figured by our friend was found at Brighton. When the anterior side is viewed, a general resemblance is observable to the genus *Pholadomya*; but the posterior side is so exactly similar in form to the heart-shaped cockles, that, in the absence of all knowledge of the hinge, we follow Mr. Mantell in referring this species to *Cardium*, along with the *hibernicum*.

CARDIUM alæforme.

TAB. DLII.—*fig. 2.*

SPEC. CHAR. Triangular, ventricose, longitudinally ribbed; anterior side truncated, produced near the hinge, concentrically ribbed; posterior side much produced, compressed, ribbed.

THIS approaches much to *Cardium hibernicum* in general aspect; but it has no sharp keel, and the anterior side is strongly ribbed. The posterior side is so produced as to form a kind of lobe, which improves the resemblance the outline has to a wing. The ribs upon the central part of the anterior side diverge from one of the longitudinal ribs on each margin of it; the ribs upon the other parts are very close, and alternately large and small; the cast has only the larger ribs.

The specimens figured are from Queen's County, Ireland: the same species has also been found at Scarlet on the Isle of Man, by Mr. Henslow; in both places in dark coloured fetid Limestone.



CARDIUM hibernicum.

TAB. DLII.—*fig. 3.* and TAB. LXXXII.—
fig. 1, & 2.

WE here give a representation of a part of this fossil which had formerly escaped notice,—the remarkable extension of the keel around the anterior portion of the shell, to which, if perfect, it would give the form of a cup with a broad bottom; this keel is of a cellular structure, the cells long and placed transversely.

CARDIUM striatulum.

TAB. DLIII.—*fig.* 1.

SPEC. CHAR. Orbicular, convex, concentrically striated; posterior side longitudinally striated with a toothed edge.

STRONGLY resembling *Cardium Hillanum*, tab. 14, but it is more perfectly orbicular; the transverse striæ are less regular, and the longitudinal ones twice as numerous as the angular sulci which occupy a similar situation in the *Hillanum*:

This *Cardium* accompanies the *Sanguinolaria undulata* (tab. 548), &c. in the argillaceous and at the same time areniferous Limestone next above the coal at Brora, where it was collected by R. I. Murchison, Esq. in the reef opposite the Old Salt Pans (see the larger figure); the smaller figure is from a specimen preserved by Mr. Farey,—it is accompanied by another species.



CARDIUM dissimile.

TAB. DLIII.—*fig.* 2.

SPEC. CHAR. Transversely obovate, gibbose, smooth; posterior side bounded by a small rib, longitudinally striated; front rather straight.

A SMOOTH shell, so much resembling several species of *Venus*, that it has been referred to that genus: it is very thick every where except near the beaks: the length is a little less than the width.

Very frequent in the Portland Limestone. We have specimens from Portland, Purbeck, and Tisbury.

CARDIUM truncatum.

TAB. DLIII.—*fig. 3.*

SPEC. CHAR. Transversely ovate, gibbose, smooth ; posterior side obliquely truncated, longitudinally sulcated ; beaks small.

SYN. *Cardium pectinatum*, *Young and Bird*, 226. *pl. 8. f. 5.*



NEARLY as long as wide, most gibbose towards the beaks, the ridges between the sulci upon the posterior flattened side are scabrous.

Specimens of this remarkable shell have been supplied to us by S. Hailstone, Esq., who found them in a gray sandy Limestone, along with *Terebratulæ*, *Pectens*, and *Aviculæ*, at Roseberry Topping, Yorkshire : also by Mrs. Murchison, who collected them on the Cleveland Hills ; and by Mr. Williamson, from Robin Hood's Bay. At both these latter places they are composed of ferruginous sandstone, which from its friable texture appears to be produced by the decomposition of a limestone.

It was also found on Brambury Hill, Sutherland, by R. I. Murchison, Esq.

NUCULA deltoidea.

TAB. DLIV.—*fig. 1.*

SPEC. CHAR. Triangular, inflated; posterior side obliquely truncated, flat, pointed; anterior side short, rounded.

SYN. *Nucula deltoidea*, Lamarck, *Env. de Paris*, 194. *Hist. Nat.* vi. 60.

A PRETTY little shell, unlike any other species of *Nucula*: it is generally smooth, but is sometimes longitudinally striated, especially near the anterior margin.

Very abundant in some parts of the Clay of the so called upper marine formation on the Isle of Wight.

Specimens are sometimes found at Grignon half as wide as the larger figures, which are magnified.



NUCULA inflata.

TAB. DLIV.—*fig. 2.*

SPEC. CHAR. Nearly globular, smooth; the posterior side produced, compressed, pointed.

LARGE individuals of this shell are transversely oblong; the small ones heart-shaped or nearly globose; the produced side is small.

Found in Septaria in the London Clay at Highgate, in 1810. I have been favoured with casts in pyrites from Southend, by the Rev. F. W. Hope, who has made a very extensive collection at that place.

NUCULA undulata.

TAB. DLIV.—*fig. 3.*

SPEC. CHAR. Globular, concentrically undulated ;
posterior side produced, contracted, pointed.

MUCH resembling the last : its width is rather greater than its length, and it is a little oblique.

A cast in pyrites from the Clay at Folkstone. Its valves are equal, or it might be referred to Corbula.



NUCULA amygdaloides.

TAB. DLIV.—*fig. 4.*

SPEC. CHAR. Transversely elliptical, elongated and sulcated, compressed ; sides equal.

THE width of this neat shell is double the length : the sulci are small, numerous, and regular.

Found at various periods in Hyde Park, and also St. James's Park : and casts in pyrites have been collected in abundance at Southend, by the Rev. Mr. Hope.

AMMONITES *Jamesoni*.TAB. DLV.—*fig. 1.*

SPEC. CHAR. Discoid, radiated; sides flattened; volutions 5 or 6; the inner ones exposed; radii large, simple, obtuse, equal to the spaces between them, bent towards the aperture as they pass over the front.

THE numerous large radii, considerably bent as they pass over the front, strongly characterize this shell; the aperture is nearly twice as long as wide.

Collected on the Islè of Mull, by R. I. Murchison, Esq., during a tour which has been the foundation of a valuable paper lately read before the Geological Society.

At the request of this gentleman I am happy to commemorate the celebrated Geologist whose name it bears, and who needs no panegyric from me. It has also been found in Robin Hood's Bay.

AMMONITES *navicularis*.TAB. DLV.—*fig. 2.*

SPEC. CHAR. Umbilicated, costated; costæ large, numerous, annular, simple; whorls ventricose, very few; the inner ones half exposed; aperture transversely oblong.

SYN. *Ammonites navicularis*. *Mantell, Geol. of Sussex, 198. t. 22. f. 5.*

ABOUT three whorls, rapidly increasing, compose this Ammonite: all the costæ reach the edge of the umbilicus, half or more of them turn into it, and at the same time are rather enlarged; the costæ and the spaces between them are nearly equal.

From the lower Chalk at Guildford: presented to Mrs. Murchison by Mr. Mantell. It is only half the size of the one figured in the *Geology of Sussex*, where it is spoken of as a very rare shell.

AMMONITES *latæcosta*.TAB. DLVI.—*fig. 1.*

SPEC. CHAR. Discoid, compressed, radiated; whorls 5, exposed; radii large, sharp, slightly waved, much flattened and widened as they pass over the rounded front; aperture oblong.

THE flattened sides of this Ammonite distinguish it from the young state of *A. planicosta* (tabs. 73 and 406), independently of its much larger size. When young, neither of them has any appearance of spines; when old, the last whorl of the *latæcosta* has only slight indications of tubercles, which consist of two small knots upon each ray on each side; the *planicosta* has one large spine in place of two, and that only upon some of the rays.

A Lyas fossil: all the specimens I have seen except one are from Alluvium; that one is from Lyme: it is about $3\frac{1}{2}$ inches in diameter, and was liberally presented by Mrs. Murchison. One specimen nearly four inches in diameter shows the little knots upon the rays; it is in the collection of W. Peete, Esq. of Dartford. Several small ones have been found by Miss Baker at Braunston, in what is called a gravel-pit.

AMMONITES *brevispina*.TAB. DLVI.—*fig. 2.*

SPEC. CHAR. Discoid, compressed, radiated; whorls 5 or 6; inner ones exposed; rays numerous, passing over the round front, furnished with 2 small spines on each side; aperture obovate.

THE rays are rather blunt, and not much elevated, but most prominent where they pass over the front. The spines are short, and placed near the inner and outer edges of the whorls.

Fragments of this Ammonite were brought from Pabba last year, by R. I. Murchison, Esq.

LUCINA mitis.

TAB. DLVII.—*fig. 1.*

SPEC. CHAR. Orbicular, convex, ornamented with minute, longitudinal striæ, and numerous small, regular, concentric laminæ; lunette oval, very concave; cardinal teeth obscure; no lateral tooth.

Lucina mitis, *Deshayes MSS.*



THE concentric laminæ are beautifully regular, the spaces between them are crossed by minute irregular striæ: within, the surface is rough, but not marked with sunken punctums, as many of the genus are; it is in these two characters we conceive this species to differ from *L. elegans* (*Deshayes*, i. p. 101, t. 14, f. 10, 11.), of which we have no authentic specimen. Specimens of *L. mitis*, sent us by Mons. *Deshayes*, agree precisely with the shell before us.

Found abundantly in Barton Cliff by Miss Bemister.

LUCINA antiquata.

TAB. DLVII.—*fig. 2.*

SPEC. CHAR. orbicular, convex, ornamented with concentric laminæ; surface irregular; anterior side angular; lunette flat, lanceolate.

GENERALLY the laminæ are worn off the surface, and leave it irregularly furrowed; there are two teeth under the beaks, one of which is bifid, and one lateral tooth under the lunette; the shell is moderately thick.

I have not been able to refer this to any published species, although we possess many specimens from near Valognes, that accord precisely with the small unworn English ones. It approaches near to *L. circinaria* of Lamarck.

Occurs in Crag at Woodbridge, and other parts of Suffolk.



LUCINA crassa.

TAB. DLVII.—*fig. 3.*

SPEC. CHAR. Nearly orbicular, convex; covered with thick, slightly elevated, concentric laminæ; superior margin obtuse; lunette linear, concealed; valves thick.

A LITTLE wider than long, rather flat in the middle, and irregular; the beaks are very small.

Found by Mr. Weir in Sandstone at Horncastle, and by R. I. Murchison, Esq. at Brambury Hill, Sutherland. Our figure is from a specimen from the former place.

ROSTELLARIA Pes-Pellicani.

TAB. DLVIII.—fig. 1.

SPEC. CHAR. Turreted, striated; whorls angular in the middle and nodulose; last whorl three-keeled; the two upper keels divided into tubercles; lip expanded into three, pointed, diverging lobes; the canal at the base oblique, subfoliaceous.

SYN. Strombus Pes-Pellicani. *Linn. et Auct. Brocchi*, 2. 385.

Rostellaria Pes-Pellicani. *Parkinson's Organic Remains*, 3. 63. *Lamarck, Syst.* 7. 193.

Var. meridionalis. *Basterot, Mém. de la Soc. d'Histoire Nat. de Paris*, 2. 69.

THE fossil shell now before us so precisely resembles the species well known as an inhabitant of the sea at the present day, that we can but consider them the same. Similar shells are found in the vicinity of Dax and in Placentia; but although they are referred to the same species, some differences may be observed which appear to be constant:—those found near Dax are smaller, and have more elongated but less prominent tubercles; those of Placentia have the angles upon the upper whorls, and

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the keels upon the last whorl, as Mons. Brongniart has justly observed, either smooth without any tubercle, or only furnished with projecting points. It may be doubted whether these and the *R. Pes-Carbonis* of Brongniart (*Terrains du Vicentin*, p. 75.), which has no angles upon the upper whorls, but only elongated tubercles or costæ, are not varieties of the same species, depending upon locality. We find much difference among specimens of the recent type from different places.

In a clay-pit at Tottenhill near Lynn in Norfolk, are great numbers of this fossil, as we learnt several years ago from Mr. Wales of Downham. We have also been supplied with specimens by Mr. Rose of Swaffham, who finds *Turbo Terebra* (Linn.) with them. Specimens have been found in Suffolk, in Crag, by the Rev. G. R. Leathes, of which we have represented one, but not perfect enough to show the three lobes of the lip. May it not have been such a one that Parkinson found in the Essex Cliff, since he describes it as having but one spur-like process? or did he find the London Clay species?

ROSTELLARIA composita.

TAB. DLVIII.—*fig. 2.*

SPEC. CHAR. Turreted, striated; spire costated; last whorl bicarinated; lip with but one, cuspidated lobe, besides the canal at its upper part.



A SMALL species, distinguished by the costated spire and the broadly expanded lip with a spine where the upper keel terminates upon its edge.

We have seen but very imperfect individuals of this interesting shell. One (the upper figure), more strongly costated than the others, was picked up at Weymouth, in the Oxford Clay; others have been sent us from Scarborough: but the only ones that have the lip preserved (see the lower figure) were collected at Brora, in the stone immediately above the Coal, by our assiduous friend R. I. Murchison, Esq. It is an interesting species, because it proves that the genus occurs in a stratum older than the Greensand, at the same time that it helps to support the parallelism that may be traced between the fossil contents of the Greensand and Oxford Clay.

ROSTELLARIA Parkinsoni.

TAB. DLVIII.—*fig. 3.*

SPEC. CHAR. Turreted, striated, costated ; last whorl costated and obscurely carinated ; lip expanded and furnished with one styloid process ; costæ numerous.

SYN. Rostellaria, having only one spur-like process.
Parkinson, Org. Rem. 3. 63. tab. 5. f. 11.

Rostellaria Parkinsoni. *Mantell, Geology of Sussex, p. 72, 82, & 108.*

THE length of the costæ upon the last whorl, and the single spur-like process, are the essential characters of this shell. The former seems to distinguish it from the London Clay species given under the same name at tab. 349 ; but so great is their resemblance, that, with only imperfect specimens before us, we still remain in doubt.

The late sale of Mr. Parkinson's collection has enabled us to give figures of the type of this species. The upper specimen is from Blackdown, the other from near Faversham.

We have seen two other species from the Greensand : one with four smooth carinæ and a very long beak (*R. carinata*, Mantell ?), another with the lip resembling that of the *Pes-Pellicani* ; but the specimens are much too indistinct for figuring.

The Syn. "*S. Pes-Pellicani Brocchi*," must be erased from p. 66 of vol. iv. ; as indeed all the synonyms perhaps ought to be, and even a new name given.

PLAGIOSTOMA *concentrica*.TAB. DLIX.—*fig. 1.*

SPEC. CHAR. Elliptical, oblique, convex, ornamented with many longitudinal striæ and a few regular concentric lines; hinge-line short; shell thin.

A NEATLY marked slender shell, whose greatest diameter is about double the least: it is most convex towards the beaks, which are but a little produced.

One of the many discoveries made by R. I. Murchison, Esq. in his late tour to the North of Scotland. It was found in a block of gray argillaceous Limestone, accompanied by Ammonites, upon the beach at Ethie, near Cromarty.

PLAGIOSTOMA *elongata*.TAB. DLIX.—*fig. 2.*

SPEC. CHAR. Obliquely elliptical, convex, costated; costæ few, distinct, rounded; hinge-line short.

SYN. *Plagiostoma*. *Mantell, Geology of Sussex, p. 129. t. 19. f. 1.*

THE longest diameter of this *Plagiostoma* is equal to twice the shortest. The costæ are about fifteen or sixteen, prominent, rounded and smooth: they produce undulated margins to the valves.

An inhabitant of the Gray Chalk Marl and Upper Greensand. The upper figure is from a specimen found at Folkstone; the other from one presented in 1814 by Mr. Mantell, who obtained it at Hamsey.

PLAGIOSTOMA duplicata.

TAB. DLIX.—*fig. 3.*

SPEC. CHAR. Obliquely obovate, convex, costated ; costæ numerous, sharp ; between each of the costæ is a sharp elevated line ; beaks rather prominent.



THE costæ, which are sharp-edged, are about 25 in number : alternating with them is a set of much smaller but equally sharp elevations, which appear characteristic of the species.

The larger specimen is from the Oolite at Malton, the other apparently from Cornbrash ; but the label has unfortunately been lost. We have a group with one an inch and a half long ; but we do not know from what country it came.

PRODUCTA costata.

TAB. DLX.—*fig. 1.*

SPEC. CHAR. Transversely oblong, with an angular depression in the middle, costated; costæ few, broad, decussated at their upper parts, compressed upon the deflected front; each side furnished with two or three spines and a small lobe.

STRONG sulci divide the surface of this shell into 18 broad ribs, which are crossed by concentric furrows upon the upper part of the convex valve: at each side is formed a small lobe, upon which are two or three spines: the front is much produced and deflected.

For the use of this strongly marked Producta we are indebted to Mrs. Murchison. It was found near Glasgow; and seems to have been imbedded in a shaley Limestone.



 PRODUCTA calva.
TAB. DLX.—*figs. 2 to 6.*

SPEC. CHAR. Nearly square, smooth, flat or concave in the middle; beak much incurved; one row of spines on each side the hinge-line.

Var. α . Small, flat or slightly concave in the middle. *fig. 2.*

Var. β . Twice the size of var. α , with a canal along the middle. *figs. 3—6.*

EXTERNALLY this species is remarkably smooth; but, like many others, it is scabrous within, or beset with

short spines. The surface of var. α is generally very flat in the middle ; but some specimens are concave, and lead to the larger variety, from which they differ only in size. The spines upon each side the beak are in a single row, and few. It is difficult to detect them except in casts. Var. β much resembles *P. horrida* (t. 319. f. 1.).

Var. α (fig. 2.) was found some years back, and forwarded to us by Samuel Hailstone, Esq., at Nosterfield near Tanfield, north of Ripon, Yorkshire, in Magnesian Limestone, where Prof. Sedgwick has since observed it.

Var. β (figs. 3 and 4) are from a bed of compact gray Magnesian Limestone, immediately above a yellow Marl-slate, containing at least six species of fish, at East Thickley, near West Auckland, Durham ; while the casts represented at figs. 5 and 6, are from the higher bed of yellow Magnesian Limestone of Humbleton Hill and other quarries near Sunderland, towards Durham.

In the series of figures given upon this plate, we have a complete illustration of the genus *Producta*. Figs. 1, 2, 3, and 4, exhibit various views of the outer surfaces of the two valves, as they appear when separated from the stone ; in which case the spines are commonly lost. Fig. 6. shows the cast of the same surfaces with the impressions of the spines near the hinge line. Fig. 5. exhibits a cast of the inside ; it discovers the impressions of the muscles and tendons that gave the valves motion, a short septum in the lesser valve, and the impressions of the short spines of its scabrous surface.

PRODUCTA hemisphærica.

TAB. DLXI.



THIS plate represents some large specimens that were formerly referred to *P. scotica*: but upon an exact comparison, we find they do not agree with the figure in *Mineral Conchology*, tab. 69. f. 3; but that in fact half of the small specimen drawn at fig. 2. of the present plate was given upon tab. 328. to show a section of *P. hemisphærica*; to which species we see no reason why the large specimens should not be referred: and we consider the figures of them essential to illustrate it. The very narrow space between the valves is a useful character; the total want of spines distinguishes it from *P. scotica*. It is more difficult to distinguish from *P. personata* (tab. 321.), which is perhaps the internal cast of the same species, but seems rather more globose.

We have recently discovered, by purchasing the specimen it is taken from, that fig. 11. of tab. 12. of *Parkinson's Organic Remains*, which is called *Trigonia rugosa* (vol. iii. p. 177.), is taken from a large crushed individual of *Producta scabricula* (tab. 69. f. 1.).

SPIRIFER undulatus.

TAB. DLXII.—*fig.* 1.

SPEC. CHAR. Transversely elongated, very convex, with pointed extremities, radiated, transversely and deeply striated; front elevated, with a rounded sinus; radii obtuse, about 16 on each side the central elevation; beaks a little removed; area flat, narrow.



FULL twice as wide as long, nearly semicircular, with the sides produced as they approach the extremities of the hinge; the area between the beaks is narrow, with nearly parallel edges; the striæ upon the surface are regular, and waved by the obtuse radii, which scarcely rise enough to be called ribs; the central elevation is obtuse, and occupies the space of about four radii.

Presented by Professor Sedgwick, who collected it at East Thickley, along with *Producta calva* β (tab. 560.).

SPIRIFER octoplicatus.

TAB. DLXII.—*figs. 2, 3, & 4.*

SPEC. CHAR. Transversely elongated, gibbose, semi-circular, plaited; plaits 8 or 10, deep and angular; central elevation plain; beaks remote, incurved; area triangular, curved.

A NEAT shell, strongly marked by the depth and small number of its plaits.

Collected in Derbyshire by the author of "Petrificata Derbyensia;" but it does not appear to be figured in that work.

Fig. 4. represents a larger specimen from the same place, with a striated or rather imbricated surface; but in other respects strongly resembling the small ones. May additional specimens prove it to be a distinct species?



SPIRIFER triangularis.

TAB. DLXII.—*figs. 5 & 6.*

SPEC. CHAR. Triangular, transversely elongated, convex, radiated; extremities acute; front angular, with an acute elevation; radii about 16, obtuse; area narrow, flat.

SYN. Conch. Anomites triangularis. *Martin, Pet. Derby. t. 36. f. 2.*

READILY known by the straight lines that form its outline.

From the collection of the late Mr. Martin. Fig. 6. is from a remarkable specimen with dissimilar sides.

AMMONITES Sutherlandiæ.

TAB. DLXIII.

SPEC. CHAR. Discoid, gibbose, smooth ; whorls two or three, partly exposed ; umbilicus large and deep ; aperture obovate, nearly circular.

SYN. A. Sutherlandiæ. *Murchison in Geol. Trans.* 2d Series, vol. ii. pt. ii. p. 323.

A PLAIN thick Ammonite with very few whorls, small portions only of the inner turns are seen within the wide umbilicus. The front is regularly rounded ; the length of the aperture is nearly equal to half the diameter of the shell.

Discovered by R. I. Murchison, Esq. in the white Sandstone that composes the hills of Braambury in the district of Brora*, Sutherlandshire. It is named, at the request of Mr. Murchison, in compliment to the Marchioness of Stafford as Countess of Sutherland.

Fig. 1. represents a specimen that was found by the quarrymen after Mr. Murchison's visit to the district, and was reported to be a fossil human skull, whereon the Marquis of Stafford ordered it to be sent to London and presented to the Geological Society, in whose cabinet it now is. It is so compressed as to resemble a Scaphites ; its diameter is double that of the figure.

Fig. 2. is from the first discovered specimen, and is two-thirds its diameter.

* For an account of this district see Mr. Murchison's very valuable and elaborate paper in the *Geol. Trans.* 2d Series, vol. ii. part ii. p. 293.

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AMMONITES *cinctus*.TAB. DLXIV.—*fig. 1.*

SPEC. CHAR. “ Discoidal, subumbilicate ; volutions depressed, half inserted, transversely radiated ; radii annular, distant, bifurcated, undulated ; umbilicus expanded, sides smooth, with a marginal row of oblique tubercles ; ambit convex, embraced by the radii ; aperture ovato-sagittate.



THE volutions, although compressed, have a slight degree of convexity, and are ornamented by transverse radiations that arise from a row of small tubercles on the inner margin. Each radius divides into two branches, which pass with a gentle sweep across the ambit, and unite with the corresponding undulations of the opposite side ; small oblique tubercles are placed on each radius at the point of bifurcation.

It is scarcely necessary to remark, that although this species approaches to *A. varians* in having bifurcating radiations and a row of tubercles on the inner margin, yet it is widely separated from it by the rounded form of the back (front) and other obvious differences.

Longest diameter 3·8 inches ; width of the outer volution two-fifths of the diameter ; transverse diameter of the aperture 1·1 inch.

Locality, Middleham.”

The above description is copied from the *Geology of Sussex*, pp. 116 and 117. It appears that only one individual has been found ; and the permission granted by Mr. Mantell to figure that, is the more valuable, because it had not been figured before. It is a cast in Chalk Marl ; the edge of the aperture seems to have been perfected, as it was evidently somewhat thickened.

AMMONITES *Catillus*.TAB. DLXIV.—*fig. 2.*

SPEC. CHAR. Discoid, thin, with obscure, tubercular elevations near the narrow, obtuse edge; inner whorls one-third exposed; aperture lanceolato-sagittate with obtuse angles.



A VERY flat species with only three or four whorls; the surface of it is even, except a row of short tubercles on each side the margin, which degenerate into obscure waves upon the outer whorl. It might possibly be taken for a compressed specimen of *A. varians*, but it wants both the carina and radii, vestiges of which are distinguishable in the most flattened specimens of the *A. varians*.

Found in the Malm-rock of Sussex (Upper Greensand) in a quarry at Nursted near Petersfield. We are indebted to Mrs. Murchison for the discovery. The figure is two-thirds of the diameter of the specimen, which is above six inches wide and only nine-tenths of an inch thick.

TURRITELLA granulata

TAB. DLXV.—*fig. 1.*

SPEC. CHAR. Subulate, transversely striated and granulated; whorls about fifteen, their upper edges bordered with an antiquated band.

THE rows of granules between the striæ are very characteristic of this species; they are numerous, but three or four of them are generally larger than the rest.

Very abundant, replaced by *Silex*, in the whetstone pits at Blackdown, where it appears to be gregarious. It is mentioned as a *Turritella* by Smith in his *Stratigraphical System*, p. 25, and figured in his *Strata Identified*. Parkinson calls it *Cerithium turritellatum*, which is however a different shell (*Org. Rem.* vol. iii. p. 71.), so that it does not appear to have been hitherto correctly named.

The group figured is part of a larger one in the cabinet of H. H. Goodhall, Esq.

 TURRITELLA abbreviata.
TAB. DLXV.—*fig. 2.*

SPEC. CHAR. Conical, pointed; two small close ridges run round the middle, and one large obscurely granulated ridge forms each edge of every whorl, the produced base has one ridge upon it.

A VERY short turreted shell with about seven whorls. I have not seen the aperture, but judge by the lines of growth and the absence of plaits upon the columella that it is a *Turritella*.

Found in the decomposing carboniferous Limestone (Mountain Limestone) of Bradley, near Newton Bushel, Devonshire: the specimen is in the cabinet of H. T. De la Beche, Esq.

TURRITELLA Terebra.

TAB. DLXV.—fig. 3.

SPEC. CHAR. Turreted, elongated, transversely sulcated; whorls convex, sulci many, nearly equal; spire pointed.

SYN. Turritella Terebra. *Lamarck Hist. Nat.* 7. p. 56. Turbo Terebra *Auct.*

IF this differ at all from the recent species, it is in the thickness of the shell and greater distinctness of the whorls; but these differences are very slight.

Found with *Rostellaria Pes Pellicani* (t. 558.) by Mr. Rose of Swaffham. I suspect both to be shells of a more modern growth than any genuine Crag shells.

TURRITELLA costata.

TAB. DLXV.—fig. 4.

SPEC. CHAR. Subulate, striated, rough, costated; the costæ terminate above the lower carinated edge of each whorl; base flat, its edge carinated.

THE carinated edge of this elegant shell forms a thread that winds round the spire separating the costæ of one whorl from those of the next; the whorls are very numerous.

An individual of this species is now and then met with along with *T. granulata*.

TURRITELLA concava.

TAB. DLXV.—fig. 5.

SPEC. CHAR. Short subulate, smooth; whorls many, concave; base convex.

FROM eight to twelve whorls with elevated edges and concave surfaces form this shell: when full grown the last whorls have a ridge in the middle, as shown in the lower figure.

Occurs not rarely in the Limestone at Chilmark near Tisbury, Wiltshire. Presented by Miss Benett.

BUCCINUM acutum.

TAB. DLXVI.—*fig. 1.*

SPEC. CHAR. Ovate, elongated, pointed, smooth ;
 volutions convex ; aperture elongated, pointed
 above, nearly half as long as the shell.

SOMEWHAT resembling the following, but longer and
 more acute, besides being well distinguished by the sim-
 ple union of the whorls.

This figure is taken from a large individual obtained
 in Queen's County, Ireland, where the species occurs of
 various sizes in the Mountain Limestone.



BUCCINUM imbricatum.

TAB. DLXVI.—*fig. 2.*

SPEC. CHAR. Ovate pointed, obscurely striated ;
 whorls about six, their upper edges blunt, pro-
 duced and pressed against the spire ; aperture
 ovate, elongated, half the length of the shell.

A NEARLY smooth shell, that has nothing remarkable in
 its general appearance ; but the upper edge of each
 whorl is upon close examination found to embrace the
 preceding whorl in a peculiar manner.

BUCCINUM breve.

TAB. DLXVI.—*fig. 3.*

SPEC. CHAR. Nearly globose, tuberculated; upper edges of the whorls wavy.

EACH whorl upon the spire, which has only three, is furnished with one row of obtuse knobs; upon the last whorl are exposed three similar rows; the upper edges of the whorls are undulated as they pass over a row of knobs which they conceal; the aperture is nearly round with a short canal at its upper angle; the lower edge is not notched, but only a little bent back, consequently it approaches that of the genus Turbo.



BUCCINUM spinosum.

TAB. DLXVI.—*fig. 4.*

SPEC. CHAR. Conical, elongated with a produced base; a sharp furrow winds round each whorl, a row of large blunt spines is above it; a row of smaller spines surrounds the base.

WHEN perfect, this must have been a handsome shell: the specimens we have now before us are however so mutilated, that it is with doubt we place it among the Buccina.

The three species last described are from the Carboniferous Limestone (Mountain Limestone) of Bradley, near Newton Bushel, Devonshire, and are figured from specimens in the cabinet of H. T. De la Beche, Esq., who is at present engaged in preparing an account of the Torquay Limestones for the Geological Society.

VENUS ovalis.

TAB. DLXVII.—*figs. 1. & 2.*

SPEC. CHAR. Transversely oval, and finely striated, convex, thin; beaks not very prominent; lunette obscure, convex, smooth, elongated.

LENGTH little more than two-thirds the width; the regular oval form and fine concentric striæ distinguish this from every other Venus.

From Blackdown, collected by H. H. Goodhall, Esq.

Fig. 2. is probably a variety: it is so worn that it may have lost the striæ; it differs slightly in the position of the beak, which is further removed from the centre; it was found near Faversham in Kent.

Both specimens are siliceous.



VENUS Faba.

TAB. DLXVII.—*fig. 3.*

SPEC. CHAR. Transversely obovate, elongated, finely striated, convex, flattened in the middle; sides unequal; beaks very short.

MUCH resembling the last, but it is less convex towards the beaks and less pointed at the sides; the length is three-fourths of the width.

A siliceous fossil from Blackdown. Casts also occur at Parham Park and Shanklin Chine.

MEGALODON.

GEN. CHAR. An equal-valved, longitudinal bivalve, acuminate towards the beaks; hinge a long external ligament, a large bifid tooth placed upon a septum across the beak of the right valve, and one irregular and one pointed tooth similarly placed in the left valve; a small pit near the teeth for the reception of the anterior ligament.



A GENUS nearly related to *Mytilus*, but distinguished by the large teeth of the hinge and weight of the shell. It also resembles *Myoconcha*; but the situation of the only muscular impression the specimens expose to view indicates its place in a natural arrangement nearer to *Mytilus*.

MEGALODON cucullatus.

TAB. DLXVIII.

SPEC. CHAR.



A SMOOTH, ovato-lanceolate, thick shell with pointed incurved beaks, the surface is uniformly convex. We have not seen a perfect specimen, so cannot describe the position of the posterior muscle or tendon; for the reception of the anterior one, there is a sharply excavated pit close to the thick plate that supports the hinge teeth.

For the knowledge of this remarkable shell we are indebted to our friend H. T. De la Beche, Esq., who obtained the specimens from the limestone of Bradley, near Newton Bushel, Devonshire. The decomposed state of the stone has much facilitated the development of the hinge. The shells accompanying this are *Cardium alæforme*, *Terebratulæ*, *Spiriferæ*, *Buccina*, *Turritellæ*, &c.,—a list of which will be laid before the Geological Society by Mr. De la Beche.

AMMONITES *complanatus*.TAB. DLXIX.—*fig. 1.*

SPEC. CHAR. “Flat, volutions wholly inserted, the inner half marked with numerous indistinct transverse undulating striæ, the outer portion plicated; umbilicus very small, almost concealed; carene slightly convex, its margins crenated by the angular terminations of the plicæ; aperture sagittate.”



“THE longest diameter is about 8 inches, greatest thickness 1·8 inch, width of the outer volution 5 inches.

“The volutions are thickest near the middle, and gradually contract into a narrow keel, which at the aperture does not exceed 4-tenths of an inch in width, and has an elevation or ridge down the centre. . . . The septa are numerous, and very foliaceous.

“Locality, Hamsey.”

With Mr. Mantell’s kind permission we have figured the specimen from which the above description, copied from his *Geology of Sussex*, pages 118 and 119, was taken. We know of no other example of the species: it is twice the diameter of the figure. The plicæ do not occur upon the outer volution.

AMMONITES undatus.

TAB. DLXIX.—*fig. 2.*

SPEC. CHAR. Discoid, smooth, with a rounded edge; whorls flat on their sides, their inner edges square; inner whorls partly visible; aperture much elongated, sagittate, with obtuse angles; edge crossed by undulations which proceed a short way over the sides.

A VERY flat Ammonite, distinguished from all others by the undulations over the edge and square inner margins of the whorls.

This rare specimen was presented to my father in 1820, by G. A. Mantell, Esq., who obtained it from the Upper Chalk of Sussex.



AMMONITES Bakeriæ.

TAB. DLXX.—*figs. 1. & 2.*

SPEC. CHAR. Depressed, radiated; inner whorls exposed; radii curved, furcate, continued over the front; whorls crossed by about ten sinuous lines; aperture oblong.

THE peculiarity of this Ammonite consists in the sinuous lines that mark its surface, and probably indicate successive periods when the edge of the aperture was completed and the growth for a while suspended, although

they are mere lines ; thus leading to those Ammonites which have deep furrows in several parts of their whorls, and which have been elevated into another genus. The radii form rings that are split just before they pass over the front. Upon the inner laminæ of the shell these rings are interrupted where they pass over the siphuncle, but on the outer surface they are continuous.

The specimen represented at fig. 1. is a portion of an indurated Marl Nodule found amongst Alluvium in the parish of Braunston in Northamptonshire, by Miss Baker, whose zeal in collecting the natural productions of the district, to assist her brother in a general history, has induced me to commemorate her name.

Fig. 2. represents a cast in Pyrites.



AMMONITES lævigatus.

TAB. DLXX.—fig. 3.

SPEC. CHAR. Depressed, smooth ; inner whorls exposed ; aperture transversely oblong ; the edge of the aperture thickened, produced in the front.

THE convex smooth whorls of this shell are so like the innermost ones of some large Ammonites, that I suspect it to be very young, probably the first period of its growth only has been completed. It therefore serves to introduce us to the two following species, as well as to *Ellipsolites funatus* (tab. 32.), and Montfort's genus *Planulites*.

Drawn from a specimen in the collection of H. T. De la Beche, Esq., who found it in the Lyas near Lyme-Regis.

AMMONITES *Rotula*.TAB. DLXX.—*fig. 4.*

SPEC. CHAR. Gibbose, smooth, umbilicated; each whorl contracted by six or seven varices; inner whorls partly exposed; front rounded, crossed by many small furrows; aperture orbicular. Whorls very few.

IN this species of Montfort's genus *Planulites* the contractions of the whorls are very conspicuous. Their number is various; some specimens having seven or even eight in each whorl: they are perfectly independent of the septa.

Casts in Pyrites collected at Speeton on the coast of Yorkshire.

AMMONITES *planulatus*.TAB. DLXX.—*fig. 5.*

SPEC. CHAR. Depressed; whorls flat on their sides, contracted by four or five varices; inner whorls two-thirds exposed; front crossed by many broad furrows; aperture oblong oval.

HALF of each whorl is plain, the remaining part marked with numerous broad furrows that pass over the rounded front; the inner edges of the whorls are obtuse, the exposed portion of the inner whorls is flat.

A single specimen found in the Marl at Hamsey, near Lewes, is in the collection of Mr. Mantell, who has kindly permitted it to be engraved.

NAUTILUS *sulcatus*.TAB. DLXXI.—*figs. 1. & 2.*

SPEC. CHAR. Discoid, minutely striated; whorls almost wholly exposed, ventricose, with two large furrows on each side and several small ones; front concave.



ONE of the remarkable furrows that modify the form of the whorls of this shell is concealed in the inner turns; the concave front is bounded by sharp edges; there is also a sharp elevation between the two furrows: the rest of the side is gibbose, with two or three very shallow broad furrows upon its most elevated part. The aperture is half as long again as it is wide, its sides of course indented: the siphuncle is placed just opposite to the inner indentation; the septa are numerous, with even edges.

Occurs in the Mountain Limestone. We have met with two or three specimens in the late Mr. G. Humphreys's collection, labelled by him as having been found at Castleton.

Fig. 1. shows a cast of the inside. Fig. 2. the external surface of the shell.

NAUTILUS Woodwardii.

TAB. DLXXI.—*fig. 3.*

SPEC. CHAR. Discoid, granulated; inner whorls exposed; sides of the whorls angular; front rounded with a linear sulcus along its middle: aperture obovate with angular sides.

SYN. Conch. Naut. Ammonites Woodwardii, *Martin Pet. Derby. t. 35. f. 4. & 5.*



THE granulations upon this fossil are arranged in concentric lines; they cover the whole surface: the substance of the shell is very thin where the furrow occurs upon the front, for that on the outer whorls is met by a sharp carina in the cast, which is otherwise smooth.

Although from its similarity in form to the preceding species this is placed as a Nautilus, it is highly probable that it belongs to the genus Bellerophon; for although I have removed a considerable portion of the shell, no traces of septa can be discovered: the furrow on the front is also in favour of this opinion.

Drawn from Mr. Martin's specimen, which was found at Winster, Derbyshire.

CORBULA elegans.

TAB. DLXXII.—*fig. 1.*

SPEC. CHAR. Subglobose, concentrically sulcated ; posterior side produced, smooth, truncated ; left valve subtriangular, smooth.

OF this neat little Corbula one valve is gibbose, sharply sulcated, and has a smooth rather curved beak ; the other is flatter, angular, and smooth without a beak. It much resembles *Corbula gigantea* (tab. 209.) in miniature.

Very abundant in the Whetstone Pits at Blackdown.



CORBULA striatula.

TAB. DLXXII.—*figs. 2. & 3.*

SPEC. CHAR. Ventricose, obovate, beaked, minutely striated ; valves nearly equal ; beak long, straight, channeled within.

A LARGER species than the last, with more equal valves and distinct two-channeled beak.

Very abundant in the ferruginous beds belonging to the Lower Greensand at Pulborough in Sussex. W. P. Martin, Esq. communicated the specimens. The shell has entirely disappeared, but the casts of both surfaces remain very neat ;—see fig. 3.

CORBULA rotundata.

TAB. DLXXII.—*fig. 4.*

SPEC. CHAR. Obovate with produced beaks, gibbose, concentrically sulcated; sides nearly equal, the posterior slightly truncated.

THE lesser valve of this is probably smooth, but the specimen is too much worn to be depended upon.

Found in the Crag of Suffolk. The specimens figured are from Holywells, presented by the late Mrs. Cobbould.



CORBULA obscura.

TAB. DLXXII.—*fig. 5.*

SPEC. CHAR. Obovate, gibbose, smooth; posterior side flattened, so as to form an angle upon the surface.

SYN. *Corbula* (*new species*). *Trans. Geol. Soc.* 2d series, vol. ii. p. 320.

A SMALL shell much resembling *Corbula Pisum*, but smaller and flatter.

An abundance of this species of shell, which appears to be a *Corbula*, is firmly imbedded in the sandy stone above the coal in the district of Brora, and has been preserved by R. J. Murchison, Esq., Sec. G.S.

PETRICOLA. *Lamarck.*

GEN. CHAR. An unequal-sided, equal-valved, transverse bivalve; the anterior side smallest, rounded, the posterior produced, rather gaping; teeth of the hinge three or four, small, curved; no lateral teeth; a large sinus in the mark of the attachment of the mantle; ligament external, short.

UNDER the generic name *Petricola* are arranged some of the shells belonging to animals that have the power of forming hollows in calcareous rocks, not by a rotatory motion as the *Pholas* does, but by some solvent power that enables them to make holes that nearly fit the shells. Dirt and foreign substances that are not calcareous often make way into these holes; and as they cannot easily be removed, they interfere with the growth of the shells, which are consequently often distorted*.

The species are almost as variable in their external forms as in the number and form of their teeth; some are nearly smooth, others striated and even rough like *Pholades*, some depressed, others gibbose; they are mostly white, but one or two are coloured. They are all tender shells.

* *Lithodomi* and some other boring shells belong to animals possessed of the same power, and which at the same time line a portion of the hole with a calcareous deposit. The animals of many spiral shells operate in a similar way upon their own shells, removing parts of their surface or spines to lighten them or make room for their further growth. In these cases, does the animal secrete two kinds of fluid, or, which seems more probable, is it endowed with the faculty of changing the electric state of the same fluid, so as to make it dissolve or deposit the lime at different seasons or as occasion may require?

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PETRICOLA laminosa.

TAB. DLXXIII.

SPEC. CHAR. Ovate, gibbose, ornamented with erect concentric laminae ; posterior side subcuneiform ; one broad bifid tooth in the left valve, two small teeth in the other.



THIS is the largest species of Petricola known ; the laminae upon its surface are entire, rather thick, and tolerably close set ; they distinguish it from every other.

Found by the Rev. G. R. Leathes in the Suffolk Crag ; who has kindly allowed us the use of the only specimens he has.

Fig. 1. represents two views of the left valve of a regularly grown shell : **Fig. 2.** the same valve from a distorted individual : **Fig. 3.** the inside of the right valve, also a distorted shell.

PECTEN dentatus.

TAB. DLXXIV.—*fig.* 1.

SPEC. CHAR. Nearly orbicular, convex, minutely striated concentrically, ribbed; ribs about twenty close, large, angular, obtuse; ears defined, small; margin deeply toothed; valves similar.



THE peculiar characters of this Pecten are, the sharp projection of the edge between each rib and the flat inclined sides of each rib.

Several specimens of this fossil are in the collection of Miss Baker, who found them in transported fragments of limestone, in what are there called gravel-pits, at Bugbrook and Staverton, in Northamptonshire. It also occurs in the valley of Catmus in Rutlandshire. The figure is taken from a specimen which has both valves, but wants the ears; they are supplied from another, in other respects inferior, individual.

PECTEN granosus

TAB. DLXXIV.—*fig. 2.*

SPEC. CHAR. Nearly orbicular, oblique, convex; surface marked with about thirty granulated rays, and as many nearly smooth ones, alternating with them; ears undefined, unequal, extending nearly the width of the valve.

RATHER wider than long; the ears, although they form a long hinge line, are narrow and small; the alternately large and small rays are very regular.

Found in the Black Limestone in Queen's County, Ireland.



PECTEN plicatus.

TAB. DLXXIV.—*fig. 3.*

SPEC. CHAR. Nearly orbicular, oblique, convex, with numerous irregular, elevated, smooth striæ; ears undefined, unequal, extending the whole width of the shell.

NEARLY like *Pecten papyraceus* (tab. 354); but it has smaller ears, a less number of striæ, and is more convex.

From Black Limestone with the last.

In this limestone several *Pecten*s occur nearly resembling this: but it is difficult from such specimens as are to be obtained, to determine whether they be different or not; we shall not at present attempt it.

PECTEN duplicatus.

TAB. DLXXV.—*figs. 1. 2. & 3.*

SPEC. CHAR. Orbicular, depressed, radiated; one valve nearly smooth, the other very rough and ornamented with many distant, thin, round ribs, which become more numerous towards the margin; ears defined, small.

ONE of the valves has the surface covered with minute sharp scales; the other is smooth and almost free from ribs, being only undulated in their places: this is the most convex, the inside of both valves is nearly plain. Near the beak the ribs are about ten; but at the margin there are forty, in consequence of the interposition of new ones as the shell increases in size.

First found 200 feet from the surface in a well dug in London Clay on the top of the hill in Richmond Park. See *fig. 3.* In Hyde Park it has been found whenever the Clay has been exposed. The specimen delineated at *figs. 1. and 2.* was kindly given me by Mr. Marshal, who collected several last year.

 PECTEN carinatus.
TAB. DLXXV.—*fig. 4.*

SPEC. CHAR. Orbicular, rather elongated, convex, smooth, ribbed; ribs about seventeen, distant, rounded, with a sharp keel along the middle of each; ears defined, rather large; internally sulcated.

BETWEEN each of the broad carinated ribs is an equally broad flat smooth space, along whose middle there generally runs a sharp line: the ears are square and ample; the valves are equally convex.

Found in Barton Cliff, and also in other parts of Hampshire.

PECTEN reconditus.

TAB. DLXXV.—*figs. 5. & 6.*

SPEC. CHAR. Orbicular, oblique, with above twenty rounded rays, the intermediate spaces not longitudinally striated; the whole surface covered by concentric lines of sharp scales; valves unequally convex, sulcated within; ears defined, nearly equal.

SYN. *Ostrea recondita?* *Brander, fig. 107.*

VERY nearly resembling *Pecten sulcatus* (tab. 393. fig. 1.), but there is something, not easily described, in its general aspect, that has caused it to be separated by several acute observers. The most obvious mark of distinction is the want of longitudinal striæ between the rays; each ray at a little distance from the beaks is furnished with three rows of scales, while the spaces between the rays have only one large scale: the valves only differ in convexity, together they are more convex than those of *P. sulcatus*, and more unequal.

Common in Crag on various parts of Norfolk and Suffolk; it is also sometimes found at Stubbington and Barton, where *P. sulcatus* also occurs, but generally small.

Brander's fig. 107. is evidently taken from a damaged specimen. We quote it with doubt, because it is of a longer form.

We have reason to suspect that *P. sulcatus* of M. C. is *P. plebeius* of Lamarck; it is certainly *P. plebeius* of Brocchi, who quotes Lamarck, but it does not agree with Lamarck's description, neither have we met with specimens from the neighbourhood of Paris that are nearly equal to it in size.

TEREBRATULA porrecta.

TAB. DLXXVI.—*fig.* 1.

SPEC. CHAR. Nearly square, with rounded angles, convex, smooth; beak of the larger valve very much produced, pointed, slightly curved, the area within it large; margin sharp.



Most specimens have the beak of the larger valve almost straight: it is perforated, but the perforation is elongated and placed within the sharp apex, and pointing towards the sinus in the area, which it nearly meets: the largest specimen is wider than long; the others vary, but in general are longer than wide, with an obtuse angular front.

From the Carboniferous Limestone of Bradley, described in a paper now in course of reading before the Geological Society, from H. T. De la Beche, Esq. It was accompanied by several uncommon shells. See tab. 566. p. 128.

TEREBRATULA variabilis.

TAB. DLXXVI.—*figs. 2—5.*

SPEC. CHAR. Orbicular or oblong, very convex, smooth; the beak of the larger valve produced, truncated, with a round perforation.



ALWAYS very convex, but varying in shape from oblong oval to orbicular: the beak is large, straight, and truncated deeply; the area within it is convex, with a large sinus.

A very abundant fossil in the Crag; but the valves are never found joined, and are always much worn.

Figs. 2. and 4. are from specimens collected by our zealous geological friend Mrs. Murchison.

SCALARIA frondosa.

TAB. DLXXVII.—*fig. 1.*

SPEC. CHAR. Conical, elongated, costated, smooth; costæ membranous, recurved, their upper parts produced into concave spines; volutions distinct, but close, about seven.

A VERY distinct and extremely beautiful shell. The very thin costæ are very uniform; there are about twelve upon each whorl: it is rather a shorter shell than the *S. acuta*.

The unique specimen figured is from Crag. It graces the splendid collection of the Rev. G. R. Leathes.

SCALARIA acuta.

TAB. DLXXVII.—*fig. 2.* and TAB. XVI.

Var. *mutica*: costæ thick, sharp-edged, reflected, unequal, not produced above into a spine.

ABOUT an inch long and four-tenths wide. The volutions are ventricose, with about sixteen costæ upon each.

Collected in the London Clay in Alum Bay, Isle of Wight, by G. E. Smith, Esq.—It was not until the plate was finished that I discovered this to be only a variety.

SCALARIA interrupta.

TAB. DLXXVII.—*fig. 3.*

SPEC. CHAR. Subulate? transversely striated, costated, with one large varix upon each whorl; costæ numerous, obtuse, slightly elevated, united at both ends by transverse ridges; whorls united, convex.

THE most remarkable character in this *Scalaria* is the union of all the ribs together by two transverse ridges, forming the exact resemblance to a spirally curved rope ladder.

The only specimen we have seen of this consists of about two whorls: it is preserved by H. J. Goodhall, Esq., who brought it from Barton Cliff.

SCALARIA undosa.

TAB. DLXXVII.—*fig. 4.*

SPEC. CHAR. Subulate, transversely striated, costated; costæ numerous, slightly elevated, crossed by the striæ, terminating in a band that covers the base; volutions united, convex.

COSTÆ about twenty-four upon each whorl, waved, broad, and very slightly raised; the base is nearly smooth, being only marked lightly by lines continuing from the costæ.

An imperfect specimen from Barton is in Mr. Goodhall's collection.

SCALARIA reticulata.

TAB. DLXXVII.—*fig. 5.*

SPEC. CHAR. Subulate, short; surface reticulated; whorls united; columella hollow; base smooth.

SYN. Turbo reticulatus. *Brander, fig. 27.*

EIGHT whorls compose this shell, which is only about half an inch long; nine or ten prominent transverse striæ cross numerous not more prominent ribs, forming a network that covers the convex whorls, and is bounded by a nearly smooth band extended over the base.

Presented many years ago by Miss Bemister: found at Barton. Miss Teed has in her cabinet a broken individual above an inch long.

SCALARIA semicostata.

TAB. DLXXVII.—*fig. 6.*

THIS figure is from a nearly full-grown individual, such as are not uncommon at Barton. A small one only has been represented in the middle of tab. 16. In the vicinity of Paris a *Scalaria* is found still longer, with more numerous costæ and less distinct striæ, but apparently the same species; I have received it as *S. plicata* from Mons. Deshayes.

MUREX *Smithii*.TAB. DLXXVIII.—*fig. 1. 2. & 3.*

SPEC. CHAR. Pyriform, transversely striated, furnished with three rows of short tubercles, those of the upper row largest, pointed; beak elongated, straight; upper parts of the whorls flattened.

Var. β. spire produced: *fig. 3.*



THE spire being very short, the last whorl very large, and the beak much produced, give the pear-like form to this shell: two rows of the tubercles are wholly concealed within the last whorl. When the shell is removed from the stone, the cast of the spire appears longer, and in *var. β.* it is so much produced as to show the middle row of tubercles.

The beautiful specimen represented at *figs. 1. and 2.* is nearly covered by a Flustra: it was collected in Alum Bay, Isle of Wight, by Gerrard E. Smith, Esq., whose zeal we wish to commemorate by naming it after him. The variety *fig. 3.* is a cast found at Maida Hill, Paddington: it is in the collection of G. A. Mantell, Esq., who also possesses a cast of the first variety imbedded in part of a Septarium from Bognor. It seems to be a rare London Clay shell, as we know of no other specimens.

MUREX tuberosus.

TAB. DLXXXVIII.—*fig. 4.*

SPEC. CHAR. Ovate, pointed, transversely striated; one row of blunt tubercles upon the upper part of each whorl; whorls squarish; spire as long as the last whorl; beak produced.

A GENERAL bluntness in the outline of this shell gives it some resemblance to a tuberoso root. The length of the aperture is about equal to the diameter of the last whorl, which is something greater than the length of the spire.

Casts in compact oolitic limestone, with small portions of the shell replaced by calcareous spar, are not unfrequent in the Pisolite at Malton. We have never met with a specimen sufficiently perfect to determine the form of the beak by, or even to ascertain for certain the true genus to which to refer the species.

MUREX Harpula.

TAB. DLXXXVIII.—*fig. 5.*

SPEC. CHAR. Obovate, squarish, pointed at both ends, decorated with numerous longitudinal ribs; spire very short, aperture nearly orbicular; beak straight.

CLOSE, thin, oblique ribs, squarish whorls, broadest towards the base, and a small spire, are the prominent features of this pretty Murex. The ribs are extended quite over the base, where their number is increased by the irregular insertion of shorter ones. The specimen is very imperfect, the aperture particularly being incomplete.

Taken out of the Carboniferous Limestone of Bradley, and now in the cabinet of H. T. De la Beche, Esq.

AMMONITES falcatus.

TAB. DLXXIX.—*fig. 1.*

SPEC. CHAR. Discoid, subumbilicate, radiated; whorls crenated and flat at both edges, the inner ones almost concealed; radii falciform, bent in the middle; aperture sagittate with truncated angles.

SYN. A. falcatus. *Mantell Geol. Suss. p. 17. tab. 21. f. 6. & 12.*



“THIS rare and elegant species is almost flat, the longest diameter exceeding its greatest thickness nearly four-fifths. The volutions are slightly enlarged in the centre, but are contracted at the ambit with delicate plicated edges. The radii are very slender at their origin in the umbilicus, but gradually increase in breadth; and passing obliquely to the centre of the volutions, make a sudden curve towards the margin, where they terminate in obtuse folds.” The front is very narrow and flat; the cast of it shows a furrow along the middle in which the siphuncle was placed.

I am indebted to Mr. Mantell for permission to figure his best specimen, which was found at Middleham in Gray Chalk Marl.

AMMONITES *curvatus*.TAB. DLXXIX.—*fig. 2.*

SPEC. CHAR. Discoid, subumbilicate, radiated; inner whorls almost concealed; radii falcate, near equal over half the whorl, then bent, and alternately broad and narrow; the broad ones furnished with two tubercles each near the front, the narrow ones gradually lost towards the front; front flat, narrow; umbilicus large, with a row of flattened tubercles around it; aperture obtusely sagittate.

SYN. *A. curvatus*. *Mantell Geol. Suss. p. 118. tab. 21. f. 18.*

“THIS Ammonite is nearly allied to the preceding, but is evidently a distinct species. In *A. falcatus* the curvatures are more numerous than the oblique radii; but in the present species the proportions are reversed, two or three radii uniting to form one curved rib. The terminations of the ribs in the latter are tubercular, and separated from each other by a sulcus; in the former they are gently curved, and appear as if folded or plaited over each other. The umbilicus is rather deeper than in *A. falcatus*, and has a marginal row of oblique tubercular projections, from each of which two or three radii proceed.

“Locality, Hamsey.”

We are favoured with this along with the last: it appears to be unique. In both descriptions parts of Mr. Mantell's are copied, as they appeared so appropriate. The furrow in the front mentioned by him is the situation of the siphuncle, and of course would be covered by the shell.

CORBIS. *Cuvier.*

GEN. CHAR. A free, transverse, equal-valved, bivalve, with incurved umbones; two lateral and two hinge teeth in each valve, one of the lateral teeth near the hinge, the other remote; attachment of the mantle upon a curved, not sinuated line.

“ALL the species of this genus that have hitherto come under observation are transverse shells (that is, they are longer in a direction transverse to the position of their hinge-teeth): in common with many other bivalves, the umbones are curved inwards, in opposite directions in the two valves; there are two cardinal and two lateral teeth in each valve; that which is on the opposite side of the hinge to the ligament, is much nearer to the cardinal teeth than the other, which is rather remote, but placed near the termination of the ligament. This is external; but the parts to which it is attached form a deep groove when the two valves are closed; when also, a rather oblong cordiform impression immediately behind the umbones may be observed.

“This Genus was established by Cuvier, and is adopted by Lamarck. It is related to *Lucina*, but may be distinguished from that genus by its muscular impressions, which are simple and rather oblong, but neither of them produced into an elongated tongue shape; it approaches also to *Tellina*, but, wanting the fold of the anterior (posterior) margin of that genus, it will not be confounded with it. Not many species of this genus are yet known; the only recent one with which we are acquainted is a very beautiful, transversely oval, rather gibbous shell, with longitudinal striæ and undulated transverse furrows, and its interior margin is crenulated; it is the *Venus fimbriata* of Linné, the *Corbis fimbriata* of Cuvier, and according to Lamarck an inhabitant of the Indian

Ocean. Two fossil species are described by Lamarck, both of which are found in the more recent formation above the Chalk; one at Grignon, and the other at Granville. Neither of them are so gibbous as the recent one. Several others are now known.

“Whether the shells of this genus be covered with an epidermis in their natural state or not, we have no means of ascertaining; there is, however, some reason for believing this to be the case.”

The above description is taken from my brother’s “Genera of Recent and Fossil Shells,” No. 2. I have only to add, that the hinge teeth are unequal, that the anterior side is largest, and that the recent species is nearly colourless.

CORBIS lævis.

TAB. DLXXX.

SPEC. CHAR. Transversely oval, elongated, rather gibbose, smooth except a small portion of the posterior extremity which is transversely undulated or rather imbricated; margin entire.

IN the general form of the valves and the disposition of the muscular impressions, this agrees well with the genus *Corbis*: the hinge is somewhat different, but as one of the remote teeth is worn away, and the whole cannot be relieved from the stone, we will not venture to say that it is sufficiently different to characterize a new genus.

Collected many years ago by G. E. Smith, Esq., from the Sandy Limestone at Marsham Field, near Oxford. A second specimen has not been found.

PHOLAS priscus.

TAB. DLXXXI.

SPEC. CHAR. Oblong oval, finely striated; striæ smooth, transverse; anterior extremity rounded very short, with a deep angular sinus in its edge, becoming closed by shell when old; posterior extremity truncated; beaks covered by an accessory valve; a series of scales form a longitudinal band nearly in the middle of each valve.



A SMALL species, very similar to *P. clavata* of Lamarck and others, that dwell in holes they form in wood. The anterior side is very small; its edges near the beaks are reflected and covered by a heart-shaped valve. In the young state of the animal the sinuses in the valves form a rhomboidal opening, which in the adult is closed by a smooth continuation of the shell.

For the discovery of this highly interesting Fossil we are indebted to H. H. Goodhall, Esq. Wood penetrated

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by *Teredines* had long been known in a fossil state; but the genus *Pholas* was unknown, except in Crag, until Mr. Goodhall was so fortunate as to pick up the specimen here figured, behind Lord Darnley's park. It is a siliceous mass, from the uppermost stratum of Limestone near Sandgate. Exposure to the weather has laid open the shells to view in their natural situations in the fossil wood, part of which, being impregnated with siliceous matter, is preserved around the stony matter that has filled their cells. The mass also contains numerous single valves of a small *Avicula*.

INOCERAMUS *latus*.TAB. DLXXXII.—*fig. 1.*

SPEC. CHAR. Ovato-rhomboidal, depressed, concentrically undulated; valves equal; anterior side* concave; posterior side broad, expanded towards the very oblique hinge line; beaks small, short.

SYN. *Inoceramus latus.* *Mantell, Geol. Suss. 216. t. 27. f. 10.*



A LARGE flat species, almost uniformly covered with large, slightly elevated, angularly bent undulations or ridges, and sharp striæ. The part upon which the hinge line is placed does not form a lobe, but is an almost smooth projection, that completes the rhomboidal form of the margin. The regularity and obliquity of the undulations distinguish this from *I. Cuvieri*, which is either plain, or has a few large irregular waves upon its surface.

At the time *Inoceramus Cuvieri* was published in "Mineral Conchology," I did not possess characteristic specimens of the *I. latus*. Such have been supplied by C. B. Rose, Esq. from the Upper Chalk near Swaffham, Norfolk. In size it equals *I. Cuvieri*, acquiring eighteen inches or more in length. The front is often suddenly deflected.

* In the descriptions of the species of *Inoceramus* formerly given, this is called the *posterior* side; whereas the side upon which the ligament of the hinge is placed is the posterior.

INOCERAMUS striatus.

TAB. DLXXXII.—fig. 2.

SPEC. CHAR. Subglobose, even, concentrically striated, the striæ accompanied by shallow furrows; anterior side concave, smooth.

SYN. *Inoceramus striatus*. *Mantell, Geol. Suss.* 217. t. 27. f. 5.

THIS rare species has not been found sufficiently perfect to exhibit all its characters. Its valves, however, appear to be equal, and the beaks very short and blunt. Its form readily distinguishes it from *I. mytilloides*, which it accompanies in Sussex and Wiltshire. The specimen figured is from Heytesbury. I am indebted to the intelligent author of the "Geology of Sussex" for it.

INOCERAMUS involutus.

TAB. DLXXXIII.

SPEC. CHAR. Subglobose; valves very unequal; one gibbose, even, with a large incurved beak and very hollow sides, the other nearly flat, with deep concentric waves; its margin very thick, deflected; hinge line upon an elevated narrow lobe.

WHEN once this species has been observed, even fragments are readily recognized,—especially of the larger valve, by the smoothness of its surface and convex form; or of the smaller valve, by the strength of the undulations, their circular disposition, and the long narrow lobe of the hinge, that looks as if the margin were rolled over. The flatter valve offers the greatest variation of

thickness I have observed in any shell within the same extent of surface; some parts near the edge being almost half an inch thick, while others near the beaks (only three or four inches distant) are as thin as card-paper.

For several fine illustrative specimens of this species, mostly too large to figure even in a quarto plate, I am indebted to C. B. Rose, Esq.: they are from the Upper Chalk of Swaffham and West Lexham, Norfolk. Fig. 1. is taken from a pair of shells, filled with flint, that was bought at Mr. Parkinson's sale. Fig. 2. is from a portion of the flatter valve picked out of a Chalk-pit at Bury St. Edmonds by the Rev. J. Holme, M.A. F.L.S.

The inequality of the valves of this shell, which cannot be separated from *Inoceramus*, proves the impropriety of forming two genera.

While the above was in the press, I received the specimen represented at fig. 3. from the Rev. G. R. Leathes. It came from the Bury Chalk.

INOCERAMUS *gryphæoides*.

TAB. DLXXXIV.—*fig. 1.*

SPEC. CHAR. Ovate, ventricose, concentrically undulated; valves unequal, the smallest gibbose; beaks incurved, pointed, approximated.

So nearly does this resemble *I. concentricus*, that, except size and the close beaks, we can see no marked difference; yet few persons would be induced to consider them the same species.

From the Green Sandstone west of Lyme Regis, in Dorsetshire. Large pearly fragments also occur in Blue Marle at Ringmer in Sussex, which are probably the same species. It is too gibbose for either *I. tenuis* or *I. Cripsii*,—our specimens of which are not perfect enough to describe.

INOCERAMUS *vetustus*.TAB. DLXXXIV.—*fig. 2.*

SPEC. CHAR. Ovate, convex, smooth, regularly undulated; valves nearly equal; beaks short, pointed, curved; a concave space in the anterior side resembling a large lunette; hinge line short.

VERY regularly arched and gradually rising undulations of a smooth surface distinguish this from *I. Brongniarti*, independently of the difference in the anterior side. I have not seen the hinge, but the line to which it is attached is short; the front is very round.

Occurs in the Mountain Limestone at Castleton in Derbyshire, and near Settle in Yorkshire.

INOCERAMUS *dubius*.TAB. DLXXXIV.—*fig. 3.*

SPEC. CHAR. Ovate pointed, concentrically striated and indistinctly waved; valves unequal, both convex; beaks short, pointed.

STRONGLY resembling *I. concentricus*. The convexity of the valves is variable; one valve is sometimes flat: it is then more strongly marked by the striæ formed of the edges of the laminæ, so characteristic of shells of the genus *Inoceramus*. I have not seen the hinge.

A mass of indurated Alum Shale, containing brilliant casts in Pyrites of this shell and a portion of *Ammonites elegans?* was collected by that indefatigable geologist, R. I. Murchison, Esq. on the Whitby coast in 1826. A portion of it is the subject of this figure.

PECTEN *grandis*.

TAB. DLXXXV.

SPEC. CHAR. Suborbicular, wider than long, concentrically striated, furnished with thirteen much elevated, rounded, more or less compound rays, each of which has generally a sulcus along its middle, and between each is a single secondary ray; one valve rather convex, towards the beak concave, the other very convex; ears nearly equal, square.



A LARGE Pecten, in general shape resembling *P. maximus*, but differing in the form and structure of the rays. The concentric striæ, as in *P. maximus*, are very irregular, and but little elevated upon the convex valve, while upon the other they are very regular, close, and raised into sharp laminae: the rays upon the convex valve especially are more elevated and deeply divided or sulcated, approaching to the form of those of *P. Jacobæus*, but differing from them in being much smoother and rounder.

The Rev. G. R. Leathes, to whose liberality I am indebted for a series of specimens of this species, has "selected the trivial name *grandis* for it;—not but that there are several fossil species found much larger, but as approximating to *maximus*, given to our common Escallop."

Occurs at Ramsholt in a native bed, and Newbourn, and in various other parts of the Suffolk Crag.

PECTEN complanatus.

TAB. DLXXXVI.

SPEC. CHAR. Suborbicular, wider than long, ornamented with thirteen broad flat elevated rays, concentrically striated ; one valve nearly flat, concave near the beak ; ears equal, square.



SIMILAR in size and shape to *P. maximus*, but distinct, the rays being flat, with nearly perpendicular sides; the two lateral rays are blended with many striæ upon the sides of the valve. The two valves have not, that I know of, been discovered in contact: we are therefore unacquainted with its particular characters; the flatter one is less convex than that of either *P. grandis* or *P. maximus*.

Our intelligent friend Mrs. Murchison has obtained several valves of this species from the Crag at Aldborough, and near Ipswich. It is also in the cabinet of the Rev. Mr. Leathes; but it is by no means so common as the *grandis*.

Besides the two species just described, there are found in the Crag, *P. maximus* and *P. Jacobæus*: but I have only seen fragments; and these are so identical with the recent species, that there is hardly any necessity for figuring them.

AMMONITES *Woollgari*.TAB. DLXXXVII.—*fig. 1.*

SPEC. CHAR. Compressed, carinated, radiated; whorls three or four, the inner ones partly concealed; radii distant, upon the inner whorls curved and prominent, each furnished with three tubercles, the outer of which is flat and small, as the whorls increase the middle row of tubercles expands so as nearly to occupy the whole ribs and form large blunt spines; keel deeply serrated.

SYN. A. *Woollgari*. *Mantell, Geol. of Suss. p. 197. tab. 21. f. 16. & tab. 22. f. 7.*

THE central whorls of this fossil, separated and compared with the external one, would never be thought the same species; they are compressed, and crossed by prominent curved rays, while the outer one is ventricose and furnished with about ten large conical spines on each side, placed opposite to each other, with one tooth of the carina in the middle of each pair: in the smaller whorls each ray has a flattened tubercle placed near and parallel to the keel; within this is another smaller tubercle, which as the whorls proceed is greatly enlarged and blended with a third tubercle, that seems gradually to recede from the inner edge of the whorl until it is lost; the flat tubercle still remains more or less distinct.

A handsome and scarce shell, peculiar to the Lower Chalk near Lewes in Sussex.

The figure is from the same adult specimen of which Mr. Mantell has given a diminished representation in his very complete work. I beg to acknowledge his kindness in allowing me free use of it, as well as of many other rare specimens.

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AMMONITES tetrammata.

TAB. DLXXXVII.—*fig. 2.*

SPEC. CHAR. Discoid, carinated, tuberculated; volutions about four, convex, crossed by many obscure rays, upon each of which are four tubercles, each alternate ray has a branch with two tubercles; outer tubercles compressed; keel entire, sharp.



THIS Ammonite, as far as we at present know, varies but little in its different stages of growth. It bears a great resemblance to some of the forms of *A. varians* (t. 176.), but is a larger shell; and the four rows, instead of three, of tubercles distinguish it.

We received a specimen of this many years ago from our kind friend G. A. Mantell, Esq. It is rather less than the one figured, which is in the cabinet of H. H. Goodhall, Esq., who found it at Hamsey*, and pointed it out as a new species. The specimen sent by Mr. Mantell was obtained in the same parish.

* From a pit in the road from Lewes towards Ditchling.

ORTHOCERA fusiformis.

TAB. DLXXXVIII.—*figs. 1. & 2.*

SPEC. CHAR. Fusiform.

A MIDDLING-SIZED Orthocera : it is smooth, round, and rather rapidly tapering towards both ends, the open end truncated; the siphon nearly central; the last chamber is large, commencing at the widest part.

Occurs in the Black Limestone of Ireland, particularly in Queen's County, where it is, in common with other fossils, often variously curved (See a portion at fig. 2.) by some change the rock has undergone subsequently to its being deposited. The last chamber is rarely found. The specimen figured (fig. 1.) enriches the collection of W. Gilbertson, Esq., who obtained it near Preston in Lancashire, from a Limestone corresponding in its contents very closely with that of Ireland. A great portion of the last chamber has been filled with loose earthy matter that settled to one side, and being easily removed, has left the last septum with the opening into the siphon very distinct: a few minute crystals of quartz are scattered over the surface.

ORTHOCERA cincta.

TAB. DLXXXVIII.—*fig. 3.*

SPEC. CHAR. Nearly cylindrical, surface ornamented with numerous sharp annular striæ; siphon central.



IN this species the septa are rather more concave than is usual, and also distant. The transversely striated surface is what it is best distinguished by, and seems to indicate a shell formed outside the animal.

I have seen but one specimen; it was lent me by Dr. A. Moore, who obtained it near Preston.

BELEMNITES. *Auct.*

GEN. CHAR. An elongated, straight, ponderous, univalved, shell; cavity much shorter than the shell, conical, divided by septa which have entire even edges, and are penetrated by a lateral siphuncle.

THE shells of this long-known genus are all much elongated, never spiral nor even curved, except very slightly in one or two species near the apex. The chambered cavity is composed of thin laminæ, exactly similar to the corresponding part in Nautilus, except that it is a straight, not an involute, tube or cone: this is surrounded by a coat formed of layers of fibres of a laminated or sparry structure, placed nearly perpendicularly to the surface, and corresponding to the outer coloured coat of Nautilus* or shells generally, but with the crystalline tissue much more largely developed than even in Pinna, with which Mr. Miller has very justly com-

* In speaking of the various parts of a Belemnite, we shall keep in view this analogy: the pointed extremity will thus be considered as the *apex*, the opposite end the *base*, and the side on which the siphuncle is placed the (as in Ammonites) *front*: we say the front, because that part of the base or aperture seems similarly situated to the anterior margin in the genus Helix. We cannot agree, when we are describing a Nautilus or Ammonite, to call this the back, which has often been done by other writers. This part in the Belemnite is by Blainville termed "*ventrale*;" in Spirula the position of the siphuncle is reversed.

pared it. This fibrous coat is so much produced beyond the apex of the chambered cavity upon an axis, (or elongated nucleus which probably existed in the ovum,) that it often forms the largest portion of the shell: in this circumstance principally it differs from *Orthocera*, the genus next akin to it. The genuine fossil *Orthocera* (no fossil *Orthocera* is given by Lamarck) have, moreover, a central siphuncle; and were, at least some species, external shells. A few fossils hitherto referred to that genus, would deservedly arrange under an intermediate one.

Much has been written about the nature of the animal of which the *Belemnite* formed a part. The opinions of Platt and Miller agree, as far as they suppose it to have inclosed the shell by two lobes curved round it so as to meet in a line along the front: the smooth surface, showing the impression of ramose veins in many species, and fibrous structure of the external coat, in which it resembles *Cypræa*, greatly favour this opinion.

Lamarck, justly considering the chambered cone very similar to the genus *Nautilus* and *Spirula*, the animals of which were known to resemble *Sepia*, has placed *Belemnites*, *Orthocera*, *Nautilus*, and all the chambered shells, with *Sepia* in the fourth order of *Mollusca*, the *Cephalopoda*, and appears to consider the *Belemnite* an internal shell. This opinion is supported by all later authors, and by Mr. Miller, as far as regards the form of the animal. M. de Blainville, the last writer upon the subject, thinks with Cuvier and Lamarck, that the shell was internal like the hard substance called bone in the *Sepia officinalis*, and brings forward two fossils of intermediate

forms in the series including Belemnites, between this bone and Nautilus. The first, *Beloptera sepioidea* *, generally known as a fossil Sepia, has septa half closing an expanded cavity. The second, *B. belemnitoidea* †, has septa quite across a conical cavity: but it is not proved that either of these was wholly internal, while it is known that the shell of *Spirula* is partly external, and the shell of *Nautilus* almost wholly so. Now it appears very probable that the Belemnite was inclosed, not entirely within its animal, but within two folds or lobes of its mantle or skin, partly, as supposed by Mr. Miller; these lobes, however, might be similar to what would be produced by making an incision along the back of a Sepia so as to let the apex of its bone protrude, and so bear an analogy to the two lobes that inclose the spirula, and not be produced by curving the edges or wings (fins) of the animal around it, as described by Mr. Miller.

The idea of the shell having undergone any such an alteration by mineralization as to produce the fibrous structure, is not consistent either with Mr. Miller's experiments or the general characters of changed fossil shells, wherein the internal tissue is generally wholly destroyed, as in *Echinus*' spines or siliceous casts, and even in parts of some Belemnites.

Lamarck and all modern authors, except M. de Blainville, yielding to old prejudices, have continued to describe the Belemnite as composed of two parts; the etui,

* *Sepia Cuvieri*. *D'Orbigny, Cephalopodes*, p. 66.

† *Sepia parisiensis*, *ib.*—A third species of this genus without lateral projections has been found at Highgate, and forms an additional link. (See tab. 591.)

sheath or guard, and the alveolus. Now the alveolus is composed of foreign matter that has insinuated itself into the chambers of the conical cavity, and becoming stony is easily separated from that cavity, tearing the fragile septa away with it, (when this consists of sparry matter it may be observed, that it is of a different character from the sheath, which confirms the opinion of the latter not being mineralized,) but leaving the edges of the septa attached to the inner almost pearly coat of the shell. Lamarck states the siphuncle to be central, which it never is in *Belemnites*: he has probably intended to include fossil *Orthoceratites* in the same genus.

The strata that contain *Belemnites* are all above the New Red Sandstone; they are, the Lias, the inferior or iron-shot Oolite, the Stonesfield Slate, the Oxford Clay and sandy Limestone above it; the Gault and mixtures of it with the Green-sand, and the lower and upper Chalk. It is to be remarked, that above the red marl there has not been seen a single straight-chambered shell with a central siphuncle; nor below the red marl a single one the apex of which is known to extend far beyond the apex of the chambered cavity. In the older formations the substance of the chambered shells is entirely changed into calcareous spar, the distinction between the tissues of their several coats being destroyed.

The elaborate *Mémoire sur les Belemnites*, 4to, 1827, by M. de Blainville, will furnish every particular relating to their history, &c. which may be desired; with descriptions and figures of about fifty species; and to that work we beg to refer our readers. We differ in some points from the opinions of the author of this excellent work;

but it is because we have viewed the same facts in a light which seems to warrant us in drawing conclusions from them which may tend to combine the opinions of the two best authors upon the subject. The situation of the genus in a natural series is neatly pointed out by M. de Blainville; but the sections of the genus, at least the three first by him, and the separation of *Actinocamax* by Mr. Miller, are ill-founded, as will be shown hereafter. M. de Blainville places the genus *Beloptera* immediately after *Sepia*, next *Belemnites*, then *Orthocera*,—so commencing the long series of chambered shells, all of which are supposed to belong to cephalopodous Molluscæ.

The genus *Argonauta* has long been included in the same series; but it by no means appears in its natural situation, and spoils the harmony, in whatever part it be introduced: it is in fact much nearer related to *Carinaria*. The question respecting the *Ocythoë* that is found in it, being a parasite or not, is still undecided; and we must be cautious when contemplating it, to avoid being led by the supposed analogy the shell bears to *Nautilus*,—an analogy which holds little further than in the name.

The fact that there is no surface of attachment between the animal found in it and the shell, that the animal is sometimes placed with the rectum over the beak of the shell and sometimes in the opposite direction, joined with the facility of quitting the shell the animal shows when captured, strongly favour the idea of its being a parasite; and when we contemplate the irregular form and size of the apex of the spire, we are led to conclude that the egg of the animal proper to the shell, must have been

much larger than any of the eggs that have been found to accompany the *Ocythoë*, in the proportion of at least a pea to a pin's head; Mr. Poli must therefore have been somehow deceived when he thought he saw the *Argonauta* developed in the eggs of *Ocythoë*. The probability is, that the *Ocythoë* chooses the shell of an *Argonauta* as a convenient protection for its spawn, because it is light and portable; and that the sac or mantle of *Ocythoë* in the egg has been taken for the shell. We think therefore there is good reason for removing *Argonauta* from the *Cephalopoda* to the *Heteropoda*, of which Order we take the present opportunity of mentioning, that we know of no fossil belonging to it.

BELEMNITES minimus.

TAB. DLXXXIX.—fig. 1.

SPEC. CHAR. Fusiform, squarish, expanded towards the apex, cylindrical towards the base; apex indistinctly papillose, each side marked with an obscure double furrow; base not expanded; a sulcus in the front extending a short way from the base.

SYN. Belemnites minimus. *Lister*.

B. *Listeri*. *Mantell, Geol. Suss. p. 88. tab. 19. fig. 17. 18. & 23.*

B. *minimus*. *Miller, Geol. Trans. 2d series. v. II. p. 62. pl. IX. f. 6. De Blainville, Mém. sur les Belemn. 75. pl. IV. f. 1. and p. 119. pl. V. f. 5.*

THIS small Belemnite is generally of a rather bright yellow brown colour, and possesses much transparency; its outer laminæ often show a tendency to flake off about the apex, and the axis is always opaque or tubular from decomposition, which shows that the imperfect state of the base, which has not only lost the septa that we suppose from analogy must once have existed within it, but also much of its fibrous portion, has arisen from its having remained in an exposed situation a long time before it was buried in its grave of clay or marl, which has preserved its remains for our inspection and admiration. So much indeed of the fibrous substance has decayed away from the surface of the conical cavity in many cases, that a considerable portion of the axis is

left projecting into it in the form of a tube. The length rarely exceeds two inches and a half.

It is peculiar to the Marl (blue marl, blue chalk marl or gault) between the upper and lower green-sands. The small specimens figured are from Folkstone. Mr. Goodhall has similar from Maulden and Clophill, and that vicinity, in Bedfordshire. We have others from Sussex and Cambridge. The large ones are from Speeton Cliff, Yorkshire, by favour of Mr. Williamson.

In Mr. Miller's figure two furrows are represented near the base : we have never seen such a specimen.



BELEMNITES attenuatus.

TAB. DLXXXIX.—*fig. 2.*

SPEC. CHAR. Subfusiform, squarish, not much diminished towards the base; suddenly contracted a little above the middle, whence to the rather blunt apex it is elongated and almost cylindrical; an obscure double furrow on each side, and a sulcus in the front extending a little way from the base.

THIS has a curious appearance, one third of it from the apex being more cylindrical and much narrower than the remainder, and often striated.

In colour, state of preservation, and every thing except the general form and greater length, this exactly resembles the *B. minimus* : it was found along with that species at Folkstone.

BELEMNITES pistilliformis.

TAB. DLXXXIX.—*fig. 3.*

SPEC. CHAR. Fusiform, pointed, round, very much attenuated and elongated towards the base.

SYN. *B. pistilliformis.* *De Blainville, Mém. sur les Belemn. p. 98. pl. V. f. 14. 15. 16. & 17.*



AN elegant but variable species; sometimes it is equally attenuated at both ends, at other times it is much thickest near the apex; the older individuals generally approach most towards cylindrical, and have an obtuse extremity. We are not quite certain that this is exactly the species described by De Blainville, because we find some traces of longitudinal furrows or impressions of veins. It is very possibly the young of *B. elongatus*.

The figures are all from specimens collected by our indefatigable friend H. H. Goodhall, Esq., out of the Lyas Clay at Shorne Cliff, east of Charmouth. De Blainville says it is from the Jura Limestone.

BELEMNITES *elongatus*.TAB. DXC.—*fig. 1.*

SPEC. CHAR. Slender, cylindrical in the middle, gradually expanding to a broad base one way, and tapering* to a point the other; round, and free from furrows; the chambered cavity two-thirds the length of the shell.

SYN. B. *elongatus*. *Miller, Geol. Trans. 2d series. vol. II. p. 60. pl. VII. f. 6. 7. & 8. DeBlainville, Mém. sur les Bélemn. p. 95.*

A Belemnite. *Joshua Platt, Phil. Trans. vol. liv. p. 38 (with a figure).*

A GREAT portion of the shell of this Belemnite is so thin as to give rise to the opinion that only part of the chambered cavity (the alveolus) is covered by the fibrous coat (guard or sheath); and that the last formed chamber, whose sides would principally consist of this coat, is not proportionally larger than the preceding one,—an opinion that has been formed from the examination of imperfect specimens, and influenced by the idea that the alveolus may be independent of the guard. The cylindrical portion of the shell extends for about one fourth of its length, and is over the extremity of the cavity. The diameter of the base when perfect nearly equals a quarter of the length.

Found in the Lias Clay at Lyme, Charmouth, and near Bath. The specimen figured was lent in 1814 to Mr. Sowerby by the much-to-be-lamented friend to science Sir Joseph Banks, to whom it had been sent the year before by Mr. Bevan, who obtained it from the Crick Tunnel near Daventry, in Northamptonshire.

BELEMNITES abbreviatus.

TAB. DXC.—*figs. 2. 3. & 9.*

SPEC. CHAR. Short, subcylindrical, with an expanded base; extremity suddenly tapering and slightly recurved to a blunt excentric apex; sides flattened; cavity about half the length of the shell, its apex far from central.

SYN. B. *abbreviatus.* *Miller, Geol. Trans. 2d series. p. 59. pl. VII. f. 9. & 10. De Blainville, Mém. sur les Belemn. p. 91.*

THERE appear to be no furrows upon any part of this shell; its thickness in proportion to its length, the contraction and curvature of its superior extremity, and the cavity inclining towards the front, are so many marks by which the species may be known.

Occurs in the Inferior or Ironshot Oolite (probably only in the lower beds), and the upper beds of Lyas.

Fig. 1. is from a Weymouth specimen: fig. 2. is from Banbury in Oxfordshire, by favour of the Rev. W. D. Conybeare; it is part of an alveolus, and shows how closely the inflated tubes of the siphuncle between the septa approach the surface of the cavity, which in fact cuts off a segment from each. Fig. 9. represents a young individual of precisely the same form, from near Bath: it is in Mr. Goodhall's cabinet.

The figure referred to by Miller in *Parkinson's Org. Remains*, does not decidedly represent this species.

BELEMNITES acutus.

TAB. DXC.—*figs. 7. 8. & 10.*

SPEC. CHAR. Conical, terminating in an acute point, round; cavity very deep, central.

SYN. *B. acutus.* Miller, *Geol. Trans.* 2d series. vol. II. p. 60. pl. VIII. f. 9.

A REGULARLY conical smooth shell; very slightly compressed on the sides, and without any furrow. From the great diameter of the cavity at the base, we judge it to be very deep.

B. acutus of De Blainville is certainly not the same species; that has a distinct longitudinal furrow, and is more cylindrical. M. De Blainville has probably been misled by Mr. Miller's having quoted, with a query, a figure in Luid that does not agree with his own.

Both our figures are taken from specimens in Mr. Goodhall's cabinet: fig. 7. was found at Weston, near Bath; and fig. 10. in Shorne Cliff, Charmouth. The latter shows some curious marks produced by decomposition and partial exfoliation of the outermost crust: the shell is also split in two or three parts by the expansion of some substance within its cavity.

BELEMNITES penicillatus.

TAB. DXC.—*figs. 5. & 6.*

SPEC. CHAR. Short, compressed, very gradually tapering towards the superior extremity, near which it is suddenly contracted to an obtuse nearly central striated or sulcated obtuse point; cavity deep.

SYN. *B. penicillatus.* *De Blainville, Mém. sur les Belemn. p. 89. pl. III. f. 7. Knorr, part 2. pl. I*. f. 1, 2. 3. & 4.*



THE short compressed form and suddenly contracted extremity serve to distinguish this species by, although the furrowed or striated apex may be concealed, which it often is.

Found in Shorne Cliff by Mr. Goodhall, but by no means plentiful.

We strongly suspect *B. brevis* and *B. penicillatus*, and also *B. digitalis*, to be but varieties of one species.

BELEMNITES compressus.

TAB. DXC.—*fig. 4.*

SPEC. CHAR. Thick, straight, compressed, regularly tapering to a furrowed extremity; furrows deep, two of them extending down the flattened sides further than the others; cavity deep, its apex excentral; base oval, not expanded.

SYN. *B. compressus.* De Blainville, *Mém. sur les Belemn.* p. 84. pl. II. f. 9.

DISTINGUISHED from *B. ellipticus* of Miller by being much shorter, and from *B. Gigas* of De Blainville by the sulcated extremity. It has no furrow at the base, nor any indication of veins upon its surface. The septa are very numerous.

An inhabitant of the Inferior Oolite. Our specimens are from near Scarborough, out of the gray Oolite below the coal grit, where they were accompanied by Saurian remains.

BELOPTERA. *Deshayes.*

GEN. CHAR. Shell (bone?) internal, oblong, expanded, concave, thin : to its inner surface is attached a chambered cone, placed longitudinally ; from the apex of the cone the shell is considerably thickened.

THIS genus has been formed to receive those organic remains found in the Calcaire grossier of France, which resemble the bones of cuttle-fish (*Sepia officinalis*); but one of the species is (perhaps two may be) so nearly like the recent *Sepia*, that it does not seem necessary to remove it from that genus. We have modified the Gen. Char. of *Beloptera* so that it may only include such species as have a chambered cone resembling *Belemnite*, that is, De Blainville's 2nd section of the genus.

We have given outlines of two of the species De Blainville refers to the genus; the third we have never seen. Fig. 1. is *B. sepioidea* (*Sepia Cuvieri*), which we would refer to *Sepia*; its septa being placed like the laminae of that bone, and not crossing a conical cavity. Fig. 3. is *B. belemnitoidea*, the only species in De Blainville's 2nd section; the cone in it is completely divided by the septa into many narrow cells; we know not whether it had a siphuncle. The first appears to be a small portion only of the shell or bone, while this has rather the appearance of being nearly entire, the chambered cone filling half its length. We consider it as the type of the genus. Only one species is found in England, which is in the London Clay.

BELOPTERA anomala.

TAB. DXCI.—*fig. 2.*

SPEC. CHAR. Oblong; section trigonal; sides very little expanded; apex very obtuse, with a circular pore on the front.

CHAMBERED cone very thin, filling the whole of the concave side or front of the shell, a little curved; as the cone diminishes, the shell increases in thickness at the back and sides until it terminates in a convex apex as broad as the base of the cone; on the front of the termination is placed a circular hole, towards which the apex of the cone is curved; the shell about the base of the cone is very thin; the whole is smooth.

A very curious little fossil found at the time the excavations were in progress in Highgate Hill. Only one individual has been discovered; it is in a good state of preservation, although its chambers are filled with Pyrites.

The central figure is an enlarged representation.

BACULITES. *Lamarck.*

GEN. CHAR. A straight lanceolate shell, a part of it internally divided by septa whose edges are sinuated: a siphuncle penetrates the septa near their anterior margins.

A GENUS very closely related to Hamites, differing only in being quite straight. Most of the species are very long and laterally compressed, so that the transverse section is elliptical; the apex has never been discovered, and we only know of one instance of the opposite extremity: it is furnished with two elongated lobes, which, bending a little, seem to point out the anterior part; they turn from the siphuncle: the edge near these lobes is thickened, and is only completed periodically, as appears from the successive impressions left upon the casts of many individuals. The six principal lobes of the septa have a peculiar roundness of form, which helps to distinguish small specimens from Hamites.

The first generic name was Homaloceratites, given by the Baron Hupsch. We are not aware of Lamarck's reason for changing it; but his name is now come into general use, therefore we retain it.

Lamarck describes three species;—one from Maestricht, and two British: we regret that the latter have not fallen under our observation. One (*B. anceps*) is described with one sharp edge; in which it resembles a species very abundant in Normandy, which we have received as *B. vertebralis*: the other may possibly prove to be a Hamites from Folkstone.

All the species occur in the lower beds of Chalk or Chalk Marl and the Upper Greensand.

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BACULITES Faujasii.

TAB. DXCII.—fig. 1.

SPEC. CHAR. Smooth; section oval; sides compressed.

SYN. Ammonite droite. *Faujas, Hist. Nat. de la Mont. de St. Pierre*, 140. pl. 21. f. 2. & 3.

Baculites vertebralis. *Lam. Syst.* 103.

———— Faujasii. *Lam. Hist.* 7. 647.

BOTH edges of this species are equally rounded, and the sides a little compressed: there is no appearance of any kind of undulation upon the surface.

A cast in Chalk, figured from the collection of C. B. Rose, Esq.: it was found at Norwich. We have seen a larger specimen from Hamsey, in Mr. Goodhall's cabinet. It is very near *B. ovata* of Dr. Morton, in the *Journ. of the Academy of Nat. Sciences of Philadelphia*, vol. vi.; but we cannot trace any undulations upon the sides.

BACULITES obliquatus.

TAB. DXCII.—figs. 2. & 3.

SPEC. CHAR. Surface undulated; section oval; undulations oblique, annular, deepest at the margins.

SYN. Hamites baculoides. *Mantell, Geol. Suss.* p. 123. t. 23. f. 6. & 7.

THE very oblique undulations or furrows which pass all round the surface readily distinguish this species: they are generally deepest over the part where the siphuncle is placed, which is marked by S in the figures. The shorter (fig. 2.) represents an unique specimen, that shows the form of the aperture, which is placed obliquely; on each side is a large oval lobe, placed anteriorly and bent backward: upon the specimen of which two portions are represented (fig. 3.), may be seen the contractions upon the cast produced by the thickened shell near the edge of the aperture at each succeeding period of growth.

An abundant fossil in the Gray Chalk Marl about Lewes. The specimens were placed in Mr. Sowerby's Museum many years ago by his liberal friend G. Mantell, Esq.: they are from Hamsey.

HAMITES grandis.

TAB. DXCIII.—*fig. 1.*

SPEC. CHAR. Section circular; surface anteriorly undulated; undulations numerous, not deep, oblique; on each side are a few short, oblique ribs, enlarged at their extremities.



BETWEEN each rib, which only occupies a small portion of each side, are about six rounded furrows, that extend to the line beneath which the siphuncle lies: the posterior surface is smooth. The edges of the septa are formed into very acute and numerous intricate sinuses, arranged in six very unequal lobes.

Found in a quarry of Kentish Rag-stone (a calcareous bed in the Lower Green-sand), on the estate of E. Hughes, Esq. in the parish of Smeeth, near Hythe. We are indebted to Dr. Buckland for the use of the specimen.

HAMITES Gigas.

TAB. DXCIII.—*fig. 2.*

SPEC. CHAR. Largely ribbed; inner side plain, flattish; ribs composed of six laterally expanded tubercles.



A RATHER suddenly curved species: six blunt spines are united, three on a side, to form each oblique rib, which is nearly lost as it passes over the front; the spines near the front are largest; the section is rather square.

We have to acknowledge our obligations to the Right Honourable Lord Greenock, whose anxiety to render a service to Geology has induced him to lend us this and several other rare subjects from the Greensand formation near Sandgate.

“It occurred in the second or lower bed of Limestone, in its uppermost course of Rag and Clay above Seabrooke, between Sandgate and Hythe. Other specimens have been collected in the same stratum and bed, upon the Roughs west of Hythe, one of which is in Mr. Hill’s collection.” For these particulars I am obliged to my respected friend G. E. Smith, Esq. who is residing at Sandgate.

We are informed that there are much more gigantic Hamites to be found in the rocks at the south-eastern part of the Isle of Wight: possibly they are of the same species?

UNIO porrectus.

TAB. DXCIV.—*fig. 1.*

SPEC. CHAR. Subcylindrical, rather compressed, above twice as wide as long; anterior side very small, the other pointed.

THIS is the largest species of Unio found in the Sandstone of Tilgate Forest: it is distinguished by its regularly convex surface and pointed posterior extremity.



UNIO compressus.

TAB. DXCIV.—*fig. 2.*

SPEC. CHAR. Ovate, compressed; hinge-line bent; beaks rather prominent; lateral ridge square.

LENGTH and breadth in the proportion of 2 to 3: the hinge slope is flattened, so as to make the ridges that bound it square. The anterior side is as large as in the preceding species, although the other is much less.

A rare species, from Tilgate Forest.

UNIO antiquus.

TAB. DXCIV.—*figs. 3. 4. & 5.*

SPEC. CHAR. Transversely ovate, elongated, compressed; back and front nearly parallel and straight; anterior side small.

LENGTH half the width. The anterior side is larger in this than in *U. porrectus*, and the general form is more square. Fig. 3. exhibits the usual character of casts. Fig. 4. has the substance of the shell remaining, but converted into spar. Fig. 5. is from a cast that is more pointed than usual, and approaches to *U. porrectus*, of which it is even possible that it may be the young shell.

The commonest species in the Sandstone of Tilgate Forest in the Weald Clay.

UNIO aduncus.

TAB. DXCV.—*fig. 2.*

SPEC. CHAR. Wedge-shaped, gibbose, antiquated; anterior side straight, small; the opposite extremity more or less produced, truncated, and bent downwards; shell very thick.

THE straight anterior extremity and concave margin of the front are striking characters. Length generally exceeding half the width, but variable.

Not very uncommon in the same formation as the last: it seems to be the species figured by Mr. Mantell in his *Fossils of Tilgate Forest*, p. 57. pl. 10. f. 11.

UNIO cordiformis.

TAB. DXCV.—*fig. 1.*

SPEC. CHAR. Heart-shaped, posteriorly pointed; umbones inflated.



A THICK shell, whose length, width, and the united depth of the valves, are nearly equal. The anterior side is very small.

This is the rarest shell that occurs in the beds of Sandstone at Tilgate Forest, subordinate to the Weald Clay of Sussex.

We are under obligations to G. Mantell, Esq. for the loan or possession of the specimens figured in this and the preceding plates.

Much diversity of opinion exists regarding the propriety of arranging the shells given in these two tables in the genus Unio. They appear to be confined to certain Sandstone beds included in the Weald Clay; a formation that contains very few species of shells excepting oysters, and these referable to only three genera, Paludina, Cyclas, and Unio. In most cases the shells are firmly united to the stone, and only casts can in general be extracted, which renders it difficult to observe those parts by which the genera are clearly indicated, and lay a foundation for doubt. The genera above assumed are composed of freshwater shells; and from this it has been concluded that the formation they are found in is of freshwater origin, pro-

bably deposited in an extensive lake. This opinion is strengthened by the discovery of *Cypris* (see t. 485.) in some of the beds connected with the formation, while the presence of oysters excites much speculation. It has been justly observed, that the shells referred to *Paludina* (*Vivipara*, *Min. Conch.* t. 31.) are thicker than the recent species of that genus, and approach very near to *Turbo littoreus*; but the general form is nearer to *Paludina fluviarum*, and we have never been able to extract an individual with a perfect lip. The *Cyclades* have been better determined, the hinge having been freed from the stone (see t. 527.). The shells immediately under our consideration, although very abundant, are never very perfect: casts of their interior are most frequent; and they present strong indications of the deep muscular impressions, the laminated lateral tooth, and the large teeth in the hinge, characteristic of the genus *Unio*; so that we cannot choose but arrange them under that genus of freshwater shells; and although it must appear extraordinary to find oysters mixed with freshwater shells, or a freshwater formation between marine deposits, we must not, however praiseworthy it is to admire, lose ourselves in wonder, but steadily persevere in searching after the whole truth; for by so doing we shall best display the harmony that exists in all the works of Nature, and prove that we possess a mind open to conviction, the possession of which is an enjoyment we must ever feel grateful for to Him who gave it.

VERMETUS. *Lamarck, Hist. Nat.*(*Vermicularia*, supra vol. i. p. 125.)

GEN. CHAR.* Shell tubular, in part spiral, fixed by its apex; operculum corneous, flat, attached to the foot of the cephalous animal.

IT is by the animal principally that the Vermetus (formerly called *Vermicularia* by Lamarck) is distinguished from *Serpula* and similar genera: it is formed by an animal not composed of joints, that has a distinct head, two tentaculæ, with an eye at the base of each, and a cylindrical foot (or analogous part) supporting a horny operculum, and consequently nearly related to the animals of true spiral shells, and belonging to Trachelepodous mollusca.

There does not appear to be any certain external character to distinguish the shell by; but the animal seems much less disposed to attach any large portion of its shell to foreign substances, and generally forms a tolerably regular and more or less open spire of the commencement of its tube, which is either discoid or conical. There can of course be no certainty respecting the fossil species; but as it is convenient to separate those shelly tubes which have hitherto been called *Vermiculariæ*, from among the *Serpulæ*, we shall still consider such as have been attached only by the apex (which, by the bye, form a very natural group) as belonging to the genus *Vermetus*. Most of the individuals turn one way, which, if the cone be placed in the same position, is found to be the reverse of most univalves.

* The generic character formerly given being inaccurate, and the observations upon it being founded partly in error, we wish to cancel them.

VERMETUS Bognoriensis.

TAB. DXCVI.—*figs. 1. 2. & 3.*

SPEC. CHAR. Spiral portion conical, subdiscoid, concave beneath; tube obscurely five-sided, with a furrow above and below; the produced part cylindrical, slightly curved.

SYN. Vermicularia Bognoriensis. *Mantell, Geol. Suss. p. 272.*

Serpula? *Parkinson, 3. 97. pl. 7. f. 8.*

THE tube of this is more angular, and the whorls more numerous, than in *V. concava*, t. 57. to which it nearly approaches; but when the surface is worn away, it appears cylindrical.

Very abundant in some parts of the Sandstone of the Bognor Rocks, *figs. 1. & 2.* It also occurs filled with Pyrites on the Sheppy coast (*fig. 3.*), and also at Highgate. Mr. Parkinson seems to be the first person who has noticed it.

VERMETUS tumidus.

TAB. DXCVI.—*fig. 4.*

SPEC. CHAR. Discoid; whorls few; tube thick, externally marked with a broad furrow on two sides; the produced part small, short, cylindrical; edge of the aperture thickened.

THE shell of this is so thick that it appears tumid just before the small cylindrical part of the tube that precedes the aperture: the whorls are seldom more than two, with a concentric furrow on each side, and a callus at the apex.

From the Coral Rag near Scarborough.



VERMETUS concinnus.

TAB. DXCVI.—*fig. 5.*

SPEC. CHAR. Discoid or slightly convex, a large portion of tube produced; tube five-angled, four angles acute, the fifth obscure.

A NEAT little shell: at first sight it seems to be a square tube, but upon close examination an obtuse angle is perceived round the margin of the disk.

Very abundant in a thin stratum of brown sandy Limestone in Robin Hood's Bay, said to be equivalent to the Inferior Oolite. We have received it from several correspondents.

VERMETUS polygonalis.

TAB. DXCVI.—*fig. 6.*

SPEC. CHAR. Spiral portion a short cone, with one involute ridge running up to the apex, and two ridges round the margin; produced part trumpet-formed, with seven acute angles.



THE ridge around the spire is erect and very prominent; the other ridges are less elevated, except near the expanded mouth, where they are equally prominent, and produced into short spines.

One of the specimens figured is from the Limestone, and the other from the Sand beneath it, both belonging to the Lower Greensand: they were found above Seabrooke, between Sandgate and Hythe, and are in the collection of Lord Greenock, who has liberally allowed them to travel to London.

SERPULA. *Linn.*

GEN. CHAR.* Shell tubular, variously curved, fixed by a considerable portion of one side; operculum corneous or shelly, pedunculated, attached to the anterior extremity of an articulated, acephalous animal, whose feathered branchiæ surround its mouth.

THE difficulty there always must be in distinguishing the four genera of Annelides that have shelly tubes, when we only have the means of examining the tubes deprived of their animals, has induced me to relinquish the attempt; neither does it appear to be of much importance, since the animals are very similar, and their habits the same.

The following are the four genera alluded to, which are distinguished by the characters attached. They may form subgenera.

Spirorbis. Shell curved into a discoid volute, attached by its lower flattened surface.

Animal furnished with six-pinnated branchiæ and a peltate operculum.

Obs. The shells are mostly minute, often produced beyond the convoluted part, and then irregularly curved.

Serpula. Shell irregularly contorted, fixed by a part of its side; aperture simple.

* The generic character given with tab. 30. not being sufficient, we add the present.

Animal furnished with two fan-shaped branchiæ, and a funnel or club-shaped corneous operculum.

Obs. The tubes often assume the same form as the preceding genus; they are generally larger, often very large in comparison.

Vermilia. Shell variously curved, attached by its side: one or more teeth occur upon the edge of the aperture.

Animal furnished with two fan-shaped branchiæ, and a shelly, simple, operculum.

Obs. One or more carinæ upon the tube being produced, form the teeth upon the margin of the aperture: these carinæ do not always extend to the aperture, and are sometimes wanting in a few individuals of the same species as those which have them (see *S. ampullacea*, tab. 597.). The operculum is sometimes conical, sometimes has a tricuspidate apex, and sometimes flat. *Serpula crassa* (tab. 30.) belongs to this genus, unless the concave radiated operculum would be sufficient to form a new one from.

Galeolaria. Shell variously curved, attached by its side; a spatulate process upon the edge of the aperture terminates a double keel along the back. Operculum shelly, concave; in its disk are inserted a number of lanceolate moveable pieces.

Obs. This is the most distinct genus; but should it occur among fossils, it would be difficult to discover, unless the operculum should happen to be preserved. *Serpula crassa* is between it and *Vermilia*.

Many *Serpulæ* form septa in their tubes, as the animals proceed from the smaller extremities towards the larger, in consequence of their increased thickness.

SERPULA ampullacea.

TAB. DXCVII.—*figs. 1. 2. 3. 4. & 5.*

SPEC. CHAR. Thick, irregular, antiquated, with a globose enlargement near the entire aperture; more or less carinated upon the back; surface of attachment expanded, thickened.

Kentish Chalk Fossil, a Serpulite. *Parkinson, 3. 94. pl. 7. f. 11.*



A LARGE thick species, varying in form according to the surface to which it fixed, often choosing a thin cylindrical substance, when it becomes discoid, with a perforation in the centre (*figs. 2. 3. 4. & 5.*). It has sometimes a carina extending its whole length (as in *figs. 2. & 5.*), sometimes only for a part of it (as in *fig. 4.*), and at other times scarcely to be discovered (*figs. 1. & 3.*). The surface is often marked with small undulating lines, that give it in parts a granulated appearance (*figs. 1. 4. & 5.*); other specimens are smooth (*figs. 2. & 3.*). All these varieties, when full grown, are considerably thickened before the aperture is finished; so that the extremity appears to be inflated, but the inside remains cylindrical.

Not unfrequent in Chalk, although hitherto almost unnoticed. All our figures are from the Norwich Chalk. No. 2. was presented to us by Mr. Barnes of Norwich; the others belong to the Rev. G. R. Leathes, whose favours we have so frequently had to acknowledge. We have a specimen from Northfleet resembling in form Mr. Parkinson's: it is to be distinguished from *Vermetus* by the surface of attachment which occupies one side of the disk and a great part of the tube beyond it.

SERPULA (VERMILIA ?) macropus.

TAB. DXCVII.—*fig. 6.*

SPEC. CHAR. Tube thick, slightly curved, rapidly increasing, triquetrous ; aperture small, round, elevated by the thick mass that fixes the tube ; front sulcated.

THE two free sides of this worm-shell are nearly flat ; they have, however, sometimes a slight angle along the middle of each : the thick mass that elevates the aperture from the substance it is placed upon is so divided in front as to resemble two clumsy feet.

From the Norwich Chalk in the cabinet of the Rev. G. R. Leathes.



SERPULA (SPIRORBIS ?) granulata.

TAB. DXCVII.—*figs. 7. & 8.*

SPEC. CHAR. Discoid, thick ; surface granulated.

A PRETTY *Serpula*, composed of little more than one whorl, ornamented by rows of very prominent granules : it is about two lines in diameter.

Attached to a *Terebratula* in Chalk. Presented by the Rev. R. T. Lowe.

Fig. 8. is a magnified representation.

SERPULA Plexus.

TAB. DXCVIII.—*fig. 1.*

SPEC. CHAR. Cylindrical, smooth, very much curved, entangled into dense masses; diameter about half a line, diminishing very slowly from the aperture.

A COMMON species that occurs in compact masses in Chalk. We have it from Norfolk and Sussex. The masses are sometimes as large as one's fist, and composed wholly of numerous individuals of the same species.

SERPULA Carinella.

TAB. DXCVIII.—*fig. 2.*

SPEC. CHAR. Cylindrical, gradually tapering towards the apex, repent; with a minute carina upon the back gradually lost towards the aperture.

NEARLY a line in diameter, moderately tortuose and partially raised from the substance upon which it creeps.

Occurs in the Greensand. Our figure is taken from a Blackdown specimen, in which the shells are replaced by silix; they are fixed inside a Venus.

SERPULA compressa.

TAB. DXCVIII.—*fig. 3.*

SPEC. CHAR. Lanceolate, rather compressed, smooth; slightly tortuose; aperture elliptical.

LARGEST diameter four lines, rapidly diminishing; a large part of the tube is free.

From the great Limestone Strata which traverse in a northerly direction the county of Linlithgow, and constitute the independent Coal formation of the Lothians. Presented by the Rev. John Fleming, D.D. in 1814.

1829 75.

SERPULA antiquata.

TAB. DXCVIII.—*fig. 4.*

SPEC. CHAR. Cylindrical, partly attached by an expanded surface; surface uneven, with transverse irregular rings.

THE diameter is three or four lines, very slowly decreasing; the edge of the aperture is obtuse.

Casts in silex marked with the small rings peculiar to that substance, are common in the Greensand of Wiltshire.

A small portion imbedded in clay, found in East Weare Bay near Folkstone by H. H. Goodhall, Esq., is added to the figures, as it appears to be the same species.



SERPULA tenuis.

TAB. DXCVIII.—*fig. 5.*

SPEC. CHAR. Cylindrical, with a minute carina upon the back, and a few distant sharp rings; shell thin.

A VERY small species occurring in little groups, and single individuals fixed by an expanded part of the surface to each other or to other substances.

This is the *Serpula* found in the freshwater deposit of the Hampshire Coast described by Charles Lyell, Esq., in the Second Series of the Geol. Trans. vol. ii. part II. p. 289. It occurs in the White Sand in Hordwell Cliff along with *Mya plana*, *Mytilus Brardii*, &c. See Min. Con. tab. 532. It also was observed along with *Cyclas pulcher* opposite Hampstead Cliff in the Isle of Wight, and is noticed on page 51 of the present volume. We have not ascertained that it is attached to the shells it accompanies.

The lower figures are magnified.

SERPULA tetragona.

TAB. DXCIX.—*figs. 1. & 2.*

SPEC. CHAR. Tube very long and narrow; free for a great part of its length; externally four-sided, with prominent angles; aperture round.

ABOUT one line in diameter and several inches long, variously curved; the sides are equal, nearly flat.

This square Serpula is very abundant in blocks of marl that have been removed from the oolite, and scattered over various parts of the country. Our specimens are from Suffolk, and contain also *Avicula inequivalvis*, a *Cardium*, and *Astarte elegans*.

Fig. 2. represents a variety probably of the same species in Cornbrash Limestone, from Bedfordshire.

Serpula quadrangularis of Lamarck is probably a distinct species, perhaps even a *Vermetus*.


 SERPULA rustica.
TAB. DXCIX.—*fig. 3.*

SPEC. CHAR. Tube externally four-angled, angles obtuse; as the tube increases, the angles are variously bent and interrupted, at length becoming irregular convexities arranged about a cylindrical tube.

NEARLY two lines in diameter and almost straight. The aperture is circular with a sharp edge.

Found in a light-coloured marl belonging to the Upper Greensand, at East Weare Bay, by H. H. Goodhall, Esq., in whose cabinet the specimen remains.

SERPULA articulata.

TAB. DXCIX.—*fig. 4.*

SPEC. CHAR. Externally square, furnished with rings, composed of four oval tubercles each, placed at remote irregular distances; angles rounded; aperture round.

DIAMETER about two lines; there is no flat space between the ribs of which the angles are formed; these ribs are thickened into four oval tubercles each time the orbicular sharp-edged aperture is completed.

Found in coarse sandstone of the Upper Greensand near Folkstone.



SERPULA vertebralis.

TAB. DXCIX.—*fig. 5.*

SPEC. CHAR. Tube externally square, its angles set with longitudinal, blunt tubercles disposed in rings placed at short regular distances.

SOMEWHAT smaller than the last, its tubercles are more regularly arranged and more numerous, four in each ring.

Found in the clay of the Castle Hill, Bedford.

BELEMNITES mucronatus.

TAB. DC.—*figs. 1. 2. 4. 6. & 7.*

SPEC. CHAR. Subcylindrical, base expanded; the other end obtuse, with a central mucro; aperture nearly orbicular.

SYN. *Belemnites mucronatus* (*Schlottheim.*), *Brongn. & Cuvier Geol. des Env. de Paris*, 382. *Pl. 3. f. 1.* *De Blainville, Mem. sur les Belemnites*, 64. *Pl. 1. f. 12.*

B. electrinus, *Miller, Trans. Geol. Soc.* 2nd series, *vol. 2. part 1. 61. Pl. 8. f. 18. 19. 20. 21. Pl. 9. f. 1. & 3.*

B. coniformis? *Parkinson, Org. Remains*, *vol. 3. p. 127. & 132. Pl. 8. f. 12. Pl. 9. f. 1.*

Belemnite, *Faujas, Maestricht*. 178. *Pl. 32. f. 3.*

Actinocamax verus. *Miller, Trans. Geol. Soc.* 2nd series, *vol. 2. part 1. 64. Pl. 9. f. 17. 18.*

B. Scaniæ, *B. Œsterfieldi*, & *B. quadratus?* *Blainville*, 61. & 62. *Pl. 1. f. 7. 8. & 9.*

THE otherwise cylindrical form of this *Belemnite* is destroyed by a slight contraction towards the expanded base, and by a rather sudden decrease to the mucronated apex; along the front of the expanded portion is a furrow communicating with the conical internal cavity; on each side of the back is a flat space extending nearly the whole length of the shell; numerous ramified channels diverge from these spaces round the sides and meet upon the front, or enter the furrow above mentioned. We have never seen any septa in the conical cavity, which is very deep, but only circles indicating their edges, and a furrow along the back, besides the fissure in the front. Length about four inches, greatest diameter

nearly three quarters of an inch, cavity one inch and three quarters deep.

We have ventured to arrange under one specific appellation, Mr. Miller's *Belemnites electrinus* and *Actinocamax verus*, and almost all the species of the second and third of M. de Blainville's sections of the genus. The *B. plenus*, which forms the first section, and which M. de Blainville confounds with *Actinocamax verus*, is a distinct species, rather fusiform, gradually tapering to a point, and not mucronated nor marked with what appear like the impressions of veins upon its surface: we have not seen a specimen of which we know the locality, but possess two very good ones that appear to have been imbedded in clay. The form of the base, which has led Mr. Miller to separate the *Actinocamax*, and M. de Blainville the two first sections of the genus from one species, is to be explained as follows. When the shell, upon the death of the animal, sunk from its native element into the mud, the thin sides of its conical cavity were soon worn away; the two surfaces being both exposed and worn, the cavity was gradually shortened, as we find it in Blainville's second section, where in some cases a portion of the fissure still remains, the same action continuing until the cavity had entirely disappeared, one surface alone remained to be acted upon, which was rendered first flat and thin, in consequence of the edges being most worn, then convex or conical as in the *Actinocamax*. Small individuals are most subject to this complete metamorphosis, because in them it would much sooner take place under the same circumstances. The base is either oval or triangular, or perhaps even squarish, according to the part of the tube of which it is the section, and the depth of the vein-like impressions that flatten the sides. No two specimens are found precisely similar in the depth of the worn cavity nor the convexity of the base, and all are more or less irregularly striated and furrowed from the centre.

We have no proof of the existence of septa in the cavity. M. Blainville has asserted that they do not exist; and they are not described by Mr. Miller, although he

speaks of the alveolus : circles in the direction of their edges are figured by M. Brongniart ; and we have specimens that prove the accuracy of his figure, but they show no projections. The ramose impressions upon the surface and entering the fissure indicate an internal shell ; this circumstance and the absence of septa would be sufficient grounds for placing this and one or two other species together as a distinct genus from the Belemnites with chambered alveoli, provided we could ascertain the latter character ; but in all probability the want of septa is accidental.

This mucronated Belemnite is a constant inmate of the upper beds of chalk in all countries. The specimens represented figs. 1. 2. & 4. are from Norwich. Fig. 1. shows a peculiar asperity about the pointed extremity. Fig. 2. a small specimen, with part of a *Gryphæa globosa* attached to it. Fig. 4. a section, such as is easily obtained by fracture. Fig. 6. the variety called *Actinocamax verus*. Fig. 7. a young individual from Margate.

We have a specimen considerably larger than fig. 1.

Some specimens are coated with silex, and even penetrated in parts by it.

We have specimens from the hardened chalk of the North of Ireland.

BELEMNITES *granulatus*.

TAB. DC.—*figs. 3. & 5.*

SPEC. CHAR. Subcylindrical ; apex obtuse, mucronated ; surface granulated.

SYN. *Belemnites granulatus*. (*De France*) *Blainville*, 63. *pl. 1. f. 10.*

THE form of this shell (we have not seen the expanded base) is precisely the same as that of *B. mucronatus* ; it

has also similar impressions of veins, the granulated surfaces of the lamina it is composed of alone distinguish it.

Of this species we have seen three individuals; one from Bridgwick Pit near Lewes, and another from Andover, both collected by H. H. Goodhall, Esq.; one of them shows the reticulated structure exposed by decomposition, the other the worn base in its progress towards *Actinocamax*: the third is in Mr. Mantell's collection. We have shown a view of its base at fig. 5.

This species occurs also in St. Peter's Mountain, near Maestricht.



BELEMNITES lanceolatus.

TAB. DC.—*figs. 8. & 9.*

SPEC. CHAR. Subfusiform, much elongated, gradually tapering to a point, an obscure double furrow on each side, base obscurely triangular.

A MUCH more elongated shell than *B. plenus*, which it much resembles; its base is but slightly expanded, the surface smooth; length three inches and a half, diameter four lines.

G. Mantell, Esq. has kindly lent us one, and H. H. Goodhall, Esq. another specimen of this elegantly shaped Belemnite: they are both from Hamsey; the first has a convex, the other a conical base, with a small portion of the original cavity remaining, which is frequently the case with individuals of other species that would be referred to *Actinocamax* by Mr. Miller.

We have fragments from Chute Farm that seem to belong to this species.

HINNITES. *De France.*

GEN. CHAR. An unequal-valved, nearly equal-sided, radiated, bivalve; valves eared, the area of the hinge quadrangular, tripartite, its cartilage immersed in a deep longitudinal pit in the centre, the lateral portions striated, supporting the ligament; sinus for the byssus small; muscular impression large, connected with impressions remaining from the attachment of the mantle parallel to the margin of the valves.

A GENUS established by M. de France, who has described two fossil species. Mr. Gray has added one recent one from the British Museum; and three others have been added by my brother and M. des Hayes, the last of which is the *Pecten Pusio* of authors. All the species are more or less muricated upon the surface, and when advanced in age, employ the squamæ of the most convex valves to attach them to foreign substances. This habit and the peculiar form of the hinge pit, distinguish them from *Pecten* and *Lima*; the form of the hinge, especially of the fossil species, approaches near that of *Ostrea*, but the shell does not appear to be attached in the young state, nor constantly when old; and when it is attached, it is by the right valve, which is the most convex, not the left as in *Ostrea*.

It has been supposed that the attachment is caused by the pressure against the sides of holes in which the shells have been confined; but it rather appears to us to be the effect of choice on the part of the animal, for it is constantly the right valve that is attached; and the surface of the other, although they are both distorted, is not rendered smooth nor indeed changed, as it would necessarily be if confined. We possess a specimen of *H. Cortesyi* that seems to set the question at rest; it consists of two convex valves, one attached by almost its whole outer surface (even the ears) to the inside of the other, which does not show any marks of having ever been fixed. The animal is distinguished from that of the *Oyster* by having its mantle attached to the shell, as is

proved by the impressions within the valves; and by a byssus, for which there is a sinus under the anterior ear. It is probable that when the byssus is by any accident lost, or when the shell becomes too heavy to be conveniently retained by it, resort is had to the expedient of fixing the shell by spreading the squamæ, as they are formed at the edges, upon any neighbouring substance.

The fossil species belong apparently to the Crag, or a deposit immediately succeeding to the London Clay.

HINNITES Dubuissoni.

TAB. DCI.

SPEC. CHAR. Shell rather thick, oblong; right valve covered with concentric circles, the other charged with elevated rays, which are imbricated near the margin.

SYN. *Hinnites Dubuissoni.* *De France, Dictionnaire des Sciences Naturelles*, 21. 170. *Des Hayes, Dict. Classique d'Hist. Nat.* 201. *Gray, Annals of Phil.* new series, 12. 104. *G. B. Sowerby, Zool. Journal*, 3. 70.

THE left valve is flat, ovate, the hinge and ears produced, the surface marked with many irregular elevated thin rays, which towards the margin are elevated into numerous semicylindrical scales. We have not seen the other valve. It is described as convex, with only concentric lines that mark the successive additions to the shell, and not fimbriated as in the *H. Cortesyi*, the other fossil species.

We have not seen an authentic specimen of *H. Dubuissoni*, but are induced to refer the shell before us to that species, although we have not seen the right valve; because the squamæ upon this are most numerous near the edge, and are not flat as in our specimen of *H. Cortesyi*, which we received direct from M. De France.

Found in the Crag of Ramsholt by Searles V. Wood, Esq., of Woodbridge, who liberally entrusted us with such a rarity for publication.

PANOPÆA. *Menard.*

GEN. CHAR. An equal-valved transverse bivalve ; sides unequally gaping ; one hinge tooth in each ; hinge ligament external supported by a thick prominent fulcrum in each valve.



A WELL defined genus, formed of the *Mya glycimeris* of Linneus. Only one recent species is known ; it is a large heavy shell that inhabits the Mediterranean Sea. The thick rudely formed hinge with only one tooth in each valve, and that even disappearing by age, the external short ligament and gaping sides, are strong characters of the genus. There are several fossil species, but hitherto only one has been recorded by authors ; it is found in Italy along with fossils of the same, or nearly the same, æra as those of the London Clay. The other fossil species have been published in *Min. Conchology* under *Mya* and *Lutraria*, but recent examinations have shown that they are *Panopææ* ; they are the following :

Lutraria gibbosa, tab. 42.

Mya intermedia, tab. 76. & 419. f. 2.

Mya plicata, tab. 419. f. 3.

We are indebted to Mr. Gray of the British Museum for pointing out the propriety of placing the first of these under this genus.

PANOPÆA Faujas.

TAB. DCII.

SPEC. CHAR. Transversely oblong, elongated, sub-cylindrical; posteriorly truncate; anteriorly cuneiform, slightly gaping; shell thin.

SYN. Panopæa Faujas. *Menard de la Groye, Annales du Museum, vol. 9. p. 131. t. 12. Brocchi, 2. 532. Lam. Hist. Nat. 5. 457.*



THIS differs from the recent species (*P. Aldrovandi*) in being less obliquely truncated at the anterior side, in being more regularly cylindrical, and in being thinner.

A sandy mass of indurated marl replete with fragments of shells apparently from the London Clay formation found lying upon the coast near Lowestoft in Suffolk, by Dawson Turner, Esq., contained several fragments of this celebrated shell. Figs. 1. & 2. represent two of these fragments.

The Crag near Ipswich also contains fragments of the *Panopæa Faujas*, as well as of *P. (Mya) intermedia*. Figs. 3. & 5. are of the first species; in one of them a large pearl has been formed. Fig. 4. is probably a portion of the *intermedia*.

Panopæa Faujas is one of the Italian shells that has by several authors been considered as identical with the recent species in the surrounding sea; but although they are nearly alike, there are distinctions that cannot be mistaken when once pointed out.

Since the above went to press we have seen one entire valve and a considerable portion of another valve of a small *Panopæa* that appears to be different from *P. Faujas*: they were found in Crag, by S. V. Wood, Esq.

PHOLAS? compressa.

TAB. DCIII.

SPEC. CHAR. Transversely obovate, compressed; sides deeper than the middle; extremities gaping; along the middle of one valve is a rounded ridge, and a corresponding furrow in the other; surface marked with many sharp concentric ridges crossed by eight or ten others, equally sharp, upon the anterior side.



THE base is rather angular, the ridges thin, distant, bent in the middle of the valve; the whole surface is longitudinally striated.

An intermediate shell between *Pholas candida* and *P. crispata*, since the valves gape at the sides but have no sinus in the margin: in its flattened form and prominent beaks it differs from all the species of *Pholas* we are acquainted with; it is not without some hesitation therefore that we place it under that genus.

The specimen is a cast of the inside of the shell; it was broken out of an indurated Marl nodule found in the Kimmeridge Clay upon Shotover Hill by our valued friend G. E. Smith, Esq.

We take this opportunity to acknowledge an error in the description of *Pholas priscus*, p. 158. where we observe "the genus *Pholas* was unknown;" forgetting that M. des Hayes had described several species from the Paris Basin.

INOCERAMUS pictus.

TAB. DCIV.—*fig. 1.*

SPEC. CHAR. Oblong, convex, wavy, nearly covered by small concentric furrows; anterior side flattish, smooth; valves equal.

INTERMEDIATE between *I. Brongniarti*, t. 441. and *I. striatus*, t. 582. It resembles the first in length and the smoothness of the anterior side, its surface is furrowed like the latter, (which by the by the *I. Brongniarti* is obscurely,) but it is flatter than either. The most remarkable circumstance attending it is, that it is marked with broad stripes of a brown colour.

Of this extraordinary shell we have seen but one specimen, for the use of which we are indebted to our very scientific and liberal friend Mrs. Murchison. It was found in the Chalk Marl at Guildford.



INOCERAMUS digitatus.

TAB. DCIV.—*f. 2.*

SPEC. CHAR. Longitudinally furrowed; furrows large, round, equal to the ribs between them.

MANY large round ribs and intermediate equal furrows crossed by the lines of growth distinguish this gigantic shell.

Only small fragments of this species, which appears to exceed in size even the *I. Cuvieri*, have come under

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our observation. They are mostly upon the surface of large gravel Flints among diluvium derived from the Chalk. The figured specimen still retains the shell and a portion of chalk adhering to it.

EXOZYRA. *Say.*

GEN. CHAR. An unequal valved, unequal sided, attached bivalve; umbones spirally curved to one side; hinge pit curved, nearly linear; an obtuse tooth in the flat, free valve, fits into a cavity parallel with the hinge pit in the convex, attached valve; one muscular impression in each valve.

A GENUS established by Mr. Say of Philadelphia* upon good grounds;—we say established by Mr. Say, for the imperfect indications given by Faujas† and Lamarck‡, (who, seeing but one valve of one species, considered it an univalve shell, and named it *Planospirites ostracina*,) had been abandoned. It is well distinguished from *Ostrea* by its impressed lateral spire and the consequent linear form of the hinge pit, and by the parallel furrow in the attached valve which receives the obtuse, compressed, sometimes striated tooth of the other valve. This tooth is an enlargement of that part of one of the edges which is often crenated in *Oysters*. It is distinguished from *Gryphæa* by the same characters of the hinge, by the spire being impressed, laterally curved, and very apparent in the flat valve, and further by the absence of the lobe that forms the distinction between *Gryphæa* and *Ostrea*. In its general structure it resembles *Ostrea*,

* Described by him in the *Amer. Journ. of Sci. and Arts*, vol. ii. p. 43.

† Faujas, *Maestricht*, p. 145. *Rastellum* is a name that has been applied to some species; and Faujas has proposed to separate them and *Gryphæa* from *Ostreæ*, but this name is not applicable.

‡ *Lam. Syst.* 400. This species is very large and smooth, nearly related to *Ex. haliotoidea*; but we have only one valve, which however shows both sides, thus displaying the hinge and muscular impression.

being composed of laminæ whose edges rise successively in more or less elevated scales upon the surface. Like Gryphæa it is sometimes attached only by the apex of the convex valve, and is free when full grown; and sometimes by a large part of its surface. Some species are ribbed, but irregularly, like oysters.

The mistake under which several shells that might better have been called Gryphææ were published in the first volume of Mineral Conchology as Chamæ, seems to have arisen from considering the tooth in the hinge without taking into account the muscular impressions, which in Chama are two. This important tooth seems to have been overlooked by Say, although he mentions the cavity or furrow that receives it. In the sixth volume of the Journal of the Acad. of Nat. Sciences of Philadelphia, Dr. Morton, when describing the *Exogyra costata* of America, has rightly referred the *Chama haliotoidea*, (Min. Conch. t. 25.) to the same genus, and discovers the mistake above alluded to; but is rather hard upon English Conchologists, in supposing that they join in the blunder.

The shells formerly published in Min. Conch. that should be arranged under this genus, are

<i>Chama haliotoidea</i> ,	tab. 25.*	
——— <i>recurvata</i>	tab. 26.	f. 2.
——— <i>conica</i>	tab. 26.	f. 3.
——— <i>plicata</i>	tab. 26.	f. 4.
——— <i>digitata</i>	tab. 174.	

Chama canaliculata tab. 26. is a Gryphæa.

Thus far it appears that the genus *Exogyra* is bounded by distinct lines of demarcation; but in fact it is no more insulated than any other artificial genus; for *Gryphæa nana* and *G. sinuata* have often the beaks laterally curved, and at the same time possess the characteristic lobe of *Gryphæa*, and we have seen several recent Oysters whose beaks strongly resemble those of *Exogyra*.

* Miss Benett has kindly lent us a noble specimen of *Ex. haliotoidea* nearly four inches long, which we propose to figure in a Supplement.

Exogyra appear confined principally to the Green-sand formation: but as we do not know that the American species *Ex. costata* has ever been found in Europe, it is going too far to consider that as a proof of the identity of the beds in which it occurs with our Green-sand. The smooth varieties of it which are said to resemble the *G. haliotoidea* of Min. Conch. we have not seen; but it probably is that species: if so, the consideration of it with *Gryphæa convexa* of Mr. Vanuxem and Dr. Morton, (which is *G. globosa* of Min. Conch. and *Podopsis Gryphæoides* of the French, and occurs in Green-sand as well as Chalk,) *Baculites* and other shells, will go far to prove what those gentlemen have suggested, that the beds in which these shells occur are the equivalents of the Green-sand and Chalk formations of Europe; and we see no reason why different remote districts of the same formation and period should not, like the present surface of the globe, be furnished with different shells, as well as vary in the proportions, arrangement and mineral characters, of its several members.



EXOGYRA conica.

TAB. DCV.—*figs. 1. 2. & 3.*

SPEC. CHAR. Smooth; deep valve more or less gibbose, curved, obtusely keeled along the middle; flat valve suborbicular, its beak impressed, very much incurved.

SYN. *Chamæ conica, recurvata, et plicata. Min. Conch. vol. 1. p. 69, 70. t. 26. f. 2. 3. & 4.*

THE short, almost orbicular flat valve and small size, rarely exceeding an inch and a half, are the principal marks by which to distinguish this from the following species. The nearly central keel will also assist.

The small wings mentioned in the descriptions in vol. i.

are accidental, being produced by the form of the substance or shell that the individuals were attached to when young. We have found it proper to refer all three to one species, and retained the name *conica* as being the best of the three.

We have specimens from Folkstone, Parham Park, Chute Farm, Warminster, and Blackdown; those from the latter place are selected for the present figures.

The necessity of removing this fossil from the genus *Chama* has induced us to take it again under consideration.

EXOGYRA *lævigata*.

TAB. DCV.—*fig. 4.*

SPEC. CHAR. Elongated, curved, smooth; deep valve rather gibbose, obtusely keeled; keel near the hollow side; flat valve semicircular, pointed, its beak small.

NEARLY double the size of the last, also more elongated and curved with proportionally smaller beaks.

The figures are from Irish specimens in a compact sandy limestone, from the Green-sand formation. We have seen English ones very similar.

EXOGYRA *undata*.

TAB. DCV.—*figs. 5. 6. & 7.*

SPEC. CHAR. Convex; deep valve keeled along the middle, and marked with branching ridges that diverge from the keel; flat valve plain.

A SMALL and rare shell, found at Blackdown. Fig. 5. and 6. represent specimens lent us by H. H. Goodhall, Esq.

POLLICIPES. *Leach.*

GEN. CHAR. Shell multivalved, laterally compressed, supported by a squamiferous peduncle; the five upper valves largest, the lower diminishing in size as they increase in number; apices of the valves free, pointed.

THIS genus is distinguished from other cirripodous Mollusca by the squamiferous peduncle, the slightly curved lanceolate dorsal valve, the continued succession of small valves diminishing in size towards the peduncle, and the free points of all the valves. The most common recent species, *P. Cornucopiæ*, occurs in the Mediterranean in clusters attached to shells, &c. We have given a small figure of it.

POLLICIPES *sulcatus*.

TAB. DCVI.—*figs. 1. 2. & 7.*

SPEC. CHAR. Valves marked with longitudinal, elevated striæ.

THE central or terminal valve (*fig. 1.*) is elongated, rhomboidal; the posterior valve (*fig. 2. & 7.*) is arched, broad, lanceolate and subcarinated; both are marked with irregular, sharply elevated, longitudinal striæ: we have not recognized the other valves.

An inhabitant of the Upper Chalk at Norwich, Maidstone, and Northfleet.

POLLICIPES. maximus.

TAB. DCVI.—*figs. 3—6.*

SPEC. CHAR. Terminal valves rhomboidal plane, except sometimes a central ridge, and lines of growth; posterior valve arched, lanceolate, much elongated.

THIS differs from the last in the narrowness of the posterior valve (*fig. 4.*), and smoothness of the terminal valve which in old valves (*fig. 3.*) has a furrow along its middle in place of a ridge (*fig. 5.*); the anterior valve (*fig. 6.*) is hooked and has an obtuse keel. We are not acquainted with any other valves; and in this limited state of our knowledge, we must confess that it is with some degree of hesitation we declare these two species as distinct from each other.

From the Upper Chalk, collected by Mr. Barnes at Norwich. The posterior valve (*fig. 4.*) is from Northfleet.



POLLICIPES reflexus.

TAB. DCVI.—*fig. 8.*

SPEC. CHAR. Lateral valves nearly flat, smooth; posterior valve lanceolate, straight or recurved.

A SMALL smooth species, found by G. E. Smith, Esq. in Colville Bay in the Isle of Wight, among sand accompanied by many minute shells and valves of Chitones, and probably connected with the so called upper marine formation.

PILEOPSIS.—*Lamarck.*

GEN. CHAR. Shell a recurved cone covering the animal; the apex turned backward and to the right, minute, involute; muscular impression posterior, arched, its extremities dilated.

A GENUS formerly included under *Patella*, now evidently well separated from it, even if only its own characters independent of those of its animal be considered: but when the situation of the branchiæ in a distinct cavity near the head, and the connection of the mantle with the shell are observed, no doubt can be entertained. It is more difficult to distinguish *Hipponix* from it when the secondary valve (or support as M. De France calls it) of that genus is absent: indeed Lamarck has made *Hipponix* only a section of the genus *Pileopsis*; the form and position of the apex seem to indicate a difference.

Patella Unguis (t. 139. f. 7. & 8.) belongs to this genus. There are also two or three recent species known; one, *P. ungarica*, is British, it is covered with a fringed epidermis.

The Fossil species are only in the oldest and newest conchiferous formations.

PILEOPSIS *vetusta.*

TAB. DCVII.—*figs.* 1. 2. & 3.

SPEC. CHAR. Smooth, contracted posteriorly; two or three irregular undulations rise up the front; margin sinuose.

THE sides of this shell being rather flattened, the ovate

aperture is longitudinal, it is broadest at the front; the shell is moderately thick.

Not very unfrequent in the black limestone of Queen's County Ireland (fig. 1.), and Preston in Lancashire (fig. 2. & 3.) From the latter place we have been presented with several specimens by William Gilbertson, Esq.



PILEOPSIS tubifer.

TAB. DCVII.—*fig. 4.*

SPEC. CHAR. Front surmounted by three rows of long tubes.

MUCH like the last but rather taller, the three rows of tubes are placed upon obscure ridges that run up the front, they equal the diameter of the aperture in length.

The specimen figured is in the rich cabinet of W. Gilbertson, Esq. We have seen only one other, which is smaller, but exhibits the bases of the three rows of spines very neatly: it is in the possession of Dr. Alexander Moore of Preston, from which place both individuals come.

SERPULA (*Vermilia*?) *sulcata*.TAB. DCVIII.—*figs. 1. & 2.*

SPEC. CHAR. Repent, much elevated; back and sides flattened; along the centre of the back an irregular thick keel, and along each side a narrow sulcus; lines of growth conspicuous.

THIS *Serpula* seems composed of reflected scales placed in close succession, they are blunt and irregular; the aperture is round with a single tooth proceeding from the dorsal keel. It acquires the size of a swan's quill. The lateral grooves form a prominent mark of distinction.

Abundant in the Calcareous Grit at Shotover Hill near Oxford. Part of a specimen presented by G. E. Smith, Esq. is represented at fig. 1. It is chiefly composed of *Silex*. Fig. 2. has more of the Shell remaining. Some specimens have small pores between the laminæ.

SERPULA tricarinata.

TAB. DCVIII.—*figs. 3. & 4.*

SPEC. CHAR. Repent, rather smooth, but sometimes when old squamose, round, with three thick keels, the central one largest; keels entire, sometimes disappearing. Aperture round with two thick lobes at the base, the edge thin.

SELDOM so thick as a goose quill, tapering rather quickly, the surface of attachment is expanded until the shell is old, when the last portions are nearly cylindrical and often free from keels, its surface is then squamose. Among the squamæ in such individuals, or between the lines of growth in others, there are frequently minute pores or short tubes, but whether formed by the animal of the Serpula or some minute one is not easily discovered.

The specimens figured are from the Calcareous Grit of Shotover Hill. We have others, that appear precisely the same, from the Coral Rag at Steeple Ashton, and from the Cornbrash of Felmersham, the latter collected by the Rev. T. O. Marsh: it is also found in the Diluvium of Norfolk. We have sometimes suspected it to be the Serpula intestinalis of Phillips's Geology of Yorkshire, but in the absence of description we cannot tell whether that be a decurrent species or not.

SERPULA triangulata.

TAB. DCVIII.—*fig. 7.*

SPEC. CHAR. Repent, roundish, elevated, smooth, three angles upon the back, the central one elevated into a keel; lines of growth circular.

A MUCH smaller and more cylindrical shell than the last, which it very nearly approaches; indeed there are upon the same mass of Stone several individuals so near *S. tricarinata* that, except in size, we cannot detect a difference.

Brought from Bradford, Wiltshire. Upon the same surface are two other species of *Serpula*, an *Exogyra*? and portions of the Pear *Encrinite*.



SERPULA runcinata.

TAB. DCVIII.—*fig. 6.*

SPEC. CHAR. Repent, subtriangular, with three distinct serrated or lacerated keels upon its back; aperture round.

LESS than a crow's quill, tortuose, with an expanded base; the back is round, with a central and two lateral keels, the latter are particularly sharp and lacerated.

Upon an unnamed *Plicatula*, attached to a mass of Coral from the Coral Rag of Shotover Hill: the upper figure is magnified.

SERPULA obtusa.

TAB. DCVIII.—*fig.* 8.

SPEC. CHAR. Repent, smooth, obtusely quadrangular, with an obtuse thick keel along the flat back; edge of the aperture produced as a short cylinder beyond a bilobed thick margin; base expanded.

ALMOST as thick as a goose quill; when young the aperture has a tooth at top, and when nearly full grown the edge is much thickened by two reflected variciform lobes, that meet upon this tooth; when quite perfect, a short cylinder projects beyond these lobes. The surface is remarkably smooth, the lines of growth very indistinct; the keel is sometimes wavy and sometimes even.

A beautiful group of this *Serpula* upon a portion of an *Inoceramus*, from part of which the figure is copied, is in the rich collection of C. B. Rose, Esq., it is from the Upper Chalk of Sayham in Norfolk.



SERPULA fluctuata.

TAB. DCVIII.—*fig.* 5.

SPEC. CHAR. Repent, smooth, circular, with five regularly waved low keels.

THIS very neat little *Serpula* is at once known by its regularly waved wire-like keels; the surface of attachment is small.

Found upon various shells in the Upper Chalk at Norwich: we have it from the Rev. G. R. Leathes and Mr. Barnes.

RISSOA. *Fremenville & Desmarest**.

GEN. CHAR. Shell univalved, spiral, oblong or turreted, not umbilicated, often costated; aperture entire, oval, oblique, dilated, rather angular above and with a slight sinus at the base; lips nearly united, the outer thickened, its edge not reflected. Operculum shelly.

UNDER this genus are included a number of small elegant marine Shells, many of which are ribbed, especially in the young state, while some are nearly plain; the outer lip being thickened more than the costæ, but not producing varicose sutures, and the obscure sinus or truncation at its base define it neatly.

This genus is only known in the great Oolite, the newer parts of the tertiary formation and recent.

RISSOA *lævis*.

TAB. DCIX.—*fig. 1.*

SPEC. CHAR. Oblong-oval, smooth.

THE sides of the whorls are rather flat, and the aperture less expanded than in some species: the two last whorls are almost cylindrical.

* Bull. de la Soc. Phil. de Paris, 1814.

RISSOA acuta.

TAB. DCIX.—*fig. 2.*

SPEC. CHAR. Turreted, acute, costated; costæ many, longitudinal; aperture large, outer lip much expanded; whorls convex, 7.

A RATHER large aperture, a pointed, almost subulate spire, and ten or twelve rows of costæ mark this species.



RISSOA obliquata.

TAB. DCIX.—*fig. 3.*

SPEC. CHAR. Elongated, pointed, costated; costæ many, oblique, curved; aperture rather small; whorls 5 or 6, convex.

SHORTER in proportion to its width than the last, with fewer and oblique ribs and a smaller aperture; otherwise much resembling it.



RISSOA duplicata.

TAB. DCIX.—*fig. 4.*

SPEC. CHAR. Elongated, pointed, costated; costæ very numerous, divided in their middle by a low carina; aperture rather large.

THIS beautiful little shell cannot fail to be easily recognized in all stages of its growth by the double set of ribs that extends from the central keel.

These four species of almost minute shells are all from the Ancliffe Oolite.

SYSTEMATICAL, STRATIGRAPHICAL,
AND
ALPHABETICAL INDEXES
TO THE
FIRST SIX VOLUMES
OF THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN.

TO WHICH IS ADDED
A SHORT ACCOUNT OF THE LIFE OF THE AUTHOR :

BY
JAMES DE CARLE SOWERBY, F.L.S., &c.

LONDON.

1834.

PREFACE TO THE INDEXES.

AT the time the *Mineral Conchology* was commenced, so little was generally known of the great assistance a knowledge of fossil shells would prove towards the examination of the structure of the earth's crust, that most collectors were very careless in observing the relative situations from which they obtained their specimens; and Mr. Sowerby himself, more anxious to record the existence of the species as they came in his way, than to enter into details for which he had but indifferent means, justly considered, that by publishing figures with names he would at least enable future geologists to use terms which a reference to his work would render intelligible, and thus facilitate their labours and means of communication with each other. Mr. Farey had rendered the work somewhat more useful by the Supplementary Indexes which he furnished to the earlier volumes; but as the science of geology advanced he was obliged to vary his plan, and the termination of his life unhappily prevented him from completing the task he had assigned himself, of giving an improved geological arrangement to the whole work.

The work was originally planned to be arranged zoologically, so that in the absence of an index pointing out such an arrangement it must be incomplete: this index would have been given, with another geologically arranged, soon after the conclusion of the sixth volume, but the Author of that and the one preceding was unwilling to adopt hastily any system which was then proposed, and even now feels that his duty is very imperfectly performed. He has adopted the system of Lamarck, as given by M. Deshayes, and made only a few alterations which seem to him to be absolutely needful: he would have made more, but was desirous to avoid increasing the number of systems, while he was aware that in all probability one more perfect than he could have planned would be given by a person well versed in recent shells and their animals, in which alone the characters necessary to be observed for classification can be discovered. One advantage, and that a considerable one, in the system he has adopted, is its being nearly the one followed by most modern geologists. The advancement

of the science generally, and particularly a better acquaintance with the fossil shells themselves, through more perfect specimens, have rendered some alterations in the nomenclature absolutely necessary, especially in the generic names; but the changes made in these indexes are as few as they could consistently be, because the frequent changing of names is a source of great perplexity. The alterations in the specific names are not numerous: when they occur they are pointed out. One or two new genera are proposed, and their characters given.

The Geological Index will, in some cases, be found at variance with the former text; where that is the case, the difference has arisen from some discovered error in the locality given, or has been made upon authority which cannot be questioned: still the Author fears many errors remain, which the length of time he has had the indexes in hand has not removed, and mostly arise from an inaccurate knowledge of the places from whence the fossils are stated to have come into his collection. The additional localities given are much fewer than he anticipated, the Author finding from experience that he could not trust implicitly to the lists hitherto published, or supplied by his friends, in consequence of sufficient attention not having been always paid to specific distinctions: he has therefore principally depended upon one or two collections within his reach, and upon contributions to his own, for those additional localities. The Author has received in this department much assistance from the extensive knowledge of a practical geologist, who has aided him in correcting the references to formations: to him, to H. H. Goodhall, Esq., and to many friends from whom he has had both information and specimens, he begs thus publicly to tender his sincere thanks, and to express a hope that they will continue their assistance so as to enable him to improve in the projected continuation of this work.

To the public the Author feels deeply indebted, and cannot refrain from declaring his gratitude for the encouragement bestowed upon a work commenced by his lamented father, and in the continuance of which he himself has incurred so much responsibility, and also to crave consideration for errors towards those who alike were more conversant with the pencil than the pen, and who have sacrificed much towards the advancement of their favourite sciences.

Camden Town,
July, 1835.

SYSTEMATICAL INDEX.

CRUSTACEA.

	Vol.	Tab.	Fig.	Stratum.
Cypris Fabæ	5	485		Weald.

ANNULATA.

Serpula Plexus ...	6	598	1	{ Chalk. G. S.
compressa	6	598	3	M. L.?
antiquata	6	598	4	U. G. S.
tenuis.....	6	598	5	L. F. W.
Carinella	6	598	2	G. S.
ampullacea	5	597	1-5	Chalk.
Macropus	6	597	6	Chalk.
crassa	1	30		L. C.
sulcata	6	608	1, 2	Calc. Gr.
				Calc. Gr.
tricarinata.....	6	608	3, 4	{ Coral R. Cornb.?
fluctuata	6	608	5	Chalk.
runcinata	6	608	6	Coral R.
triangulata	6	608	7	Gr. Ool.
obtusa	6	608	8	Chalk.
tetragona α.	6	599	1	Lias.
β.	6	599	2	Cornb.
rustica	6	599	3	Gault.
articulata	6	599	4	U. G. S.
vertebralis.....	6	599	5	Cornb.
granulata	6	597	7, 8	Chalk.

CIRRIPEDA.

Balanus tessellatus .	1	84	1	Crag.
crassus	1	84	2-4	Crag.
Pollicipes sulcatus .	6	606	1, 2, 7	Chalk.
maximus	6	606	3, 6	Chalk.
reflexus	6	606	8	Up. Mar.

CONCHIFERA.

ORD. I. DIMYARIA.

Clavagella coronata	5	480		L. C.
Teredo antenautæ..	1	102	1, 2, 4-8	L. C.
personata	1	102	3	L. C.
Pholas cylindrica...	2	198		Crag.
prisca	6	581		L. G. S.
compressa	6	603		Kim. C.
Gastrochæna tortu- osa	6	526	1	Inf. Ool.
contorta	6	526	2	L. C.
Pholadomya ambi- gua.....	3	227		Lias.
ovalis	3	226		Cornb.
producta	2	197		Lias.
obtusa	2	197		Inf. Ool.
lyrata	2	197		Lias.
deltoidæa	2	197		Cornb.
margaritacea	3	297	1, 2, 3	L. C.
Murchisoniæ ..	{ 3 6	{ 297 515	{ 4	{ Inf. Ool.?

	Vol.	Tab.	Fig.	Stratum.
Pholadomya æqualis	6	546	3	Kim. C.
acuticostata	6	546	1, 2	Gr. Ool.
angustata	4	327		Inf. Ool.
Fidicula (lyrata) .	3	225		Inf. Ool.
Solen affinis	1	3		L. C.
Panopea Faujas ...	6	602	1-3, 5	L. C. Crag.
gibbosa	1	42		Inf. Ool.
	{ 1 5	{ 76 419	{ 1 2	{ L. C.
intermedia	{ 6 5	{ 602 419	{ 4 3	{ Crag. L. G. S.
plicata	5	419	3	L. G. S.
oblata (gibbosa)...	5	419	1	Kim. C.
Paclomya Gigas {	6 6	504 505		G. S.
Mya lata	1	81		Crag.
Mandibula	1	43		U. G. S.
arenaria.....	4	364		Crag.
Pullus	6	531	2	Crag.
? angustata.....	6	531	1	Up. Mar.
depressa.....	5	418		Kim. C.
literata	3	224	1	Lias?
V-scripta	3	224	2-5	Kell. R.
angulifera	3	224	6-7	F. E. R.
Lutraria oblata.....	6	534	3	L. C.
carinifera	6	534	2	Chalk.
striata	6	534	1	G. S.
Maetra arcuata.....	2	160	1, 6	Crag.
dubia	2	160	2-4	Crag.
ovalis	2	160	5	Crag.
cuneata	2	160	7	Crag.
Crassatella sulcata...	4	345	1	L. C.
plicata	4	345	2	L. C.
Potamomya (Mya)				
plana	1	76	2	Up. Mar.
var. suban- gulata ... }	1	76	3	Up. Mar.
gregaria	4	363		Up. F. W.
Corbula nitida	4	362	1-3	Up. Mar.
cuspidata	4	362	4-6	Up. Mar.
complanata	4	362	7, 8	Crag.
obscura	6	572	5	Inf. Ool.?
elegans	6	572	1	L. G. S.
striatula	6	572	2, 3	L. G. S.
rotundata	6	572	4	Crag.
globosa	3	269	3	L. C.
Pisum	3	209	4	L. C.
gigantea	3	209	5-7	L. G. S.
revoluta	3	209	8-13	L. C.
Saxicava rugosa.....	5	466		Crag.
Petricolalaminosa...	6	573		Crag.
Sanguinolaria Hol- lowaysii	2	159		L. C.
compressa	5	462		L. C.
undulata	6	548	1, 2	Inf. Ool.?
gibbosa	6	548	3	M. L.
Psammobia solida...	4	342		Up. Mar.
Tellina obliqua.....	2	161	1	Crag.
ovata	2	161	2	Crag.
obtusa.....	2	179	4	Crag.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
Tellina Branderi ...	4	402	1	L. C.	Venericardia cari-				
filosa	4	402	2	L. C.	nata	3	259	2	L. C.
striatula	5	456	1	L. G. S.	deltoides	3	259	1	L. C.
inæqualis	5	456	2	L. G. S.	dubia	3	259	3	Chalk M.
ambigua	4	403		Up. Mar.	globosa	3	289	1	L. C.
Corbis lævis	6	580		Calc. Gr.	oblonga	3	289	2	L. C.
Sphæra corrugata ...	4	335		L. G. S.	chamæformis.....	5	490	1	Crag.
Lucina mitis	6	557	1	L. C.	orbicularis.....	5	490	2	Crag.
antiquata	6	557	2	Crag.	scalaris	5	490	3	Crag.
crassa	6	557	3	Calc. Gr.	Trigonia gibbosa {	3	235		
divaricata	5	417		L. C.	{	3	236		Port. L.
Astarte planata	3	257		Crag.	nodosa	6	507	1	L. G. S.
excavata	3	233		L. G. S.	dædalea	1	88		L. G. S.
obovata	4	353		L. G. S.	spectabilis	6	544		L. G. S.
striata	6	520	1	L. G. S.	clavellata	1	87		Coral R.
rotunda (orbicu- } laris).....	6	520	2	Gr. Ool.	elongata	5	431		Coral R.
lineata	2	179	1	Kim. C.	costata	1	85		Inf. Ool.
plana	2	179	2	Crag.	Pullus	6	508	2, 3	Gr. Ool.
obliquata	2	179	3	Crag.	imbricata	6	507	2, 3	Gr. Ool.
imbricata	6	521	1	Crag.	cuspidata	6	507	4, 5	Gr. Ool.
nitida	6	521	2	Crag.	angulata	6	508	1	Inf. Ool.
bipartita	6	521	3	Crag.	striata.....	3	237	1-3	Inf. Ool.
oblonga	6	521	4	Crag.	duplicata	3	237	4, 5	Inf. Ool.
rugata	4	316		L. C.	pennata	3	237	6	L. G. S.
lurida.....	2	137	1	Inf. Ool.?	spinosa	1	86		L. G. S.
elegans	2	137	3	Inf. Ool.	aliformis	3	215		L. G. S.
cuneata	2	137	2	Port. L.	excentrica	3	208	1, 2	L. G. S.
orbicularis.....	5	444	4-6	Gr. Ool.	affinis.....	3	208	3	L. G. S.
pumila	5	444	2, 3	Gr. Ool.	Cardium Parkinsoni	1	49		Crag.
trigonalis	5	444	1	Inf. Ool.	edule	3	283	1	recent.
Axinus angulatus... 4	315			L. C.	edulinum	3	283	3	Crag?
obscurus	4	314		Mag. L.	angustatum	3	283	2	Crag.
Cyclas pulchra	6	527	1	Up. Mar.	porulosum.....	4	346	2	L. C.
media.....	6	527	2	Wealden.	proboscideum ...	2	156	1	L. G. S.
membranacea ...	6	527	3	Wealden.	Gentianum				
deperdita	2	162	1	Wool. B.	(Cardita tu- } berculata) ...	2	143		U. G. S.
cuneiformis	2	162	2, 3	Wool. B.	dissimile	6	553	2	Port. L.
obovata	2	162	5, 6	Up. Mar.	truncatum	6	553	3	Lias.
var.	2	162	4	Wool. B.	turgidum	4	346	1	L. C.
Thetis major.....	6	513	1-4	U. G. S.	nitens.....	1	14		{ L. C. Lias?
minor.....	{	3	209	1, 2	L. G. S.	plumsteadense ...	1	14	Wool. B.
	{	6	513	5, 6	Gault.	semigranulatum..	2	144	L. C.
Megalodon cuculla-					striatum.....	6	553	1	Inf. Ool.?
tus	6	568		M. L.	Hillanum	1	14		L. G. S.
Cyprina æqualis ...	1	21		Crag.	hibernicum ... {	1	82	1, 2	
angulata.....	1	65		L. G. S.	{	6	552	3	M. L.
Venus incassata ...	2	155	1, 2	L. C.	elongatum.....	1	82	3	M. L.
gibbosa	2	155	3	Crag.	aliforme.....	6	552	2	M. L.
parva	6	518	4-6	L. G. S.	? decussatum.....	6	552	1	Chalk M.
ovalis	6	567	1, 2	L. G. S.	Cardita? lunulata ...	3	232	1, 2	Inf. Ool.
Faba	6	567	3	L. G. S.	? similis	3	232	3	Inf. Ool.
lineolata.....	1	20		L. G. S.	Isocardia Cor	6	516	2	Crag.
plana	1	20		L. G. S.	similis	6	516	1	U.? G. S.
transversa	5	422	1	L. C.	minima	3	295	1	Cornb.
rustica	2	196		Crag.	tenera.....	3	295	2	Kell. R.
Solandri (lineo- } lata).....	5	422	2	L. C.	rostrata.....	3	295	3	Inf. Ool.
turgida	3	256		Crag.	sulcata	3	295	4	L. C.
caperata.....	6	518	1-3	G. S.	oblonga	5	491	2	M. L.
lentiformis	2	203		Crag.	concentrica	5	491	1	Cornb.?
elegans	5	422	3	L. C.	striata.....	1	89	1	Inf. Ool.
pectinifera.....	5	422	4	L. C.	abrupta	1	89	2	Inf. Ool.
? varicosa	3	296		Cornb.	Cucullæa glabra ...	1	67		L. G. S.
Myoconcha crassa	5	467		Inf. Ool.	oblonga	3	206	1, 2	Inf. Ool.
Hippopodium pon-					decussata	3	206	3, 4	L. G. S.
derosum.....	3	250		Lias.	carinata	3	207	1	L. G. S.
Venericardia plani-					fibrosa	3	207	2	L. G. S.
costa	1	50		L. C.	elongata.....	5	447	1	Inf. Ool.
senilis.....	3	258		Crag.	costellata	5	447		L. G. S.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
• <i>Lima antiquata</i>	3	214		Lias.	• <i>Ostrea canaliculata</i> 2	135	1		U. Ch.
• <i>Pecten cornuus</i>	3	204		L. C.	• <i>acuminata</i>	2	135	2, 3	F. E. R.
• <i>orbicularis</i>	2	186		U. G. S.	• <i>gigantea</i>	1	64		L. C.
• <i>lamellosus</i>	3	239		Port. L.	• <i>pulchra</i>	3	279		Wool. B.
• <i>cinctus</i>	4	371		Inf. Ool.?	• <i>bellovacina</i>	4	388	1, 2	Wool. B.
• <i>annulatus</i>	6	542	1	Cornb.	• <i>edulina</i>	4	388	3, 4	Wool. B.
• <i>papyraceus</i>	4	354		Coal.	• <i>expansa</i>	3	238	1	Port. L.
• <i>Beaveri</i>	2	158		L. Ch.	• <i>undulata</i>	3	238	2	Wool. B.
• <i>æquivalvis</i>	2	136	1	Inf. Ool.	• <i>Meadii</i>	3	252	1, 4	Cornb.
• <i>fibrosus</i>	2	136	2	For. M.	• <i>tenera</i>	3	252	2, 3	Wool. B.
• <i>dentatus</i>	6	574	1	Inf. Ool.	• <i>Flabellulum</i>	3	253		L. C.
• <i>granosus</i>	6	574	2	M. L.	• <i>semiplana</i>	5	489	3	U. Ch.
• <i>plicatus</i>	6	574	3	M. L.	• <i>Marshii</i>	1	48		Cornb.
• <i>nitidus</i>	4	394	1	U. Chalk.	• <i>gregaria</i>	2	111	1, 3	Coral R.
• <i>striatus</i>	4	394	2-4	Crag.	• <i>Palmetta</i>	2	111	2	Calc. Gr.
• <i>Princeps</i>	6	542	2	Crag.	• <i>solitaria</i>	5	468	1	Coral R.
• <i>duplicatus</i>	6	575	1-3	L. Cl.	• <i>macroptera</i>	5	468	2, 3	L. G. S.
• <i>carinatus</i>	6	575	4	L. Cl.	• <i>carinata</i>	4	365		U. G. S.
• <i>reconditus</i>	6	575	5, 6	L. C. Crag.	• <i>costata</i>	5	488	3	Gr. Ool.
• <i>plebeius(sulcatus)</i> 4	393	1		L. C. Crag.	• <i>dorsata</i>	5	489	1, 2	L. C.
• <i>gracilis</i>	4	393	2	Crag.	<i>Anomia lineata</i>	5	425		L. C.
• <i>asper</i>	4	370	1	U. G. S.					
• <i>obliquus</i>	4	370	2	U. G. S.					
• <i>vimineus</i>	6	543	1, 2	Coral R.					
• <i>vagans</i>	6	543	3-5	{ Ool. Cornb. Coral R.					
• <i>barbatus</i>	3	231		Inf. Ool.					
• <i>grandis</i>	6	585		Crag.					
• <i>complanatus</i>	6	586		Crag.					
• <i>quadricostatus</i> ... 1	56	1, 2		G. S.					
• <i>quinquecostatus</i> ... 1	56	3-8		{ Chalk. G. S.					
• <i>obscurus</i>	3	205	1	Gr. Ool.					
• <i>lens</i>	3	205	2, 3	Coral R.					
• <i>laminatus</i>	3	205	4	Cornb.					
• <i>arcuatus</i>	3	205	5, 7	Coral R.					
• <i>similis</i>	3	205	6	Coral R.					
• <i>rigidus</i>	3	205	8	For. M.					
• <i>obsoletus</i>	6	541		Crag.					
• <i>Hinnus Dubuissoni</i> 6	601			Crag.					
• <i>proboscideus</i>	3	264		Inf. Ool.					
• <i>Dianchora lata</i>	1	80	2	U. Ch.					
• <i>striata(Podopsis)</i> } 1	80	1		U. G. S.					
• <i>striata, Def.</i> } 1	80	1		U. G. S.					
• <i>Plicatula spinosa</i> ... 3	245			Lias.					
• <i>pectinoides</i>	5	409	1	Gault.					
• <i>inflata</i>	5	409	2	Chalk M.					
• <i>Exogyra haliotoidea</i> 1	25			G. S.					
• <i>conica</i>	{ 1	26	2-4	{ G. S.					
• <i>laevigata</i>	{ 6	605	1-3	{ G. S.					
• <i>undata</i>	6	605	4	G. S.					
• <i>nana</i>	4	383	3	L. G. S.					
• <i>digitata</i>	2	174		Kim. C.					
• <i>Gryphaea Columba</i> . 4	383	1, 2		L. G. S.					
• <i>incurva</i>	2	112	1, 2	U. G. S.					
• <i>obliquata</i>	2	112	3	Lias.					
• <i>MacCullochii</i> ... 6	547	1-3		Inf. Ool.					
• <i>minuta</i>	6	547	4	Lias.					
• <i>vesiculosa</i>	4	369		Gr. Ool.					
• <i>globosa</i>	4	392		U. G. S.					
• <i>dilatata</i>	2	149	1	U. Ch.					
• <i>bilobata (dilatata)</i> 2	149	2		Oxf. C.					
• <i>gigantea</i>	4	391		Kell. R.					
• <i>bullata</i>	4	368		Inf. Ool.					
• <i>sinuata</i>	4	336		Calc. Gr.					
• <i>canaliculata</i>	1	26	1	L. G. S.					
• <i>Ostrea laeviuscula</i> ... 5	488	1		U. G. S.					
• <i>obscura</i>	5	488	2	Lias.					
• <i>deltoides</i>	2	148		Gr. Ool.					
				Kim. C.					

ORDER III. BRACHIOPODA.

<i>Crania parisiensis</i> ...	5	408		U. Ch.
<i>Orbicula reflexa</i> ...	6	506	1	Lias.
• <i>Humphriesiana</i> ...	6	506	2	Kim. C.
• <i>granulata</i>	6	506	3, 4	Gr. Ool.
<i>Producta Martini</i> ...	4	317	2-4	M. L.
• <i>antiquata</i>	4	317	1, 5, 6	M. L.
• <i>scotica</i>	1	69	3	M. L.
• <i>spinosa</i>	1	69	2	M. L.
• <i>concinna</i>	4	318	1	M. L.
• <i>lobata</i>	4	318	2-6	M. L.
• <i>sulcata</i>	4	319	2	M. L.
• <i>costata</i>	6	560	1	Tr. L.
• <i>calva</i>	6	560	2-6	Mag. L.
• <i>horrida</i>	4	319	1	Mag. L.
• <i>longispina</i>	1	68	1	M. L.
• <i>Flemingii</i>	1	68	2	M. L.
• <i>humerosa</i>	4	322		Mag. L.
• <i>gigantea</i>	4	320		M. L.
• <i>personata</i>	4	321		M. L.
• <i>hemisphaerica</i> { 4	328			M. L.
• <i>comoides</i>	4	329		M. L.
• <i>latissima</i>	4	330		M. L.
• <i>plicatilis</i>	5	459	2	M. L.
• <i>depressa</i>	5	459	3	Tr. J.
• <i>spinulosa</i>	1	68	3	M. L.
• <i>aculeata</i>	1	68	4	M. L.
• <i>scabricula</i>	1	69	1	M. L.
• <i>punctata</i>	4	323		M. L.
• <i>fimbriata</i>	5	459	1	M. L.
<i>Atrypa (Spirifer)</i> } 3	268			M. L.
• <i>oblata</i>				
• <i>glabra</i>	3	269	1	M. L.
• <i>obtusata</i>	3	269	2	M. L.
• <i>acuminata</i>	{ 4	324	1	{ M. L.
• <i>cordiformis</i>	5	495	1, 3	M. L.
• <i>reniformis</i>	5	495	2, 4	M. L.
• <i>platyloba</i>	5	496	1-4	M. L.
• <i>Pugnus</i>	5	496	5, 6	M. L.
• <i>affinis</i>	5	497		M. L.
• <i>ambigua</i>	4	324	2	Tr. L.
• <i>Spirifer resupinatus</i> 4	376			M. L.
• <i>(Terebratula) li-</i>	4	325		M. L.
• <i>neatus</i>	4	334	1, 2	M. L.
• <i>(Ter.) imbricatus</i> 4	334	3, 4		M. L.
• <i>Walcottii</i>	4	377	2	Lias.

	Vol.	Tab.	Fig.	Stratum.
<i>Spirifer minimus</i> ...	4	377	1	M. L.
<i>pinguis</i>	3	271		M. L.
<i>rotundatus</i>	5	461	1	M. L.
<i>trigonalis</i>	3	265		M. L.
<i>bisulcatus</i>	5	494	1, 2	M. L.
<i>distans</i>	5	494	3	M. L.
<i>octoplicatus</i>	6	562	2-4	M. L.
<i>triangularis</i>	6	562	5, 6	M. L.
<i>undulatus</i>	6	562	1	Mag. L.
<i>cuspidatus</i>	2	120		} M. L.
	5	461	2	
<i>attenuatus</i>	5	493	3-5	M. L.
<i>radiatus (lineatus)</i>	5	493	1, 2	Tr. L.
<i>striatus</i>	3	270		M. L.
<i>resupinatus</i>	4	325		M. L.
<i>lineatus</i>	4	334	1, 2	M. L.
<i>imbricatus</i>	4	334	3, 4	M. L.
<i>Magas pumilus</i>	2	119		U. Ch.
<i>Terebratula subro-</i>				
<i>tunda</i>	1	15	1	U. Ch.
<i>carnea</i>	1	15	5, 6	U. Ch.
<i>ovata</i>	1	15	3	U. G. S.
<i>punctata</i>	1	15	2, 4	Lias.
<i>lata</i>	1	100		Cornb.
<i>ovoides</i>	1	100		Cornb.
<i>ornithocephala</i> ..	1	101	1, 2, 4	Cornb.
<i>Lampas</i>	1	101	2	Lias.
<i>obovata</i>	1	101	5	Cornb.
<i>elongata</i>	5	435	1, 2	U. Ch.
<i>sphaeroidalis</i>	5	435	3	Inf. Ool.
<i>bullata</i>	5	435	4	Inf. Ool.
<i>emarginata</i>	5	435	5	Inf. Ool.
<i>digona</i>	1	96		Brad. C.
var.	1	96		Cornb.
<i>Sacculus</i>	5	446	1	M. L.
<i>hastata</i>	5	446	2, 3	M. L.
<i>cornuta</i>	5	446	4	Lias.
<i>triquetra</i>	5	445	1	Cornb.
<i>indentata</i>	5	445	2	Lias.
<i>Fimbria</i>	4	326		Inf. Ool.
<i>porrecta</i>	6	576	1	Tr. L.
<i>variabilis</i>	6	576	2-5	Crag.
<i>obtusa</i>	5	437	4	Gault.
<i>subundata</i>	1	15	7	L. Ch.
<i>intermedia</i>	1	15	8	Cornb.
<i>semiglobosa</i>	1	15	9	L. Ch.
<i>obesa</i>	5	438	1	L. Ch.
<i>bucculenta</i>	5	438	2	Calc. Gr.
<i>biplicata</i>	1	90		} U. G. S.
	5	437	2, 3	
<i>globata</i>	5	436	1	Inf. Ool.
<i>perovalis</i>	5	436	2, 3	Inf. Ool.
<i>Sella</i>	5	437	1	L. G. S.
<i>maxillata</i>	5	436	4	Inf. Ool.
<i>resupinata</i>	2	150	3, 4	Inf. Ool.
<i>acuta</i>	2	150	1, 2	Inf. Ool.
<i>lateralis</i>	1	83	1	M. L.
<i>Crumena</i>	1	83	2, 2*3,	M. L.
<i>tetrahedra</i>	1	83	4	U. Lias.
var. me-				
<i>dia</i>	1	83	5	U. Lias.
<i>concinna</i>	1	83	6	Gr. Ool.
<i>obsoleta</i>	1	83	7	Cornb.
<i>plicatilis</i>	2	118	1	U. Ch.
var. octo-				
<i>plicata</i>	2	118	2	U. Ch.
<i>Wilsoni</i>	2	118	3	Tr. L.
<i>latissima (lata)</i> ...	5	502	1	U. G. S.
<i>depressa</i>	5	502	2	L. G. S.
<i>nuciformis</i>	5	502	3	L. G. S.

	Vol.	Tab.	Fig.	Stratum.
<i>Terebratula angu-</i>				
<i>lata</i>	5	502	4	Inf. Ool.
<i>plicatella</i>	5	503	1	Inf. Ool.
<i>serrata</i>	5	503	2	Lias.
<i>hemisphaerica</i> ..	6	536	1	Gr. Ool.
<i>rigida</i>	6	536	2	U. Ch.
<i>striatula</i>	6	536	3-5	{ Gault to L. C.
<i>Pisum</i>	6	536	6, 7	Chalk M.
<i>rostrata</i>	6	537	1, 2	Chalk M.
<i>Gibbsiana</i>	6	537	4	G. S.
<i>Mantelliana</i>	6	537	5	Chalk M.
<i>Flabellula</i>	6	535	1	Gr. Ool.
<i>fureata</i>	6	535	2	Gr. Ool.
<i>orbicularis</i>	6	535	3	Lias.
<i>oblonga</i>	6	535	4-6	L. G. S.
<i>truncata</i>	6	537	3	L. G. S.
<i>pectita</i>	2	138	1	U. G. S.
<i>Lyra</i>	2	138	2	U. G. S.
<i>coarctata</i>	4	312	1-4	Brad. C.
<i>reticulata</i>	4	312	5, 6	Brad. C.
<i>Mantia</i>	3	277	1	M. L.
<i>obliqua</i>	3	277	2	U. Ch.
<i>inconstans</i>	3	277	3, 4	Kim. C.
<i>dimidiata</i>	3	277	5	G. S.
<i>Pentamerus laevis</i> ...	1	28		Tr. L.
<i>Knightii</i>	1	28		Tr. L.
<i>Aylesfordii</i>	1	28, 29		Tr. L.
<i>Lingula mytiloides</i> . 1	19	1, 2		M. L.?
<i>ovalis</i>	1	19	4	Kim. C.?
<i>tenuis</i>	1	19	3	L. C.

MOLLUSCA.

ORD. I. GASTEROPODA.

• <i>Patella latissima</i> ...	2	139	1, 5	Kim. C.
• <i>laevis</i>	2	139	3, 4	Lias.
• <i>aequalis</i>	2	139	2	Crag.
• <i>ancilloides</i>	5	484	2	Gr. Ool.
• <i>Nana</i>	5	484	3	Gr. Ool.
• <i>lata</i>	5	484	1	Gr. Ool.
• <i>rugosa</i>	2	139	6	Gr. Ool.
• <i>striata</i>	4	389		L. C.
• <i>Pileopsis Unguis</i> ...	1	139	7, 8	Crag.
• <i>vetusta</i>	6	607	1-3	M. L.
• <i>tubifera</i>	6	607	4	M. L.
• <i>Emarginula reticu-</i>				
<i>lata</i>	1	33	bis	Crag.
<i>crassa</i>	1	33	bis	Crag.
<i>clathrata</i>	6	519	1	Gr. Ool.
<i>scalaris</i>	6	519	3, 4	Gr. Ool.
<i>tricarinata</i>	6	519	2	Gr. Ool.
• <i>Fissurella graeca</i> ...	5	483		Crag.
• <i>Infundibulum rec-</i>				
<i>tum</i>	1	97	3	Crag.
<i>obliquum</i>	1	97	1	L. C.
<i>tuberculatum</i> ...	1	97	4, 5	L. C.
<i>echinulatum</i>	1	97	2	L. C.
<i>spinulosum</i>	1	97	6	L. C.
• <i>Bulla convoluta</i> ...	5	464	1	Crag.
<i>constricta</i>	5	464	2	L. C.
<i>elliptica</i>	5	464	6	L. C.
<i>attenuata</i>	5	464	3	L. C.
<i>filosa</i>	5	464	4	L. C.
<i>acuminata</i>	5	464	5	L. C.
• <i>Helix globosus</i> ...	2	170		F. W.
• <i>Bulinus ellipticus</i> ...	4	337		F. W.
• <i>costellatus</i>	4	366		F. W.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
• <i>Planorbis cylindri-</i>					• <i>Globulus (Ampulla-</i>				
<i>cus</i>	2	140	2	F. W.	<i>ria) acutus</i>	3	284		L. C.
<i>obtusus</i>	2	140	3	F. W.	<i>depressus</i>	1	5		L. C.
<i>Lens</i>	2	140	4	F. W.	<i>patulus</i>	3	284		L. C.
<i>hemistoma</i>	2	140	6	Wool. B.	<i>sigaretinus</i>	3	284		L. C.
<i>euomphalus</i>	2	140	7-9	F. W.	<i>Ambulacrum</i> ..	4	372		L. C.
• <i>Ancillus elegans</i> ...	6	533		U. F. W.	<i>nobilis</i>	6	522	1	M. L.
• <i>Limna minima</i> ..	2	169	1	F. W.	<i>? helicoides</i>	6	522	2	M. L.
<i>fusiformis</i>	2	169	2, 3	F. W.	• <i>Sigaretus canalicu-</i>				
<i>longiscata</i>	4	343		F. W.	<i>latus</i>	4	384		L. C.
<i>maxima</i>	6	528	1	L. F. W.	<i>Vermetus concavus</i> .	1	57	1-5	U. G. S.
<i>columellaris</i>	6	528	2	F. W.	<i>ovatus</i>	1	57	8	Coral R.
<i>pyramidalis</i>	6	528	3	F. W.	<i>umbonatus</i>	1	57	6, 7	Chalk M.
• <i>Melania fasciata</i> ...	3	241	1	F. W.	<i>radiatus (Planor-</i>				
<i>costata</i>	3	241	2	F. W.	<i>bis radiatus)</i> ...	2	140	5	G. S.
<i>minima</i>	3	241	3	F. W.	<i>bognoriensis</i>	6	596	1-3	L. C.
<i>truncata</i>	3	241	4	F. W.	<i>concinuus</i>	6	596	5	Inf. Ool.
<i>subulata</i> . VI. p. 41				Wealden.	<i>polygonalis</i>	6	596	6	L. G. S.
<i>attenuata</i> . VI. p. 52				Wealden.	<i>tumidus</i>	6	596	4	Coral R.
<i>tricarinata</i> . VI. p.				Wealden.	<i>Dentalium nitens</i> ...	1	70	1, 2	L. C.
52					<i>acuminatum (en-</i>				
• <i>Melanopsis fusifor-</i>					<i>talis)</i>	1	70	3	L. C.
<i>mis</i>	4	332	1-7	Up. Mar.	<i>striatum</i>	1	70	4	L. C.
<i>subulata</i>	4	332	8	Up. Mar.	<i>decussatum</i>	1	70	5	L. C.
<i>carinata</i>	6	523	1	L. F. W.	<i>ellipticum</i>	1	70	6, 7	Gault.
<i>brevis</i>	6	523	2	L. F. W.	<i>costatum</i>	1	70	8	Crag.
• <i>Potamides rigidus</i> ...	4	338		L. F. W.	<i>planum</i>	1	79	1	L. C.
<i>politus (mela-</i>	2	147	6, 7	Wool. B.	<i>cylindricum</i>	1	79	2	G. S.
<i>nioides)</i>	4	339	3	Wool. B.	<i>incrassatum</i>	1	79	3, 4	L. C.
<i>dubius</i>	2	147	5	L. C.	<i>medium</i>	1	79	5	G. S.
<i>fulviculatus</i>	2	147	1, 2	Wool. B.	• <i>Scalaria similis</i>	1	16		Crag.
<i>intermedius</i>	2	147	3, 4	Wool. B.	<i>semicostata</i> ...	1	16		L. C.
<i>funatus</i>	2	128		Wool. B.	<i>acuta</i>	6	577	6	L. C.
<i>margaritaceus</i> ...	4	339	4	Up. Mar.	<i>subulata</i>	4	390	1	Crag.
<i>cinctus</i>	4	340	1	Up. Mar.	<i>foliacea</i>	4	390	2	Crag.
<i>plicatus</i>	4	340	2	Up. Mar.	<i>minuta</i>	4	390	3, 4	Crag.
<i>duplex</i>	4	340	3	Up. Mar.	<i>frondosa</i>	6	577	1	Crag.
<i>concavus</i>	4	339	1, 2	Up. Mar.	<i>interrupta</i>	6	577	3	L. C.
<i>ventricosus</i>	4	341	1	Up. Mar.	<i>undosa</i>	6	577	4	L. C.
<i>acutus</i>	4	341	2	L. F. W.	<i>reticulata</i>	6	577	5	L. C.
• <i>Paludina (Vivipara)</i>					• <i>Cirrus depressus</i> ...	5	428	3	U. Ch.
<i>fluviorum</i>	1	31	1	Wealden.	<i>perspectivus</i>	5	428	1, 2	U. Ch.
<i>lenta</i>	1	31	3	U. F. W.	<i>acutus</i>	2	141	1	M. L.
<i>concinna</i>	1	31	4, 5	U. F. W.	<i>rotundatus</i>	5	429	1, 2	M. L.
<i>angulosa (orbicu-</i>					<i>plicatus</i>	2	141	3	Gault.
<i>laris)</i>	2	175	1, 2	L. F. W.	<i>nodosus</i>	2	141	2	Inf. Ool.
<i>minuta</i>	2	175	3	L. F. W.	<i>Leachii</i>	3	219	3	Inf. Ool.
<i>elongata</i>	6	509	1, 2	Wealden.	• <i>Euomphalus (Pla-</i>				
<i>carinifera</i>	6	509	3	Purbeck.	<i>norbis) æqualis</i> .	2	140	1	M. L.
• <i>Pileolus lævis</i>	5	432	5-8	Gr. Ool.	<i>pentangulatus</i> ..	1	45	1, 2	M. L.
<i>plicatus</i>	5	432	1-4	Gr. Ool.	<i>Catillus</i>	1	45	3, 4	M. L.
• <i>Neritina concava</i> ...	4	385	1-8	Up. Mar.	<i>nodosus</i>	1	46		M. L.
<i>uniplicata</i>	4	385	9, 10	Wool. B.	<i>carinatus</i>	5	429	3	Inf. Ool.
• <i>Nerita lævigata</i> ..	3	217	1	Inf. Ool.	<i>funatus</i>	5	450	1, 2	Tr. L.
<i>sinuosa</i>	3	217	2	Port. L.	<i>discors</i>	1	52	1	Tr. L.
<i>aperta</i>	5	424	2-4	Up. Mar.	<i>rugosus</i>	1	52	2	Tr. L.
<i>minuta</i>	5	463	3, 4	Gr. Ool.	<i>angulosus</i>	1	52	3	Tr. L.
<i>spirata</i>	5	463	1, 2	M. L.	<i>coronatus</i>	5	450	3	Gr. Ool.
<i>globosa</i>	5	424	1	L. C.	• <i>Solarium patulum</i> ...	1	11		L. C.
<i>costata</i>	5	463	5, 6	Gr. Ool.	<i>discoideum</i>	1	11		L. C.
<i>Natica glaucino-</i>					<i>conoideum</i>	1	11		Kim. Cl.?
<i>ides</i>	1	5		L. C.	<i>canaliculatum</i> ..	6	524	1	L. C.
<i>(Helix) Gentii</i> ...	2	45		Crag.	<i>plicatum</i>	6	524	2	L. C.
<i>similis</i>	1	5		U. G. S.	• <i>Rotella (Helicina)</i>				
<i>hantoniensis (stri-</i>				L. C.	<i>compressa</i>	1	10		Lias?
<i>ata)</i>	4	373		L. C.	<i>expansa</i>	3	273	1-3	Lias.
<i>patula</i>	4	373		L. C. Crag.	<i>solaroides</i>	3	273	4	Lias.
<i>cirriformis</i>	5	479	1	Crag.					
<i>hemiclausa</i>	5	479	2	Crag.					
<i>sigaretina</i>	5	479	3	L. C.					

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
• Rotella polita	3	285		Lias.	• Pleurotoma rostrata	2	146	3	L. C.
- Pleurotomaria (Helix) carinata ...	1	10		M. L.	• exorta	2	146	2	L. C.
• striata.....	2	171	1	M. L.	• acuminata	2	146	4	L. C.
• cirriformis.....	2	171	2	M. L.	• Comma	2	146	5	L. C.
• (Trochus) ornata	3	221	1	Inf. Ool.	• Senicolon	2	146	6	L. C.
• bicarinata	3	221	2	Calc. Gr.	• Colon.....	2	146	7, 8	L. C.
• sulcata	3	220	3	Inf. Ool.	• Fusus errans	4	400		L. C.
• granulata	3	220	2	Inf. Ool.	• bifasciatus	3	228		L. C.
• fasciata	3	220	1	Inf. Ool.	• quadratus	5	410	1	G. S.
• punctata	2	193	1	Inf. Ool.	• bulbiformis	3	291	1-6	L. C.
• elongata.....	2	193	2-4	Inf. Ool.	• Ficulneus	3	291	7	L. C.
• abbreviata	2	193	5	Inf. Ool.	• desertus	5	415	1	L. C.
• anglica	2	142		Lias.	• striatus	1	22		Crag.
• reticulata	3	272	2	Kim. Cl.	• ——— var. carinatus	2	109		Crag.
• Gibbsii	3	278	1	Gault.	• contrarius	1	23		Crag.
• Trochus agglutinans	1	98		L. C.	• latus	1	35		Wool. B.
• Benettiae	1	98		L. C.	• costatus (rugosus)	1	34		} Crag.
• extensus.....	3	278	2, 3	L. C.	• tuberosus	2	199	1, 2	
• lævigatus	2	181	1	Crag.	• nodosus (tuberosus)	3	229	1	L. C.
• angulatus	2	181	3	Inf. Ool.	• costellifer	6	578	4	Coral R.
• dimidiatus.....	2	181	4	Inf. Ool.	• echinatus	2	199	3	Crag.
• duplicatus	2	181	5	Inf. Ool.	• curtus	2	199	5	L. C.
• similis	2	181	2	Crag.	• gradatus	2	199	6	Wool. B.
• Sedgwicki	3	272	1	Crag.	• canaliculatus.....	5	415	2	L. C.
• imbricatus	3	272	3, 4	Lias.	• labiatus	5	412	1, 2	Up. Mar.
• monilifer	4	367		L. C.	• lavatus	5	412	3, 4	L. C.
• Littorina (Turbo) littorea	1	71	1	Crag.	• interruptus	3	304		L. C.
• rudis	1	71	2	Crag.	• corneus	1	35		Crag.
• suboperta	1	31	6	Crag.	• trilineatus	1	35		L. C.
• extensa	1	31	2	G. S.	• regularis	2	187	2	} L. C.
• conica	5	433	1	G. S.	• complanatus	5	423	1	
• rotundata	5	433	2	G. S.	• Lima	5	423	4	L. C.
• ornata	3	240	1, 2	Inf. Ool.	• confiferus	2	187	1	L. C.
• carinata	3	240	3	G. S.	• Carinella	2	187	3, 4	L. C.
• muricata	3	240	4	Coral R.	• longævus	1	63		L. C.
• monilifera	4	395	1	L. G. S.	• alveolatus	6	525	1	Crag.
• sculpta	4	395	2	L. C.	• cancellatus.....	6	525	2	Crag.
• Turbo Tiara	6	551	1	M. L.	• aciculatus (acuminatus)	3	274	1, 2, 3	L. C.
• ? obtusus	6	551	2	Gr. Ool.	• asper	3	274	4-7	L. C.
• Phasianella (Melania) striata	1	47		Coral R.	• porrectus (rugosus)	3	274	8, 9	L. C.
• ? heddingtonensis.	1	39		Coral R.	• Rissoa lævis	6	609	1	Gr. Ool.
Turritella Terebra.....	6	565	3	Diluv.	• acuta	6	609	2	Gr. Ool.
• granulata	6	565	1	G. S.	• obliquata	6	609	3	Gr. Ool.
• conoidea	1	51	1, 4, 5	L. C. Crag.	• duplicata	6	609	4	Gr. Ool.
• elongata.....	1	51	2	L. C.	• Pyruia nexilis	4	331		L. C.
• brevis.....	1	51	3	L. C.	• Greenwoodii.....	5	493		L. C.
• incrassata	1	51	6	Crag.	• (Murex) Smithii.	6	578	1-3	L. C.
• edita	1	51	7	L. C.	• Triton argutus	4	344		L. C.
• (Melania) sulcata	1	39		L. C.	• Murex tortuosus ...	5	434	2	Crag.
• abbreviata	6	565	2	M. L.	• tricarinatus	5	416	1	L. C.
• costata	6	565	4	L. G. S.	• bispinosus	5	416	2	L. C.
• excavata (concava)	6	565	5	Port. L.	• frondosus	5	416	3	L. C.
• muricata	5	499	1, 2	Coral R.	• cristatus.....	3	230	1, 2	L. C.
• cingenda	5	499	3	Coral R.	• coronatus	3	230	3	L. C.
• Terebra? lineata	3	218	1	Inf. Ool.	• peruvianus.....	5	434	1	Crag.
• constricta	3	218	2	M. L.	• Harpula	6	578	5	M. L.
• Cerithium pyramidale	2	127	1	L. C.	• Minax	3	229	2	L. C.
• geminatum	2	127	2	L. C.	• Calcar	5	410	2	G. S.
• Cornu-copie.....	2	188	1, 3, 4	L. C.	• defossus.....	5	411	1	L. C.
• giganteum.....	2	188	2	L. C.	• alveolatus	5	411	2	Crag.
• Pleurotoma prisca.....	4	386		L. C.	• sexdentatus	5	411	3	Up. Mar.
• Mitrula	4	375	3	Crag.	• Typhis (Murex) fistulosus	2	189	1, 2	L. C.
• lævigata	4	387	3	L. C.	• pungens (tubifer). ..	2	189	3, 4, 5, 8	L. C.
• brevirostrum	4	387	2	L. C.	• muticus	2	189	6, 7	L. C.
• fusiformis	4	387	1	L. C.					
• attenuata	2	146	1	L. C.					

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.	
• Rostellaria lucida ...	1	91	1-3	L. C.	• Voluta depauperata	4	396	4	L. C.	
• rimosa	1	91	4-6	L. C.	• spinosa	2	115	2, 4	L. C.	
• macroptera ... {	3	298		} L. C.	• ——— β.	2	115	3	L. C.	
• calcarata	4	349	6, 7		G. S.	• suspensa	2	115	5	L. C.
• Sowerbyi	4	349	1-5		} L. C.	• Volvaria acutiusecula	5	487		L. C.
• composita	6	558	2	Ool.		• Ovulum Leathesii ...	5	478		Crag.
• Parkinsoni ... {	1	75		} G. S.	• Cypræa oviformis ...	1	4		L. C.	
• Pes Pelicani	6	558	upper 3		Diluv.	• coccinelloides ...	4	378	1	Crag.
• Strombus bartonen-					• retusa	4	378	2	Crag.	
sis	1	34		L. C.	• Avellana	4	378	3	Crag.	
• Cassis bicatenata ...	2	151		Crag.	• Seraphs convolutus.	3	286		L. C.	
• Cassidaria (Cassis)					• Terebellum fusi-					
• striata	1	6		L. C.	forme	3	287		L. C.	
• carinata	1	6		L. C.	• Oliva (Ancilla) tur-					
• Dolium nodosum {	5	426		} L. Ch.	ritella	1	99		L. C.	
• Nassa elongata	2	110	1		Crag.	• aveniformis	1	99		L. C.
• reticosa	2	110	2	Crag.	• Branderi	3	288		L. C.	
• rugosa	2	110	3	Crag.	• Salishuriana	3	288		L. C.	
• granulata	2	110	4	Crag.	• Ancillaria subulata..	4	333		L. C.	
• Purpura (Bucci-					• Conus Dormitor ...	3	301		L. C.	
num) crispata ...	5	413		Crag.	• concinnus	3	302	2	L. C.	
• tetragona	5	414	1	Crag.	• scabriculus	3	303		L. C.	
• incrassata	5	414	2	Crag.	doubtful species ...	3	302	1	L. C.	
• Buccinum Dalei ...	5	486	1, 2	Crag.						
• tenerum	5	486	3, 4	Crag.						
• elegans	5	477	1	Crag.						
• labiosum	5	477	3	Crag.						
• sulcatum	4	375	2	Crag.						
— var. ...	5	477	4	Crag.						
• unilineatum	5	486	5, 6	Gr. Ool.						
• junceum	4	375	1	L. C.						
• acutum	6	566	1	M. L.						
• imbricatum	6	566	2	M. L.						
• breve	6	566	3	M. L.						
• spinosum	6	566	4	M. L.						
• Cancellaria lævis-										
cula	4	361	1	L. C.						
• evulsa	4	361	2-4	L. C.						
• quadrata	4	360		L. C.						
• Auricula? pyrami-										
dalis	4	379		Crag.						
• ?ventricosa	5	465	1	Crag.						
• ?buccinea	5	465	2	Crag.						
• ?incrassata	2	163	1-3	G. S.						
• ?turgida	2	163	4	L. C.						
• Acteon Nøe	4	374		Crag.						
• simulatus	2	163	5	L. C.						
• ?cuspidatus	5	455	1	Gr. Ool.						
• ?acutus	5	455	2	Gr. Ool.						
• erenatus	5	460	1	L. C.						
• striatus	5	460	2	Crag.						
• elongatus	5	460	3	L. C.						
• Mitra scabra	4	401		L. C.						
• parva	5	430	1	L. C.						
• pumila	5	430	2	L. C.						
• Voluta Lamberti ...	2	129		Crag.						
• costata	3	290	1, 2, 4	L. C.						
• Magorum	3	290	3	L. C.						
• ambigua	4	399	1	L. C.						
• nodosa	4	399	2	L. C.						
• Lima	4	398	2	L. C.						
• geminata	4	398	1	L. C.						
• Luctator	2	115	1	} L. C.						
• Athleta	4	397								
	4	396	1-3	L. C.						

ORD. IV. CEPHALOPODA.

† *Septa imperfect.*

Beloptera sepioidea.	6	591	1	L. C.
belemnitoidea ...	6	591	3	L. C.
anomala	6	591	2	L. C.

†† *Septa concave.*

Belemnites minimus	5	569	1	Gault.
attenuatus	6	589	2	Gault.
pistilliformis	6	589	3	Lias.
elongatus	6	590	1	} Lias.
— var. ...	1	60	1-3	
abbreviatus	6	590	2, 3, 9	Lias.
penicillatus	6	590	5, 6	Lias.
acutus	6	590	7, 8, 10	Lias.
compressus	6	590	4	Inf. Ool.
lanceolatus	6	600	8, 9	Ch. M.
mucronatus	6	600	1, 2, 4, 6, 7	U. Ch.
granulatus	6	600	3, 5	U. Ch.
• Orthocera cordifor-				
mis	3	247		M. L.
gigantea	3	246		M. L.
striata	1	58		Tr. L.
cincta	6	588	3	M. L.
fusiformis	6	588	1, 2	M. L.
undulata	1	59		M. L.
circularis	1	60	6, 7	Tr. L.
annulata	2	133		Tr. L.
Breyonii	1	60	5	M. L.
? Steinhaueri	1	60	4	Coal M.
? paradoxa	5	457		M. L.
• Couularia quadri-				
sulcata	3	260	3-6	} Coal M.
? teres	3	260	1, 2		Tr. L. ?
• Nautilus imperialis..	1	1		L. C.
centralis	1	1		L. C.
regalis	4	355		L. C.
simplex	2	122		U. G. S.
globatus	1	37		} M. L.
— var. ...	5	481		
expansus	5	458	1	Chalk M.
inaequalis	1	40		Gault.
polygonalis	6	530		Inf. Ool.

	Vol.	Tab.	Fig.	Stratum.
Nautilus striatus ...	2	182		Lias. ++
? minutus	1	53	3	Gault.
? lineatus	1	41		Gr. Ool. ++
excavatus	6	529	1	Inf. Ool. ++
hexagonus	6	529	2	Calc. Gr. ++
truncatus	2	123		Lias. ++
intermedius	2	125		Lias. ++
obesus	2	124		Inf. Ool. ++
radiatus	4	356		Coral R. ++
elegans	2	116		Chalk M.
undulatus	1	40		L. G. S.
biangulatus	5	458	2	M. L.
cariniferus	5	482	3, 4	M. L.
multicarinatus ...	5	482	1, 2	M. L.
bilobatus	3	249	2, 3	M. L.
tuberculatus	3	249	4	M. L.
pentagonus	3	249	1	M. L.
Discus	1	13		M. L.
compressus	1	38		M. L.
complanatus	3	261		M. L.
sulcatus	6	571	1, 2	M. L.
sinuatus	2	194		Inf. Ool. ++
ziczac	1	1		L. C.
Goniatites (Nauti- lus) striatus	1	53	1	M. L.
sphaericus	1	53	2	M. L.
? Henslowi	3	262		M. L.?

Ammonites.

* Margin rounded.

A. Sutherlandiæ ...	6	563		Calc. Gr.
laevigatus	6	570	3	Lias.
Selliguinus	6	549	1	Gault.
Planorbis	5	448		Lias.
parvus	5	449	2	G. S.?
peramplus	4	357		U. Ch.
lewesiensis	4	358		U. Ch.
heterophyllus ...	3	266		Lias.
Loscombii	2	183		Lias.
Greenoughii	2	132		Lias.
complanatus	6	569	1	Chalk M.
undatus	6	569	2	U. Ch.
sublaevis	1	54		Kell. R.
nutfieldiensiis	2	108		L. G. S.
Hervii	2	195		Cornb.
navicularis	6	555	2	Chalk.
funatus	1	32		M. L.
Rotula	6	570	4	Kim. Cl.?
Johnstoni	5	449	1	Lias.
omphaloides	3	242	5	Kim. Cl.
Leachii	3	242	4	Kim. Cl.
Lamberti	3	242	1-3	Kim. Cl.
Bakeriæ	6	570	1, 2	Lias.
planulatus	6	570	5	Chalk M.
Jamesoni	6	555	1	Lias.
Kœnigi	3	263	1-3	Kell. R.
plicomphalus... {	4	359		Kell. R.
	4	404		
Catillus	6	564	2	U. G. S.
annulatus	3	222		Lias.
communis	2	107	2, 3	Lias.
angulatus	2	107	1	Lias.
gigantens	2	126		Port. L.
biplex	3	293	1, 2	Kim. Cl.
rotundatus	3	293	3	Kim. Cl.
triplex	3	292		Coral R.
	3	293	4	
decipiens	3	294		Kim. Cl.

	Vol.	Tab.	Fig.	Stratum.
Ammonites fimbria- tus	2	164		Lias.
Brongniarti	2	A	2	Inf. Ool.
Gervillii	2	A	3	Inf. Ool.
Braikenridgii ...	2	184		Inf. Ool.
Humphriesianus ..	5	500	middle	Inf. Ool.
Brodiei	4	351		Inf. Ool.
Broccii (con- tractus)	2	202		Inf. Ool.
	5	500	2	
Blagdeni	2	201		Inf. Ool.
	5	500	1 up.	
Listeri	5	501	1	Coal M.
Banksii	2	200		Inf. Ool.
Davei	4	350		Lias.
fibulatus	4	407	2	Lias.
subarmatus	4	407	1	Lias.
armatus	1	95		Lias.
planicostatus ... {	1	73		Lias.
	4	406	5-7	
laticostatus	6	556	1	Lias.
brevispina	6	556	2	Lias.
Gowerianus	6	549	2	Ool.
cinctus	6	564	1	Chalk M.
Henleyi	2	172		Lias.
Bechei	3	280		Lias.
longispina	5	501	2	Oxf. Cl.
perarmatus	4	352		Coral R.
Catena	5	420		Calc. Gr.
Birehii	3	267		Lias.

** Margin flattened.

calloviensis	2	104		Kell. R.
Parkinsoni	4	307		Inf. Ool.
splendens	2	103		Gault.
dentatus	4	308		Gault.
denarius	6	540	1	G. S.
lautus	4	309		Gault.
tuberculatus	4	310	1-3	Gault.
proboscideus	4	310	4, 5	Gault.
auritus	2	134		U. G. S.
Benettiiæ	6	539		Gault.
mutabilis	4	405		Kim. Cl.
Taylori	6	514	1	Lias.
rusticus	2	177		L. Ch.
spinus	6	540	2	Kim. Cl.
Duncanni	2	157		Kim. Cl.
Gulielmi	4	311		Oxf. Cl.
Mantelli	1	55		Chalk M.
Monile	2	117		Gault.

*** Margin keeled.

a. Keel entire.

Discus	1	12		Cornb.
subradiatus	5	421	2	Inf. Ool.
concavus	1	94		Inf. Ool.
elegans	1	94		Lias.
falcifer	3	254	2	Lias.
Strangwaysii	3	254	1, 3	Lias.
Murchisonæ	6	550		Lias.
Goodhalli	3	255		L. G. S.
laeviusculus	5	451	1, 2	Inf. Ool.
corrugatus	5	451	3	Inf. Ool.
varicosus	5	451	4, 5	G. S.
striatulus	5	421	1	Lias.
jugosus	1	92	1	Lias.
triplicatus	1	92	2	Kim. Cl.
binus	1	92	3	Lias.?
ellipticus	1	92	4	Lias.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
Ammonites nodosus	1	92	5	Oxf. Cl.	Hamites compressus	1	61	7, 8	Gault.
plicatilis.....	2	166		Calc. Gr.	maximus	1	62	1	Gault.
Walcottii	2	106		Lias.	intermedius	1	62	2-4	Gault.
falcatus	6	579	1	Chalk M.	gibbosus	1	62	4 r.	Gault.
curvatus.....	6	579	2	Chalk M.	spinulosus.....	3	216	1	G. S.
inflatus	2	178		U. G. S.	spiniger	3	216	2	Gault.
varians	2	176		Chalk M.	nodosus.....	3	216	3	Gault.
Woolgari	6	587	1	L. Ch.	tuberculatus	3	216	4, 5	Gault.
tetrammatus	6	587	2	Ch. M.	turgidus.....	3	216	6	Gault.
rostratus	2	173		U. G. S.	plicatilis.....	3	234	1	Chalk M.
Browni	3	263	4, 5	Inf. Ool.	armatus.....	{	2	168	} G. S.
Sowerbyi	3	213		Inf. Ool.	grandis	3	234	2	
Smithii	4	406	1-4	Lias.	Gigas.....	6	593	1	L. G. S.
stellaris	1	93		Lias.	Turrilites costatus...	1	56		Chalk M.
obtusus	2	167		Lias.	tuberculatus.....	1	74		Chalk M.
Brookii	2	190		Lias.	undulatus.....	1	75	1-3	Chalk M.
Conybeari	2	131		Lias.	Baculites Faujasii...	6	592	1	Chalk.
Bucklandi.....	2	130		Lias.	obliquatus	6	592	2, 3	Chalk M.
Turneri	5	452		Lias.					
multicostatus.....	5	454		Lias.					
rotiformis	5	453		Lias					
<i>b. Keel crenated.</i>					††† <i>Septa convex.</i>				
excavatus	2	105		Calc. Gr.	Nummularia lævi-				
Stokesi	2	191		Lias.	gata	6	538	1	L. C.
serratus	1	24		Oxf. C.	elegans	6	538	2	L. C.
acutus	1	17	1		variolaria	6	538	3	L. C.
cordatus.....	1	17	2, 4	Coral R.	Comptoni	2	121		Chalk M.
quadratus	1	17	3	G. S.?					
vertebralis	2	165		Calc. Gr.					
rhotomagensis ...	6	515		Chalk M.					
Hippocastanum...	6	514	2	Chalk M.					
cristatus.....	5	421	3	Oxf. C.					
Scaphites æqualis ...	1	18	1-3	Chalk M.					
obliquus.....	1	18	4-7	Chalk M.					
(Ammonites)con-									
strictus	2	A	1	Chalk.					
Hamites tenuis.....	1	61	1	Gault.					
rotundus	1	61	2, 3	Gault.					
attenuatus	1	61	4, 5	Gault.					
adpressus	1	61	6	Inf. Ool.					

Nummularia lævi-				
gata	6	538	1	L. C.
elegans	6	538	2	L. C.
variolaria	6	538	3	L. C.
Comptoni	2	121		Chalk M.

ORD. V. HETEROPODA.

Bellerophon apertus	5	469	1	M. L.
Cornu-arietis	5	469	2	M. L.
hiulus	5	470	1	M. L.
tenuifascia.....	5	470	2, 3	M. L.
costatus	5	470	4	M. L.
Woodwardii	6	571	3	M. L.

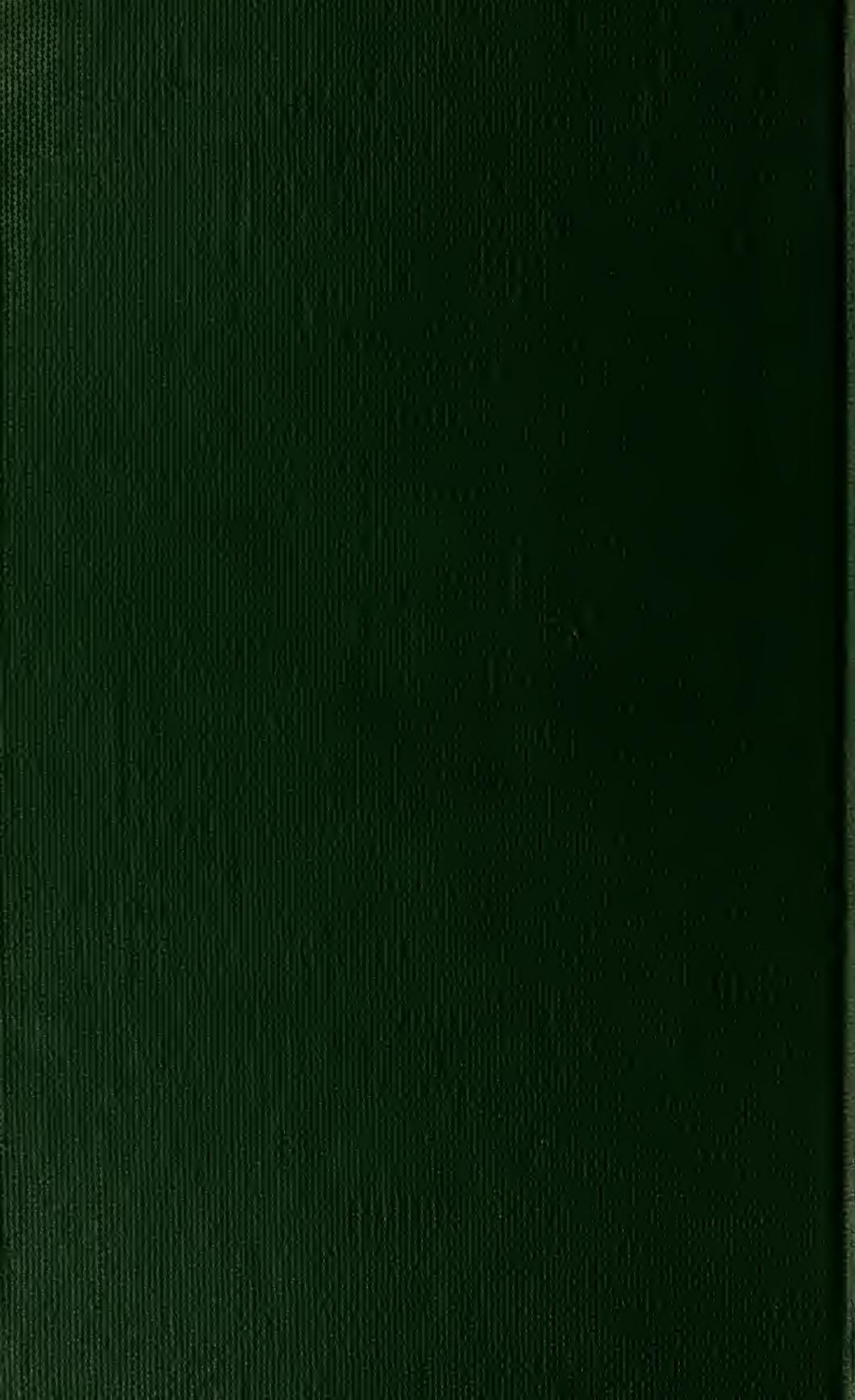
TUNICATÆ.

Amplexus coralloi-				
des	1	72		M. L.

ABBREVIATIONS.

Brad. C. *Bradford Clay.*
 Calc. Gr. *Calciferous Grit.*
 Chalk M. *Chalk Marl.*
 Coal M. *Coal Measures.*
 Coral R. *Coral Rag.*
 Cornb. *Cornbrash.*
 Diluv. *Diluvium.*
 F. E. R. *Fuller's—Earth Rock.*
 For. M. *Forest Marble.*
 F. W. *Fresh Water. (Above the London Clay.)*
 Gr. Ool. *Great (Bath) Oolite.*
 G. S. *Green Sand.*
 Inf. Ool. *Inferior Oolite.*
 Kell. R. *Kelloways Rock.*
 Kim. C. *Kimmeridge Clay.*

L. C. or L. Cl. *London Clay.*
 L. Ch. *Lower Chalk.*
 L. F. W. *Lower Fresh Water.*
 L. G. S. *Lower Green Sand.*
 Mag. L. *Magnesian Limestone.*
 M. L. *Mountain Limestone.*
 Oxf. C. *Oxford Clay.*
 Port. L. or Port. S. *Portland Limestone.*
 Tr. L. *Transition Limestone.*
 U. Ch. *Upper Chalk.*
 U. F. W. or Up. F. W. *Upper Fresh Water.*
 U. G. S. *Upper Green Sand.*
 Up. Mar. *Upper Marine.*
 Weald. *Wealden Beds. (A freshwater series.)*
 Wool. B. *Woolwich Beds. (Plastic Clay?)*





Zoological Society
Somerset House
April 27 1824

Dear Sir

The following is the list of
of deficiencies in the Society's
Copy of De Kowalewsky's Description
des Animaux Fossiles.

1st Text sheet 19 i.e. pages 145. to 1.

2nd — Tableau de la classification
du Genre Productus.

3rd Explication de Planches G,
H, V, VI, VII, VIII, IX, X, XI, XII,
XIV, XV, XVI.

4th Plates I, II, VIII, IX, X, XI, XII,
XII^{bis}, XIII, XIV, XV, XVI.

I remain Dear Sir
yours truly

J. D. C. Sowerby

Prof. Ansted



SYSTEMATICAL, STRATIGRAPHICAL,
AND
ALPHABETICAL INDEXES
TO THE
FIRST SIX VOLUMES
OF THE
MINERAL CONCHOLOGY
OF
GREAT BRITAIN.

TO WHICH IS ADDED
(A SHORT ACCOUNT OF THE LIFE OF THE AUTHOR :

BY
JAMES DE CARLE SOWERBY, F.L.S., &c.

LONDON.

1834.

THE
LONDON
LIBRARY

PREFACE TO THE INDEXES.

AT the time the *Mineral Conchology* was commenced, so little was generally known of the great assistance a knowledge of fossil shells would prove towards the examination of the structure of the earth's crust, that most collectors were very careless in observing the relative situations from which they obtained their specimens; and Mr. Sowerby himself, more anxious to record the existence of the species as they came in his way, than to enter into details for which he had but indifferent means, justly considered, that by publishing figures with names he would at least enable future geologists to use terms which a reference to his work would render intelligible, and thus facilitate their labours and means of communication with each other. Mr. Farey had rendered the work somewhat more useful by the Supplementary Indexes which he furnished to the earlier volumes; but as the science of geology advanced he was obliged to vary his plan, and the termination of his life unhappily prevented him from completing the task he had assigned himself, of giving an improved geological arrangement to the whole work.

The work was originally planned to be arranged zoologically, so that in the absence of an index pointing out such an arrangement it must be incomplete: this index would have been given, with another geologically arranged, soon after the conclusion of the sixth volume, but the Author of that and the one preceding was unwilling to adopt hastily any system which was then proposed, and even now feels that his duty is very imperfectly performed. He has adopted the system of Lamarck, as given by M. Deshayes, and made only a few alterations which seem to him to be absolutely needful: he would have made more, but was desirous to avoid increasing the number of systems, while he was aware that in all probability one more perfect than he could have planned would be given by a person well versed in recent shells and their animals, in which alone the characters necessary to be observed for classification can be discovered. One advantage, and that a considerable one, in the system he has adopted, is its being nearly the one followed by most modern geologists. The advancement

of the science generally, and particularly a better acquaintance with the fossil shells themselves, through more perfect specimens, have rendered some alterations in the nomenclature absolutely necessary, especially in the generic names; but the changes made in these indexes are as few as they could consistently be, because the frequent changing of names is a source of great perplexity. The alterations in the specific names are not numerous: when they occur they are pointed out. One or two new genera are proposed, and their characters given.

The Geological Index will, in some cases, be found at variance with the former text; where that is the case, the difference has arisen from some discovered error in the locality given, or has been made upon authority which cannot be questioned: still the Author fears many errors remain, which the length of time he has had the indexes in hand has not removed, and mostly arise from an inaccurate knowledge of the places from whence the fossils are stated to have come into his collection. The additional localities given are much fewer than he anticipated, the Author finding from experience that he could not trust implicitly to the lists hitherto published, or supplied by his friends, in consequence of sufficient attention not having been always paid to specific distinctions: he has therefore principally depended upon one or two collections within his reach, and upon contributions to his own, for those additional localities. The Author has received in this department much assistance from the extensive knowledge of a practical geologist, who has aided him in correcting the references to formations: to him, to H. H. Goodhall, Esq., and to many friends from whom he has had both information and specimens, he begs thus publicly to tender his sincere thanks, and to express a hope that they will continue their assistance so as to enable him to improve in the projected continuation of this work.

To the public the Author feels deeply indebted, and cannot refrain from declaring his gratitude for the encouragement bestowed upon a work commenced by his lamented father, and in the continuance of which he himself has incurred so much responsibility, and also to crave consideration for errors towards those who alike were more conversant with the pencil than the pen, and who have sacrificed much towards the advancement of their favourite sciences.

Camden Town,
July, 1835.

SYSTEMATICAL INDEX.

CRUSTACEA.

	Vol.	Tab.	Fig.	Stratum.
Cypris Fabæ	5	485		Wæald.

ANNULATA.

Serpula Plexus ...	6	598	1	Chalk. G. S.
compressa	6	598	3	
antiquata	6	598	4	U. G. S.
tenuis	6	598	5	L. F. W.
Carinella	6	598	2	G. S.
ampullacea	5	597	1-5	Chalk.
Macropus	6	597	6	Chalk.
crassa	1	30		L. C.
sulcata	6	608	1, 2	Calc. Gr.
tricarinata	6	608	3, 4	Calc. Gr. Coral R. Cornb.?
fluctuata	6	608	5	Chalk.
runcinata	6	608	6	Coral R.
triangulata	6	608	7	Gr. Ool.
obtusa	6	608	8	Chalk.
tetragona α	6	599	1	Lias.
————— β	6	599	2	Cornb.
rustica	6	599	3	Gault.
articulata	6	599	4	U. G. S.
vertebralis	6	599	5	Cornb.
granulata	6	597	7, 8	Chalk.

CIRRIPEDA.

Balanus tessellatus .	1	84	1	Crag.
crassus	1	84	2-4	Crag.
Pollicipes sulcatus .	6	606	1, 2, 7	Chalk.
maximus	6	606	3, 6	Chalk.
reflexus	6	606	8	Up. Mar.

CONCHIFERA.

ORD. I. DIMYARIA.

Clavagella coronata	5	480		L. C.
Teredo antenautæ..	1	102	1, 2, 4-8	L. C.
personata	1	102	3	L. C.
Pholas cylindrica...	2	198		Crag.
prisca	6	581		L. G. S.
compressa	6	603		Kim. C.
Gastrochæna tortu-				
osa	6	526	1	Inf. Ool.
contorta	6	526	2	L. C.
Pholadomya ambi-				
gua	3	227		Lias.
ovalis	3	226		Cornb.
producta	2	197		Lias.
obtusa	2	197		Inf. Ool.
lyrata	2	197		Lias.
deltoidea	2	197		Cornb.
margaritacea	3	297	1, 2, 3	L. C.
Murchisoniæ ..	{	3	297	Inf. Ool.?
	{	6	545	

	Vol.	Tab.	Fig.	Stratum.
Pholadomya æqualis	6	546	3	Kim. C.
acuticostata	6	546	1, 2	Gr. Ool.
angustata	4	327		Inf. Ool.
Fidicula (lyrata) .	3	225		Inf. Ool.
Solen affinis	1	3		L. C.
Panopea Faujas ..	6	602	1-3, 5	L. C. Crag.
gibbosa	1	42		Inf. Ool.
intermedia	{	1	76	L. C.
	{	5	419	
	{	6	602	Crag.
	{	5	419	
plicata	5	419	3	L. G. S.
oblata (gibbosa)...	5	419	1	Kim. C.
Pachymya Gigas {	6	504		G. S.
	6	505		
Mya lata	1	81		Crag.
Mandibula	1	43		U. G. S.
arenaria	4	364		Crag.
Pullus	6	531	2	Crag.
? angustata	6	531	1	Up. Mar.
depressa	5	418		Kim. C.
literata	3	224	1	Lias?
V-scripta	3	224	2-5	Kell. R.
angulifera	3	224	6-7	F. E. R.
Lutraria oblata	6	534	3	L. C.
carinifera	6	534	2	Chalk.
striata	6	534	1	G. S.
Mactra arcuata	2	160	1, 6	Crag.
dubia	2	160	2-4	Crag.
ovalis	2	160	5	Crag.
cuneata	2	160	7	Crag.
Crassatella sulcata...	4	345	1	L. C.
plicata	4	345	2	L. C.
Potamomya (Mya)				
plana	1	76	2	Up. Mar.
var. suban-				
gulata ...	{	1	76	Up. Mar.
	{	1	76	
gregaria	4	363		Up. F. W.
Corbula nitida	4	362	1-3	Up. Mar.
cuspidata	4	362	4-6	Up. Mar.
complanata	4	362	7, 8	Crag.
obscura	6	572	5	Inf. Ool.?
elegans	6	572	1	L. G. S.
striatula	6	572	2, 3	L. G. S.
rotundata	6	572	4	Crag.
globosa	3	209	3	L. C.
Pisum	3	209	4	L. C.
gigantea	3	209	5-7	L. G. S.
revoluta	3	209	8-13	L. C.
Saxicava rugosa	5	466		Crag.
Petricola lamellosa...	6	573		Crag.
Sanguinolaria Hol-				
lowaysii	2	159		L. C.
compressa	5	462		L. C.
undulata	6	548	1, 2	Inf. Ool.?
gibbosa	6	548	3	M. L.
Psammobia solida...	4	342		Up. Mar.
Tellina obliqua	2	161	1	Crag.
ovata	2	161	2	Crag.
obtusa	2	179	4	Crag.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
Tellina Branderi ...	4	402	1	L. C.	Venericardia cari-				
filosa	4	402	2	L. C.	nata	3	259	2	L. C.
striatula	5	456	1	L. G. S.	deltoidæa	3	259	1	L. C.
inæqualis	5	456	2	L. G. S.	dubia	3	259	3	Chalk M.
ambigua	4	403		Up. Mar.	globosa	3	289	1	L. C.
Corbis lævis	6	580		Calc. Gr.	oblonga	3	289	2	L. C.
Sphæra corrugata ...	4	335		L. G. S.	chamæformis.....	5	490	1	Crag.
Lucina mitis	6	557	1	L. C.	orbicularis	5	490	2	Crag.
antiquata	6	557	2	Crag.	scalaris	5	490	3	Crag.
crassa	6	557	3	Calc. Gr.	Trigonia gibbosa {	3	235		
divaricata	5	417		L. C.	3	236			Port. L.
Astarte planata	3	257		Crag.	nodosa	6	507	1	L. G. S.
excavata	3	233		Crag.	dædalea	1	88		L. G. S.
obovata	4	353		L. G. S.	spectabilis	6	544		L. G. S.
striata	6	520	1	L. G. S.	clavellata	1	87		Coral R.
rotunda(orbicu- laris).....	6	520	2	Gr. Ool.	elongata	5	431		Coral R.
lineata	2	179	1	Kim. C.	costata	1	85		Inf. Ool.
plana	2	179	2	Crag.	Pullus	6	508	2, 3	Gr. Ool.
obliquata	2	179	3	Crag.	imbricata	6	507	2, 3	Gr. Ool.
imbricata	6	521	1	Crag.	cuspidata	6	507	4, 5	Gr. Ool.
nitida	6	521	2	Crag.	angulata	6	508	1	Inf. Ool.
bipartita.....	6	521	3	Crag.	striata.....	3	237	1-3	Inf. Ool.
oblonga	6	521	4	Crag.	duplicata	3	237	4, 5	Inf. Ool.
rugata	4	316		L. C.	pennata	3	237	6	L. G. S.
lurida.....	2	137	1	Inf. Ool.?	spinosa	1	86		L. G. S.
elegans	2	137	3	Inf. Ool.	aliformis	3	215		L. G. S.
cuneata	2	137	2	Port. L.	excentrica	3	208	1, 2	L. G. S.
orbicularis.....	5	444	4-6	Gr. Ool.	affinis.....	3	208	3	L. G. S.
pumila	5	444	2, 3	Gr. Ool.	Cardium Parkinsoni	1	49		Crag.
trigonalis	5	444	1	Inf. Ool.	edule	3	283	1	recent.
Axinus angulatus... 4	315			L. C.	edulinum	3	283	3	Crag?
obscurus	4	314		Mag. L.	angustatum	3	283	2	Crag.
Cyclas pulchra	6	527	1	Up. Mar.	porulosum	4	346	2	L. C.
media	6	527	2	Wealden.	proboscideum ...	2	156	1	L. G. S.
membranacea ...	6	527	3	Wealden.	Gentianum				
deperdita	2	162	1	Wool. B.	(Cardita tu- berculata) ...	2	143		U. G. S.
cuneiformis	2	162	2, 3	Wool. B.	dissimile	6	553	2	Port. L.
obovata	2	162	5, 6	Up. Mar.	truncatum	6	553	3	Lias.
——— var.	2	162	4	Wool. B.	turgidum	4	346	1	L. C.
Thetis major	6	513	1-4	U. G. S.	nitens.....	1	14		{ L. C. Lias?
minor.....	3	209	1, 2	L. G. S.	plumsteadiense ...	1	14		{ Wool. B. L. C.
Megalodon cuculla- tus	6	568		M. L.	semigranulatum..	2	144		L. C.
Cyprina æqualis ...	1	21		Crag.	striatulum	6	553	1	Inf. Ool.?
angulata	1	65		L. G. S.	Hillanum	1	14		L. G. S.
Venus incrassata ...	2	155	1, 2	L. C.	hibernicum ... {	1	82	1, 2	
gibbosa	2	155	3	Crag.	6	552	3		M. L.
parva	6	518	4-6	L. G. S.	elongatum.....	1	82	3	M. L.
ovalis	6	567	1, 2	L. G. S.	aliforme.....	6	552	2	M. L.
Faba	6	567	3	L. G. S.	? decussatum.....	6	552	1	Chalk M.
lineolata.....	1	20		L. G. S.	Cardita? lunulata ...	3	232	1, 2	Inf. Ool.
plana	1	20		L. G. S.	? similis	3	232	3	Inf. Ool.
transversa	5	422	1	L. C.	Isocardia Cor	6	516	2	Crag.
rustica	2	196		Crag.	similis	6	516	1	U.? G. S.
Solandri(lineo- lata)	5	422	2	L. C.	minima	3	295	1	Cornb.
turgida	3	256		Crag.	tenera.....	3	295	2	Kell. R.
caperata.....	6	518	1-3	G. S.	rostrata	3	295	3	Inf. Ool.
lentiformis	2	203		Crag.	sulcata	3	295	4	L. C.
elegans	5	422	3	L. C.	oblonga	5	491	2	M. L.
pectinifera.....	5	422	4	L. C.	concentrica	5	491	1	Cornb.?
? varicosa	3	296		Cornb.	striata.....	1	89	1	Inf. Ool.
Myochoncha crassa	5	467		Inf. Ool.	abrupta	1	89	2	Inf. Ool.
Hippopodium pon- derosum.....	3	250		Lias.	Cucullæa glabra ...	1	67		L. G. S.
Venericardia plani- costa	1	50		L. C.	oblonga	3	206	1, 2	Inf. Ool.
senilis.....	3	258		Crag.	decussata	3	206	3, 4	L. G. S.
					carinata	3	207	1	L. G. S.
					fibrosa	3	207	2	L. G. S.
					elongata.....	5	447	1	Inf. Ool.
					costellata	5	447		L. G. S.

	Vol.	Tab.	Fig.	Stratum.
<i>Cucullæa minuta</i> ...	5	447	3	Gr. Ool.
<i>rudis</i>	5	447	4	Gr. Ool.
<i>Area subacuta</i>	1	44		L. C.
<i>carinata</i>	1	44		U. G. S.
<i>Branderi</i>	3	276	1, 2	L. C.
<i>appendiculata</i> ...	3	276	3	L. C.
<i>quadrisulcata</i>	5	473	1	Coral R.
<i>cancellata</i>	5	473	2	M. L.
<i>pulchra</i>	5	473	3	Gr. Ool.
<i>tumida</i>	5	474	3	Mag. L.
<i>duplicata</i>	5	474	1	L. C.
<i>depressa</i>	5	474	2	Wool. B.
<i>Pectunculus varia-</i> <i>bilis</i>	5	471		Crag.
<i>brevirostris</i>	5	472	1	L. C.
<i>sublævis</i>	5	472	4	L. G. S.
<i>umbonatus</i> ... {	2	156	2-4	L. G. S.
	5	472	3	
<i>decussatus</i>	1	27	1	L. C.
<i>plumsteadiensis</i> ...	1	27	3	Wool. B.
<i>deletus (costatus)</i>	1	27	2	L. C.
<i>scalaris</i>	5	472	2	L. C.
<i>minimus</i>	5	472	5	Gr. Ool.
<i>oblongus</i>	5	472	6	Gr. Ool.
<i>Nucula lævigata</i> ..	2	192	1, 2	Crag.
<i>similis</i>	2	192	3, 4, 10	L. C.
<i>trigona</i>	2	192	5	L. C.
<i>variabilis</i>	5	475	2	Gr. Ool.
<i>Palmæ</i>	5	475	1	M. L.
<i>amygdaloides</i> ...	6	554	4	L. C.
<i>pectinata</i>	2	192	6, 7	Gault.
<i>impresa</i>	5	475	3	L. G. S.
<i>antiquata</i>	5	475	4	L. G. S.
<i>deltoidea</i>	6	554	1	Up. Mar.
<i>minima</i>	2	192	8, 9	L. C.
<i>Lachryma</i>	5	476	3	Gr. Ool.
<i>inflata</i>	6	554	2	L. C.
<i>undulata</i>	6	554	3	Gault.
<i>Ovum</i>	5	476	1	Lias.
<i>angulata</i>	5	476	5	L. G. S.
<i>mucronata</i>	5	476	4	Gr. Ool.
<i>claviformis</i>	5	476	2	Lias.
<i>lanceolata</i>	2	180	1	Crag.
<i>Cobboldiæ</i>	2	180	2	Crag.
<i>Unio Solandri</i>	6	517		L. F. W.
<i>concinuus</i>	3	223		Lias.
<i>crassiusculus</i>	2	185		Lias?
<i>crassissimus</i>	2	153		Lias.
<i>Listeri</i>	2	154	1, 3, 4	Lias.
<i>hybridus</i>	2	154	2	Lias.
<i>subcontractus</i> ..	1	33	1-3	Coal.
<i>uniformis</i>	1	33	4	Cornb.
<i>acutus</i>	1	33	5-7	Coal.
<i>porrectus</i>	6	594	1	Wealden.
<i>compressus</i>	6	594	2	Wealden.
<i>antiquus</i>	6	594	3-5	Wealden.
<i>aduncus</i>	6	595	2	Wealden.
<i>cordiformis</i>	6	595	1	Wealden.
<i>Modiola subcarinata</i>	3	210	1	L. C.
<i>æqualis</i>	3	210	2	L. G. S.
<i>bipartita</i>	3	210	3, 4	Kim. C.
<i>minima</i>	3	210	5-7	Lias.
<i>cuneata</i>	3	211	1	Inf. Ool.
<i>gibbosa</i>	3	211	2	F. E. R.
<i>reniformis</i>	3	211	3	Inf. Ool.
<i>depressa</i>	1	8		L. C.
<i>pallida</i>	1	8		Port. L.
<i>lævis</i>	1	8		Lias.
<i>elegans</i>	1	9		L. C.
<i>imbricata</i>	3	212	1, 3	Cornb.

	Vol.	Tab.	Fig.	Stratum.
<i>Modiola Hillana</i> ...	3	212	2	Lias.
<i>aspera</i>	3	212	4	Cornb.
<i>plicata</i>	3	248	1	Cornb.
<i>Scalprum</i>	3	248	2	Lias.
<i>Mytilus antiquorum</i>	3	275	1-3	Crag.
<i>aliformis</i>	3	275	4	Crag.
<i>edentulus</i>	5	439	1	L. G. S.
<i>lanceolatus</i>	5	439	2	L. G. S.
<i>sublævis</i>	5	439	3	Cornb.
<i>affinis</i>	6	532	1	Up. Mar.
<i>Brardii</i>	6	532	2	L. F. W.
<i>pectinatus</i>	6	282		Kim. C.
<i>Pinna affinis</i>	4	313	2	L. C.
<i>arcuata</i>	4	313	3	L. C.
<i>granulata</i> ..	4	347		Kim. C.
<i>ampla</i>	1	7		Inf. Ool.
<i>tetragona</i>	4	313	1	U. G. S.
<i>lanceolata</i>	3	281		Calc. Gr.
<i>Chama squamosa</i> ...	4	348		L. C.

ORDER II. MONOMYARIA.

<i>Avicula media</i>	1	2		L. C.
<i>ovata</i>	6	512	2	Gr. Ool.
<i>lanceolata</i>	6	512	1	Lias.
<i>costata</i>	3	244	1	Brad C.
<i>inæquivalvis</i>	3	244	2	Lias.
-----?.....	3	244	3	Kell. R.
<i>echinata</i>	3	243	1	Cornb.
-----?	3	243	2	Lias.
<i>Crenatula ventricosa</i>	5	443		Lias.
<i>Perna quadrata</i>	5	492		Cornb.
<i>aliformis</i>	3	251		L. G. S.
<i>Inoceramus Cuvieri</i>	5	441	1	U. Ch.
<i>Brongniarti</i>	5	441	2, 3	U. Ch.
<i>latus</i>	6	582	1	U. Ch.
<i>striatus</i>	6	582	2	L. Ch.
<i>involutus</i>	6	583		U. Ch.
<i>gryphæoides</i>	6	584	1	U. G. S.
<i>vetustus</i>	6	584	2	M. L.
<i>dubius</i>	6	584	3	Lias.
<i>pictus</i>	6	604	1	Chalk M.
<i>digitatus</i>	6	604	2	U. C.
<i>mytiloides</i>	5	442		L. Ch.
<i>concentricus</i>	3	305		Gault.
<i>sulcatus</i>	3	306		Gault.
<i>cordiformis</i>	5	440		U. Ch.
<i>Gervillia solenoides</i>	6	510	1-4	L. G. S.
<i>acuta</i>	6	510	5	Gr. Ool.
<i>aviculoides</i>	1	66		Calc. Gr.
-----?.....	6	511		G. S.
<i>Plagiostoma gigan-</i> <i>teum</i>	1	77		Lias.
<i>Hoperi</i>	4	380		U. Ch.
<i>punctatum</i>	2	113	1, 2	Lias.
<i>cardiiforme</i>	2	113	3	Inf. Ool.
<i>rigidum</i>	2	114	1	Coral R.
<i>ovale</i>	2	114	3	F. E. R.
<i>obscurum</i>	2	114	2	Kell. R.
<i>pectinoides</i>	2	114	4	Lias.
<i>rusticum</i>	4	381		Port. S.
<i>lævisculum</i>	4	382		Coral R.
<i>elongatum</i> (Mo- {	6	559	2	Gault.
<i>diola parallela</i> }	1	9	1	
<i>duplicatum</i>	6	559	3	Coral R.
<i>concentricum</i> ..	6	559	1	Lias.
<i>spinosum</i>	1	78		U. Ch.
<i>Lima gibbosa</i>	2	152		Inf. Ool.
<i>rudis</i>	3	214		Coral R.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
<i>Lima antiquata</i>	3	214		Lias.	<i>Ostrea canaliculata</i>	2	135	1	U. Ch.
<i>Pecten corneus</i>	3	204		L. C.	<i>acuminata</i>	2	135	2, 3	F. E. R.
<i>orbicularis</i>	2	186		U. G. S.	<i>gigantea</i>	1	64		L. C.
<i>lamellosus</i>	3	239		Port. L.	<i>pulchra</i>	3	279		Wool. B.
<i>cinctus</i>	4	371		Inf. Ool.?	<i>bellovacina</i>	4	388	1, 2	Wool. B.
<i>annulatus</i>	6	542	1	Cornb.	<i>edulina</i>	4	388	3, 4	Wool. B.
<i>papyraceus</i>	4	354		Coal.	<i>expansa</i>	3	238	1	Port. L.
<i>Beaveri</i>	2	158		L. Ch.	<i>undulata</i>	3	238	2	Wool. B.
<i>aequivalvis</i>	2	136	1	Inf. Ool.	<i>Meadii</i>	3	252	1, 4	Cornb.
<i>fibrosus</i>	2	136	2	For. M.	<i>tenera</i>	3	252	2, 3	Wool. B.
<i>dentatus</i>	6	574	1	Inf. Ool.	<i>Flabellulum</i>	3	253		L. C.
<i>granosus</i>	6	574	2	M. L.	<i>semitana</i>	5	489	3	U. Ch.
<i>plicatus</i>	6	574	3	M. L.	<i>Marshii</i>	1	48		Cornb.
<i>nitidus</i>	4	394	1	U. Chalk.	<i>gregaria</i>	2	111	1, 3	Coral R.
<i>striatus</i>	4	394	2-4	Crag.	<i>Palmetta</i>	2	111	2	Calc. Gr.
<i>Princeps</i>	6	542	2	Crag.	<i>solitaria</i>	5	468	1	Coral R.
<i>duplicatus</i>	6	575	1-3	L. Cl.	<i>macroptera</i>	5	468	2, 3	L. G. S.
<i>carinatus</i>	6	575	4	L. Cl.	<i>carinata</i>	4	365		U. G. S.
<i>reconditus</i>	6	575	5, 6	L. C. Crag.	<i>costata</i>	5	488	3	Gr. Ool.
<i>plebeius(sulcatus)</i>	4	393	1	L. C. Crag.	<i>dorsata</i>	5	489	1, 2	L. C.
<i>gracilis</i>	4	393	2	Crag.	<i>Anomia lineata</i>	5	425		L. C.
<i>asper</i>	4	370	1	U. G. S.					
<i>obliquus</i>	4	370	2	U. G. S.					
<i>vimineus</i>	6	543	1, 2	Coral R.					
<i>vagans</i>	6	543	3-5	Ool. Cornb.					
<i>barbatus</i>	3	231		Coral R.					
<i>grandis</i>	6	585		Inf. Ool.	<i>Crania parisiensis</i> ...	5	408		U. Ch.
<i>complanatus</i>	6	586		Crag.	<i>Orbicula reflexa</i> ...	6	506	1	Lias.
<i>quadricostatus</i> ...	1	56	1, 2	Crag.	<i>Humphriesiana</i> ...	6	506	2	Kim. C.
<i>quinquecostatus</i> ...	1	56	3-8	G. S.	<i>granulata</i>	6	506	3, 4	Gr. Ool.
<i>obscurus</i>	3	205	1	Chalk.	<i>Producta Martini</i> ...	4	317	2-4	M. L.
<i>Lens</i>	3	205	2, 3	G. S.	<i>antiquata</i>	4	317	1, 5, 6	M. L.
<i>laminatus</i>	3	205	4	Gr. Ool.	<i>scotica</i>	1	69	3	M. L.
<i>arcuatus</i>	3	205	5, 7	Coral R.	<i>spinosa</i>	1	69	2	M. L.
<i>similis</i>	3	205	6	Cornb.	<i>concinna</i>	4	318	1	M. L.
<i>rigidus</i>	3	205	8	Coral R.	<i>lobata</i>	4	318	2-6	M. L.
<i>obsoletus</i>	6	541		For. M.	<i>sulcata</i>	4	319	2	M. L.
<i>Hinnus Dubuissoni</i>	6	601		Crag.	<i>costata</i>	6	560	1	Tr. L.
<i>proboscideus</i>	3	264		Inf. Ool.	<i>calva</i>	6	560	2-6	Mag. L.
<i>Dianchora lata</i>	1	80	2	U. Ch.	<i>horrida</i>	4	319	1	Mag. L.
<i>striata (Podopsis)</i>	1	80	1	U. G. S.	<i>longispina</i>	1	68	1	M. L.
<i>striata, Def.</i>)					<i>Flemingii</i>	1	68	2	M. L.
<i>Plicatula spinosa</i> ...	3	245		Lias.	<i>humerosa</i>	4	322		Mag. L.
<i>pectinoides</i>	5	409	1	Gault.	<i>gigantea</i>	4	320		M. L.
<i>inflata</i>	5	409	2	Chalk M.	<i>personata</i>	4	321		M. L.
<i>Exogyra haliotoidea</i>	1	25		G. S.	<i>hemisphaerica</i> {	4	328		M. L.
<i>conica</i>	6	605	1-3	G. S.	<i>comoides</i>	6	561		
<i>laevigata</i>					<i>latissima</i>	4	330		M. L.
<i>undata</i>	6	605	5-7	L. G. S.	<i>plicatilis</i>	5	459	2	M. L.
<i>nana</i>	4	383	3	Kim. C.	<i>depressa</i>	5	459	3	Tr. L.
<i>digitata</i>	2	174		L. G. S.	<i>spinulosa</i>	1	68	3	M. L.
<i>Gryphaea Columba</i> ..	4	383	1, 2	U. G. S.	<i>aculeata</i>	1	68	4	M. L.
<i>incurva</i>	2	112	1, 2	Lias.	<i>scabricula</i>	1	69	1	M. L.
<i>obliquata</i>	2	112	3	Inf. Ool.	<i>punctata</i>	4	323		M. L.
<i>MacCullochii</i>	6	547	1-3	Lias.	<i>fimbriata</i>	5	459	1	M. L.
<i>minuta</i>	6	547	4	Gr. Ool.	<i>Atrypa (Spirifer)</i>	3	268		M. L.
<i>vesiculosa</i>	4	369		U. G. S.	<i>oblata</i>				
<i>globosa</i>	4	392		U. Ch.	<i>glabra</i>	3	269	1	M. L.
<i>dilatata</i>	2	149	1	Oxf. C.	<i>obtusa</i>	3	269	2	M. L.
<i>bilobata (dilatata)</i>	2	149	2	Kell. R.	<i>acuminata</i>	4	324	1	M. L.
<i>gigantea</i>	4	391		Inf. Ool.	<i>cordiformis</i>.....					5	495	2, 4	M. L.
<i>bullata</i>	4	368		Calc. Gr.	<i>reniformis</i>	5	496	1-4	M. L.
<i>sinuata</i>	4	336		L. G. S.	<i>platyloba</i>	5	496	5, 6	M. L.
<i>canaliculata</i>	1	26	1	U. G. S.	<i>Pugnus</i>	5	497		M. L.
<i>Ostrea laeviuscula</i> ...	5	488	1	Lias.	<i>affinis</i>	4	324	2	Tr. L.
<i>obscura</i>	5	488	2	Gr. Ool.	<i>ambigua</i>	4	376		M. L.
<i>deltoides</i>	2	148		Kim. C.	<i>Spirifer resupinatus</i>	4	325		M. L.
					(<i>Terebratula</i>) li-				
					<i>neatus</i>	4	334	1, 2	M. L.
					(<i>Ter.</i>) <i>imbricatus</i>	4	334	3, 4	M. L.
					<i>Walcotti</i>	4	377	2	Lias.

	Voi.	Tab.	Fig.	Stratum.
<i>Spirifer minimus</i> ...	4	377	1	M. L.
<i>pinguis</i>	3	271		M. L.
<i>rotundatus</i>	5	461	1	M. L.
<i>trigonalis</i>	3	265		M. L.
<i>bisulcatus</i>	5	494	1, 2	M. L.
<i>distans</i>	5	494	3	M. L.
<i>octoplicatus</i>	6	562	2-4	M. L.
<i>triangularis</i>	6	562	5, 6	M. L.
<i>undulatus</i>	6	562	1	Mag. L.
<i>cuspidatus</i>	2	120		} M. L.
<i>attenuatus</i>	5	461	2	
<i>radiatus (lineatus)</i>	5	493	3-5	M. L.
<i>striatus</i>	5	493	1, 2	Tr. L.
<i>resupinatus</i>	3	270		M. L.
<i>lineatus</i>	4	325		M. L.
<i>imbricatus</i>	4	334	1, 2	M. L.
<i>imbricatus</i>	4	334	3, 4	M. L.
<i>Magas pumilus</i>	2	119		U. Ch.
<i>Terebratula subro-</i>				
<i>tunda</i>	1	15	1	U. Ch.
<i>carnea</i>	1	15	5, 6	U. Ch.
<i>ovata</i>	1	15	3	U. G. S.
<i>punctata</i>	1	15	2, 4	Lias.
<i>lata</i>	1	100		Cornb.
<i>ovoides</i>	1	100		Cornb.
<i>ornithocephala</i> ..	1	101	1, 2, 4	Cornb.
<i>Lampas</i>	1	101	3	Lias.
<i>obovata</i>	1	101	5	Cornb.
<i>elongata</i>	5	435	1, 2	U. Ch.
<i>sphaeroidalis</i> ..	5	435	3	Inf. Ool.
<i>bullata</i>	5	435	4	Inf. Ool.
<i>emarginata</i>	5	435	5	Inf. Ool.
<i>digona</i>	1	96		Brad. C.
<i>var.</i>	1	96		Cornb.
<i>Sacculus</i>	5	446	1	M. L.
<i>hastata</i>	5	446	2, 3	M. L.
<i>cornuta</i>	5	446	4	Lias.
<i>triquetra</i>	5	445	1	Cornb.
<i>indentata</i>	5	445	2	Lias.
<i>Fimbria</i>	4	326		Inf. Ool.
<i>porrecta</i>	6	576	1	Tr. L.
<i>variabilis</i>	6	576	2-5	Cornb.
<i>obtusata</i>	5	437	4	Gault.
<i>subundata</i>	1	15	7	L. Ch.
<i>intermedia</i>	1	15	8	Cornb.
<i>semiglobosa</i>	1	15	9	L. Ch.
<i>obesa</i>	5	438	1	L. Ch.
<i>bucculenta</i>	5	438	2	Calc. Gr.
<i>biplicata</i>	1	90		} U. G. S.
<i>biplicata</i>	5	437	2, 3	
<i>globata</i>	5	436	1	Inf. Ool.
<i>perovalis</i>	5	436	2, 3	Inf. Ool.
<i>Sella</i>	5	437	1	L. G. S.
<i>maxillata</i>	5	436	4	Inf. Ool.
<i>resupinata</i>	2	150	3, 4	Inf. Ool.
<i>acuta</i>	2	150	1, 2	Inf. Ool.
<i>lateralis</i>	1	83	1	M. L.
<i>Crumena</i>	1	83	2, 2*3	M. L.
<i>tetrahedra</i>	1	83	4	U. Lias.
<i>var. me-</i>				
<i>dia</i>	1	83	5	U. Lias.
<i>concinna</i>	1	83	6	Gr. Ool.
<i>obsoleta</i>	1	83	7	Cornb.
<i>plicatilis</i>	2	118	1	U. Ch.
<i>var. octo-</i>				
<i>plicata</i>	2	118	2	U. Ch.
<i>Wilsoni</i>	2	118	3	Tr. L.
<i>latissima (lata)</i> ..	5	502	1	U. G. S.
<i>depressa</i>	5	502	2	L. G. S.
<i>nuciformis</i>	5	502	3	L. G. S.

	Voi.	Tab.	Fig.	Stratum.
<i>Terebratula angu-</i>				
<i>lata</i>	5	502	4	Inf. Ool.
<i>plicatella</i>	5	503	1	Inf. Ool.
<i>serrata</i>	5	503	2	Lias.
<i>hemisphaerica</i> ..	6	536	1	Gr. Ool.
<i>rigida</i>	6	536	2	U. Ch.
<i>striatula</i>	6	536	3-5	} Gault to L. C.
<i>Pisum</i>	6	536	6, 7	
<i>rostrata</i>	6	537	1, 2	Chalk M.
<i>Gibbsiana</i>	6	537	4	G. S.
<i>Mantelliana</i>	6	537	5	Chalk M.
<i>Flabellula</i>	6	535	1	Gr. Ool.
<i>furcata</i>	6	535	2	Gr. Ool.
<i>orbicularis</i>	6	535	3	Lias.
<i>oblonga</i>	6	535	4-6	L. G. S.
<i>truncata</i>	6	537	3	L. G. S.
<i>pectata</i>	2	138	1	U. G. S.
<i>Lyra</i>	2	138	2	U. G. S.
<i>coarctata</i>	4	312	1-4	Brad. C.
<i>reticulata</i>	4	312	5, 6	Brad. C.
<i>Mantia</i>	3	277	1	M. L.
<i>obliqua</i>	3	277	2	U. Ch.
<i>inconstans</i>	3	277	3, 4	Kim. C.
<i>dimidiata</i>	3	277	5	G. S.
<i>Pentamerus laevis</i> ..	1	28		Tr. L.
<i>Knighiti</i>	1	28		Tr. L.
<i>Aylesfordii</i>	1	28, 29		Tr. L.
<i>Lingula mytiloides</i> ..	1	19	1, 2	M. L.?
<i>ovalis</i>	1	19	4	Kim. C.?
<i>tenuis</i>	1	19	3	L. C.

MOLLUSCA.

ORD. I. GASTEROPODA.

<i>Patella latissima</i> ..	2	139	1, 5	Kim. C.
<i>laevis</i>	2	139	3, 4	Lias.
<i>aequalis</i>	2	139	2	Crag.
<i>ancilloides</i>	5	484	2	Gr. Ool.
<i>Nana</i>	5	484	3	Gr. Ool.
<i>lata</i>	5	484	1	Gr. Ool.
<i>rugosa</i>	2	139	6	Gr. Ool.
<i>striata</i>	4	389		L. C.
<i>Pileopsis Unguis</i> ..	2	139	7, 8	Crag.
<i>vetusta</i>	6	607	1-3	M. L.
<i>tubifera</i>	6	607	4	M. L.
<i>Emarginula reticu-</i>				
<i>lata</i>	1	33	bis	Crag.
<i>crassa</i>	1	33	bis	Crag.
<i>clathrata</i>	6	519	1	Gr. Ool.
<i>scalaris</i>	6	519	3, 4	Gr. Ool.
<i>tricarinata</i>	6	519	2	Gr. Ool.
<i>Fissurella graeca</i> ..	5	483		Crag.
<i>Infundibulum rec-</i>				
<i>tum</i>	1	97	3	Crag.
<i>obliquum</i>	1	97	1	L. C.
<i>tuberculatum</i> ..	1	97	4, 5	L. C.
<i>echinulatum</i>	1	97	2	L. C.
<i>spinulosum</i>	1	97	6	L. C.
<i>Bulla convoluta</i> ..	5	464	1	Crag.
<i>constricta</i>	5	464	2	L. C.
<i>elliptica</i>	5	464	6	L. C.
<i>attenuata</i>	5	464	3	L. C.
<i>filosa</i>	5	464	4	L. C.
<i>acuminata</i>	5	464	5	L. C.
<i>Helix globosus</i>	2	170		F. W.
<i>Bulinus ellipticus</i> ..	4	337		F. W.
<i>costellatus</i>	4	366		F. W.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
<i>Planorbis cylindri-</i>					<i>Globulus (Ampulla-</i>				
<i>cus</i>	2	140	2	F. W.	<i>ria acutus</i>	3	284		L. C.
<i>obtusus</i>	2	140	3	F. W.	<i>depressus</i>	1	5		L. C.
<i>lens</i>	2	140	4	F. W.	<i>patulus</i>	3	284		L. C.
<i>hemistoma</i>	2	140	6	Wool. B.	<i>sigaretinus</i>	3	284		L. C.
<i>euomphalus</i>	2	140	7-9	F. W.	<i>Ambulacrum</i> ..	4	372		L. C.
<i>Ancillus elegans</i> ...	6	533		U. F. W.	<i>nobilis</i>	6	522	1	M. L.
<i>Limnea minima</i> ...	2	169	1	F. W.	? <i>helicooides</i>	6	522	2	M. L.
<i>fusiformis</i>	2	169	2, 3	F. W.	<i>Sigaretus canalicu-</i>				
<i>longiscata</i>	4	343		F. W.	<i>latus</i>	4	384		L. C.
<i>maxima</i>	6	528	1	L. F. W.	<i>Vermetus concavus</i> .	1	57	1-5	U. G. S.
<i>columnellaris</i>	6	528	2	F. W.	<i>ovatus</i>	1	57	8	Coral R.
<i>pyramidalis</i>	6	528	3	F. W.	<i>umbonatus</i>	1	57	6, 7	Chalk M.
<i>Melania fasciata</i> ...	3	241	1	F. W.	<i>radiatus (Planor-</i>				
<i>costata</i> ..	3	241	2	F. W.	<i>bis radiatus</i>) ...	2	140	5	G. S.
<i>minima</i>	3	241	3	F. W.	<i>bognoriensis</i>	6	596	1-3	L. C.
<i>truncata</i>	3	241	4	F. W.	<i>concinus</i>	6	596	5	Inf. Ool.
<i>subulata</i> . VI. p. 41				Wealden.	<i>polygonalis</i>	6	596	6	L. G. S.
<i>attenuata</i> . VI. p. 52				Wealden.	<i>tumidus</i>	6	596	4	Coral R.
<i>tricarinata</i> . VI. p. 52				Wealden.	<i>Dentalium nitens</i> ...	1	70	1, 2	L. C.
<i>Melanopsis fusifor-</i>					<i>acuminatum (en-</i>				
<i>mis</i>	4	332	1-7	Up. Mar.	<i>talis</i>)	1	70	3	L. C.
<i>subulata</i>	4	332	8	Up. Mar.	<i>striatum</i>	1	70	4	L. C.
<i>carinata</i>	6	523	1	L. F. W.	<i>decussatum</i>	1	70	5	L. C.
<i>brevis</i>	6	523	2	L. F. W.	<i>ellipticum</i>	1	70	6, 7	Gault.
<i>Potamidis rigidus</i> ...	4	338		L. F. W.	<i>costatum</i>	1	70	8	Crag.
<i>politus (mela-</i>	2	147	6, 7		<i>planum</i>	1	79	1	L. C.
<i>nioides</i>)	4	339	3	Wool. B.	<i>cylindricum</i>	1	79	2	G. S.
<i>dubius</i>	2	147	5	L. C.	<i>incrassatum</i>	1	79	3, 4	L. C.
<i>fimiculatus</i>	2	147	1, 2	Wool. B.	<i>medium</i>	1	79	5	G. S.
<i>intermedius</i>	2	147	3, 4	Wool. B.	<i>Scalaria similis</i>	1	16		Crag.
<i>funatus</i>	2	128		Wool. B.	<i>semicostata</i> ...	1	16		
<i>margaritaceus</i> ..	4	339	4	Up. Mar.	.....	6	577	6	L. C.
<i>cinctus</i>	4	340	1	Up. Mar.	<i>acuta</i>	1	16		
<i>plicatus</i>	4	340	2	Up. Mar.	.....	6	577	2	L. C.
<i>duplex</i>	4	340	3	Up. Mar.	<i>subulata</i>	4	390	1	Crag.
<i>concavus</i>	4	339	1, 2	Up. Mar.	<i>foliacea</i>	4	390	2	Crag.
<i>ventricosus</i>	4	341	1	Up. Mar.	<i>minuta</i>	4	390	3, 4	Crag.
<i>acutus</i>	4	341	2	L. F. W.	<i>frondosa</i>	6	577	1	Crag.
<i>Paludina (Vivipara)</i>					<i>interrupta</i>	6	577	3	L. C.
<i>fluviarium</i>	1	31	1	Wealden.	<i>undosa</i>	6	577	4	L. C.
<i>lenta</i>	1	31	3	U. F. W.	<i>reticulata</i>	6	577	5	L. C.
<i>concinna</i>	1	31	4, 5	U. F. W.	<i>Cirrus depressus</i> ...	5	428	3	U. Ch.
<i>angulosa (orbicu-</i>					<i>perspectivus</i> ...	5	428	1, 2	U. Ch.
<i>laris)</i>	2	175	1, 2	L. F. W.	<i>acutus</i>	2	141	1	M. L.
<i>minuta</i>	2	175	3	L. F. W.	<i>rotundatus</i>	5	429	1, 2	M. L.
<i>elongata</i>	6	509	1, 2	Wealden.	<i>plicatus</i>	2	141	3	Gault.
<i>carinifera</i>	6	509	3	Purbeck.	.....	2	141	2	
<i>Pilcolus laevis</i>	5	432	5-8	Gr. Ool.	.....	3	219	1, 2, 4	Inf. Ool.
<i>plicatus</i>	5	432	1-4	Gr. Ool.	<i>Leachii</i>	3	219	3	Inf. Ool.
<i>Neritina concava</i> ...	4	385	1-8	Up. Mar.	<i>Euomphalus (Pla-</i>				
<i>unplicata</i>	4	385	9, 10	Wool. B.	<i>norbis aequalis</i> .	2	140	1	M. L.
<i>Nerita laevigata</i>	3	217	1	Inf. Ool.	<i>pentangulatus</i> ...	1	45	1, 2	M. L.
<i>sinuosa</i>	3	217	2	Port. L.	<i>Catillus</i>	1	45	3, 4	M. L.
<i>aperta</i>	5	424	2-4	Up. Mar.	<i>nodosus</i>	1	46		M. L.
<i>minuta</i>	5	463	3, 4	Gr. Ool.	<i>carinatus</i>	5	429	3	Inf. Ool.
<i>spirata</i>	5	463	1, 2	M. L.	<i>funatus</i>	5	450	1, 2	Tr. L.
<i>globosa</i>	5	424	1	L. C.	<i>discors</i>	1	52	1	Tr. L.
<i>costata</i>	5	463	5, 6	Gr. Ool.	<i>rugosus</i>	1	52	2	Tr. L.
<i>Natica glaucino-</i>					<i>angulosus</i>	1	52	3	Tr. L.
<i>ides</i>	1	5		L. C.	<i>coronatus</i>	5	450	3	Gr. Ool.
(<i>Helix</i>) <i>Gentii</i> ...	2	45		L. C.	<i>Solarium patulum</i> ...	1	11		L. C.
<i>similis</i>	1	5		L. C.	<i>discoideum</i>	1	11		L. C.
<i>hantoniensis (stri-</i>					<i>conoideum</i>	1	11		Kim. Cl.?
<i>ata)</i>	4	373		L. C.	<i>canaliculatum</i> ..	6	524	1	L. C.
<i>patula</i>	4	373		L. C. Crag.	<i>plicatum</i>	6	524	2	L. C.
<i>cirriformis</i>	5	479	1	Crag.	<i>Rotella (Helicina)</i>				
<i>hemiciclusa</i>	5	479	2	Crag.	<i>compressa</i>	1	10		Lias?
<i>sigaretina</i>	5	479	3	L. C.	<i>expansa</i>	3	273	1-3	Lias.
					<i>solariooides</i>	3	273	4	Lias.

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
<i>Rotella polita</i>	3	285		Lias.	<i>Pleurotoma rostrata</i>	2	146	3	L. C.
<i>Pleurotomaria</i> (<i>Helix</i>) <i>carinata</i> ...	1	10		M. L.	<i>exorta</i>	2	146	2	L. C.
<i>striata</i>	2	171	1	M. L.	<i>acuminata</i>	2	146	4	L. C.
<i>cirriformis</i>	2	171	2	M. L.	<i>Comma</i>	2	146	5	L. C.
(<i>Trochus</i>) <i>ornata</i>	3	221	1	Inf. Ool.	<i>Semicolon</i>	2	146	6	L. C.
<i>bicarinata</i>	3	221	2	Calc. Gr.	<i>Colon</i>	2	146	7, 8	L. C.
<i>sulcata</i>	3	220	3	Inf. Ool.	<i>Fusus errans</i>	4	400		L. C.
<i>granulata</i>	3	220	2	Inf. Ool.	<i>bifasciatus</i>	3	228		L. C.
<i>fasciata</i>	3	220	1	Inf. Ool.	<i>quadratus</i>	5	410	1	G. S.
<i>punctata</i>	2	193	1	Inf. Ool.	<i>bulbiformis</i>	3	291	1-6	L. C.
<i>elongata</i>	2	193	2-4	Inf. Ool.	<i>Ficulneus</i>	3	291	7	L. C.
<i>abbreviata</i>	2	193	5	Inf. Ool.	<i>desertus</i>	5	415	1	L. C.
<i>anglica</i>	2	142		Lias.	<i>striatus</i>	1	22		Crag.
<i>reticulata</i>	3	272	2	Kini. Cl.	— var. <i>carinatus</i>	2	109		Crag.
<i>Gibbsii</i>	3	278	1	Gault.	<i>contrarius</i>	1	23		Crag.
<i>Trochus agglutinans</i>	1	98		L. C.	<i>latus</i>	1	35		Wool. B.
<i>Benettii</i>	1	98		L. C.	<i>costatus</i> (<i>rugosus</i>)	1	34		} Crag.
<i>extensus</i>	3	278	2, 3	L. C.	<i>tuberosus</i>	3	229	1		L. C.
<i>laevigatus</i>	2	181	1	Crag.	<i>nodosus</i> (<i>tuberosus</i>)	6	578	4	Coral R.
<i>angulatus</i>	2	181	3	Inf. Ool.	<i>costellifer</i>	2	199	3	Crag.
<i>dimidiatus</i>	2	181	4	Inf. Ool.	<i>echinatus</i>	2	199	4	Crag.
<i>duplicatus</i>	2	181	5	Inf. Ool.	<i>curtus</i>	2	199	5	L. C.
<i>similis</i>	2	181	2	Crag.	<i>gradatus</i>	2	199	6	Wool. B.
<i>Sedgwicki</i>	3	272	1	Crag.	<i>canaliculatus</i>	5	415	2	L. C.
<i>imbricatus</i>	3	272	3, 4	Lias.	<i>labiatus</i>	5	412	1, 2	Up. Mar.
<i>monilifer</i>	4	367		L. C.	<i>lavatus</i>	5	412	3, 4	L. C.
<i>Littorina</i> (<i>Turbo</i>) <i>littorea</i>	1	71	1	Crag.	<i>interruptus</i>	3	304		L. C.
<i>rudis</i>	1	71	2	Crag.	<i>corneus</i>	1	35		Crag.
<i>suboperta</i>	1	31	6	Crag.	<i>trilineatus</i>	1	35		L. C.
<i>extensa</i>	1	31	2	G. S.	<i>regularis</i>	2	187	2	} L. C.
<i>conica</i>	5	433	1	G. S.	<i>complanatus</i>	5	423	1		L. C.
<i>rotundata</i>	5	433	2	G. S.	<i>Lima</i>	5	423	4	L. C.
<i>ornata</i>	3	240	1, 2	Inf. Ool.	<i>coniferus</i>	2	187	1	L. C.
<i>carinata</i>	3	240	3	G. S.	<i>Carinella</i>	2	187	3, 4	L. C.
<i>muricata</i>	3	240	4	Coral R.	<i>longævus</i>	1	63		L. C.
<i>monilifera</i>	4	395	1	L. G. S.	<i>alveolatus</i>	6	525	1	Crag.
<i>sculpta</i>	4	395	2	L. C.	<i>cancelatus</i>	6	525	2	Crag.
<i>Turbo</i> <i>Tiara</i>	6	551	1	M. L.	<i>aciculatus</i> (<i>acuminatus</i>)	3	274	1, 2, 3	L. C.
<i>?obtusus</i>	6	551	2	Gr. Ool.	<i>asper</i>	3	274	4-7	L. C.
<i>Phasianella</i> (<i>Melania</i>) <i>striata</i>	1	47		Coral R.	<i>porrectus</i> (<i>rugosus</i>)	3	274	8, 9	L. C.
<i>?heddingtonensis</i>	1	39		Coral R.	<i>Rissoa laevis</i>	6	609	1	Gr. Ool.
<i>Turritella</i> <i>Terebra</i>	6	565	3	Diluv.	<i>acuta</i>	6	609	2	Gr. Ool.
<i>granulata</i>	6	565	1	G. S.	<i>obliquata</i>	6	609	3	Gr. Ool.
<i>conoidea</i>	1	51	1, 4, 5	L. C. Crag.	<i>duplicata</i>	6	609	4	Gr. Ool.
<i>elongata</i>	1	51	2	L. C.	<i>Pyrula nexilis</i>	4	331		L. C.
<i>brevis</i>	1	51	3	L. C.	<i>Greenwoodii</i>	5	498		L. C.
<i>incrassata</i>	1	51	6	Crag.	(<i>Murex</i>) <i>Smithii</i>	6	578	1-3	L. C.
<i>edita</i>	1	51	7	L. C.	<i>Triton argutus</i>	4	344		L. C.
(<i>Melania</i>) <i>sulcata</i>	1	39		L. C.	<i>Murex tortuosus</i>	5	434	2	Crag.
<i>abbreviata</i>	6	565	2	M. L.	<i>tricarinatus</i>	5	416	1	L. C.
<i>costata</i>	6	565	4	L. G. S.	<i>bispinosus</i>	5	416	2	L. C.
<i>excavata</i> (<i>concava</i>)	6	565	5	Port. L.	<i>frondosus</i>	5	416	3	L. C.
<i>muricata</i>	5	499	1, 2	Coral R.	<i>cristatus</i>	3	230	1, 2	L. C.
<i>cingenda</i>	5	499	3	Coral R.	<i>coronatus</i>	3	230	3	L. C.
<i>Terebra</i> ? <i>lineata</i>	3	218	1	Inf. Ool.	<i>peruvianus</i>	5	434	1	Crag.
<i>constricta</i>	3	218	2	M. L.	<i>Harpula</i>	6	578	5	M. L.
<i>Cerithium</i> <i>pyramidale</i>	2	127	1	L. C.	<i>Minax</i>	3	229	2	L. C.
<i>geminatum</i>	2	127	2	L. C.	<i>Calcar</i>	5	410	2	G. S.
<i>Cornu-copiae</i>	2	188	1, 3, 4	L. C.	<i>defossus</i>	5	411	1	L. C.
<i>giganteum</i>	2	188	2	L. C.	<i>alveolatus</i>	5	411	2	Crag.
<i>Pleurotoma</i> <i>prisca</i>	4	386		L. C.	<i>sexdentatus</i>	5	411	3	Up. Mar.
<i>Mitula</i>	4	375	3	Crag.	<i>Typhis</i> (<i>Murex</i>) <i>fistulosus</i>	2	189	1, 2	L. C.
<i>laevigata</i>	4	387	3	L. C.	<i>pungens</i> (<i>tubifer</i>)	2	189	3, 4, 5, 8	L. C.
<i>brevirostrum</i>	4	387	2	L. C.	<i>muticus</i>	2	189	6, 7	L. C.
<i>fusiformis</i>	4	387	1	L. C.					
<i>attenuata</i>	2	146	1	L. C.					

	Vol.	Tab.	Fig.	Stratum.		Vol.	Tab.	Fig.	Stratum.
Rostellaria lucida...	1	91	1-3	L. C.	Voluta depauperata	4	396	4	L. C.
rimosa	1	91	4-6	L. C.	spinosa	2	115	2, 4	L. C.
macroptera ... {	3	298		L. C.	—β.	2	115	3	L. C.
	3	299			suspensa	2	115	5	L. C.
	3	300			Volvaria acutiuscula	5	497		L. C.
calcarata	4	349	6, 7	G. S.	Ovulum Leathesii...	5	478		Crag.
Sowerbyi	4	349	1-5	L. C.	Cypræa oviformis ...	1	4		L. C.
	6	558	lower 3			coccinelloides ...	4	378	1	Crag.
composita	6	558	2	Ool.	retusa.....	4	378	2	Crag.
Parkinsoni ... {	1	75		G. S.	Avellana	4	378	3	Crag.
	6	558	upper 3			Seraphs convolutus.	3	286		L. C.
Pes Pelicani	6	558	1	Diluv.	Terebellum fusi-				
Strombus bartonen-					forme.....	3	287		L. C.
sis	1	34		L. C.	Oliva (Ancilla) tur-				
Cassid bicatenata ...	2	151		Crag.	ritella.....	1	99		L. C.
Cassidaria (Cassid)					aveniformis	1	99		L. C.
striata.....	1	6		L. C.	Branderi	3	288		L. C.
carinata.....	1	6		L. C.	Salisburyana	3	288		L. C.
Dolium nodosum {	5	426		L. Ch.	Ancillaria subulata..	4	333		L. C.
	5	427				Conus Dormitor ...	3	301		L. C.
Nassa elongata	2	110	1	Crag.	concinus	3	302	2	L. C.
reticosa	2	110	2	Crag.	scabriculus.....	3	303		L. C.
rugosa	2	110	3	Crag.	doubtful species ...	3	302	1	L. C.
granulata	2	110	4	Crag.					
Purpura (Bucci-									
num) crispata... ..	5	413		Crag.					
tetragona	5	414	1	Crag.					
incrassata	5	414	2	Crag.					
Buccinum Dalei ...	5	486	1, 2	Crag.					
tenerum.....	5	486	3, 4	Crag.					
elegans	5	477	1	Crag.					
labiosum	5	477	3	Crag.					
sulcatum	4	375	2	Crag.					
— var.	5	477	4	Crag.					
unilineatum	5	486	5, 6	Gr. Ool.					
juncum	4	375	1	L. C.					
acutum	6	566	1	M. L.					
imbricatum	6	566	2	M. L.					
breve	6	566	3	M. L.					
spinosum	6	566	4	M. L.					
Cancellaria lævis-									
cula	4	361	1	L. C.					
evulsa	4	361	2-4	L. C.					
quadrata	4	360		L. C.					
Auricula? pyrami-									
dalis	4	379		Crag.					
?ventricosa	5	465	1	Crag.					
?buccinea	5	465	2	Crag.					
?incrassata	2	163	1-3	G. S.					
?turgida.....	2	163	4	L. C.					
Acteon Noæ	4	374		Crag.					
simulatus	2	163	5	L. C.					
?cuspidatus	5	455	1	Gr. Ool.					
?acutus	5	455	2	Gr. Ool.					
crenatus.....	5	460	1	L. C.					
striatus	5	460	2	Crag.					
elongatus	5	460	3	L. C.					
Mitra scabra	4	401		L. C.					
parva	5	430	1	L. C.					
pumila	5	430	2	L. C.					
Voluta Lamberti ...	2	129		Crag.					
costata	3	290	1, 2, 4	L. C.					
Magorum	3	290	3	L. C.					
ambigua.....	4	399	1	L. C.					
nodosa	4	399	2	L. C.					
Lima	4	398	2	L. C.					
geminata	4	398	1	L. C.					
Luctator	{	2	115	1	L. C.				
	{	4	397						
Athleta	4	396	1-3	L. C.					

ORD. IV. CEPHALOPODA.

† *Septa imperfect.*

Beloptera sepioidea.	6	591	1	L. C.
belemnitoidea ...	6	591	3	L. C.
anomala.....	6	591	2	L. C.

†† *Septa concave.*

Belemnites minimus	5	589	1	Gault.
attenuatus	6	589	2	Gault.
pistilliformis	6	589	3	Lias.
elongatus	{	6	590	Lias.
	{	1	60		1-3
abbreviatus	6	590	2, 3, 9	Lias.
penicillatus	6	590	5, 6	Lias.
acutus	6	590	7, 8, 10	Lias.
compressus	6	590	4	Inf. Ool.
lanceolatus ...	6	600	8, 9	Ch. M.
mucronatus	6	600	1, 2, 4, 6, 7	U. Ch.
granulatus.....	6	600	3, 5	U. Ch.
Orthocera cordifor-				
mis	3	247		M. L.
gigantea.....	3	246		M. L.
striata.....	1	58		Tr. L.
cincta.....	6	588	3	M. L.
fusiformis	6	588	1, 2	M. L.
undulata	1	59		M. L.
circularis	1	60	6, 7	Tr. L.
annulata	2	133		Tr. L.
Breyii	1	60	5	M. L.
? Steinhaveri	1	60	4	Coal M.
? paradoxica	5	457		M. L.
Conularia quadri-				
sulcata	{	3	260	Coal M.
	{	3	260		3-6
? teres.....	3	260	1, 2	Tr. L. ?
Nautilus imperialis..	1	1		L. C.
centralis.....	1	1		L. C.
regalis	4	355		L. C.
simplex	2	122		U. G. S.
globatus.....	{	1	37	M. L.
	{	5	481	
expansus	5	458	1	Chalk M.
inæqualis	1	40		Gault.
polygonalis	6	530		Inf. Ool.

	Vol.	Tab.	Fig.	Stratum.
<i>Nautilus striatus</i> ...	2	182		Lias.
? <i>minutus</i>	1	53	3	Gault.
<i>lineatus</i>	1	41		Gr. Ool.
<i>excavatus</i>	6	529	1	Inf. Ool.
<i>hexagonus</i>	6	529	2	Calc. Gr.
<i>truncatus</i>	2	123		Lias.
<i>intermedius</i>	2	125		Lias.
<i>obesus</i>	2	124		Inf. Ool.
<i>radiatus</i>	4	356		Coral R.
<i>elegans</i>	2	116		Chalk M.
<i>undulatus</i>	1	40		L. G. S.
<i>biangulatus</i>	5	458	2	M. L.
<i>cariniferus</i>	5	482	3, 4	M. L.
<i>multicarinatus</i> ..	5	482	1, 2	M. L.
<i>bilobatus</i>	3	249	2, 3	M. L.
<i>tuberculatus</i> ..	3	249	4	M. L.
<i>pentagonus</i>	3	249	1	M. L.
<i>Discus</i>	1	13		M. L.
<i>compressus</i>	1	38		M. L.
<i>complanatus</i>	3	261		M. L.
<i>sulcatus</i>	6	571	1, 2	M. L.
<i>sinuatus</i>	2	194		Inf. Ool.
<i>ziczac</i>	1	1		L. C.
<i>Goniatites</i> (<i>Nauti-</i> <i>lus</i>) <i>striatus</i>	1	53	1	M. L.
<i>sphaericus</i>	1	53	2	M. L.
? <i>Henslowi</i>	3	262		M. L.?

Ammonites.

* *Margin rounded.*

<i>A. Sutherlandiæ</i> ...	6	563		Calc. Gr.
<i>laevigatus</i>	6	570	3	Lias.
<i>Selliguinus</i>	6	549	1	Gault.
<i>Planorbis</i>	5	448		Lias.
<i>parvus</i>	5	449	2	G. S.?
<i>peramplus</i>	4	357		U. Ch.
<i>lewesiensis</i>	4	358		U. Ch.
<i>heterophyllus</i> ...	3	266		Lias.
<i>Loscombi</i>	2	183		Lias.
<i>Greenoughii</i>	2	132		Lias.
<i>complanatus</i>	6	569	1	Chalk M.
<i>undatus</i>	6	569	2	U. Ch.
<i>sublaevis</i>	1	54		Kell. R.
<i>nutfieldiensis</i> ..	2	108		L. G. S.
<i>Hervii</i>	2	195		Cornb.
<i>navicularis</i>	6	555	2	Chalk.
<i>finatus</i>	1	32		M. L.
<i>Rotula</i>	6	570	4	Kim. Cl.?
<i>Johnstoni</i>	5	449	1	Lias.
<i>omphaloides</i>	3	242	5	Kim. Cl.
<i>Leachii</i>	3	242	4	Kim. Cl.
<i>Lamberti</i>	3	242	1-3	Kim. Cl.
<i>Bakeriæ</i>	6	570	1, 2	Lias.
<i>planulatus</i>	6	570	5	Chalk M.
<i>Jamesoni</i>	6	555	1	Lias.
<i>Koenigi</i>	3	263	1-3	Kell. R.
<i>plicomphalus</i> ... {	4	359		Kell. R.
	4	404		
<i>Catillus</i>	6	564	2	U. G. S.
<i>annulatus</i>	3	222		Lias.
<i>communis</i>	2	107	2, 3	Lias.
<i>angulatus</i>	2	107	1	Lias.
<i>giganteus</i>	2	126		Port. L.
<i>biplex</i>	3	293	1, 2	Kim. Cl.
<i>rotundatus</i>	3	293	3	Kim. Cl.
<i>triplex</i>	3	292		Coral R.
	3	293	4	
<i>decipiens</i>	3	294		Kim. Cl.

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<i>Ammonites fimbria-</i> <i>tus</i>	2	164		Lias.
<i>Brongniarti</i>	2	A	2	Inf. Ool.
<i>Gervillii</i>	2	A	3	Inf. Ool.
<i>Braikenridgii</i> ...	2	184		Inf. Ool.
<i>Humphriesianus</i> .	5	500	middle	Inf. Ool.
<i>Brodiei</i>	4	351		Inf. Ool.
<i>Brocchii</i> (con-	2	202	2	} Inf. Ool.
<i>tractus</i>)				
	5	500		} Inf. Ool.
<i>Blagdeni</i>	2	201		
	5	500	1 up.	} Coal M.
<i>Listeri</i>	5	501	1	
<i>Banksii</i>	2	200		Inf. Ool.
<i>Davœi</i>	4	350		Lias.
<i>fibulatus</i>	4	407	2	Lias.
<i>subarmatus</i>	4	407	1	Lias.
<i>armatus</i>	1	95		Lias.
<i>planicostatus</i> ... {	1	73		} Lias.
	4	406	5-7	
<i>laticostatus</i>	6	556	1	Lias.
<i>brevispina</i>	6	556	2	Lias.
<i>Goverianus</i>	6	549	2	Ool.
<i>cinctus</i>	6	564	1	Chalk M.
<i>Henleyi</i>	2	172		Lias.
<i>Bechei</i>	3	280		Lias.
<i>longispina</i>	5	501	2	Oxf. Cl.
<i>perarmatus</i>	4	352		Coral R.
<i>Catena</i>	5	420		Calc. Gr.
<i>Birchii</i>	3	267		Lias.

** *Margin flattened.*

<i>calloviensis</i>	2	104		Kell. R.
<i>Parkinsoni</i>	4	307		Inf. Ool.
<i>splendens</i>	2	103		Gault.
<i>dentatus</i>	4	308		Gault.
<i>denarius</i>	6	540	1	G. S.
<i>lautus</i>	4	309		Gault.
<i>tuberculatus</i> ..	4	310	1-3	Gault.
<i>proboscideus</i>	4	310	4, 5	Gault.
				} U. G. S.
<i>auritus</i>	2	134		
<i>Benettiæ</i>	6	539		Gault.
<i>mutabilis</i>	4	405		Kim. Cl.
<i>Taylori</i>	6	514	1	Lias.
<i>rusticus</i>	2	177		L. Ch.
<i>spinosis</i>	6	540	2	Kim. Cl.
<i>Duncanni</i>	2	157		Kim. Cl.
<i>Gulielmi</i>	4	311		Oxf. Cl.
<i>Mantelli</i>	1	55		Chalk M.
<i>Monile</i>	2	117		Gault.

*** *Margin keeled.*

a. Keel entire.

<i>Discus</i>	1	12		Cornb.
<i>subradiatus</i>	5	421	2	Inf. Ool.
<i>concavus</i>	1	94		Inf. Ool.
<i>elegans</i>	1	94		Lias.
<i>falcifer</i>	3	254	2	Lias.
<i>Strangwaysii</i>	3	254	1, 3	Lias.
<i>Murchisonæ</i>	6	550		Lias.
<i>Goodhalli</i>	3	255		L. G. S.
<i>laeviusculus</i>	5	451	1, 2	Inf. Ool.
<i>corrugatus</i>	5	451	3	Inf. Ool.
<i>varicosus</i>	5	451	4, 5	G. S.
<i>striatulus</i>	5	421	1	Lias.
<i>jugosus</i>	1	92	1	Lias.
<i>triplicatus</i>	1	92	2	Kim. Cl.
<i>binus</i>	1	92	3	Lias?
<i>ellipticus</i>	1	92	4	Lias.

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plicatilis.....	2	166		Calc. Gr.	maximus	1	62	1	Gault.
Walcottii	2	106		Lias.	intermedius	1	62	2-4	Gault.
falcatus	6	579	1	Chalk M.	gibbosus	1	62	4 r.	Gault.
curvatus.....	6	579	2	Chalk M.	spinulosus	3	216	1	G. S.
inflatus	2	178		U. G. S.	spiniger	3	216	2	Gault.
varians	2	176		Chalk M.	nodosus	3	216	3	Gault.
Woolgari	6	587	1	L. Ch.	tuberculatus	3	216	4, 5	Gault.
tetraminatus	6	587	2	Ch. M.	turgidus.....	3	216	6	Gault.
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obtusus	2	167		Lias.	tuberculatus.....	1	56		Chalk M.
Brookii	2	190		Lias.	undulatus.....	1	74		Chalk M.
Conybeari	2	131		Lias.	Baculites Faujasii...	1	75	1-3	Chalk M.
Buecklandi	2	130		Lias.	obliquatus	6	592	1	Chalk.
Turneri	5	452		Lias.		6	592	2, 3	Chalk M.
multicostatus.....	5	454		Lias.					
rotiformis	5	453		Lias.					

b. Keel crenated.

excavatus	2	105		Calc. Gr.
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Hamites tenuis.....	1	61	1	Gault.
rotundus	1	61	2, 3	Gault.
attenuatus	1	61	4, 5	Gault.
adpressus	1	61	6	Inf. Ool.

††† *Septa convex.*

Nummularia laevi-				
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elegans	6	538	2	L. C.
variolaria	6	538	3	L. C.
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ORD. V. HETEROPODA.

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TUNICATÆ.

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ABBREVIATIONS.

Brad. C. *Bradford Clay.*
 Calc. Gr. *Calceiferous Grit.*
 Chalk M. *Chalk Marl.*
 Coal M. *Coal Measures.*
 Coral R. *Coral Rag.*
 Cornh. *Cornbrash.*
 Diluv. *Diluvium.*
 F. E. R. *Fuller's—Earth Rock.*
 For. M. *Forest Marble.*
 F. W. *Fresh Water. (Above the London Clay.)*
 Gr. Ool. *Great (Bath) Oolite.*
 G. S. *Green Sand.*
 Inf. Ool. *Inferior Oolite.*
 Kell. R. *Kelloways Rock.*
 Kim. C. *Kimmeridge Clay.*

L. C. or L. Cl. *London Clay.*
 L. Ch. *Lower Chalk.*
 L. F. W. *Lower Fresh Water.*
 L. G. S. *Lower Green Sand.*
 Mag. L. *Magnesian Limestone.*
 M. L. *Mountain Limestone.*
 Oxf. C. *Oxford Clay.*
 Port. L. or Port. S. *Portland Limestone.*
 Tr. L. *Transition Limestone.*
 U. Ch. *Upper Chalk.*
 U. F. W. or Up. F. W. *Upper Fresh Water.*
 U. G. S. *Upper Green Sand.*
 Up. Mar. *Upper Marine.*
 Weald. *Wealden Beds. (A freshwater series.)*
 Wool. B. *Woolwich Beds. (Plastic Clay?)*

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<i>imbricata</i>	6		521	1	<i>sepioidea</i>	6		591	1
<i>lineata</i>	2		179	1	<i>Buccinum acutum</i>	6		566	1
<i>lurida</i>	2		137	1	<i>breve</i>	6		566	3
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* * The names printed in *Italic* letters are those given in the body of the work but which require alteration. If the alteration be in the generic name, that name, followed by several dots, is placed in a parenthesis; if it be the specific name that requires alteration, the new name is given without dots in the parenthesis.

Price 4s.

MARCH, 1840.

No. CVI.

OF THE

MINERAL CONCHOLOGY

OF

GREAT BRITAIN ;

OR

COLOURED FIGURES AND DESCRIPTIONS

OF THOSE

REMAINS OF TESTACEOUS ANIMALS

OR

Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN
THE EARTH.

By JAMES SOWERBY, F.L.S. G.S. W.S.

HONORARY MEMBER OF THE PHYSICAL SOCIETY OF GÖTTINGEN, OF THE SOCIETY
OF JENA, &c.

CONTINUED BY

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MDCCCXL.

VOL. VII.

Strictures upon the commencement of a Publication entitled "*Conchologie Mineralogique de la Grande Bretagne, par James Sowerby.—Traduction Francaise revue, corrigee, augmentee, par L. Agassiz.*" With a Reply by Prof. Agassiz, and a Letter from Mr. J. D. C. Sowerby.

(From the *MAGAZINE OF NATURAL HISTORY, New Series,*
1839, p. 254.)*

SOME numbers of a work have, within the last few days, come under our notice, the publication of which we see with no small share of surprise, mingled with a feeling not far short of indignation. The covers bear the following indication of their contents.—"*Conchologie Mineralogique de la Grande Bretagne, par James Sowerby.—Traduction Francaise revue, corrigee, augmentee, par L. Agassiz.*" A French version of the text of Mr. Sowerby's Fossil Conchology, with coloured imitations of the accompanying figures, and this published at one fourth the cost of the original work, is about the last thing we should have looked for from the hands of Louis Agassiz. The illustrations, for the most part, are but sorry imitations, though sufficiently characteristic to serve for the identification of the species, and thus check at least the foreign demand for a work, upon which so many years of toil have been expended. As a set-off against this undue appropriation of the labours of another,—this inroad upon the property of a fellow-labourer in the field of science, we are told that "*l'utilité d'une édition Francaise du Mineral Conchology, mise à la portée de toutes les bourses devant être incontestable aux yeux de tous ceux qui favorisent les progrès de la Géologie.*"

Now if some noble patroniser of science in this country, acting under a belief that an English translation of the '*Poissons Fossiles*,' with a fac-simile of the numerous illustrations, if published at ten shillings each part, instead of thirty, would be very acceptable to all those who are favourable to the progress of Geology, either by the aid of a government grant, or from his own private resources, were to carry this

* Prof. Agassiz having sent out with the last livraison of his '*Poissons Fossiles*' copies of his answer to the Remarks in the Magazine of Natural History, the Editor has in consequence struck off copies of the *entire* discussion for distribution.—*Ed. Mag. Nat. Hist.*

idea into execution, the "utilité" of such an edition would, in this case, be equally incontestable, and probably no one would be better able to appreciate its value than Louis Agassiz himself. We believe the number of copies of Agassiz's work sold in this country exceeds one hundred, and were this demand supplanted by an English translation, we would not venture to predict how many more livraisons of the 'Poissons Fossiles' would be forthcoming. Of this we feel satisfied, that the Fossil Conchology would never have been undertaken, if its authors (the Messrs. Sowerby) had anticipated such a course as that pursued in the present instance by Agassiz; and if his first speculation succeed, we suppose he will follow it up with a regular system of piracy upon the literary productions of English naturalists.

Personal knowledge, and a feeling of respect for the proud position in the zoological world occupied by the author of the 'Poissons Fossiles' make us, on the present occasion, most reluctant censors.—Agassiz has met with the most cordial support on all sides, and in various ways, from the cultivators of science in this country; and although it may appear harsh thus to express ourselves, we do not hesitate openly to declare our conviction, that in editing a transcript in the French language of the 'Mineral Conchology of Great Britain,' its author cannot be said to have really promoted the objects of science, still less to have added to his own reputation.

*Letter from PROF. AGASSIZ on the subject of the French Edition of the 'Mineral Conchology of Great Britain.'**

Neuchâtel, Mai 15, 1839.

MONSIEUR,

Je viens de lire dans votre journal (N. 29) une incrimination odieuse de la part que j'ai prise à la publication que fait dans ce moment M. Nicolet, d'une édition à bon marché de la 'Conchyliologie Minéralogique' de J. Sowerby.—Rien ne me parôitroit mieux mérité que les reproches qui m'y sont adressés, si les assertions et les insinuations que renferme cet article n'étoient d'un bout à l'autre perfides ou mensongères. Puisque vous avez accueilli cette accusation dans votre journal, j'attends de votre loyauté que vous y insérerez ma justification dans votre plus prochain No.

Malgré l'immense importance de l'ouvrage de Sowerby sur les fossiles d'Angleterre, cette publication n'a pu trouver qu'

* Mag. Nat. Hist. Vol. iii. n. s. p. 356.

un petit nombre d'acquéreurs sur le continent. Aussi le connoissance que j'ai des établissemens scientifiques des localités les plus importants d'Europe m'a telle donné *la certitude* qu'une édition Française ou Allemande de cet ouvrage, si elle pouvoit être publiée à meilleur marché que l'original, seroit un véritable service rendu à la science, *sans nuire en aucun façon à l'édition originale*, qui s'est surtout écoulées en pays Anglois. N'y auroit-il pas dès lors mauvaise foi à représenter une pareille publication comme une piraterie systématique? comme si des traductions d'ouvrages scientifiques ne se feroient pastous les jours au gré des auteurs, et à plus fort raison après leur mort! et comme si, en faisant ce que vous, auteur d'un journal scientifique, vous devez savoir être de bon droit, je devois causer la ruine des héritiers de Sowerby, en les privant du bénéfice d'une publication dont ils disposent depuis plus de quinze ans, et qui est terminée depuis dix, après avoir reçu deux volumes posthumes. Mais il y a plus, lorsque j'ai engagé un lithographe d'ici,—M. Nicolet,—à faire un Sowerby à bon marché, je lui ai fourni *gratuitement* la traduction du texte, enrichie *de nombreuses additions et corrections*. Il est donc absolument faux de dire que l'édition Française de Sowerby, dont il s'agit, n'est qu'une mauvaise contrefaçon des planches de l'ouvrage Anglois, accompagnée d'une simple translation du texte. Je n'aurois jamais prêté mon nom à une pareille machination. Je dois donc trouver bien étrange la conduite d'un éditeur d'un journal scientifique qui accueille sans examen de pareilles calomnies, et je déclare positivement mensongères les insinuations que j'aurois entrepris, ou fait entreprendre, cette publication dans le but d'en faire une affaire de lucre. Au contraire, il n'en a été tiré que 300 exemplaires, et j'ai mit à l'éditeur pour prix de ma participation, la condition que l'ouvrage ne seroit pas vendu au-dessus du prix nécessaire pour couvrir les frais de publication. Je proteste en outre n'avoir en aucune intention de nuire aux éditeurs de l'édition originale; si j'en ai envoyé quelques exemplaires en Angleterre, c'est uniquement afin que mes amis scientifiques puissent prendre connoissance des nombreuses additions que j'ai faite à ma traduction. Tout ceci prouve, que dans cette circonstance, comme toujours, j'ai agi uniquement dans l'intérêt de la science. Un illustre géologue Anglois pourroit au besoin rapporter ce que je lui ai dit à ce sujet, avant de m'occuper de cette traduction.

Ceci m'amène à vous faire encore une observation. J'apprends que pour user de représailles envers moi, (comme si j'avois commis des hostilités), il se préparoit une souscription pour favoriser une contrefaçon de mes 'Poissons Fossiles,' ac-

compagnée d'une traduction Anglaise du texte, qui puisse être publiée à 10s. la livraison, au lieu de 30s. Permettez-moi de vous dire ma façon de penser à ce sujet. Si le fait est vrai, j'envisagerois cet acte, *en tant que représaille*, comme tout ce que l'on pourroit imaginer de plus perfide et indigne de tout homme qui se respecte; mais si la chose n'avoit lieu que dans un but d'utilité, je déclare aussi franchement que j'appellerois la réussite de tous mes vœux, espérant voir par là mon ouvrage passer entre les mains de quelques cents personnes qui n'auroient peut-être pas pû l'acquérir au prix de souscription. Depuis le nombre de mes souscripteurs m'est approximativement connu, je n'ai fait tirer qu'un petit nombre d'exemplaires en sus; mon édition sera donc épuisée avant qu'une pareille contrefaçon puisse être terminée, et comme j'ai détruis les gravures de mes planches, dans aucun temps je ne serai curieux de refaire une édition d'un ouvrage qui n'a été pour moi qu'une source intarissable de désagrémens et de sacrifices, quelques jouissances intellectuelles qu'il m'ait procuré. Si donc l'idée d'une édition à bon marché de mes 'Poissons Fossiles' n'est pas une mauvaise plaisanterie, je désirerais sérieusement connoître les personnes qui veulent s'en charger; j'aurois, j'en suis certain, plusieurs bons conseils à leur donner, afin de contribuer à leur faire atteindre plus facilement leur but, qui doit être, je le pense du moins, de répandre un ouvrage envisagé comme utile, et non pas uniquement de me nuire. D'ailleurs, mon ouvrage sera complètement achevé dans un an, avec le 15me livraison que j'espère publier à Pâques prochain; et je m'estimerais heureux de le voir traduit et reproduit sous quelle forme que ce soit.

Espérant que vous voudrez bien insérer le contenu de ma lettre au complet en le traduisant littéralement, j'ai l'honneur de vous prévenir que j'en expédie quelques copies à plusieurs de mes amis.

Veuillez agréer,
Monsieur,
L'assurance de ma considération distinguée,
L. AGASSIZ.

[TRANSLATION.]

Neuchatel, May 15, 1839.

SIR,

I have just read in the 29th number of your Journal an invidious crimination of the part which I have taken in the cheap edition of Sowerby's *Min. Conchology*, now in course of publication by M. Nicolet.

Nothing would be more richly merited than the strictures which are there passed upon me, were it not that the assertions and insinuations which the article contains are altogether malicious and without foundation. As you have brought forward this accusation in your journal, I expect from your sense of honour that you will give publicity to my justification in your forthcoming number.

Notwithstanding the great importance of Mr. Sowerby's work on the Fossils of England, this publication has met with but few purchasers on the continent; and the knowledge which I possess of the most important European Scientific Institutions, has assured me that a French or German edition of the work, published at a lower price, would be rendering a real service to Science, without in any way proving injurious to the original edition, for which the principal demand is in England. Would it then not be unfair to represent such a publication as a systematic piracy; as though translations of scientific works were not being made every day with the consent of authors, and with still greater reason after their death; and as if in doing that, which you, as the conductor of a scientific journal, ought to know I am justified in, I am likely to injure the family of Mr. Sowerby in depriving them of the benefit of a publication of which they have had the disposal for more than fifteen years, and which has been completed ten years, after the addition of two posthumous volumes? But in addition to this, when I agreed with a lithographer, M. Nicolet, to bring out a cheap Sowerby, I gratuitously furnished him with a translation of the text, enriched with numerous additions and corrections. It is then altogether untrue to say that the edition in question is but a sorry imitation of the plates of the English work accompanied by a mere translation of the text. I should never have lent my name to such a machination. It appears to me therefore, very strange conduct in the Editor of a scientific journal to give, without examination, publicity to such calumnies; and I affirm that the insinuation of my having entered upon this undertaking with a view to pecuniary emolument, to be altogether unfounded. On the contrary, only 300 copies have been struck off, and I agreed with the Editor as the price of my participation in it, that the work should not be sold at a sum above that necessary to cover the expense of its publication. I protest also, that I had not the least intention of injuring the Editor of the original edition: if I have dispatched some copies to England it has been with the view of letting my scientific friends see the number of additions and corrections which I have incorporated in my translation. All this proves that in the present instance, as always, I have only acted from a regard to the interests of science. An illustrious English geologist can, if required, relate what I said to him on this subject before I occupied myself with the translation.

This leads me to make one other remark to you. I understand, that by way of reprisal, as though I had committed hostilities, there is in preparation a subscription to bring out a reprint of my Fossil Fishes, with an English translation of the text, at 10s. a livraison instead of 30s. Permit me to tell you my notions upon this subject. If the fact be true, and I am to regard this act in the light of a reprisal, I must deem it most perfidious and disreputable; but if the thing be only undertaken as a matter of utility, I declare with the same frankness, that I shall be gratified, hoping thus to see my work pass into the hands of some hundreds of persons who would not perhaps be able to obtain it at the original subscription price. As I have now pretty well ascertained the amount of my subscribers, I have only had a few copies struck off beyond that number, and my edition will consequently be disposed of before a reprint can be completed; and as I have effaced the drawings from the stones, at no future time shall I be de-

sirous of attempting another edition of a work which has all along been to me a source of vexation and sacrifice, whatever intellectual enjoyment it may have produced me. If, therefore, a cheap edition of my work be really seriously talked of, I should like to know the parties who are about to engage in it, as I should have some advice to give them to enable them more readily to attain the object which I, at least, think they should have in view; viz., the diffusion of a work regarded as useful, and not merely an attempt to injure me. As my work will be completely finished in a year, with the 15th livraison, which I hope to publish next Easter, I shall esteem myself fortunate to see the work translated, in whatever shape it may appear.

Hoping that you will insert the contents of this letter entire and literally translated, I have the honour to inform you that I have sent copies to several of my friends.

LOUIS AGASSIZ.

*To the Editor of the
Magazine of Natural History.*

[Observations in reply to the preceding letter.]*

OUR remarks upon M. Nicolet's French edition of Sowerby's work on the fossil shells of this country, have drawn forth a reply from Prof. Agassiz, which should have received a place in our last month's number, had it not reached us too late for publication. We now insert his letter, with a translation of its contents, that every publicity in our power may be given to the vindication which he has put forward. Had the work under notice originated with none other name than those of the printer, publisher, and artist, greatly as we might have regretted, for the interests of science, the non-existence of international protecting enactments, the matter would have appeared to us one of comparatively trivial importance, and instead of advancing anything in the shape of reproach or remonstrance, we should have deemed it the wiser course to have been altogether silent.

The name, however, of Louis Agassiz, as the Editor and avowed projector of the reprint, and the plausible statement from a man of such high scientific reputation, that its cheapness, when compared with the price of the original work, must necessarily tend to further the progress of Geology, made us determine, without a moment's hesitation, on the course which we pursued. For though originating in such a quarter the scheme threatened to be tenfold more injurious in its operation, we felt that Agassiz was bound by so many ties to this country, that he would probably consider himself amenable to the expression of censure, if publicly di-

* Mag. Nat. Hist. Vol. iii. n. s. p. 359.

rected against him in the columns of an English Journal. We are glad to find that on this head we have not been mistaken; and we may add too that our expectations have been completely realised, in not even the shadow of an argument being adduced to oppose the views which we put forward, as to the injurious prospective operation of the part acted by Agassiz. He repeats, it is true, the substance of the shallow sophism that we quoted from his preface; but how does he support the position which he would there maintain,—the assumed “utilité” of the measure we condemn? Three hundred cheap Sowerbys, he tells us, will be distributed over the continent, and pass into the hands of those who would not otherwise have possessed copies of this important work. But has Agassiz so little foresight,—so small a share of penetration, that he looks to this *one* result as the sole and only consequence of the course which he is pursuing? Can he not perceive that the system which he has commenced, if followed up upon the strength of his example, must strike at the very existence of a class of works upon which the progress of Geology is essentially dependent;—works which convey to us delineations of new forms as they are brought to light in both the past and existing order of creation;—which tell their own tale without the aid of a translator, let the country be what it may to which science is indebted for their acquisition; but which, from the heavy cost of their production, and the limited class among whom they circulate, require that kind of support which is not restricted by the boundaries of clime or country?

Agassiz has saved us the necessity of selecting an instance by way of illustration. Singularly enough, the same document which contains the attempt to justify his conduct, informs us that notwithstanding the unexampled support which, although a foreigner, he has in this country received, by the aid of public pecuniary grants, and that of most extensive private subscription, still that his ‘Poissons Fossiles’ has been to him “une source intarissable de désagréments et de sacrifices.” Surely then this, his own experience, might have suggested to Agassiz the importance of every possible encouragement being held out to the present author of the ‘Mineral Conchology,’ with a view to the continuation of that work, rather than that the continental demand should, for the future, be supplied by an edition so low in price, that competition on the part of Mr. Sowerby would be utterly impossible.

As it respects the minor points adverted to by Agassiz, we shall be very brief. That an English sale of the cheap edition was calculated upon, we feel satisfied, because a large number of prospectuses have been dispatched to this country, and great pains taken to circulate them; but whether at the instigation of Prof. Agassiz or his lithographer, we cannot

say. The general principle of translating scientific works from one language into another is utterly foreign to the question, and cannot possibly be brought to bear upon those publications whose scientific value is vested in faithful representations of species, fac similes of which can be at any time produced at an enormous reduction of expense below that which they have originally cost the author.

That Agassiz is altogether in error on the subject of the relation in which the present Mr. James De Carle Sowerby stands in respect to the 'Mineral Conchology,' is clear from the following passage, which will be found in No. 105. "To the public the author feels deeply indebted, and cannot refrain from declaring his gratitude for the encouragement bestowed upon a work commenced by his lamented father, and in the continuation of which he himself has incurred so much responsibility."—Dated Camden Town, July, 1835.*

As to the numerous additions and corrections in the French edition upon which Agassiz seems to plume himself, we cannot give him a great deal of credit on this score, when his zeal for science has not induced him to procure from England such species as are now well known and readily obtained in a more perfect condition than some of the specimens figured in the early numbers of Mr. Sowerby's work. And upon the subject of an English edition of the 'Poissons Fossiles,' though, as far as we are aware, nothing of the kind is in contemplation, yet if its author really have acted with so little prudence as not to have reserved a supply to meet the demand that must arise when the work is rendered complete; and never intends, after the issue of his 15th livraison, to resume those labours in ancient Ichthyology which have shed so much light upon this department of science, and reflected so much lustre on himself; in that case most cordially should we adopt his avowed sentiments, and look upon a cheap English fac-simile of the 'Poissons Fossiles,' as a matter of the highest 'utilité.'

*It is hardly necessary to observe that since the publication of the above number in 1835, English geologists have been anxiously hoping that Mr. J. de C. Sowerby would again proceed with the continuation of the 'Mineral Conchology.'

Letter from MR. JAMES DE CARLE SOWERBY, on the subject of the French Edition of *Mineral Conchology*.*

Camden Town, July 27, 1839.

SIR,

It is hardly possible that I should remain silent after seeing, from the strictures you have made on the French edition of my 'Mineral Conchology,' the great interest you feel in the cause of that class of authors, whose works are similar in character to this publication. And feeling practically that unless some protection be afforded them by at least their *brother authors*, and the scientific portion of the public, they must soon be reduced to that small number who are sufficiently opulent to pay for the satisfaction they experience in their own minds, in being able to contribute to the advancement of knowledge, I beg to thank you for the manly way in which you have advocated what appears to me to be the true and lasting interest of science,—the encouragement of original publications, in opposition to the specious but fleeting advantages which cheap piracies possess. Such works only tend to convert what would otherwise be a flowing stream, into a stagnant lake, by cutting off the springs which had given it life.

Mons. Agassiz has, however, proposed to revise and correct the work in question; a proposal which, if carried fully into effect, would certainly be beneficial to the study of Geology: but in many instances it will be found that his translation perpetuates the errors of the original.

The following short history of the work will explain why revision and correction are necessary, and also account for the inequalities (justly observed by M. Agassiz) which occur in the execution of the different parts of it. This statement is not offered as an excuse for the errors, many of which have been corrected in the later volumes, but to show that such errors were mostly unavoidable at the time the work was in progress, and also as being likely to interest all who take a part in the discussion you have excited.

The first number of the 'Mineral Conchology' was published by the late Mr. James Sowerby, in June, 1812, two years before Lamarck's 'Système' appeared. The author being much more partial to the pictorial department, referred the principal part of the text to his two eldest sons (myself and Mr. G. B. Sowerby), while he executed the plates wholly himself: and he continued his task regularly, even during a long and painful illness, until within three or four days of his

*Mag. Nat. Hist. Vol. iii. n. s. p. 418.

death in 1822, when a considerable portion of the fourth volume had been published. For some time previously to this sad event, it had fallen to my lot to describe the whole of the shells, and now I was obliged, in addition, to engrave the plates, a few only having been done in advance by my father. At the conclusion of the sixth volume, circumstances induced me to close the work, with a view to commencing it again in a form more agreeable to the wishes of geologists; and this intention has not been lost sight of, for a continual expense has been incurred in collecting new materials, and many thanks are due to my friends in responding to my request; still however the whole of the indexes are not published, and chiefly because I have been induced to give up my time towards forwarding the immediate objects of the leading geologists of England, by yielding them the best assistance my humble talent would permit.

The sale of the 'Mineral Conchology' has only been about 400 copies, above one fourth of which number has been sent abroad. The encouragement therefore for carrying on the work has hitherto been not very great; but your having directed public attention so strongly to it, and the anxious wishes of my friends, have stimulated me to determine now upon its immediate continuation, which I hope to effect in a month from this time.

I fear I have said too much about myself, but you will perhaps excuse me if I say a few words in reference to the translation. Mons. Agassiz has not always improved the generic characters by the alterations he has made. For instance, under *Solen* he says, "CAR. GEN. Bivalve..... longitudinale," instead of transversely elongated. In *Ammonites* the word "dorsal" is inserted whereas the siphon is truly ventral; &c. Neither has he embodied all the corrections given in the latter part of the work, indeed he seems not to have consulted the index in No. 105 in any case. There *Cassis* is referred to *Cassidaria*; *Modiola parallela* to *Plagiostoma elongatum*; *Helicina* to *Rotella*; *Helix carinatus* to *Pleurotomaria*, whether correctly or not, may be a question, but certainly it is not a *Cirrus*, (Mons. Agassiz proposes to name it *Cirrus Sowerby*); *Venus* to *Cyprina*; *Murex* to *Fusus*; and *Vivipara* to *Paludina*: but Agassiz has introduced several of these alterations as his own. Still, some of his remarks are good, and will not be lost sight of by me.

I am, Sir,
Your's, &c.

J. D. C. SOWERBY.

Editor Magazine of
Natural History.

PANOPÆA gentilis.

TAB. DCX.—*fig. 1.*

SPEC. CHAR. Transversely ovato-elongated, flattened on the sides, nearly even, slender; posterior half rather pointed, the other rounded and expanded upwards; umbones nearly central; both extremities slightly gaping; width nearly twice the length.

THIS resembles *P. Basteroti* of Valenciennes, which is found near Bordeaux, but the umbones are more nearly central; it is an elegantly formed shell, and apparently a distinct species. Two views are given of the only valve which has been obtained. It is in the collection of Mr. S. V. Wood, who found it in Crag at Alderton, near Bawdsay, above ten years ago.

PANOPÆA Norvegica, var. nana.

TAB. DCX.—*fig. 2, and DCXI.—figs. 1 and 2.*

SPEC. CHAR. Transversely oblong, compressed, thick, the posterior extremity largely truncated; surface divided into three parts by two diverging, longitudinal slight elevations; beaks nearly central; muscular impressions deep, those of the mantle large, unconnected; the sinus shallow and not complete.

SYN. *Mya Norvegica*, *Spengler Act. Soc. d'Hist. Nat. Copenh.* 46. *Pl. II. f.* 18. *Mya Glycimeris*, *Donovan Brit. Shells t.* 142. *Glycimeris arctica*, *Lam. Hist. Nat. vol.* 6. 458. *Lam. Hist. Nat. ed. 2. vol.* 6. 68. *note.* *Panopæa Glycimeris*, *Turton Brit. Bivalves* 42. *Bean*

in Mag. Nat. Hist. vol. 8. 562. P. Bivonæ, Phill. Enum. Moll. Sicil. 8. Pl. II. f. 1. Smith, Mem. Wern. Soc. vol. VIII. 23, 45 and 49. t. 2. f. 4. P. Spengleri, Valenc. Arch. du Mus. d'Hist. Nat. vol. 15 and 34. Pl. V. f. 3.

Var. β . Nana. Flatter and smaller than α .

THIS *Panopæa* varies much in form, sometimes being truncated in one direction and sometimes in another, at other times being hardly truncated at all. The var. α is living in the northern seas of Europe*; it is also found fossil on the Isle of Bute and at Palermo. The var. β , which is the one before us, is found in the Red Crag at Sutton; its small size indicates that it had not been in a congenial situation for some time before it ceased to live; it is also often variously thickened and distorted, but not so much so as several of the large variety, which occur in their natural position in the sandy clay raised above the level of the sea on the shore at Ruduback Farm on the Isle of Bute, where they were found by Mr. G. B. Sowerby in company with James Smith, Esq. of Jordan Hill, in 1838. (See the Transactions of the Wernerian Society above-quoted.)

The large as well as the small varieties are subject to a diseased thickening of the shell, and seem to have struggled against a change of circumstances, (we can hardly suppose of climate,) unless it were an increased temperature, for the species is still found living and healthy in the northern seas, where it appears to thrive in deep water, and would probably be rendered sickly by being brought into shallow water, or perhaps by an accession of fresh water.

The specimens I have from Palermo do not appear so much diseased; they were probably more suddenly acted upon. The dwarf variety before us had perhaps been long subjected to such a change as we have spoken of before the disturbance took place that reduced it to the same state as the older Crag Fossils scattered upon the shores where it supported a feeble existence with difficulty.

* Shells dredged up on the Yorkshire coast are made into snuff-boxes by the fishermen.

PANOPÆA Ipsviciensis.

TAB. DCXI.—*figs. 3 and 4.*

SPEC. CHAR. Subcylindrical, rather compressed, undulated, thin, anteriorly rounded or obliquely rotundato-truncate, posteriorly truncated, gaping. Beaks central.

SYN. Panopæa Ipsviciensis, *Valenc. Arch. du Mus. d'Hist. Nat. vol. I. 28 and 36.* P. Faujasii, *Supra, t. 602. figs. 3 and 5.*

THIS species is justly distinguished by Prof. Valenciennes from P. Faujasii of Sicily, which is a much more ventricose and oval shell; he also separates it from the shell represented in the upper figure of Tab. 602 of this work, which he has named P. Sowerbyi. If that be really different from P. Ipsviciensis, it will be known by being flatter, and having the umbones nearer the anterior side; but it is evidently a crushed specimen.

Found abundantly in the Coralline Crag at Ramsholt, but rarely perfect; also at Ipswich and other places in Suffolk. The specimen figured enriches Mr. S. V. Wood's cabinet.

In the following list of all the fossil species of Panopæa some errors that have been published are corrected.

1. Panopæa Aldrovandi (Menard). Chama Glycimeris altera, *Aldrovandus Test. lib. 3. 473.* *Lister Conch. t. 414. f. 258.* Mya Glycimeris, *Gmel. 3222.* *Chemnitz Conch. 6. t. 3. f. 25.* Panopæa Aldrovandi, *Menard de la Groye, Ann. du Musée, 9. 131.* *Lam. Hist. Nat. 5. 457.* *Phil. Enum. Moll. Sicil. 7. t. 2. f. 2. a. b.* Valenciennes, *Arch. du Mus. d'Hist. Nat. 1. 22 and 35. pl. 4. f. 1. a. and b.*
2. P. Faujasii, (Menard). Panopæa Faujasii, *Menard l. c. 131. t. 12.* *Phil. l. c. 7. t. 2. f. 3.* *Valenc. l. c. 13 and 35.* Mya Panopæa, *Brocchi 532.* Panopæa Aldrovandi foss., *Lam. Hist. Nat. 5. 457.*
3. P. Ipsviciensis (Valenc.). P. Faujasii, *M. C. 602. f. 3*

- and 5. *P. Ipsviciensis*, *Valencienn. l. c.* 28 and 36. *M. C.* 611. *f.* 3 and 4.
4. *P. reflexa* (Say). *Philadel. Journal*, 4. 153. *pl.* 13. *f.* 4. *Valenc. l. c.* 26. *P. Americana*, *Wagner. Bronn. Leth.* 974.
 5. *P. Menardi* (Desh.). *P. Faujasii*, *Basterot Mem. de la Soc. d'Hist. Nat.* 2. 95. *P. Menardi*, *Dujardin, Mem. de la Soc. Geol. de France, vol. II*, 255. *Bronn. Lethæa*, 974. *P. Basteroti*, *Valenc. l. c.* 22 and 35. *pl.* 6. *f.* 2. *ab.*
 6. *P. gentilis*, *M. C.* 610. *f.* 1.
 7. *P. Rudolphii* (Eichwald). *Panopæa Faujasii*, *Du Bois Conch. Foss. Wolhyni-podolien.* 51. *pl.* 4. *f.* 1—4. *P. Rudolphii*, *Eichwald, Naturh-Scizze* 204. *Valenc. l. c.* 24 and 35. *pl.* 5. *f.* 1. *a. b.*
 8. *P. intermedia* (M. C.). *Mya intermedia*, *M. C.* 76. *f.* 1. and 419. *f.* 2. *Panopæa intermedia*, *M. C. v.* 6. 211. *t.* 602. *f.* 4. *Corbula dubia*, *Deshayes Cocquilles de Paris, V. I.* 59. *pl.* 9. *f.* 13 and 14. *P. Deshayesii*, *Valenc. l. c.* 20 and 35. *pl.* 4. *f.* 2. *a. b.*
 9. *P. plicata*, *M. C.* 419. *f.* 3. *P. Deshayesii* var. *Valenc. l. c.* 20 and 35.
 10. *P. Sowerbyi*, *Valenc. l. c.* 27 and 36. *P. Faujasii*, *M. C.* 602. *f.* 1. 2.
 11. *P. oblata* (M. C. Index). *Mya gibbosa*, *M. C. t.* 419. *f.* 1.
 12. *P. gibbosa* (M. C.). *Lutraria gibbosa*, *M. C. t.* 42. *Panopæa gibbosa*, *M. C. vol.* 6. 211. *Panopæa Agassizii*, *Valenciennes, l. c.* 31.
 13. *P. subsinuosa*, *Valenc. l. c.* 31.
 14. *P. Norvegica*, *M. C. supra vol.* 7. 1. 610. 611.
 15. *P. ? abrupta* (Valenc.). *Pholadomya abrupta*, *Conrad Fossil Shells of N. America, v.* 1. *t.* 12. *P. abrupta*, *Valenc. l. c.* 28.
 16. *P. ? margaritacea* (Valenc.). *Glycimeris margaritacea*, *Lam. Hist. Nat. v.* 5. 458. *Clavagella Lodoisca*, *Caillat Ann. Soc. des Sciences de Seine et Oise, pl.* 9. *f.* 9. *Lam. Hist. Nat. ed.* 2. *v.* 6. 68. *note.* *Panopæa margaritacea*, *Valenc. l. c.* 29 and 35. *pl.* 5. *f.* 2. *a. b.*
- Of the above *P. Aldrovandi* and *P. Norvegica* are also found living, the first in the Mediterranean Sea, and the latter in the Northern Ocean. Three other living species are described besides these.

VOLUTA Wetherellii.

TAB. DCXII.—*figs. 1 to 5.*

SPEC. CHAR. Fusiform, elongated, smooth or very finely and spirally striated; plaits on the columella about three; apex obtuse; volutione elliptical.

SYN. V. Wetherellii, *Sowerby in Phil. Mag. and Journ. of Science, 3rd Series, v. 9. 463.*

A MORE elongated shell than V. Lamberti, Tab. 129: the pullus (*figs. 1 and 2*) appears to have been about the size of a small pea. As the animal grows, elevated striæ, which are conspicuous on the young shell, cease to be formed, and the surface is smooth and even.

Many specimens have been obtained from the clay during the formation of the London extremity of the Birmingham Railroad, near Camden Town; it has also been found at Bayswater, Brentford, and on the Isle of Sheppey, but it did not occur at Highgate. *Figs. 1, 2 and 4* are from specimens in the cabinet of N. T. Wetherell, Esq., to whom I have had the pleasure of dedicating it; *fig. 5* represents a specimen preserved by the late H. Woods, Esq., while he resided in Camden Town.

VOLUTA protensa.

TAB. DCXII.—*figs. 6 and 7.*

SPEC. CHAR. Fusiform, elongated, costated, and transversely striated; volutione rather conical.

THE form of the volutione and the costæ, which however are less conspicuous on the last-formed whorls, distinguish this from the V. Wetherellii.

From the Birmingham Railroad with the last, rare. Mr. Wetherell's museum.

VOLUTA tricornona.

TAB. DCXIII.—*fig. 2.*

SPEC. CHAR. Ovato-rhomboidal, transversely striated, costated, spire short, acute; whorls crowned by three rows of short spines; costæ thin, as long as the volutions.

THIS Volute is distinguished at first sight by its sharp ribs, each of which has three very short spines upon its upper part, and by the striæ extending over the whole of the whorl.

Collected from the clay at Primrose Hill, near Camden Town, with the two preceding species, by Mr. Wetherell: it is rare.

Fig. 1. represents a young specimen of *V. nodosa*, Tab. 399, for comparison; it is from Highgate, where it was not uncommon.

VOLUTA denudata.

TAB. DCXIII.—*fig. 3.*

SPEC. CHAR. Elliptical, ribbed; ribs short, thick, with a short spine near the upper part of each; lower part of the whorl striated; inner lip thick, extending far over the whorl; columella with several irregular plaits.

WELL distinguished by its oval form, smooth surface and the thick inner lip; it resembles *Voluta rarispina*, Lam.; but that shell has longer spines, a less regular form, and is much more strongly striated near the beak.

This shell has long been known in the sandstone of the Bognor Rocks; but until Mr. Bowerbank, with much perseverance, cleared a series of good specimens, it had not been recognised as a species; one individual, cleared since the figure was engraved, measures three inches long. The same species has also been found at Brentford, but it is rare.

VOLUTA elevata.

TAB. DCXIII.—*fig. 4.*

SPEC. CHAR. Elliptical elongated; transversely striated, costated; spire produced; the whorls convex, their upper parts deeply furrowed and crowned with rows of small spines between the furrows.

THE elongated spire distinguishes this from all the *Volutes* which approach it in general appearance.

Found by Mr. Wetherell at the Railroad, near Camden Town; it is rare.

VOLUTA Harpula.

TAB. DCXIV.—*fig. 1.*

SPEC. CHAR. Ovate-fusiform, longitudinally costated, the upper edges of the whorls crenated; the suture defined; columella many-plaited, the three lower plaits large, the last but one largest; aperture oval, truncated at the base.

SYN. *Voluta Harpula*, *Lam. Hist. Nat. vol. 7. 352.*
Deshayes Coquilles Foss. vol. 2. 702. pl. 91.
f. 10. 11.

THIS *Volute* appears to vary in form with its locality. The English specimens have the costæ obtuse, and gradually lost towards the base of the last whorl, while in those from Grignon the elegantly curved costæ are sharp and complete to the very edge of the aperture. The fine striæ which cross the ribs are also more conspicuous in the British variety. The lip is thickened when full-grown in both.

A rare shell at Barton. I am indebted to Mr. Lowry for the only specimen I have seen.

VOLUTA Labrella.

TAB. DCXIV.—*fig. 2.*

SPEC. CHAR. Ovate-turbinate, ventricose, transversely furrowed towards the pointed base; upper part of the last whorl more or less keel-shaped; spire short, distinct from the last whorl, imperfectly ribbed, each rib divided into several spines which are gradually lost towards the last whorl; columella with one large and several small plaits; aperture much elongated, 3-angled; the inner lip tumid above

SYN. *Voluta Labrella*, *Lam. Hist. Nat. vol. 7. 353.*
Deshayes Coquilles Foss. Vol. I. 694, pl. 91. f. 1—6.

THE French specimens of this species are generally much more carinated than the English ones, but even in them the keel varies in sharpness: the difference between young shells from the two countries is very slight. In the English full-grown shell the keel is broad, rounded and not distinct from the body of the whorl, which is nearly even and smooth except toward the base. The swelled inner lip appears to be an important character.

Specimens of this shell in various stages of growth have been lately collected in Bracklesham Bay, by J. S. Bowerbank, Esq. It is a valuable addition to the list of British tertiary Fossils, which resemble those of France. It is accompanied by *Cerithium Cornu-copia*, *C. giganteum*, *Ovula tuberculosa*, *Desh.*, and many undescribed shells.

LEPTÆNA, Dalman.

OBJECTIONS have been so strongly urged against the name *Productus*, that we have found it necessary to adopt Dalman's name *Leptæna* for this genus. It is characterized by the hinge-area in each valve extending the whole width of the shell, and by the margins of the valves being produced together beyond that part of the shell which contains the animal, and bent down so as to form a kind of inverted cup. The flatter (lower) valve has no projecting beak, but in the middle of its hinge-line is a process which nearly fits the aperture in the convex deltidium of the other valve, which slides upon it as it opens or closes; this process is divided within into two diverging teeth. The same valve has a smaller longitudinal septum in its middle, between the muscular impressions. The beak of the (upper) convex valve is in some species produced considerably. All the species have striated surfaces, and many have long spines, often tubular, on the outside, and numerous little spine-like projections within.

LEPTÆNA anomala.

TAB. DCXV.—fig. 1.

SPEC. CHAR. Irregularly triangular, elongated, compressed, striated; beak very much produced, its sides spinose; hinge-area large, triangular.

SYN. *Pinna inflata*. *Phillips, Geol. Yorks. Part II. 211. Pl. VI. f. 1.* *Mytilus striatus*. *Fischer, Orycht. Mosc. 181. Pl. XIX. f. 4.*

A VERY irregular and often distorted shell, with a surface and texture precisely similar to that of *Leptæna scabricula* and the other species of the genus.

Individuals rarely occur separate: they are commonly distorted, broken, and imbedded one in another, which renders them very difficult to comprehend. The spines near the hinge are small, they are best defined in fig. a.; their bases are seen on the internal cast (fig. d.). Figs. b b. are two views of one specimen, which shows the large area beneath the beak, an approach to which is seen at fig. 3 b. Those found in Russia are often much larger and less elongated, therefore more resembling the ordinary form of *Leptæna*. The specimen represented at fig. 1 c, is in Mr. Gilbertson's cabinet; it is from the mountain limestone of Bolland. I am not acquainted with the localities of the others.

LEPTÆNA analoga.

TAB. DCXV.—fig. 2.

SPEC. CHAR. Nearly semicircular, with the front either straightish or concave, much depressed near the beak; both valves inflated towards the front, their margins suddenly deflected; lower valve flat near the beak; surface ornamented with diverging striæ and concentrically undulated; waves numerous; hinge-line bent, its area very narrow; beak pointed, hardly projecting.

SYN. *Producta analoga*. Phillips, *loc. cit.* 215. Pl. VII. f. 10.

THIS shell grows much larger than the *L. depressa* (Tab. 459); its valves are more similar, both being inflated towards the front, and its outline more rounded; otherwise it strongly resembles it. The area between the valves is very narrow.

It is possible that it may be the *L. rugosa* of Dalman; but the specimens I have seen from Sweden are most like *L. depressa*, a shell which I believe never occurs above the limestone of the Devonian system. Rather frequent in the mountain limestone of the North of England and in Ireland.

LEPTÆNA distorta.

TAB. DCXV.—fig. 3.

SPEC. CHAR. Irregularly orbicular, concentrically waved, striated; front generally concave, the margin flattened; hinge-line straight, its area triangular; beak prominent.

A THICKER shell than *L. analoga*; well distinguished by its projecting beak, very convex valves, which are not compressed near the beak, and its smaller size.

I suspect this is *P. depressa* of Phillips, 215. Pl. VIII. f. 15; but as he says he cannot distinguish his specimens from *P. depressa* of the Dudley limestone, I have not ventured to quote his name as a synonym. The specimens fig. a. are from the Isle of Man, by favour of Mr. Gilbertson. The middle figure shows the impressions attributed to the ovaria; similar ones are frequent in casts of other species of this genus, especially *L. analoga*. Fig. 3 b. shows the area of the hinge in both valves. It is probably from Scotland.

It is important to distinguish the two last species from *L. depressa*, which belongs to the rocks of the Silurian system, and it may readily be done with a little practice.

ATRYPA, Dalman.

GEN. CHAR. Shell equilateral, unequal-valved, with both valves convex ; hinge furnished with two spiral appendages, its margin short, arched ; the area between the beaks small, generally convex, rarely flat, with a triangular pit or notch in the middle, closed by a *deltidium* admitting the smaller beak ; beaks pointed, incurved ; animal a Brachiopodous Mollusk.

THE shells to which Dalman has given the generic name *Atrypa*, because they have no circular aperture at the extremity of the larger beak, although in general appearance they resemble *Terebratulæ*, were placed by the late Mr. Sowerby in his genus *Spirifer*. They form a very natural genus, which may be divided into several sections. Hisinger makes two,—“*Striatæ* and *Lævigatæ* ;” we would prefer dividing the latter into two, and shall then have three sections, viz.,

1st. Not striated longitudinally, and with the edges of the valves on one plane. (Cardinal area none.)

2nd. Not striated longitudinally, and with the front of the larger valve elevated.

3rd. Striated or plaited longitudinally.

The first section contains some of the “*Spiriferæ Terebratuliformes*” of Phillips ; the second, the remainder of these, and his “*Glabratæ* ;” and the third, the “*Filosæ*” of the same author. Several species of the two first sections are ornamented with concentric laminæ or fringes, and among the latter are some with imbricating scales on the surface. Most of the species have two longitudinal septa in the beak of the larger valve and one in the other ; these are very broad in some of the species belonging to the second section (by which circumstance they approach the genus *Pentamerus*) ; in others they are reduced to mere

lines, with a thick tongue-like process between the two in the larger valve.

The small size of the area between the beaks, and the short hinge-line, distinguish this genus from *Spirifer*, but there is evidently a passage from one into the other; there can, however, be no difficulty in distinguishing the genus *Terebratula* from both, if attention be paid to the structure of the beaks, the deltidium, the texture of the shell (which in *Terebratula* is punctato-laminated,—a distinction first pointed out by Mr. Morris), and the general habit. The deltidium in the genus *Terebratula* is generally formed of two pieces, and always opens at the extremity of the beak, or (as Von Buch describes it) separates the muscle of attachment from the hinge-line of the larger valve, hence the circular aperture; but in *Atrypa*, *Spirifer*, *Orthis* and *Leptæna*, it is composed of one immoveable piece filling up the beak, but sometimes leaving a sinus in the middle of the hinge-line. In many species, especially of the genera *Atrypa* and *Spirifer*, it is concave, and admits the beak of the lesser valve to repose upon it; in others it is flat. Von Buch has mixed the species of the genus *Atrypa* with *Terebratula*; he would have done better to have united them with *Delthyris*, under which he includes *Spirifer*; for whenever there is an opening in the deltidium, it is a sinus on the hinge-line, and not close to the apex of the beak, as in *Terebratula*, which natural genus alone comes under his definition. The flat area on each side the deltidium is variable in size in all the genera which possess it: the species of *Atrypa* in which it is found have it much less than the width of the shell, and bounded by the curved surface of the beak. In *Leptæna* and *Orthis* it is equal to the width of the shell, and occupies the whole inner curve of the beak; a similar but smaller area occurs in the other valve. The genus *Pentamerus* (*Gypidia Conchidium*, Dalm.) is the most difficult to distinguish from *Atrypa*, and requires further consideration; it, however, is perfectly distinct from *Terebratula*, with which Von Buch

has arranged it. But it seems that he has confounded Strigocephalus and Uncites of DeFrance with Pentamerus, from which they are really distinct, and placed Gypidia (to which genus Goldfuss has referred *Uncites Gryphus* of DeFrance) under Delthyris, along with Spirifer and Orthis. If the principles of Von Buch's arrangement of the Brachiopods are to be adopted, it will be necessary to place many of the species of his genus Terebratula in the genus Delthyris, and subdivide that genus into Strigocephalus, Pentamerus, Atrypa, Spirifer and Orthis. Calceola and Thecidea would come well before Strigocephalus; and Leptæna (in the structure and use of whose tubular spines he has been misled) will follow Orthis. So the section "Ohne Perforation" (without any perforation at the edge of the hinge) will be found unnecessary, and Terebratula and Magas will stand together; this arrangement will be found very natural.

I would propose the following distribution of the order Brachiopoda, as an improvement upon that of Von Buch.

BRACHIOPODA.

	Hinge none.	LINGULA.
Animal attached to foreign bodies by the edge of the shell through the medium of a membranous tube and ligamentous fibres.	With a hinge. Aperture for the fibres of attachment confined to the beak of the larger valve.	TEREBRATULA.
		MAGAS.
	With a hinge. Aperture for the fibres between the valves.	CALCEOLOA.
		THECIDEA.
		STRIGOCEPHALUS.
		PENTAMERUS.
		ATRYPA.
		SPIRIFER.
		ORTHIS.
LEPTÆNA.		
Animal attached by fibres penetrating the disc of one valve.	.....	ORBICULA.
Animal attached by the surface of one valve directly.	.....	CRANIA.

ATRYPA. Section I.

Without longitudinal striæ, and with the edges of the valves upon one plane. (“Cardinal area none.”)

ATRYPA pectinifera.

TAB. DCXVI.

SPEC. CHAR. Transversely obovate; surface covered with concentric ciliated fringes.

THE valves of this shell are moderately and equally convex, the larger beak is only slightly prominent, and the internal septa are obscure.

Very abundant in the magnesian limestone of Humbleton Hill, near Sunderland. It is one of the *Terebratulæ* spoken of by Professor Sedgwick in his paper on the magnesian limestone (*Geol. Trans. New Series, Vol. III. pt. I. 119*), and several other shells there mentioned as *Terebratulæ* have spiral appendages, and belong also to the genus *Atrypa*.

The three middle figures are magnified.

ATRYPA expansa.

TAB. DCXVII.—fig. 1.

SPEC. CHAR. Orbicular, becoming transversely oval with age, convex; front even; surface covered with broad, striated, imbricating fringes; beak small, produced, incurved.

SYN. *Spirifera expansa. Phill. Geol. Yorks. Pt. II. 220. Pl. X. f. 18.*

WHEN the surface of this shell is deprived of its fringes, which it most commonly is, it appears to be concentrically striated: the even, very convex surface and pointed beak distinguish it from *At. fimbriata*, fig. 4. Abounds in the mountain limestone of Bolland; the figured specimens are in Mr. Gilbertson's Museum, except that with the fringes, which is from Ireland; it is out of a small mass of limestone, to which the fringes adhere.

A figure strongly resembling this shell accompanies a paper by M. Verneuil upon some interesting Brachiopods of the old formations (in the *Bulletin de la Société Géologique de France*, tom. xi. 259); but as he has referred it to *Terebratula (Atrypa) Roissyi*, it must be a different thing; the *T. Roissyi* has the front elevated; it is *Spirifera globularis* of Phillips.

ATRYPA planosulcata.

TAB. DCXVII.—fig. 2.

SPEC. CHAR. Pentahedral, rounded, depressed, the middle of each valve longitudinally planosulcate; surface covered with broad wavy fringes.

SYN. *Spirifera planosulcata*. *Phill. loc. cit.* 220.
Pl. X. f. 15.

A SPECIES well distinguished by its pentagonal form and waved fringes. The central figure represents a fragment of limestone, upon the surface of which is displayed one fringe nearly perfect, and portions of several others on the edge; it is one of the most instructive specimens that enrich Mr. Gilbertson's collection, from which the other figures were also taken. It is also found in Ireland.

ATRYPA oblonga.

TAB. DCXVII.—fig. 3.

SPEC. CHAR. Oblong, very convex; edge obtuse; the middle of each valve longitudinally plan-
sulcate; (surface fimbriated?) beak small.

WE have seen but one specimen of this apparently distinct species; it is from Queen's County.

 ATRYPA fimbriata.

TAB. DCXVII.—fig. 4.

SPEC. CHAR. Orbicular, becoming transversely oval by age, depressed; the middle of each valve a little flattened longitudinally; surface uneven, imbricated and striated.

SYN. Spirifera fimbriata. *Phillips, loc. cit. 220.*

FROM the mountain limestone of Kendal in Westmoreland. The specimens do not well agree with the description given by Prof. Phillips of *Sp. fimbriata*; but they are considered to belong to that species by Mr. Gilbertson, in whose cabinet they are.

TEREDO Amphibæna.

TAB. DCXVIII.

SPEC. CHAR. Valves; tube very long, tapering, tortuose, strong, smooth, composed of short segments with concave surfaces.

SYN. *Teredo articulata*, *M. C. sub t.* 618. *T. annularis*, *Rev. G. E. Smith, MSS.* *Serpula Amphibæna*, *Goldfuss, Petr.* 239, *t.* 70. *f.* 16.



THIS is nearly of the same diameter as *Teredo personata*, but it is much longer and more tortuose; at the smaller end it generally tapers rather rapidly, and shows but little of its articulated appearance. Our description is necessarily imperfect, for we have not been able to obtain more than the tube, the anterior portion of which is inflated (see fig. 1.).

Found imbedded in flint and chalk, with rarely any remains of the wood in which it had been formed. The largest specimen figured is from near Rochester, and is in Mr. Bowerbank's cabinet. The specimen in flint is

also from Kent, where it was collected several years ago by Lord Greenock. The chalk at Guildford and in Norfolk also produces this shell. Goldfuss has it from Maestricht and from Westphalia.

I believe the name *T. articulata* to be older than that given by Goldfuss, and have engraved it upon the plate, but as I cannot find the authority for it, it must be laid aside for the present: specimens accompanied by fossil wood show it not to be a *Serpula*, but a *Teredo*.

The name *Teredo annularis* was appended to a drawing presented to me by the Rev. Mr. Smith, of the specimen, fig. 1.

CYPRINA planata.

TAB. DCXIX.

SPEC. CHAR. Cordiform, rather compressed ; sides flattened towards the ventral margin ; beaks large, not very prominent ; lunette nearly flat, imperfectly defined ; hinge-slope flattened, broad ; between the hinge-slope and each side is a slightly depressed area ; the principal tooth in the right valve narrow.



THE length and breadth are nearly equal ; the greatest thickness of the united valves is near the beak ; the surface is smooth, excepting near the margin and upon the area on the sides of the hinge-slope, where the lines of growth form irregular furrows ; the hinge-slope is so flattened, that the specimen will stand upon it as upon a base.

Several examples of this handsome large fossil have been found by Mr. Prestwich at Basingstoke, and small individuals have been discovered in the clay at Brentford and in Bracklesham Bay.

CYPRINA Morrisii.

TAB. DCXX.

SPEC. CHAR. Transversely oval or oblong, regularly convex, rather compressed; beaks prominent; anterior slope sharp-edged, the posterior slope rounded; lunette sunk, undefined; principal hinge-tooth in the right valve broad.

SYN. *Venus incrassata*, *Wetherell, Foss. of the London Clay, &c, Phil. Mag. and Journ.* v. ix. 463. *V. Morrisii*, *ib. v. x. 239.*

A SMOOTH thin shell of variable proportions, generally oval; the depth of the undefined lunette gives a character to its form, which when once noticed is easily recognized. It occurs in the lower beds of the London Clay, sometimes called Plastic Clay, either in sand, as at Reculvers, Herne Bay and Pegwell Bay, on the coast of Kent, and at Plumstead, Watford and Reading; or in indurated sandy marl, as at Bognor, and near the bottom of the well on Hampstead Heath.

When I made the alteration in Mr. Wetherell's list, quoted above, which Mr. Morris suggested, the hinge was still unknown, and consequently I referred the shell to the wrong genus; a number of specimens from the sandy beds and from the Hampstead Well have been since worked out, so as to enable me to correct this error.

Figs. 1—4. represent specimens from Herne Bay, some of which are in Mr. Bowerbank's cabinet; fig. 5, a variety from Pegwell Bay; fig. 6, a small variety from Boughton, near Canterbury: it is a cast in Calcedony; many such were found, and some of them contained water.

EUOMPHALUS Colei.

TAB. DCXXI.—*fig. 1.*

SPEC. CHAR. Volutions few, rapidly increasing in size, four-sided, their two outer sides largest; margin rather acute.



A LARGE shell, concave both above and below; the aperture is trapezoidal. As I have only seen a cast of the interior, I know not the characters of the outer surface; the substance appears to have been rather thick.

Found in black Limestone in Johnstone Quarry, between Finglass-bridge and Glassnevin, near Dublin, by Mr. J. Humphrey.

I have applied the family name of the Earl of Enniskillen to this noble fossil; not because I think by so doing to fix the name of Cole more firmly in the minds of geologists, where his lordship's zeal and ability have already obtained for it a most honourable standing, but because I think so rare a shell is worthy of his patronage.

EUOMPHALUS Pugilis.

TAB. DCXXI.—fig. 2, 3, & 4.

SPEC. CHAR. Concave both above and below ; volutions gradually increasing, rounded, with two rows of tubercles, one above, the other below.

SYN. *Euomphalus Pugilis*, *Phill. Yorks.* 225.



THE volutions of this *Euomphalus* are somewhat less angular than those of *E. pentagonalis*, and the upper side is generally, but not always, more concave. The tubercles beneath are sometimes very slightly prominent or irregular, when it approaches to *E. bifrons*, *Phill. loc. cit.* 225. t. 13. f. 4, which has tubercles on the upper side only, and is probably a variety of it ; they are both found at Bolland. The *E. Pugilis* also occurs in the county of Kildare. *E. nodosus*, *M. C. tab.* 46, having tubercles on the under side only, may be a third variety ; the three do not differ materially in anything but the number of tubercles, which vary very much in size even on the same individual.

I am indebted to Mr. Gilbertson for the specimens figured.

PSEUDOLIVA, Swainson.

GEN. CHAR. Shell thick, ventricose ; spire short ; aperture large, longitudinal, oval, with a broad, short canal at the base and a narrow canal at the opposite extremity ; outer lip with a tooth on its sharp edge corresponding to a groove around the outside of the lower part of the whorl ; inner lip thick, tumid at the upper part.

A GENUS of shells nearly related to *Oliva* and *Eburna*, and of which the typical recent species is the *Buccinum plumbeum* of Chemnitz. Its most obvious character is the furrow upon the lower part of the whorl, terminating with a tooth on the edge of the lip, as in *Ancillaria* ; a genus to which some of the fossil species approach, in having the inner lip spread over a part of the spire.

PSEUDOLIVA obtusa.

TAB. DCXXII.

SPEC. CHAR. Obovate, smooth, with a few striæ below the furrow ; spire short, small, partly concealed by the expansion of the inner lip ;

the canal or beak slightly projecting ; furrow below the middle of the whorl.

SYN. *Buccinum obtusum*, *Deshayes, Foss. de Paris*, v. ii. 657. t. 88. f. 1, 2.

FROM the recent *Pseudoliva plumbea* this shell differs in being shorter ; in having the tooth and furrow corresponding with it much higher up the whorl ; in the projecting beak, which produces a flattened band around the base, not a furrow, which is made part of the generic character by Swainson. The expansion of the inner lip partly over the spire is also a remarkable character, which makes it almost as distinct from the recent *Pseudoliva* as *Ancillaria* is from *Oliva*. The surface of the last whorl is spirally but very faintly, striated above the furrow, and has eight or ten strongly-marked lines below it. I have not seen a specimen of *P. obtusa* from Chaumont, therefore it is possible I may not be correct in referring the English species to it, but it agrees well with Deshayes' description.

For the discovery of this curious and rare fossil we are indebted to the researches of Mr. Bowerbank and Mr. Edwards upon the beach at Bracklesham Bay ; it has also been obtained by Mr. Lowry from Hook Common, near Basingstoke. The specimens from the former place are commonly much flattened by pressure.

CONUS deperditus.

TAB. DCXXIII.—*fig. 1 & 2.*

SPEC. CHAR. Doubly conical ; spire as high as it is wide, acute ; upper parts of the whorls narrow, concave, concentrically striated, the angles of the inner ones crenated ; the last whorl longer than the spire, with nearly straight sides, striated about the beak ; aperture narrow.

SYN. CONUS deperditus, *Brug. Enc. Méth. Vers*, i. 691. *pl. 337. f. 7.* *Lam. Ann. du Mus.* xv. 441 ; *Lam. Hist. Nat.* vii. 528. *Desh. Coq. Foss.* ii. 745. *pl. 98. f. 1, 2.* *Morris, Catalogue of British Fossils*, 143.

THERE are about four striæ upon the concave space above the angle of each whorl ; the sides of the whorls are slightly convex. On some specimens there are still visible many narrow bands of colour with equal white spaces between them. The length of the spire is variable, and thus this shell approaches to the next species.

CONUS diversiformis.

TAB. DCXXIII.—*fig. 3—6.*

SPEC. CHAR. Doubly conical; spire half as high as it is wide, acute; upper portions of the whorls narrow, concave, and concentrically striated; last whorl much longer than the spire, with straight sides, striated about the beak; aperture narrow.

SYN. *Conus diversiformis*, *Desh. Coq. Foss. ii. 746. pl. 98. f. 9—12. Morris, Cat. Brit. Foss. 143.*

Var. β . Inner whorls crenated on their angles (*fig. 6.*); *fig. 3* shows indications of similar crenatures.

THE striæ about the beak of this Cone sometimes extend half way up the last whorl. It is difficult to fix upon characters to distinguish this from *C. deperditus*; the short spire, which however is variable, and the straighter sides of the last whorl are relied upon: the extended lip is the same in both species. The specimens found at Parnes and Mouchy are said by M. Deshayes to have no crenatures upon the spire, whereas most of the English specimens have a few near the apex.

CONUS velatus.

TAB. DCXXIII.—*fig. 7.*

SPEC. CHAR. Doubly conical; spire wider than it is high; whorls concave and granulated above their angles, which are even; the last whorl much longer than the spire, straight-sided, with obscure striæ towards the beak; lines of growth conspicuous.

SYN. *Conus velatus*, Sow. *Morris, Cat. Brit. Foss.* 143.

THE granulations on the spire are produced by decussating striæ; and these, with the conspicuous lines of growth, give the shell the appearance of having been enclosed in a net or net-veil, whence the name: the surface of the lower part of the last whorl is rather concave; in other respects it resembles *Conus diversiformis*.

CONUS Corculum.

TAB. DCXXIII.—*fig. 8 & 9.*

SPEC. CHAR. Doubly conical, transversely striated; spire one-third the length of the shell, longer

than wide ; the angles of the whorls obtuse, waved, the upper edges finely crenated ; striæ sharp, elevated ; aperture narrow.

SYN. *Conus Corculum*, *Sow. Morris, Cat. Brit. Foss.* 142.

A BEAUTIFUL and rare shell : it much resembles *C. concinnus* (M. C. 302), but it has a shorter spire, finer striæ, and less ornament.

These four species of *Conus* are all from Bracklesham Bay, on the coast of Sussex, where they were collected by Mr. Bowerbank. The *Corculum* and *velatus* are very rare, only one specimen of each is known. The other two are among the many instances of species occurring at Bracklesham which are perfectly identical with those of the Paris Basin ; while nearly all the shells of the clay of London and Barton, although similar, are distinguishable from the French ones. The discovery of this fact has rewarded the incessant labours of Messrs. Bowerbank and Edwards, whose assistance I beg to acknowledge with gratitude.

PHANEROTINUS.

GEN. CHAR. Shell a convoluted tube, discoid ; whorls several, not touching each other, arranged nearly in a plane ; aperture roundish ; substance thick, composed of several coats.

THE shells of this genus are composed of a thick tube which is wound about a transverse (in this case an imaginary) axis, as it is in *Ammonites* ; but the whorls expose their whole surfaces. The general form is discoid ; and the two sides of the disc being nearly alike, although not precisely so, I consider the tube as convoluted, and that it may possibly not belong to the same order of mollusks as *Euomphalus*, to which genus the leading species, *P. cristatus*, has been referred by Prof. Phillips. In the genus *Ecculiomphalus* of Captain Portlock (Geol. Report on Londonderry, p. 411) the shell is much less curved, and very thin ; its general aspect also is so different, that although it may not be easy to frame a satisfactory generic character, I am unwilling to believe it can include the fossils now under consideration.

PHANEROTINUS *cristatus*.

TAB. DCXXIV.—*fig. 1 & 2.*

SPEC. CHAR. Margin decorated with triangular foliaceous appendages.

SYN. *Euomphalus cristatus*, *Phillips, Geol. York.* ii. t. 13. f. 5. *Morris, Cat. Brit. Foss.* 144 & 155.

VOLUTIONS 4 or 5, the latter ones expanding rather more rapidly than those nearer the centre ; one side more con-

vex than the other, and the margin a little flattened. The foliaceous appendages are large, broad at the base and recurved towards their points: they are so numerous as to touch or even cross one another, and are probably placed in two rows. The aperture is oblique with rounded edges, ovate, biangular, the angles being at the extremities of the longest diameter, which is terminated by the foliaceous expansions. The lines of growth are numerous, arched and sharp, indicative of an internal animal. The smaller part of the tube is usually separated by a septum as the animal advances.

I have seen three specimens of this extraordinary shell, two of which, found in the limestone of Kendal, were only portions of the last whorl, which measured 9 inches by 6; the termination of one of these is shown at fig. 2. The third specimen is the same as that figured by Prof. Phillips; it is from near Whittle in Yorkshire. I am indebted to Mr. Gilbertson of Preston for the use of all these specimens: the last has been transferred by that gentleman, along with his splendid collection of mountain-limestone fossils, to the British Museum.

PHANEROTINUS nudus.

TAB. DCXXIV.—fig. 3, 4 & 5.

SPEC. CHAR. Unarmed.

SYN. *Phanerotinus nudus*, *J. Sow. Morris, Cat. 155.*

A SIMPLE, nearly round, convoluted tube, with a slight ridge along one side; lines of growth strong, circular; thickness unequal.

This occurs in mountain limestone with *Euomphalus pentangularis*, &c. The specimens are in Mr. Gilbertson's collection.

VOLUTA Cithara.

TAB. DCXXV.—fig. 1, 2 & 3.

SPEC. CHAR. Ovate-oblong, ventricose, ribbed ; base contracted, furrowed ; ribs distant, with two or three small spines on their upper parts ; spire short, acuminate, furnished with small spines ; whorls rounded above.

SYN. *Voluta Cithara*, *Lam. Hist. Nat.* vii. 348. *Desh. Enc. Méth. Vers*, iii. 1143 ; *Desh. Coq. Foss.* ii. 682. *pl.* 90. f. 11, 12. *Morris, Cat.* 167.

Voluta harpa, *Lam. Ann. du Mus.* i. 476, and xvii. 74.

So perfectly does this agree with some French individuals of this species, that there can be no hesitation in referring it to the same type : the three rows of small spines upon the rounded upper parts of all the whorls but the last distinguish it from every other *Volute* ; on the last whorl one row of spines is often nearly obliterated. The English specimens have a short spire ; in some French ones the spire is considerably produced.

Found at Bracklesham Bay. The figures are from specimens in the collections of Mr. Bowerbank and Mr. Edwards.

The localities given by Deshayes are Grignon, Courtaignon and Parnes.

VOLUTA scalaris.

TAB. DCXXV.—*fig. 4 & 5.*

SPEC. CHAR. Ovate, ventricose, costated and transversely striated; costæ numerous, with two nearly equal small spines on the upper part of each; striæ distant, equal; spire shorter than wide, acute; base attenuated; whorls with a narrow flat space between the upper row of spines and the suture, and concave between the two rows of spines.

A SMALLER, more inflated and more regularly shaped shell than *V. spinosa*: the narrow costæ, numerous, nearly equal spines, and regular, sharp striæ, which continue almost up to the lowest spine, give it an aspect by which it may easily be recognized. It occurs plentifully at Barton, but seldom exceeds an inch and a quarter in length. The variety β of *V. spinosa*, t. 115, approaches to it, but is less rather than more inflated, and has a portion of the last whorl smooth.

VOLUTA depauperata.

TAB. DCXXV.—*fig. 6, & 396. fig. 4.*

THIS figure of a rare species is given to show the young state, and the coloured stripes which are constantly observable, but were obscure and therefore omitted in the specimen formerly figured. Of five individuals I have seen, the largest is an inch and three quarters long.

VOLUTA muricina.

TAB. DCXXVI.—fig. 4, 5 & 6.

SPEC. CHAR. Ovate-fusiform, with a rather produced base; the lower part even, the upper tuberculato-costated; the last whorl longer than the spire, rather convex.

SYN. *Voluta muricina*, *Lam. Ann. du Mus.* i. 477. & xvii. 75; *Lam. Hist. Nat.* vii. 350. *Desh. Coq. Foss.* ii. 697. *pl.* 91. *f.* 18, 19. *pl.* 93. *f.* 3, 4. & *pl.* 94. *f.* 3, 4. *Morris, Cat.* 168.

So variable is this shell, that it is almost impossible to define it. The costæ are often elongated and rounded, with a protuberance at their upper terminations (fig. 5 and 6). This is particularly the case with those upon the spire; at other times they are very short, and assume the form of angular tubercles (fig. 4): the length of the shell also varies with the form of the costæ: when perfect the surface is finely striated transversely. Fig. 5 represents a variety approaching to the following species.

The French localities are Grignon, Parnes, Mouchy and Courtagnon. The fine striæ on the surface appear to have escaped Deshayes' observation.

VOLUTA *angusta*.TAB. DCXXVI.—*fig. 1, 2 & 3.*

SPEC. CHAR. Subfusiform, elongated, narrow, costated, transversely striated; whorls rather convex; the last whorl as long as the spire, tuberculato-costated; aperture narrow; striæ extremely fine and numerous.

SYN. *Voluta angusta*, *Desh. l. c. ii. 697. pl 94. f. 5, 6.* *Morris, Cat. Brit. Foss. 167.*



I FIND nothing to distinguish this shell from *V. muricina* excepting its greater length; in fact the specimens figured form a complete series from one species into the other. Deshayes has anticipated this circumstance; but as the English fossils do not show the plaits on the columella, which afford him a distinguishing mark among the French ones, I have not ventured to unite the species. They both are found rather rarely at Bracklesham Bay.

The specimens given in the plate, *figs. 2, 4 and 6*, are in Mr. Edwards's collection, *figs. 1 and 3* in that of Mr. Bowerbank. Deshayes obtained his *V. angusta* from Retheuil, Guise, Lamothe and Soissons.

NAUTILUS Sowerbyi.

TAB. DCXXVII.—*fig. 1, 2 & 3.*

SPEC. CHAR. Lenticular, with a rounded edge, umbilicated; septa very convex, their ends much recurved and obliquely truncated; siphuncle very near the inner edge of the septum; aperture triangular, longer than wide; lines of growth suddenly bent very far backwards.

SYN. *Nautilus Sowerbyi*, *Wetherell in Phil. Mag. and Journ. v. ix. 466. Morris, Cat. 183.*

ONE of the discoveries made by Mr. Wetherell in the cutting at Chalk Farm for the Birmingham railroad, in the middle part of the London Clay. It also occurs at Bognor, as I learn from Mr. Dixon of Worthing, and I have seen it from Sheppy. It is a well-marked species, which grows to nine inches in diameter.

Figs. 4, 5 and 6 are added to this plate to show the position of the siphuncle and form of the septum in each of three other species of *Nautilus*. Fig. 4 is *N. imperialis* (tab. 1), which has a somewhat triangular septum, wider than long, with broad obliquely truncated sides which are suddenly reflected, and a siphuncle that recedes from the inner margin as the shell increases in size. Fig. 5,* *N. regalis* (t. 355): the septum rather square, no part of it reflected, and the siphuncle nearly central. Fig. 6,*

* In some copies these numbers are accidentally reversed.

N. centralis (tab. 1), with a semicircular septum, much wider than long, regularly convex, without any second curvature, and a nearly central siphuncle. These characters will be found of importance when imperfect specimens are to be examined, as some one or other of them is generally to be ascertained.

NAUTILUS urbanus.

TAB. DCXXVIII.

SPEC. CHAR. Discoid, thick, convex, with a rounded margin, umbilicated; sides undulated when old; septum oblong, regularly convex, anteriorly narrowed, posteriorly (interiorly) truncated, not recurved; siphuncle nearest the inner edge; lines of growth not remarkably recurved.

SYN. *N. urbanus*, *Sow. Morris, Cat.* 183.

A FLATTER shell than any other tertiary species of *Nautilus* except *N. ziczac*. In common with *N. centralis* and *N. regalis*, its surface is in the young state concentrically striated and the lines of growth beautifully decussated. I have long had this in my possession; it was found in digging for the St. Katharine's Docks near the Tower of London. The smaller individual is from Sheppy, and is in Mr. Bowerbank's collection; it has also been found at Highgate.

PHOLADOMYA hesterna.

TAB. DCXXIX.

SPEC. CHAR. Elliptical, transverse, gibbose, slightly curved, obscurely ribbed ; ribs about 12, composed of small tubercles ; beaks near the small anterior extremity.

SYN. *Pholadomya candidoides*, S. V. Wood, *Ann. and Mag. Nat. Hist.* v. 6. 245.

STRONGLY resembling the recent *P. candida*, but the posterior extremity is more rounded and the ribs smaller. Some specimens are so much longer in proportion to their width, and so distorted by fracture, that it is difficult to distinguish them from *P. Dixoni* ; the short and more curved anterior margin may assist in such cases. (See the lower figure.) The specimens are in Mr. Wood's matchless collection, and are from Ramsholt near Woodbridge. I have ventured to alter the name with Mr. Wood's consent, *candidoides* being only provisional and not regularly formed.

PHOLADOMYA *virgulosa*.TAB. DCXXX.—*fig.* 1.

SPEC. CHAR. Transversely elongated, convex, ribbed; ribs numerous (about 24), rounded, thin, crossed by many irregular waves, obscure on the anterior and wanting on the posterior slope; beaks near the anterior extremity, which is truncate; section ovato-cuneiform.

AT least one-fourth wider than long, with the sides a little flattened; the ribs above 24, thin, and divided into small tubercles by the concentric undulations. This shell has long been known as found in the Bognor rocks, but I am not aware that it has been discovered elsewhere. The name has been given it by a society of gentlemen who meet to study tertiary fossils. It is a very distinct species; the specimen figured is in Mr. Dixon's cabinet.

PHOLADOMYA *Dixonii*.TAB. DCXXX.—*fig.* 2.

SPEC. CHAR. Transversely oblong, gibbose, ribbed along the middle, concentrically waved; ribs few (about 12), slender; beaks large, placed near the truncated but not gaping an-

terior extremity, which is separated by a ridge from the middle; posterior extremity produced, rounded, gaping; section obovate.

SHELL very gibbose, wider than long, with prominent beaks, and the anterior portion almost flat and without ribs. Hitherto found only at Bognor: Mr. Dixon has several specimens in his cabinet besides the one figured.

PHOLADOMYA margaritacea.

TAB. DCXXX.—fig. 3.

SPEC. CHAR. Subquadrate, very convex, ribbed; ribs small, few (about 12), extending over the small anterior portion of the surface, which is separated by an angle from the middle; beaks produced, pointed, placed near the anterior, almost straight, truncated extremity; section elliptical.

SYN. *Cardita margaritacea*, *M. C. t.* 175. fig. 2 & 3.
Pholadomya margaritacea, *M. C. General Index*.
Morris, Cat. 98.

Two new species of *Pholadomya* having been found in the London Clay, it has become necessary to describe the *P. margaritacea* with more precision; and thus we have been

led to the discovery of a fourth species, the subject of the next description. *P. margaritacea* is to be known from both the preceding species by its length and square form; it is often so crushed as to resemble *Cardium Cardissa* in shape, when the beaks become remarkably pointed. It was found abundantly in the lower part of the London Clay at Chalk Farm, while the excavation for the Birmingham railroad was proceeding: it is also common on the Isle of Wight, whence the remarkably perfect specimen, figured on the present plate, was obtained for me by Professor Morton. It also occurs at Brentford and at Bognor, and was found in a well at Richmond, as formerly stated.

PHOLADOMYA ? *cuneata*.

TAB. DCXXX.—*fig. 4.*

SPEC. CHAR. Trigonal, concentrically striated, posteriorly wedge-shaped; the anterior side cordiform, nearly flat, obscurely ribbed, its margin raised and reflected over the beaks; length and breadth about equal.

SYN. *Cardita margaritacea*, *M. C.* 297. *f.* 1.
Pholadomya cuneata, *Morris, Cat.* 97.

A SMALL species approaching very nearly to the genus *Pholas*, having thin sharp lines upon its surface, with the anterior side extremely short, and gaping when young; the peculiar elevation of the anterior portion of the hinge line, which is reflected over the beaks, also favours the resemblance to *Pholas*; the pallial impression is remarkably strong and rough. Found only at Pegwell Bay near Ramsgate (called Bogwell Bay in the description of plate 297). This shell was formerly confounded with *P. margaritacea*, but the discovery of more perfect specimens, with the anterior margin reflected between and over the beaks, has proved it to be quite a different thing.

THRACIA, Leach.

GEN. CHAR. Valves unequal, more or less gaping posteriorly ; hinge without teeth, its ligament attached to a sunken narrow fulcrum, its cartilage internal, bifid, seated between two thick equal processes or calli, one in each valve ; sinus in the attachment of the mantle short.

A GENUS very properly separated by Dr. Leach from *Mya* of Linnæus and other authors. The equality of the processes for the support of the hinge cartilage in the two valves being a very strong character ; near the beak there is a protuberance which may be considered as a rudimentary tooth, and above this protuberance the old shell is usually eroded. It has the strong epidermis of the *Myaria* and an opaque not pearly substance.

The recent species inhabit muddy or sandy shores in temperate climates : a few only are known, and the fossil ones are scarcely more numerous ; they occur in the tertiary and newer formations.

 THRACIA pubescens.

TAB. DCXXXI.—fig. 1.

SPEC. CHAR. Transversely elongated, ovate, convex ; surface granular beneath the epidermis ; posterior extremity truncated, the truncation inclined towards the nearly straight ventral

margin ; beaks central ; hinge callus large, triangular.

SYN. (Fossil). *Thracia pubescens*, *S. V. Wood in Annals and Mag. Nat. Hist. v. 6. 245. Morris, Cat. 102.*

(Recent) tab. DCXXXII. f. 4. *Mya declivis*, *Pennant, Brit. Zool. iv. no. 15. Maton and Racket in Trans. Linn. Soc. v. viii. 36. Wood, Gen. Conch. 93. t. 18. f. 2 & 3.*

Mya pubescens, *Pulteney in Hutchins's Dorset. 27. t. 4. f. 6. Montague, Test. Brit. 40. Turton, Conch. Dict. 99. Brit. Bivalves, 45. pl. 4. f. 3.*

Thracia pubescens, *Lam. Hist. Nat. 2nd ed. vol. 6. 83.*

IN all the essential characters this crag fossil agrees with the recent shell of the western coast of England ; if there be any difference the crag one is smoother and more truly oval, the ventral margin being more curved.

Both the coralline at Ramsholt and the red crag at Sutton furnish this fragile shell ; it is also among the fossil shells of Sicily (*Lamarck Hist. Nat. supra*), and I have a young individual very closely resembling it.

Some doubts having been formerly entertained of the identity of Pennant's shell, which occurs in the Hebrides, with the Dorsetshire species, the name of the latter has been adopted, although *declivis* is the older, and ought in truth to be retained in preference.

THRACIA oblata.

TAB. DCXXXII.—*fig. 1 & 2*, and TAB.
DXXXIV. *fig. 3.* (*Lutraria oblata.*)

SPEC. CHAR. Transversely elongated, oval, convex, surface granular; posterior extremity truncated, truncation longitudinal, a little curved; ventral margin nearly straight, beaks nearest the anterior extremity; hinge callus lanceolate.

SYN. *Thracia oblata*, *Morris, Cat. 102.*

So nearly does this resemble the last that it was not until the hinge was observed that there were good grounds for considering it more than a variety. An outline of the recent species is given at *fig. 4* for comparison, the hinge is seen on the preceding plate.

An abundant shell at Bracklesham Bay, Sussex; it is also found in the cliffs at Pegwell Bay and Herne Bay in Kent. The imperfect cast figured at *tab. 534. f. 3.* was found at Bognor, where it is supposed to be rare. The rich mine at Bracklesham, opened by Mr. Bowerbank, has enabled us to become better acquainted with a shell so interesting from its near resemblance to a recent one that also occurs in the crag.

 THRACIA inflata.

TAB. DCXXXI.—*fig. 2, 3 & 4.*

SPEC. CHAR. Ovate, suborbicular, inflated; posterior extremity produced, truncated, with a

longitudinal low ridge extending from the central beaks ; ventral margin arched.

SYN. *Thracia convexa*, S. V. Wood, *Annals*, &c. v. 6. 245. (non auctorum.)

THRACIA convexa, a recent species, is a convex nearly heart-shaped shell, with a straight ventral margin, and beaks nearest the posterior extremity; but still so much is the shell before us like it, that imperfect specimens may easily be mistaken for the same; and Mr. Wood observes in the 'Annals,' that his "specimens are compressed and broken; too imperfect for identification." Specimens since collected at Sudburn Hall and Ramsholt by the Rev. R. Wilson and Mr. S. V. Wood have enabled us to determine the difference and to give nearly complete figures. A species more nearly allied to *T. convexa* is found in the newest tertiary beds of Sicily.

THRACIA sulcata.

TAB. DCXXXII.—fig. 3.

SPEC. CHAR. Transversely elongated, oval, largely truncated, compressed, concentrically furrowed; truncated extremity separated by an obtuse ridge; beaks rather nearest to the posterior extremity, hinge callus lanceolate.

THE surface of this is composed of granules, like several others of the same genus; it is otherwise so distinctly marked that it is easy to recognise it. The specimens figured are in the cabinet of F. E. Edwards, Esq., who discovered them at Bracklesham.

EUOMPHALUS clausus.

TAB. DCXXXIII.—*fig.* 1.

SPEC. CHAR. Discoid, thick, with conspicuous lines of growth ; whorls few, angular above, rounded beneath, margin obtusely angular ; umbilicus small, closed over the inner whorls ; aperture higher than wide.

SYN. Cirrus pileopsideus, *Phill. Geol. Yorks. pt. 2. 226. pl. 13. f. 6.* *Morris, Cat. 142.*

A THICK shell with a perfectly depressed spire, hence not a *Cirrus* ; the angle on the upper part of the whorl being close to its inner margin, and the umbilicus too small to show the inner whorls, distinguish it from *E. pentangulatus*.

The only specimen known of this shell was many years ago named *E. clausus* in Mr. Gilbertson's collection, which is now in the British Museum ; and as it is not a *Cirrus* I have thought it best to retain that name.

EUOMPHALUS depressus.

TAB. DCXXXIII.—*fig.* 3.

SPEC. CHAR. Discoid, depressed, smooth ; whorls few, angular above, rounded beneath, equally visible on both sides ; aperture wider than high.

A MUCH flatter shell than *E. pentangulatus*, which it much resembles; it has also fewer whorls. From Mr. Gilbertson's collection.

Euomphalus serpens (Phillips' Devon and Cornwall, 94) wants the angle on the upper surface and is more concave beneath.

EUOMPHALUS carbonarius.

TAB. DCXXXIII.—*fig. 4 to 7.*

SPEC. CHAR. Discoid, depressed, smooth; whorls few, subtrigonal, bicarinated; keels distinct, large, rounded, forming the boundaries of the upper and under surfaces, the lower one widest in diameter; margin convex; aperture orbicular.

A SMALL species with strongly marked characters: it is smooth, equally concave on both sides, the lower surface being considerably the largest; the two keels bound the margin, from which they are separated by shallow furrows produced by the convexity of the surface between them; the aperture is orbicular because the keels are formed entirely in the thickness of the shell.

I am indebted for this interesting fossil to Dr. Rankin of Carlisle and Mr. Purdue; the following note, obligingly

furnished to me by Mr. Morris, contains the necessary information respecting its geological position. "*E. carbonarius*, which is very common in the shales near Glasgow and also frequently found in the lower limestone shale at Denwick Lane near Alnwick, at North Sunderland, and Buddle Bay in Northumberland. At the latter locality it is associated with *Chonetes sarcinulata* (*Leptaena lata*, Sil. Syst.) and *Possidonomya tuberculata* (*Possidonia*, Geol. Trans. 2nd ser. v. 5.), the shales being considerably altered by their proximity to a trap dyke. This species appears to be a characteristic shell of the lower carboniferous shales, for I believe it has not hitherto been found in any of the upper members of the carboniferous system."



EUOMPHALUS Calyx.

TAB. DCXXXIII.—*fig.* 8, 9 & 10.

SPEC. CHAR. Discoid, thick, very concave beneath; margin broad, inclined upwards, bounded by two carinæ; aperture triangular, its upper edge shortest.

SYN. *Euomphalus Calyx*, *Phill. Yorks. pt. 2. 225. pl. 13. f. 3.* *Morris, Cat. 144.*

THIS differs from *Euomphalus Catillus* in the much greater height of the whorls and their inclined sides, which give it the form of a deeply truncated cone or an inverted cup. It is a rather a rare shell in the carboniferous limestone of Bolland, and also in that of Kildare in Ireland, where it acquires a considerable size.



EUOMPHALUS *Pugilis* var. *bifrons*.

TAB. DCXXXIII.—*fig. 2.*

SYN. *Euomphalus bifrons*, *Phill. Yorks. pt. 2. 225.*
pl. 13. f. 4. Morris. Cat. 144.

HAVING examined several individuals of this and the *E. pugilis* (t. 621.), in which the tubercles of the underside are various in elevation, I have come to the conclusion that they are only varieties of one species. The specimen figured is in Mr. Gilbertson's collection in the British Museum.

SERPULA? *extensa*.TAB. DCXXXIV.—*fig. 1.*

SPEC. CHAR. Nearly straight, faintly corrugated; shell thick, the greater portion of it free; aperture round.

SYN. *Serpula extensa*, *Brand. Foss. Hants. 12. pl. 1. f. 12.* *Morris, Catal. 66.*

THE tube diminishes slowly and regularly until near the apex, when it contracts rather suddenly. The surface is marked with broad, annular, slightly raised ridges, which are numerous and nearly equal; otherwise the shell is smooth; it is composed of several laminæ, which together give a considerable thickness.

Great numbers of solitary fragments of this shell are found in Barton Cliff, but any mark of attachment is rarely met with. It has long been doubted whether these fragments may not be portions of the tubes of *Teredo antenautæ*; but the shell of them is thicker than *Teredo* generally has it, and I am not aware that they are ever found at Barton with remains of wood around them. Clusters of very similar tubes occur at Bognor imbedded in fossil wood; sometimes they are even more tortuose, and therefore more like the usual form of *Serpulæ*; in these however the shell is still thin and fragile. The specimens figured are in the cabinet of Mr. Edwards.

Fig. 1. *a.* is a magnified representation of a portion showing the surface of attachment.

SERPULA flagelliformis.

TAB. DCXXXIV.—fig. 2 & 3.

SPEC. CHAR. Attached by its whole length ; tortuous, increasing very gradually towards the mouth ; shell thin, smooth, with slightly raised annular undulations ; mouth round, its diameter half a line.

SYN. *Vermilia flagelliformis*, *Morris, Catal. 67.*

FOUND attached to shells in the sandy beds of the London clay in Bracklesham Bay, by F. E. Edwards, Esq. It is one of the most simply formed species we know, and differs from the recent *S. vermicularis*, Linn., in the total absence of a keel. A *Serpula* occurs in the crag which only differs in being rather larger than the biggest specimen (fig. 2.) from the clay.

SERPULA exigua.

TAB. DCXXXIV.—fig. 4.

SPEC. CHAR. Attached throughout, involute, discoid, smooth, minute ; tube depressed, enlarging gradually towards the aperture, which is transversely elongated ; lines of growth oblique.

ATTACHED to a small *Natica* found at Barton by Mr. Edwards.

SERPULA prismatica.

TAB. DCXXXIV.—fig. 5.

SPEC. CHAR. Linear, four-sided, minute ; lines of growth strong, bent acutely over the angles.

SYN. *Vermilia angulata*, *Morris, Catal. 67.*

ALTHOUGH the fragment of this shell be very imperfect, it is easily distinguished as a species by its square form.

Discovered in the clay at Chalk Farm by Mr. Wetherell, whose patient attention to the minute fossils of the London clay is so well known.

SERPULA trilineata.

TAB. DCXXXIV.—fig. 6.

SPEC. CHAR. Linear, attached throughout, tortuose, minute ; attached surface broad ; on the back are three slightly elevated keels.

SYN. *Vermilia trilineata*, *Morris, Catal. 67.*

FIXED upon *Terebratula striatula*, found at Chalk Farm by Mr. Wetherell.

SERPULA heptagona.

TAB. DCXXXIV.—fig. 7.

SPEC. CHAR. Cylindrical, with seven keels ; free except near the apex, where it is conical, with 3 to 5 keels curved and attached ; lines of growth strong ; keels often expanded into variously undulating wings. Operculum funnel-shaped, its disc radiated.

SYN. *Serpula heptagona*, *Morris, Catal.* 66. *Dentalium elephantinum*, *Brander, II. pl. 1. f. 11.*

THIS curious *Serpula* in the young state, which is rare, much resembles *S. crassa* (tab. 30.), but is distinguished by showing indications, first of two, and soon afterwards of two more keels, besides the dorsal one, making with the edges of the base in all seven angles; it is also rougher and more conical. The seven angles become equal upon the free shell. The operculum varies much in form, as shown in the figures *a.* and *b.*

Brander has confounded the free form of this *Serpula* with *Dentalium costatum* (tab. 70. fig. 8.) under the name of *Dentalium elephantinum*.

Not uncommon at Barton. The specimens figured are in Mr. Edwards's collection; we have the same species also from near Paris, sent to the late Mr. Sowerby by Mons. Defrance.

SERPULA avita.

TAB. DCXXXV.—fig. 1.

SPEC. CHAR. Attached throughout, gradually enlarging, variously curved, subcylindrical, with an expanded base and a dorsal keel, which forms a spine projecting over the aperture; lines of growth arched; edge of the aperture thin.

NEARLY related to the recent *Serpula triquetra* (*Vermilia*, Lam.), but differing in having a thinner keel and smoother sides.

Attached to a fragment of *Inoceramus* in chalk. Presented by Mr. Sankey in 1819, who found it at Dover.

SERPULA Proteus.

TAB. DCXXXV.—fig. 2.

SPEC. CHAR. Attached for a great part of its length, smooth, subcylindrical, with the base expanded and a prominent thin keel along the back; the free part cylindrical with a small dorsal keel; a varix round the aperture, which is circular, with a sharp edge; lines of growth nearly straight.

THE fixed portion of this *Serpula* strongly resembles *S. triquetra*, but it is smoother, and the straight lines of growth distinguish it from *S. avita*. A varix is formed before the tube rises from its support, and another grows round the extremity, in which it agrees with *S. ampullacea* (tab. 597. figs. 1-5.), but it is smaller than that species.

The individual figured is upon a *Plagiostoma spinosa*, in chalk from Kent.

SERPULA Ilium.

TAB. DCXXXV.—fig. 3.

SPEC. CHAR. Filiform, slender, smooth, curled up into irregular masses; shell rather thick; aperture round, its diameter $\frac{1}{3}$ rd of a line.

SYN. *Serpula Ilium*, *Goldfuss*, 234. t. 69. f. 10.

DISTINGUISHED from *Serpula Plexus* (tab. 598.) by its small size and less gregarious habit. I find nothing to distinguish it from *S. Ilium* of Goldfuss except it be a less tendency to curl in a spiral direction which he has given as the specific character.

From the chalk at Portsdown and Gravesend. Goldfuss has it from the upper beds of the Jura limestone of Streitberg.

SERPULA plana.

TAB. DCXXXV.—fig. 4.

SPEC. CHAR. Attached, involute, discoid, smooth; base broad; aperture slightly expanded, nearly circular.

SYN. *Serpula plana*, Woodward, *Geol. Norfolk*, t. 5. f. 9. Morris, *Catal.* 66.

A SMALL shell with only one or two turns; it is smooth, excepting a few sharp ridges produced by the expanded lip at successive periods of growth.

From Portsdown, Kent. Woodward's specimens were from Eastern Norfolk.

SERPULA pusilla.

TAB. DCXXXV.—fig. 5.

SPEC. CHAR. Attached in part, involute, subdiscoid; the free portion erect, cylindrical; base expanded; surface obscurely granulated; aperture slightly contracted.

A SMALL shell from the chalk of Norwich; it is attached to a young *Exogyra globosa*. The granulations are obscure and arranged in lines.

SERPULA Turbinella.

TAB. DCXXXV.—fig. 6.

SPEC. CHAR. Wound into the form of an elongated cone attached by its apex; surface nearly smooth; whorls flattened, aperture contracted.

FROM Portsdown, with *S. Ilium*.

GLYCIMERIS, Lam.

GEN. CHAR. Equal-valved, transverse, thick, gaping at both sides ; epidermis thick, extending beyond the edge of the shell ; hinge-line thick, toothless ; fulcra large, tumid ; ligament external ; muscular impressions two ; impression of the attachment of the mantle deep, broad, rugged, with hardly any sinus.

A GENUS related to *Panopæa*, and according to some, to *Solen*, but distinguished from both by the absence of teeth in the hinge, and the want of a sinus in the mantle : from *Solen* it also differs in having more equal and rounded sides. It is related to the *Myaria* in having a thick projecting epidermis, which leaves the impressions of its wrinkles upon the shell. The foot of the animal as well as the length of its tubes must be however very different from those parts in the *Myaria*, as well as in the above-mentioned genera. It is remarkable that the umbones are often eroded. The recent species inhabit the Northern Ocean.

GLYCIMERIS *Vagina*.

TAB. DCXXXVI.

SPEC. CHAR. Transversely oblong-ovate, compressed, smooth; the anterior portion much the larger, rather attenuated and slightly convex; the posterior flattened, truncated, more or less angular. Width to the length as 7 to 3.

SYN. *Glycimeris Vagina*, *Wood in Ann. and Mag. Nat. Hist. v. 6. 245.* *Morris, Catal. 88.*

THE different degrees of convexity of the two parts of this shell, which give to each valve when separate a peculiar twisted appearance, and the great distance of the umbones from the anterior extremity, will at first sight serve to distinguish it from the recent *G. Siliqua*, which is the only species at present known that resembles it. The rectangular form of the fulcra, and the angular, not rounded, outline, are additional characters. Neither does it appear to have the umbones eroded, as they generally are in *G. Siliqua*, and in many shells of the northern seas, as well as in those which live in lakes and freshwater rivers: it probably lived in a temperate climate, or at least in a situation where vegetable substances were not decaying around it.

From the coralline Crag of Ramsholt, in the cabinets of the Rev. R. Wilson and S. V. Wood, Esq.; the latter gentleman has also traced it in the red crag of Sutton.

KELLIA, Turton.

GEN. CHAR. An equivalved, more or less transverse, slender bivalve; valves close at the sides; hinge with sometimes two central teeth and one lateral tooth in the left valve, sometimes only one central and no lateral tooth; ligament internal, linear, attached to a pit along and within the posterior edge of the hinge-plate; muscular impressions two, nearly orbicular; impression of the mantle obscure, entire?

DR. TURTON established this genus and gave the characters from a small recent British shell, discovered by Montague, who called it *Mya suborbicularis*. The genus is named in commemoration of Mr. J. M. O'Kelly of Dublin. Dr. Turton's definition is,—

“Shell somewhat globular, equivalved, closed; hinge with two approximate teeth and a remote lateral tooth in one valve, and a concave tooth and a remote lateral one in the other; ligament internal.”

It has been necessary to alter this description that it may include several species so nearly related that Mr. S. V. Wood has arranged them together, and also to distinguish it from *Erycina*, Lam., which has a sinus in the impression of the mantle, and has a pit for the ligament between, not behind, the two cardinal teeth; nevertheless several fossil species of Lamarck's as well as of Deshayes' *Erycina* belong probably to *Kellia*.

The position of the surface or pit for the attachment of the ligament also distinguishes *Kellia* from *Mesodesma* of Deshayes, which is *Erycina* of G. B. Sowerby, but not of Lamarck.

KELLIA suborbicularis.

TAB. DCXXXVII.—fig. 1.

SPEC. CHAR. Suborbicular, nearly equilateral, very convex, smooth; front rather straight; one lateral posterior and two cardinal teeth in the left valve, and one lateral and one cardinal tooth in the other valve.

- SYN.** *Kellia suborbicularis*, *Turton, Brit. Biv.* 57. *t.* 11. *f.* 5 & 6. *Wood, Ann. and Mag. Nat. Hist.* v. 6. 247. *fossil.* *Morris, Catal.* 89. *fossil.*
- Mya suborbicularis*, *Montague, Test. Brit.* 39. *Maton and Racket, Trans. Linn. Soc.* v. 8. 41. *Montague, Test. Brit. Supp. t.* 26. *f.* 6. *Turton, Brit. Fauna*, 167. *Dilhewyn, Catal.* 55. *Wood, Index Test.* 13.
- Tellina suborbicularis*, *Turton, Conch. Dict.* 179.
- Amphidesma physoides*, *Lam. Hist. Nat. ed.* 1. v. 5. 493. *ed.* 2. v. 6. 130. *fide* G. B. Sowerby.
- Bornia inflata*, *Philippi, Enum. Moll. Sicil.* v. 1. 14. v. 2. 11.

A SLIGHT squareness appears to characterise the fossil specimens, which are also rather longer than the recent shells, but the difference is so small that Mr. Wood considers them the same species; I have therefore given the synonyms of the recent as well as of the fossil shell. The *Amphidesma physoides* of Lamarck is an Australian shell,

and therefore might have been supposed to be different; I have quoted it upon the authority of my brother, who has seen the specimen described by Lamarck. The *Mya orbicularis*, a recent Devonshire shell first described by Montague, is quoted by Philippi as much like his *Bornia inflata*, which is found both recent and fossil in Sicily, and agrees in description perfectly with our shell, an inhabitant of the coralline Crag of Sutton, and also of the pleistocene beds at Largs.

KELLIA orbicularis.

TAB. DCXXXVII.—*fig. 2.*

SPEC. CHAR. Orbicular, oblique, tumid, with a slight ridge, concentrically striated, rugose, anterior side largest; only one tooth close to the beak in each valve; muscular impressions large, elongated.

SYN. *Kellia orbicularis*, *Wood, loc. cit. v. 6. 247.*

“THIS shell is retained in the genus *Kellia*, although it does not possess all the characters originally required, having but one tooth in each valve. The exterior has an apparent twist which gives it a slight obliquity, and the ventral margin nearly straight, consequently the disc a little flattened. The shell is exceedingly gibbose, the depth of each valve being equal to half its length. It somewhat resembles the preceding, but it differs in its dentition.” From the coralline Crag, Sutton.

KELLIA pumila.

TAB. DCXXXVII.—fig. 3.

SPEC. CHAR. Transverse, ovate, oblique, tumid, glossy, anterior side much the larger and rather longer than the other. One central and two lateral teeth in the right, and only obscure lateral teeth in the left valve.

SYN. *Montacuta pumila*, *S. V. Wood, loc. cit. v. 6. 247.*

THIS strongly resembles *Kellia rubra*, Turton, (*Cardium rubrum*, Montague, *Amphidesma nucleola*, Lamarck? *Bornia seminulum*, Philippi?) but appears to differ in several characters; it is more inequilateral and oblique, its lateral teeth are also smaller, especially the anterior one, and more removed from the centre. The *Bornia seminulum*, to which Philippi refers *Cardium rubrum*, has a larger number of teeth, and is less oblique also than our shell. The muscular impressions are large and ovate; the pit for the ligament is linear, small, and slopes inwards towards the posterior side.

Abundant in the lower crag of Sutton, with the two valves frequently united.

KELLIA dubia.

TAB. DCXXXVII.—*fig. 4.*

SPEC. CHAR. Transversely elongate-oval with rather straight sides, slightly convex, smooth, tender; anterior side the smaller; one erect somewhat compressed tooth in the right valve, and one obtuse lateral tooth and one minute central tooth in the other valve.

SYN. *Kellia dubia*, *Wood, loc. cit.* 247. *Morris, Catal.* 89.

EXTERNALLY smooth, with the exception of fine lines of growth; internally fine radiating lines are seen in some specimens. The muscular impressions are generally obscure, but one specimen shows the posterior one as subovate, the other more elongated, and the impression of the mantle without a sinus. This is the largest species of *Kellia* we know; it is subject to some variation in shape, as shown in figures β . and γ . We cannot agree with Mr. Wood in referring this to *Psammotea dubia* of Deshayes, because that is a gaping shell, and has a very different hinge. It is more like *Erycina anodon* of Philippi, vol. i. 13. t. 1. f. 20, but that is said to have a small, very obtuse sinus in the pallial impression, and is smaller, with the umbo differently placed.

Both the red and coralline Crag of Sutton afford this shell.

KELLIA flexuosa.

TAB. DCXXXVII.—fig. 5.

SPEC. CHAR. Ovato-orbicular, transverse, convex, smooth; anterior side the larger; superior margin of the right valve thin, sharp and flexuose. One central tooth in the right valve and two in the other. Lateral teeth obsolete.

SYN. *Kellia flexuosa*, *Wood, loc. cit. v. vi. 247. Dec. 1840.* *Lucina oblonga*, *Phil. v. i. 34. t. 4. f. 1.* *Loripes ellipticus*, *Scacchi, Catal. p. 5. 1.* *Scacchia elliptica*, *Phil. v. ii. 27. t. 14. f. 8. (1844.)*

THE peculiar folds of the margin on both sides the umbo of the right valve produce corresponding sinuses on the edge of the left valve, as may be most distinctly seen when the valves are together. There are two teeth in the left valve, that nearest the beak being placed longitudinally; the other is almost at right angles with it and is produced along the hinge-line. The pit for the ligament is elongated, small, and under the posterior portion of the hinge-line. The muscular impressions are large.

An abundant shell in the coralline Crag at Sutton, but rarely found with the valves united. It is living on the coast of Sicily.

KELLIA cycladea.

TAB. DCXXXVII.—*fig.* 6.

SPEC. CHAR. Transverse, ovato-quadrangular, tumid, slightly oblique, very thin, smooth, the posterior side much the smaller; one obscure tooth in each valve.

SYN. *Kellia cycladea*, *Wood, loc. cit. v. vi. 247.*

UNFORTUNATELY only two or three single valves of this extremely fragile shell have come under our notice, and they are not quite perfect. It much resembles a fresh-water *Cyclas* in general aspect and texture. The squareness of its form with a slightly concave basal margin distinguish it at first sight from every other *Kellia*. Occurs rarely in the coralline Crag at Sutton.

The shells on this plate are all in the cabinet of S. V. Wood, Esq., who has kindly supplied me with copious notes, of which I have gladly availed myself in the above descriptions, adding a few observations in consequence of the publication of Philippi's second volume since I received

Mr. Wood's favour. It is probable that the genus *Kellia* may be subdivided, and especially that *Scacchia* may be adopted by naturalists; but I have preferred to retain Mr. Wood's names, trusting to his experience and careful examination of such minute subjects.

CIRRUS tabulatus.

TAB. DCXXXVIII.

SPEC. CHAR. Spire conical; in the old shell the latter whorls are more expanded, strongly marked by lines of growth; upper part of each whorl flat or somewhat concave, bounded by an obtuse, uneven keel, the lower part rounded; umbilicus very large; aperture sub-orbicular, truncated above; height less than the width.

SYN. Cirrus tabulatus, *Phill. Geol. Yorks.* 225. *pl.* 13. *f.* 7. *Morris, Catal.* 142. *Griffiths, Notice of Fossils of Mount. Lime.* 20.

Cirrus euomphaloides, *Griffiths as above,* 20. *and pl.* 7. *f.* 4.

A RATHER rugged-looking shell, distinguished from *Euomphalus pentangulatus*, M. C. t. 45, by its conical form, rough surface, and great size, for it sometimes reaches a foot in diameter. There is a peculiarity in its structure arising from its mode of growth: additions to the shell are made by thin layers, which are very thin where they line the tube, but instead of being continued far beyond the aperture to add to the length of the whorl, they are reflected against the edge of the lip, and at the same time much thickened, so that it is by the added thickness of each coat only, which however is considerable, that the increase of the lip takes place; as the layers are composed of fibres arranged perpendicularly to their planes, a section of the shell across the axis shows these fibres nearly parallel to its surface, or

rather diverging from an imaginary central line towards both the inner and outer surfaces, as shown at fig. 4, and partly in fig. 3. When several of the coats are broken off the exposed portions of those remaining have the appearance of trumpet-shaped tubes inserted into one another, as may be seen in figures 2. and 3 : a longitudinal section, that is, in the direction of the axis of the shell, shows fibres perpendicular to the surface, as round the aperture in fig. 1 : this structure was first pointed out by Mr. Lonsdale, who had a portion (fig. 4.) polished in which the variation of colour assists in developing the thickness of the layers. A similar structure may be traced, less readily, in *Euomphalus*. The edge of the mouth has a slight sinus, formed by the projecting keel that runs round the spire upon the whorls ; it is otherwise even, and is continued over the preceding whorl ; it is placed more perpendicularly than in *Euomphalus pentangulatus* ; in old subjects it becomes elliptical and transverse. A few obscure furrows may be observed along the whorls, and add somewhat to the rugosity of their upper parts ; the base and the umbilicus are particularly smooth. In old shells septa are formed which separate the smaller whorls, as in many other spiral shells, especially in *Euomphalus*.

This appears to be an abundant shell near Kendal ; our figure 3. is taken from a portion of one sent me by the Rev. Mr. — Fisher from that place, and several fine specimens from the same locality are preserved in the University Museum at Cambridge. Fig. 1. is from the best individual in Mr. Gilbertson's collection, at the British Museum ; fig. 2. from Settle in Yorkshire ; and fig. 4. a section made by Mr. Lonsdale of a fragment from Ireland, placed in the cabinet of the Geological Society by the Earl of Enniskillen. It also occurs in Northumberland and other places in the middle and lower beds of the carboniferous limestone.

Cirrus acutus, tab. 141. f. 1, is distinguished by the form of the upper portion of the whorl.

HIPPIAGUS, Lea.

GEN. CHAR. Shell equivalved, cordiform, longitudinally costated; hinge with a subinternal ligament winding up under the umbones, and one obtuse tooth which is in the right valve; fulcrum of the left valve linear, apparently tubular; a lunette under the beaks.

SYN. *Verticordia*, S. V. Wood, MSS.

“ I HAVE ventured to propose a new genus for the reception of a shell I had with doubt placed in the genus *Cryptodon* in my ‘Catalogue of Shells from the Crag,’ and to remove it from that genus in consequence of its rugosely costated exterior and its internal ligament. It resembles in general appearance a *Venericardia*, but differs from that genus in the position of the ligament and the want of solidity about the hinge. It is further characterized by the short fulcrum or portion of the hinge (in the left valve) with a circular perforation or opening (at its extremity), into which the ligament appears to have entered laterally from the posterior side: there is a prominent obtuse tooth in the right valve, with a sort of notch in the opposing one for its reception; beneath the umbones is a deep semicircular lunette, particularly marked in the left valve; one ovate muscular impression is seen in the anterior side, the second impression is indistinct, the interior is smooth and nacreous.”

“ The generic name is one of the synonyms of the Goddess of Beauty, and is also appropriate from the elegant curvature of this cordiform shell.”

The above description was drawn up by Mr. S. V. Wood previous to the publication of the second volume of the *Enumeratio Molluscorum Siciliae* by Philippi, where a recent Mediterranean shell is described and figured (*Hippagus acuticostatus*) which differs only in slight specific characters from the subject before us; Philippi has referred this shell to the genus *Hippagus* of Lea, (Contributions to Geology, Philadelphia 1833. p. 72. pl. 2. f. 50, *Hippagus*

isocardioides.) a minute fossil in many respects closely related to it, but said by Lea to be destitute of teeth: as he says nothing about the ligament, but mentions the close approach of its general characters to those of *Isocardia*, it is probable that the ligament winds up under the beaks as in that genus, and so Philippi describes it in his *H. acuticostatus*. The general form of Lea's type of *Hippagus* is very different, but the resemblance of the hinge is great, and he says the edge of the shell is toothed; upon the whole therefore we adopt his genus for this shell, but with doubt, and have made some additions to his GEN. CHAR. with a view to its including both shells. The name *Verticordia* was hastily adopted on early impressions of the plate from Mr. Wood's manuscript, but is objectionable, having been long ago applied to a plant.

HIPPAGUS ? cardiiformis.

TAB. DCXXXIX.

SPEC. CHAR. Convex, orbicular, costated; costæ 15 or 16 prominent, obtuse, rugosely squamose, projecting beyond the edge, furrows finely granulated; umbones incurved.

SYN. Cryptodon *Verticordia*, S. V. Wood, *Catal. Ann. and Mag. Nat. Hist. v. vi. 247.*

AN orbicular shell, rendered beautiful by the curvature of its ribs and almost pectinated margin; internally the ribs are indicated by slight furrows. It is produced by the coralline Crag of Sutton; about twenty individuals, single valves, have been found.

Hippagus acuticostatus (Phil. Enum. v. ii. 41. tab. 14. f. 19.) is distinguished by sharp lamellar ribs, of which there are only 13, not 15 or 16 which our shell has, and by the corresponding furrows within being confined almost to the margin, neither do they project so far beyond the edge of the shell; in size and other respects the two shells hardly differ.

PLEUROTOMARIA, Defrance.

GEN. CHAR. A trochiform spiral shell, with an angular sinus near the middle of the outer lip, from which a band marked with lines of growth that indicate the sinus is carried round the whorls; no beak or sinus at the base of the aperture; a columella with or without an umbilicus.

A GENUS of shells only known in the fossil state; the species vary much in the elevation of the spire, but are generally short shells. It is named *Pleurotomaria*, because it bears the same relation to *Trochus* as *Pleurotoma* does to *Fusus*; some of the most elongated species occur in the Silurian system of rocks, others are met with in various parts of the series up to the greensand, where the newest is found; they are most abundant in the mountain limestone, and not unfrequent in the lower oolite. The following is a list of the species already published under various names in the 'Mineral Conchology': *Helix carinatus*, tab. 10. f. 2; *H. striatus*, t. 171. f. 1; *H. cirriiformis*, t. 171. f. 2; *Trochus anglicus*, t. 142; *T. punctatus*, t. 193. f. 1; *T. elongatus*, t. 193. f. 2-4; *T. abbreviatus*, t. 193. f. 5; *T. fasciatus*, t. 220. f. 1; *T. granulatus*, t. 220. f. 2; *T. sulcatus*, t. 220. f. 3; *T. ornatus*, t. 221. f. 1; *T. bicarinatus*, t. 221. f. 2; *T. reticulatus*, t. 272. f. 2; *T. Gibsii*, t. 278.

PLEUROTOMARIA rotundata.

TAB. DCXL.—fig. 1 & 2.

SPEC. CHAR. Turbinate, irregularly striated; whorls 4 or 5, regularly convex; band rather broad, flat, slightly elevated, placed above the most prominent part of the whorl; base convex; columella solid, cylindrical, accompanied by a spiral ridge; aperture nearly orbicular.

DISTINGUISHED from *Pleurotomaria (Helix) carinata* of tab. 10. and fig. 3. of the present plate by its taller spire, rounder whorls, and smoother surface (see letter *a*), but more particularly by the solid columella and its accompanying ridge; the band also is less raised. Fig. 2. is from a younger, smoother, less elevated specimen, but it bears the characteristic ridge of the species.

These specimens are I believe from Bolland; they are all I have seen of the species.

 PLEUROTOMARIA carinata.

TAB. DCXL.—fig. 3.

SPEC. CHAR. Turbinate, conical, short, neatly striated all over in both directions; whorls 5 or 6, less convex above the band which is raised, convex and moderately broad; base convex, umbilicated; aperture rather angular.

SYN. *Pleurotomaria carinata*, *Phill. Geol. Yorks.* 226. *pl.* 15. *f.* 1. *Min. Conch. Index to 6 volumes.* *Morris, Catal.* 158.

P. flammigera, *Phill. Geol. Yorks.* 226. *pl.* 15. *f.* 2.
Helix carinata, *Min. Conch. t.* 10.

HAVING ascertained by more perfect specimens that the *Helix carinata*, *Min. Conch.*, and *Pleurotoma flammigera* of Phillips are the same species, I have taken the opportunity, while figuring some others of the same genus, to give another representation of that shell: the former figure did not show the zigzag marks of colour which are so remarkably preserved, nor the form of the aperture, which is probably the reason why Prof. Phillips did not think his *P. flammigera* to be the same. The outline at the back shows the size it sometimes attains.

De Koninck, in his work on the fossils of Belgium, has figured it with its coloured marks, and Goldfuss (tab. 183. f. 9.) has given the same shell, but neither of these authors has yet published the name.

PLEUROTOMARIA conica.

TAB. DCXL.—*fig.* 4.

SPEC. CHAR. Conical, with straight sides and prominent convex base; whorls flat above, convex below the band, transversely and elegantly striated; striæ above the band very oblique, arched; band concave, prominent, with a furrow beneath it; umbilicus closed, with a thin columella.

SYN. *Pleurotomaria conica*, *Phill. Geol. Yorks.* 228.
pl. 15.f. 22. Morris, Catal. 158.

THE band around the margin of this elegant shell is narrow and so hollow as to appear like two sharp ridges or keels, and the furrow below produces almost a third ridge, particularly in some specimens. The striæ above the band are numerous, elevated, slightly curved and very oblique; the striæ below the band are equally numerous and elegantly curved.

P. striata (*Helix*, *Min. Con. tab. 171.*) has slightly convex whorls, more distant, less oblique and stronger striæ, a wider and flatter band, and shorter spire, otherwise it bears a strong resemblance: they both are liable to be variegated with dark brown.

Found in the carboniferous limestone of Bolland.

PLEUROTOMARIA tumida.

TAB. DCXL.—*fig. 5.*

SPEC. CHAR. Depressed, nearly smooth; whorls few, rounded, convex above with a slight canal near the suture, very convex beneath; umbilicus small with a sharp edge; band moderately broad, sunk; aperture transversely ovate.

SYN. *P. tumida*, *Phill. Geol. Yorks.* 226. *pl. 15.f. 3. Morris, Catal. 159.*

REMARKABLE for the rapid increase of the whorls and the slight depression in them near the suture. The specimen has lost much of the shell, but what remains is of a very dark colour except a white stripe below the band. Sent to me from Bolland by Mr. Gilbertson.

SOLENS, Linn.

GEN. CHAR. Equivalved, very inequilateral and transverse, straight, gaping at both ends; superior and inferior margins parallel; umbones nearly close to the anterior extremity. Hinge with one direct tooth in each valve; ligament external, strong, attached to long linear fulcra. Epidermis thick. Muscular impressions two, the anterior wide, elongated, parallel to the fulcrum; the other submarginal, distant from the beaks. Pallial impression with a deep sinus. Epidermis thick.

Animal with the mantle closed except at the extremities.

THE division of the genus *Solen* of Linnæus into five genera, and the discovery of several species in a fossil state of four of the genera, have rendered it necessary to give an amended generic character. Amidst the various opinions as to the number of genera into which it should be divided, the separation of all those shells whose umbones are not quite lateral is most general; and next, the presence of lateral teeth in the hinge is allowed as sufficient to distinguish another group, which is however very artificial, and the genus *Solen* is thus limited as in the above **GEN. CHAR.**; but it may hereafter be further divided into two subgenera, one of them being characterized by a longitudinal furrow near the anterior margin, which the other does not possess. The

fossils we are about to describe belong to the first division.

This shell affords an excellent example of a continuous line of muscular impressions from the beaks along the line of attachment of the mantle, forming a complete circuit; they are very strong at the anterior edge, where they support the powerful muscles of the cylindrical foot, the rapid action of which, when boring down into the sand, has been so often remarked; the animal is said to descend sometimes two feet perpendicularly with great rapidity.

There are several recent as well as fossil species, all of which are littoral shells. *Solen vagina*, Linn., is the type of the genus.



SOLENS gracilis.

TAB. DCXLI.—fig. 1.

SPEC. CHAR. Transversely linear, seven times as wide as long, subcylindrical, slightly curved, smooth; anterior portion separated by a direct furrow, small but rather wide, its upper margin oblique; the posterior extremity slightly rounded.

THIS is a pretty shell, much like the *Ensis* (*Solen Ensis*, Linn.) of the British shores, but it is more convex; its generic characters also distinguish it. It is one of the most interesting among the many discoveries of new shells made at the Barton Cliff by Mr. F. E. Edwards. Several specimens were picked up.

Fig. *a.* is an enlarged representation of the hinge.

SOLENI obliquus.

TAB. DCXLI.—*fig. 2.*

SPEC. CHAR. Nearly five times as wide as long, straight, slightly convex, posteriorly flattened, strongly marked with lines of growth; anterior portion separated by a deep oblique furrow, which is distant from the very obliquely truncated margin; posterior extremity square.

SYN. *Solen obliquus*, *Dixon, Geol. Suss. ined. tab.*

A SHELL well-distinguished by its obliquely truncated anterior extremity and the furrow parallel to it. The lines of growth are strongly marked, the edges of the laminae being often imbricate; there are also a few obscure oblique radiating striæ on the surface.

Discovered at Bracklesham Bay by Mr. F. Dixon and Mr. F. E. Edwards, who have kindly favoured me with specimens; it was abundant in one spot.

Fig. 2. *b.* represents an end view of the shell.

SOLEN Dixoni.

TAB. DCXLI.—*fig.* 3.

SPEC. CHAR. Four and a half times as wide as long, straight, regularly convex, smooth; anterior side very slightly oblique, its furrow rather distant; posterior extremity rounded; fulcrum very long.

WE have great pleasure in dedicating this new species to F. Dixon, Esq. of Worthing, whose forthcoming work on the Tertiary and Chalk formations of Sussex will bear ample testimony to his zeal and perseverance in bringing to light a great number of new and interesting fossils. The species before us resembles very much the *S. vaginalis*, Desh., which is found at Grignon, but that is a thinner shell and has a much shorter fulcrum.

ENSIS, Schumacher.

GEN. CHAR. Equivalved, very inequilateral, transverse, slightly arched; gaping at both ends, margins parallel, umbones close to the anterior extremity. Hinge with one conical erect tooth in the right valve, and two compressed erect teeth in the left valve, and an elongated transverse lateral tooth, connate with the fulcrum, and the erect teeth, in each. Muscular impressions, &c. as in *Solen*.

THE presence of the long lateral teeth in the hinge is so strong a character, that we cannot avoid adopting Schumacher's genus. We are not prepared to say it is positively a natural genus, but most, if not all, of the species are a little arched, and none of them have the anterior side defined by a furrow, which is so often the case in *Solen*: these general relations, although slight, have some pretensions to natural characters; moreover, the long lateral teeth, whose office is to steady the valves when they open, must have reference to some habits of the animal in which it differs from *Solen*. *Solen Ensis* of Linnæus is the type of the genus; it includes also *S. siliqua*, and a few others.

 ENSIS ensiformis.

TAB. DCXLII.—fig. 1.

SPEC. CHAR. Gently curved, thin, smooth, convex, about four times as wide as long, the two angles of the posterior and the lower angle of the anterior extremities rounded; the posterior portion a little flattened; the basal edge

more curved than the opposite ; cardinal teeth small, lateral teeth more than one-third the length of the long fulcra.

SYN. *Solen ensiformis*, S. V. Wood, *Ann. and Mag. Nat. Hist. v. vi.* 245.

FROM *Solen siliqua*, Linn., our shell differs in its proportional width, which is much less, and in its greater degree of convexity; also in the absence of an angle separating the upper edge of the posterior area; from *Solen Ensis*, Linn., *Ensis magnus*, Schum., in having only half the proportional width.

From the coralline Crag of Ramsholt, and the red Crag of Walton Naze.

ENSIS complanatus.

TAB. DCXLII.—*figs. 2, 3 and 4.*

SPEC. CHAR. Slightly curved, strong, smooth, compressed, anterior side shortest, angles rounded. Anterior hinge-tooth large, lateral teeth less than one-third the length of the long fulcra.

SYN. *Solen siliqua*, Morris, 101. Wood, *Ann. and Mag. Nat. Hist. v. vi.* 245.

THE regular very slight convexity, less width, and the want of an angle to separate the posterior area from the hinge-slope, are marks by which this species is known from the recent *Ensis siliqua*.

Found at Sutton in the red, and at Bramerton in the mammiferous Crag. The specimens figured were in the late Mr. Parkinson's collection.

CULTELLUS, Schumacher.

GEN. CHAR. An equivalved, inequilateral, transverse, compressed shell, with slightly gaping, seldom truncated sides. Hinge-teeth in the right valve, two, one longitudinal, erect, the other (posterior) oblique, decumbent; in the left valve, three, the central one bifid with divaricating apices, fulcrum long, marginal. Beaks distant from, but nearest to, the anterior extremity. Epidermis strong.

MORE or less oval, transversely elongated, generally shining, tender shells, with the beaks at about one-third the width from the anterior extremity. This genus includes the shells arranged by De Blainville under the third division of his genus *Solenocurtus*, and the first section of his genus *Solen*. But the characters of the hinge are sufficiently alike in all the species we know to connect them, although their forms are various.

CULTELLUS *cultellatus*.

TAB. DCXLII.—*fig.* 5—8.

SPEC. CHAR. Shell elongate-ovate, with obtuse, slightly gaping sides, smooth; beaks one-third the width of the shell from the anterior extremity, dorsal and basal margins arched;

posterior tooth of the right valve the shorter, notched ; muscular impressions round.

SYN. *Cultellus cultellatus*, *S. V. Wood in Ann. and Mag. Nat. Hist. v. vi. 245.*

A VERY fragile and rare shell, differing in its oval shape as well as in the form of the hinge-teeth from *C. affinis*, from *Solen tenuis* of Philippi and Nyst, and *Solen fragilis* of Lamarck, to any one of which it might possibly be referred.

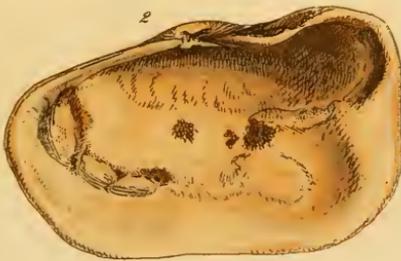
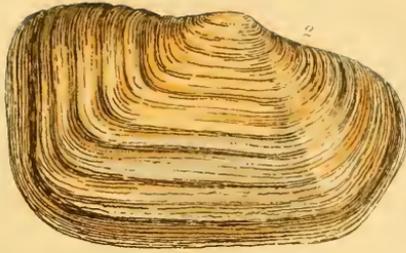
We are indebted to S. V. Wood, Esq., for the use of the specimens figured. The species occurs in coralline Crag of Sutton and the red Crag of Walton Naze.

CULTELLUS affinis.

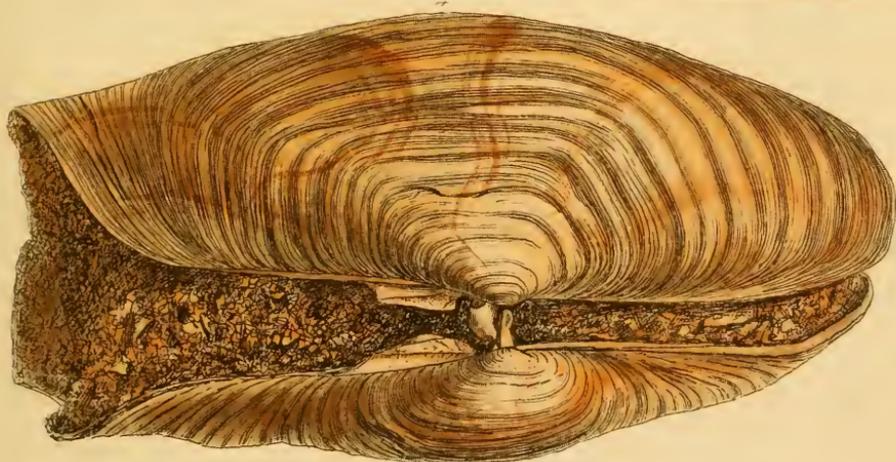
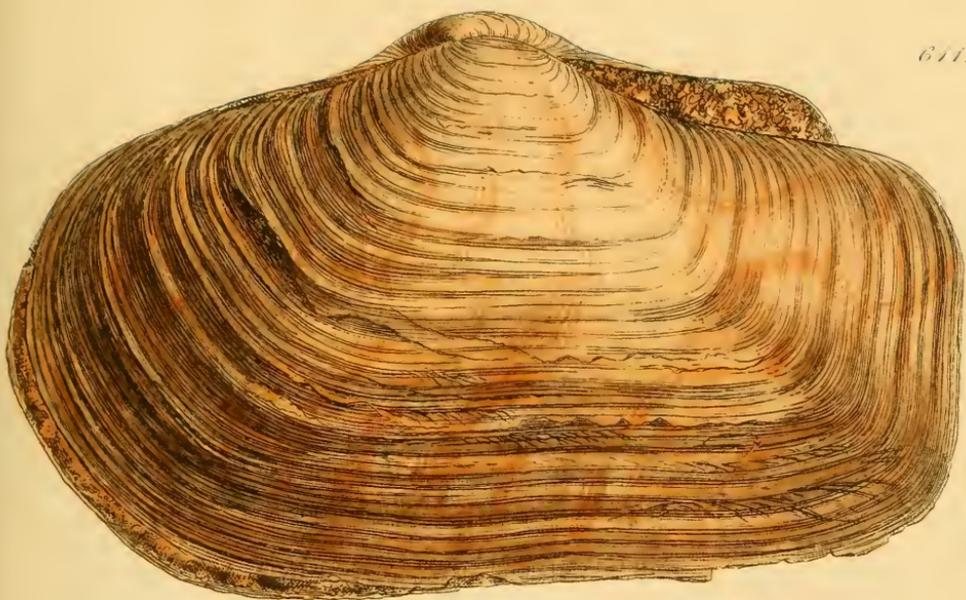
SPEC. CHAR. Transversely elongated with rounded extremities, compressed, shining, obscurely radiated, upper and basal edges nearly straight and parallel, the anterior margin slightly reflected and thickened within. Width three times the length. Posterior hinge-tooth in the right valve the larger and flattened.

SYN. *Solen affinis. Min. Con. t. 3.*

THE larger figures upon this plate are from fine specimens discovered in the Barton Cliff by Mr. F. E. Edwards; in them the edges are so much more parallel than in the Highgate (young?) shells, that they have been thought a distinct species, and have received the manuscript name of *Bartonensis*; however, the lines of growth near the beaks show that the young shell was more elliptical, and therefore I must suppose them to be all one species. Small individuals have been found at Bognor. The teeth of the hinge distinguish it from *Cultellus cultellatus*.



1 *Panopaea salina*
2 *Arca*



1. *Pinnaea* *Kors. & A.*
 2. *Pinnaea* *Kors. & A.*



1



2



4



3



5

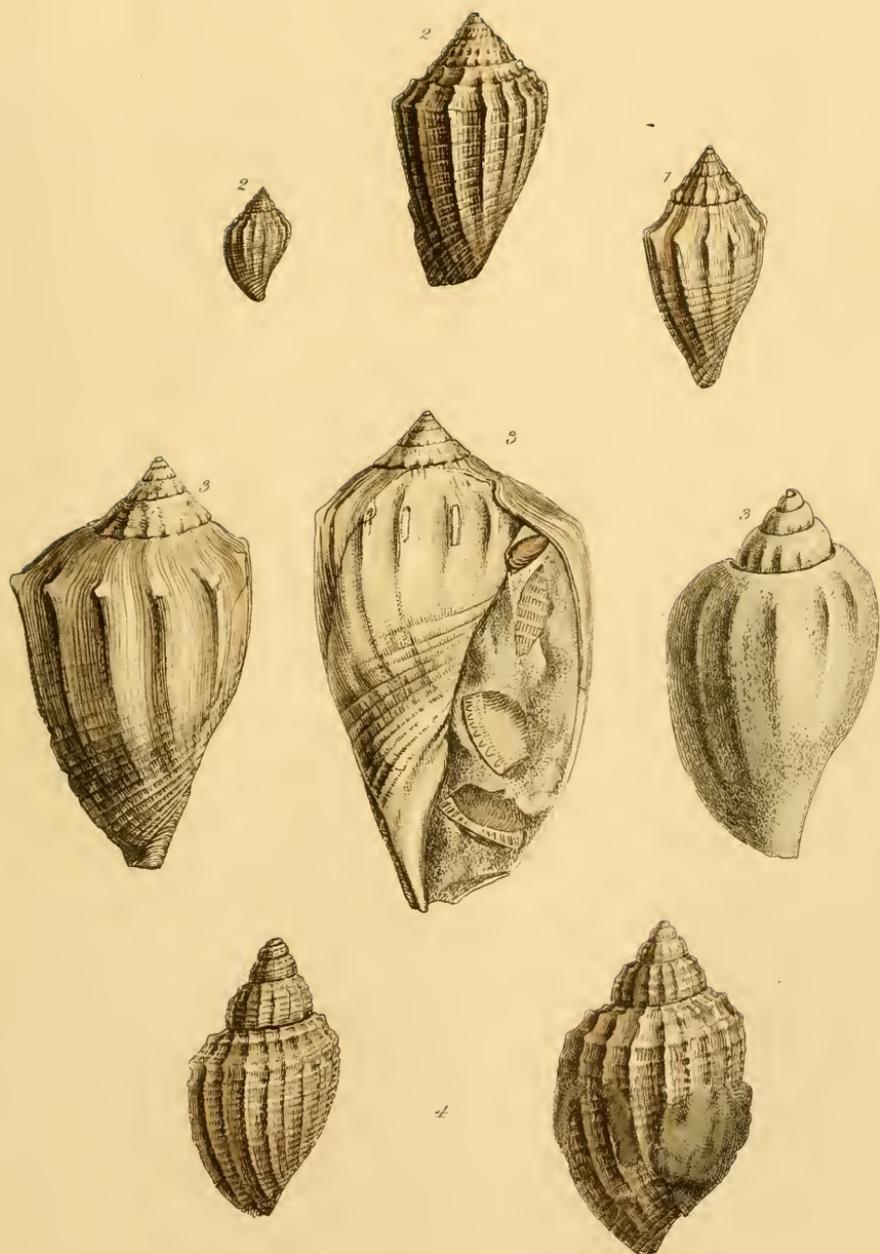


6



7

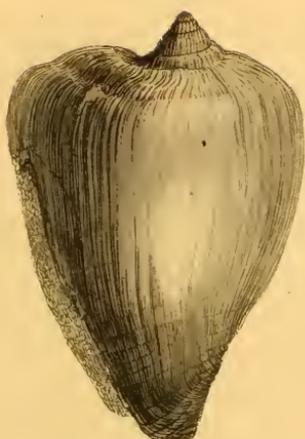
14. 5. *Voluta* *dentata*
6 7. *protensa*



1. *Voluta nodosa*, young.
 2. *tricornis*.
 3. *dentata*.
 4. *devala*.



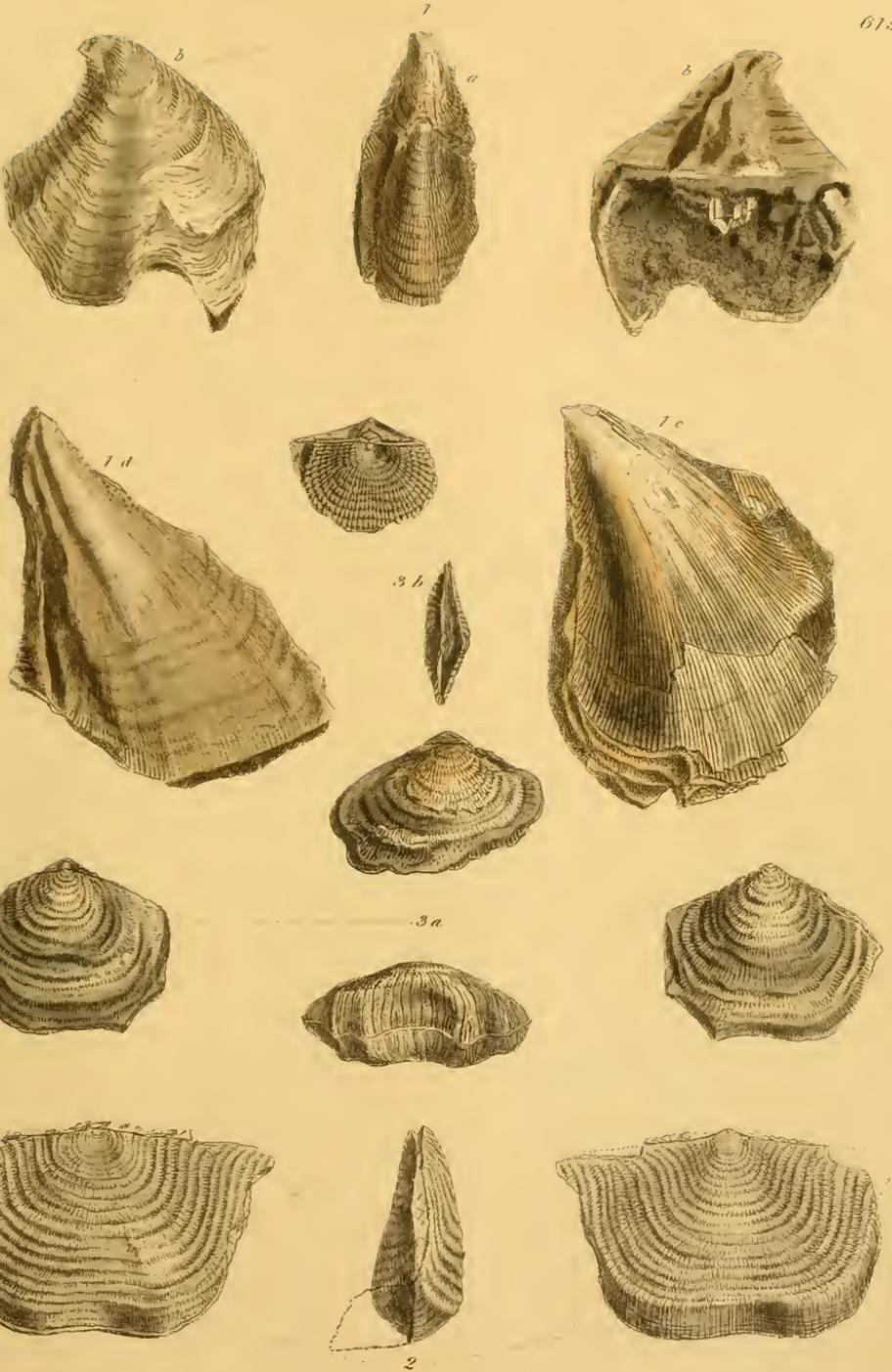
1



2



1. *Voluta Harpula.*
2. *Labrella.*



1 *Leptana anomala*.
2. *anuloga*.

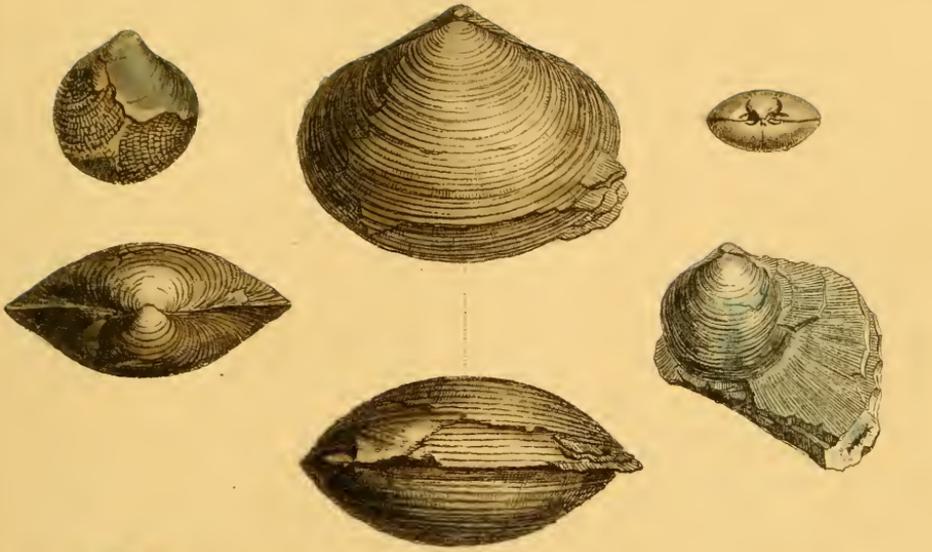
3. *Leptana distorta*.



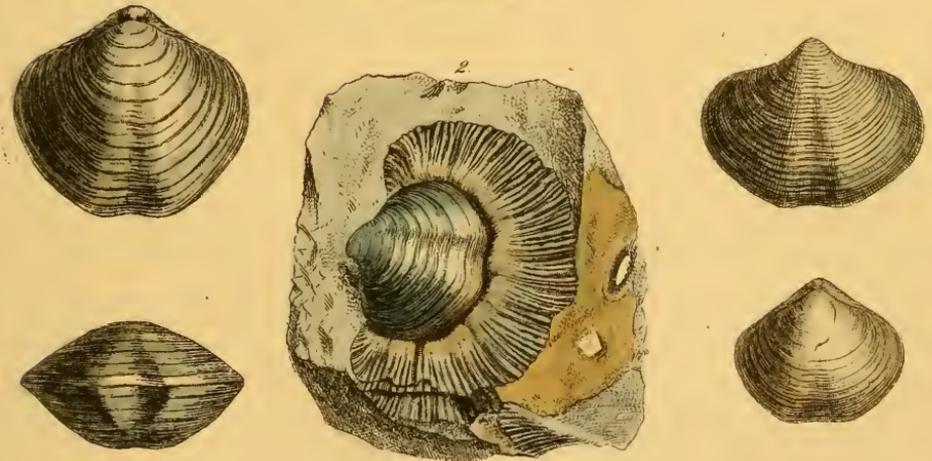
Atrypa pectinifera.

Oct 1. 1840.

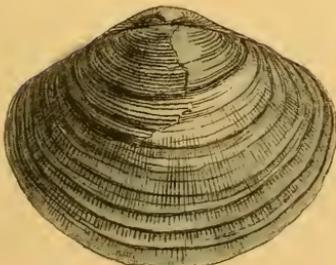
1



2



4

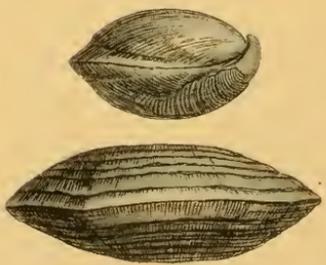


1. *Atrypa expansa*.
 2. *plano-sulcata*.

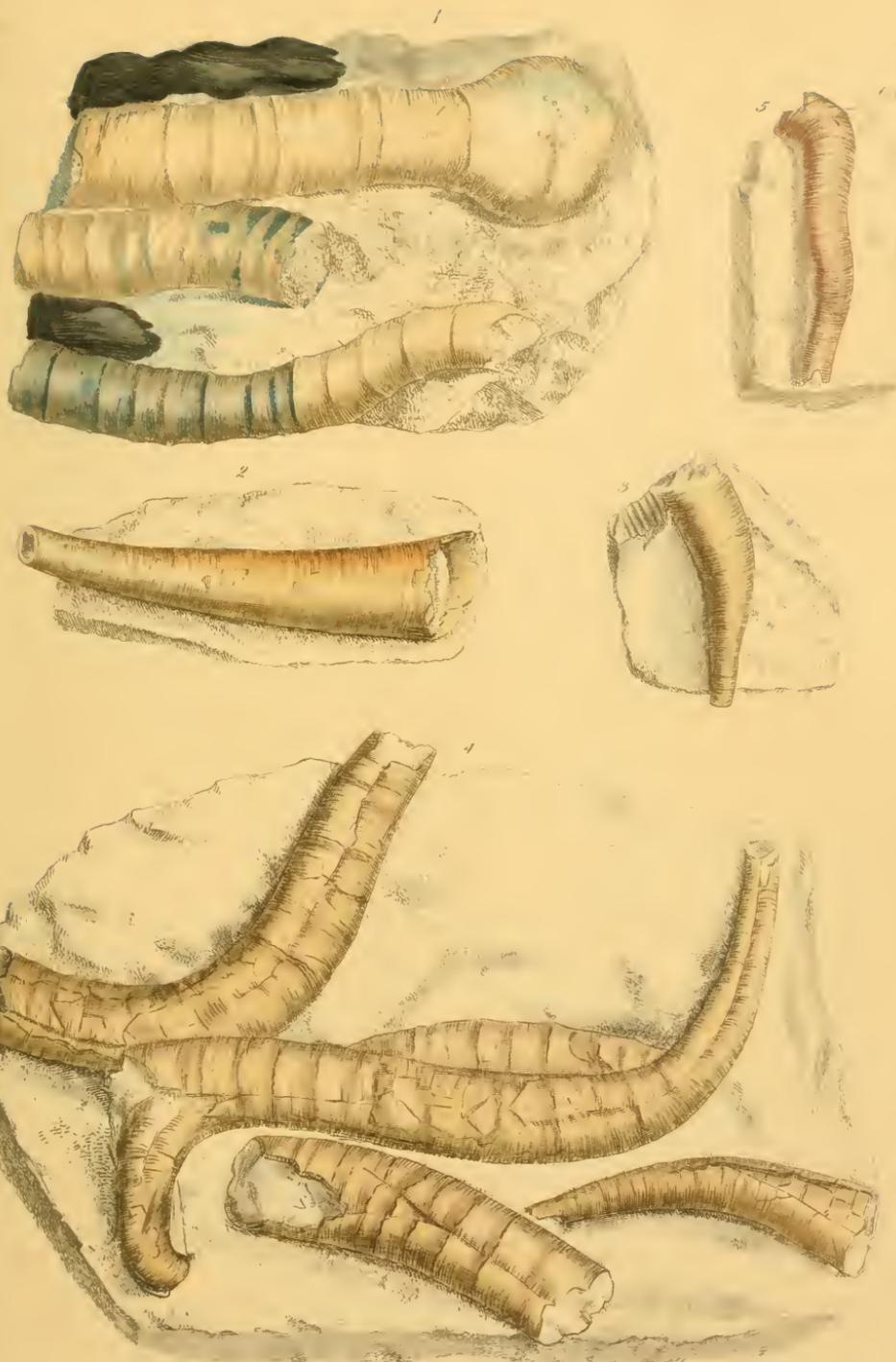
3



4



3. *Atrypa oblonga*.
 4. *fimbriata*.



Teredo articulata.

Oct. 1st 1840.



Cyprina planata.

March 1st 1841



Cyprina Morrisii.

Marsh P^l 141



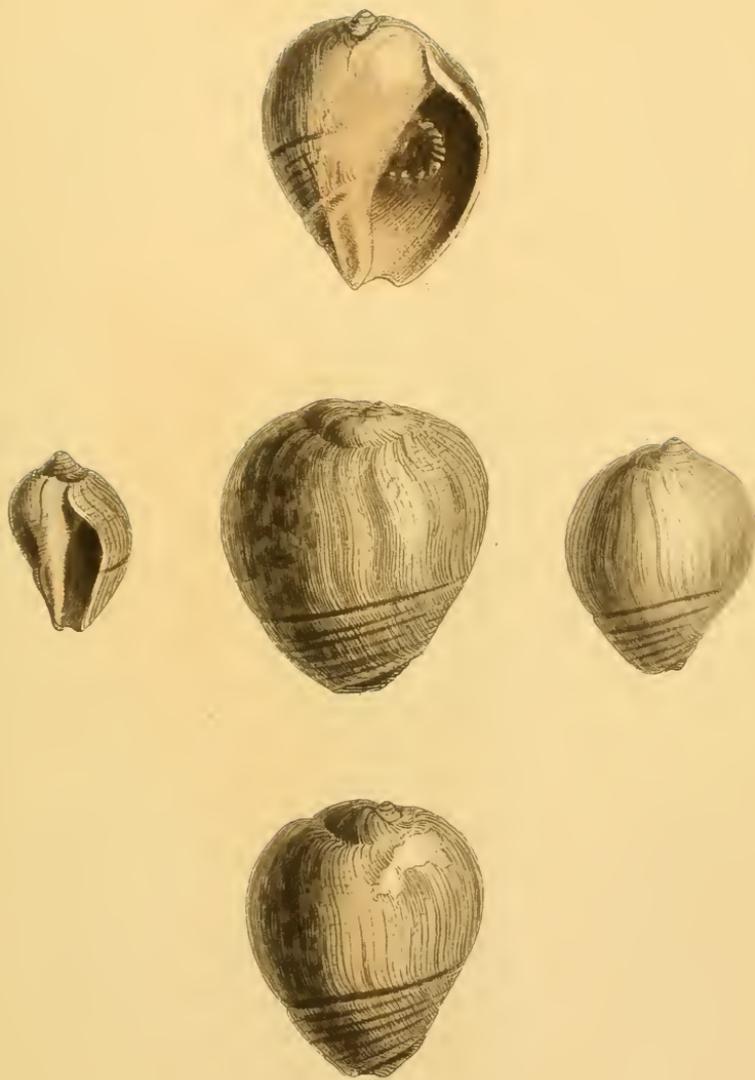
621.



1. *Euomphalus Colet.*

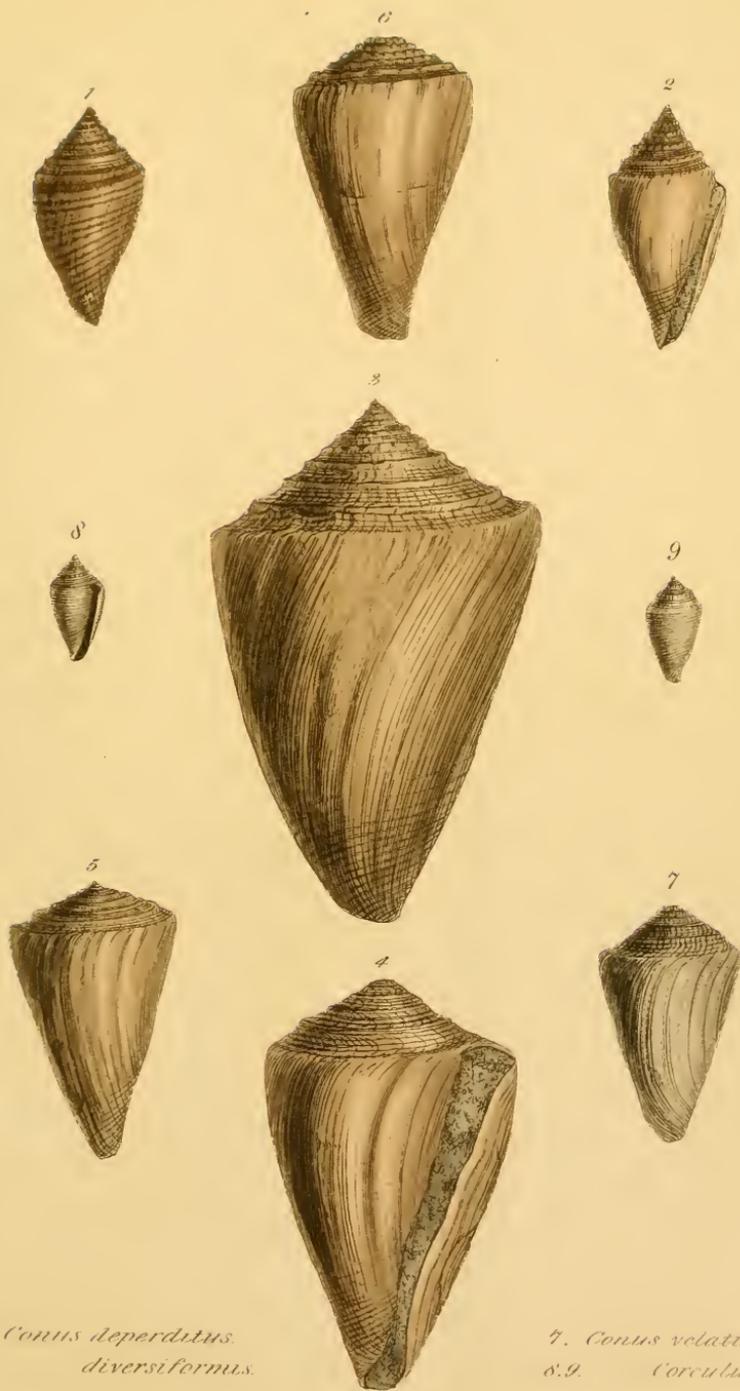
2,3,4. *Euomphalus Pugilis*

March 1st 1841.



Pseudolyca arctus 366

March 1794



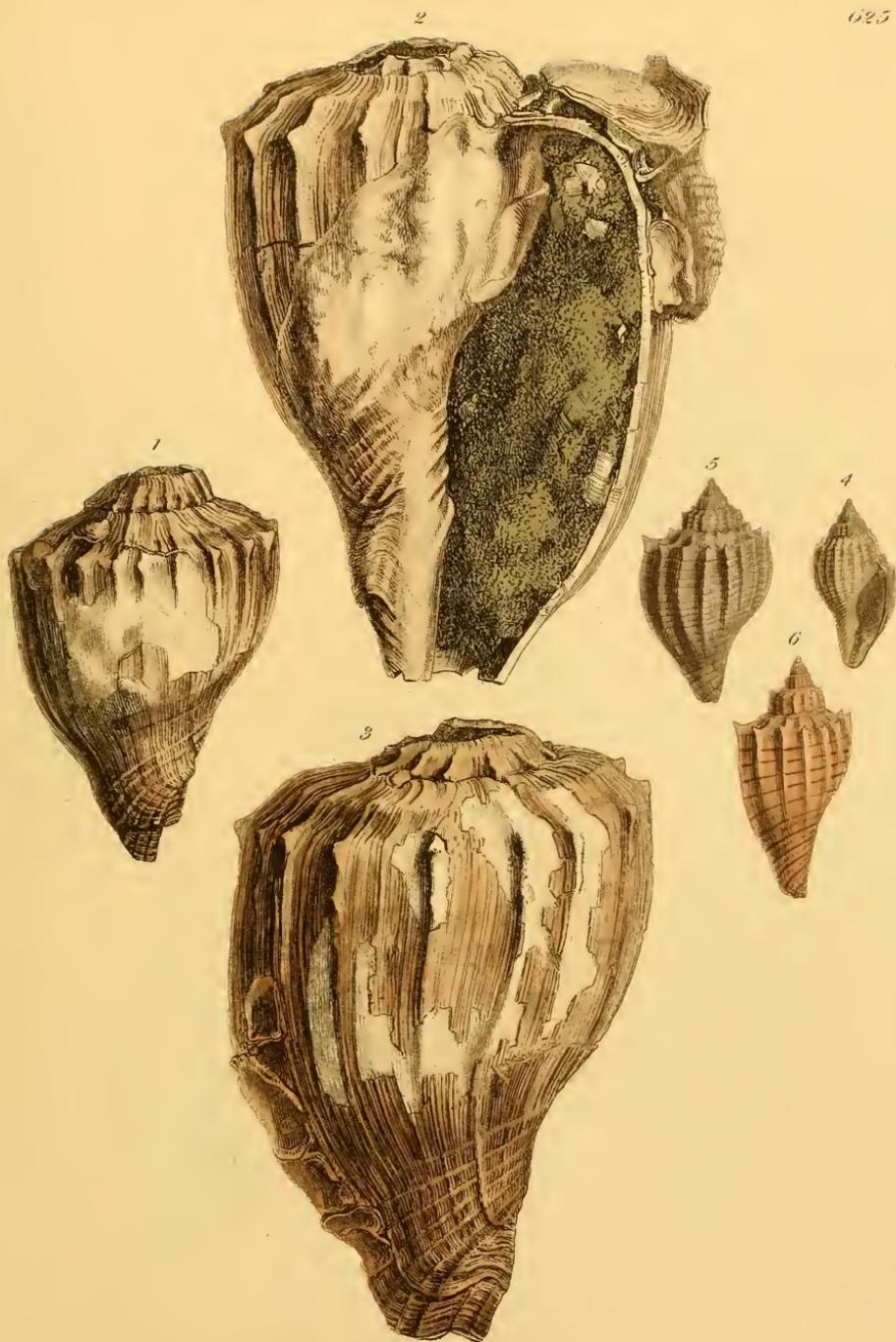
1. 2. *Conus deperditus*
 3. 5. *diversiformis*
 6. var

7. *Conus velatus*
 8. 9. *Corculum*.



1 & 2. *Phanerotinus cristatus*.
 3 & 4. *undus*.
 5.





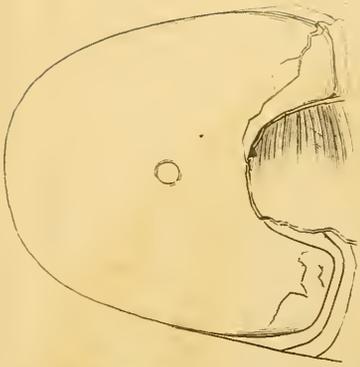
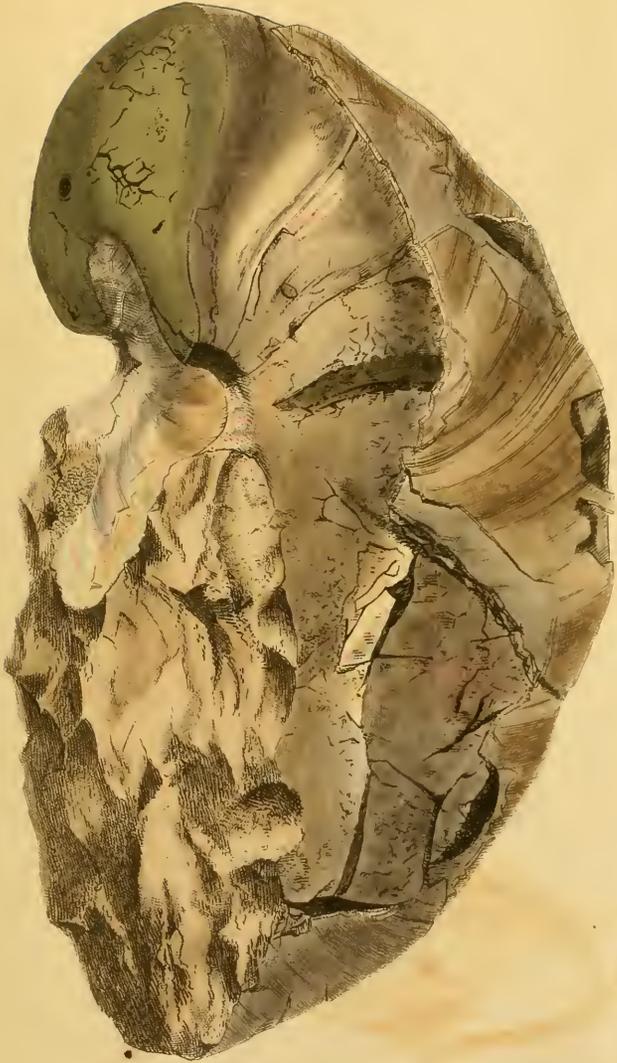
1283. *Voluta Cithara.*
 4 & 5. *scaturis.*
 6. *depauperata.*



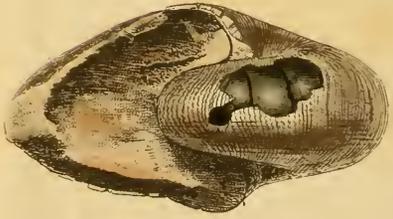
1 to 3. *Voluta angusta*
 4 to 6. *Voluta muricina*



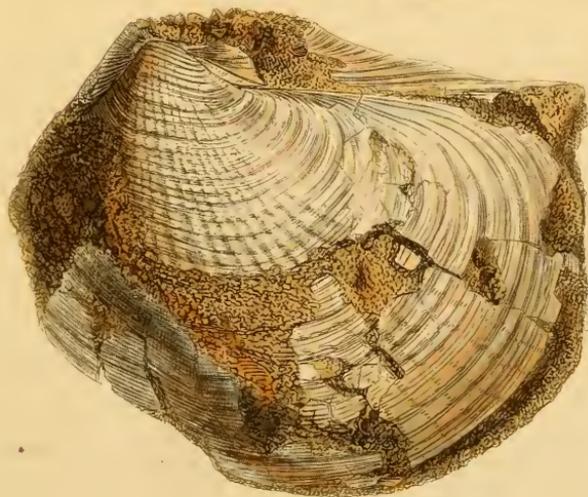
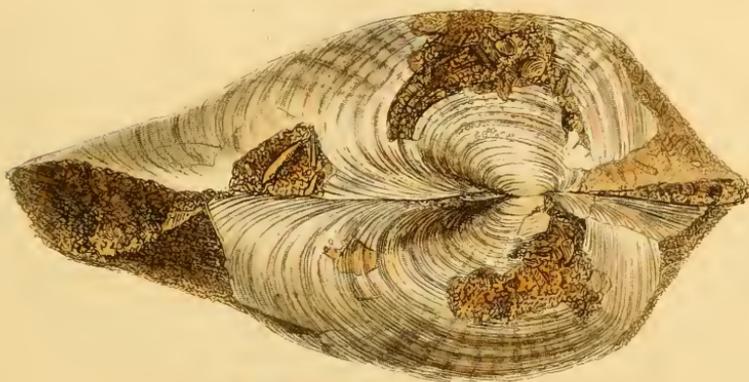
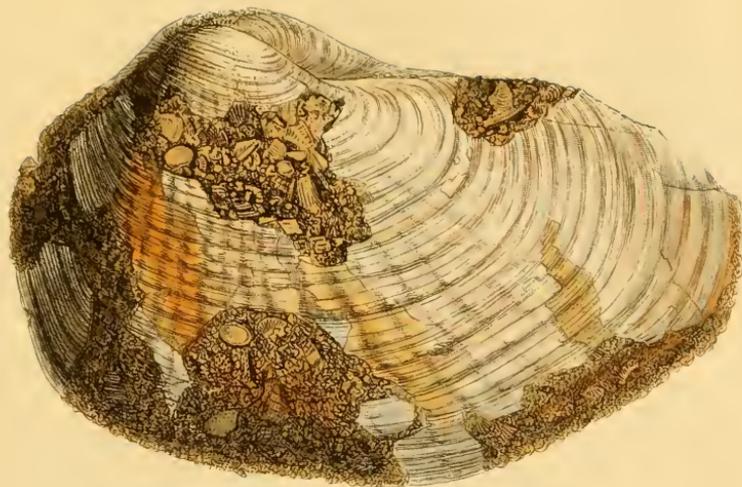
No 3 *Nautilus Sowerbyi*
 4 *superialis*
 5 *regalis*
 6 *centralis*.



Ventulus urhanois



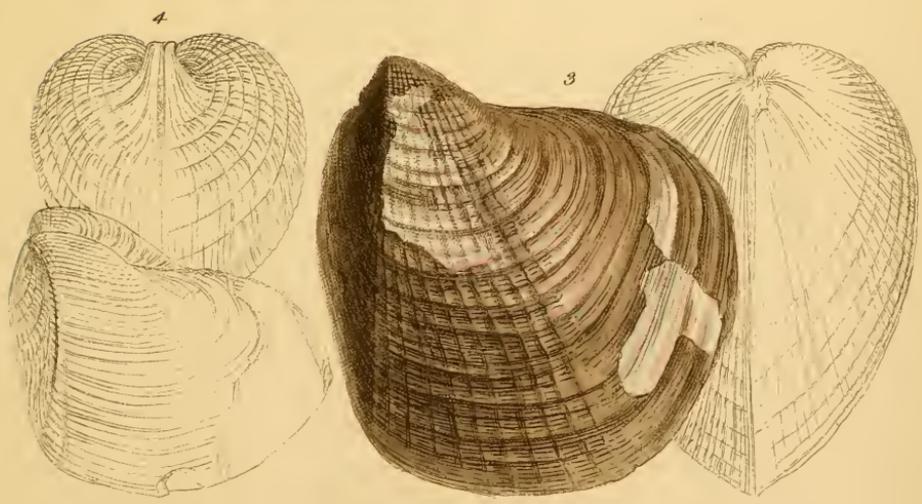
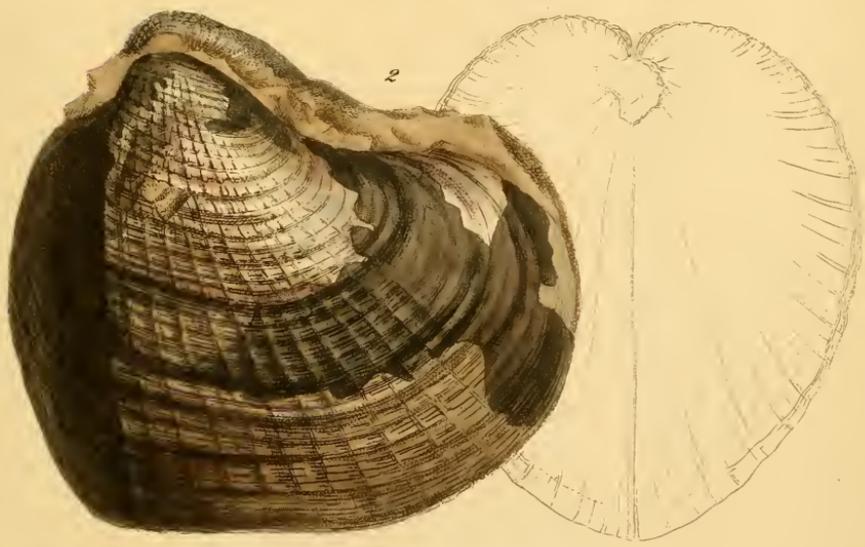
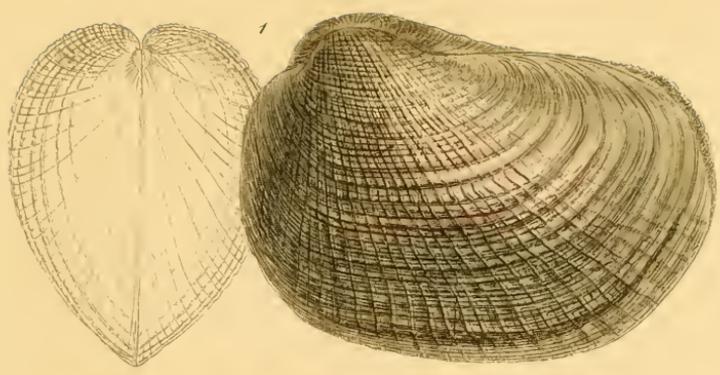




Pholadomya hesterna

Jan 27th 1844



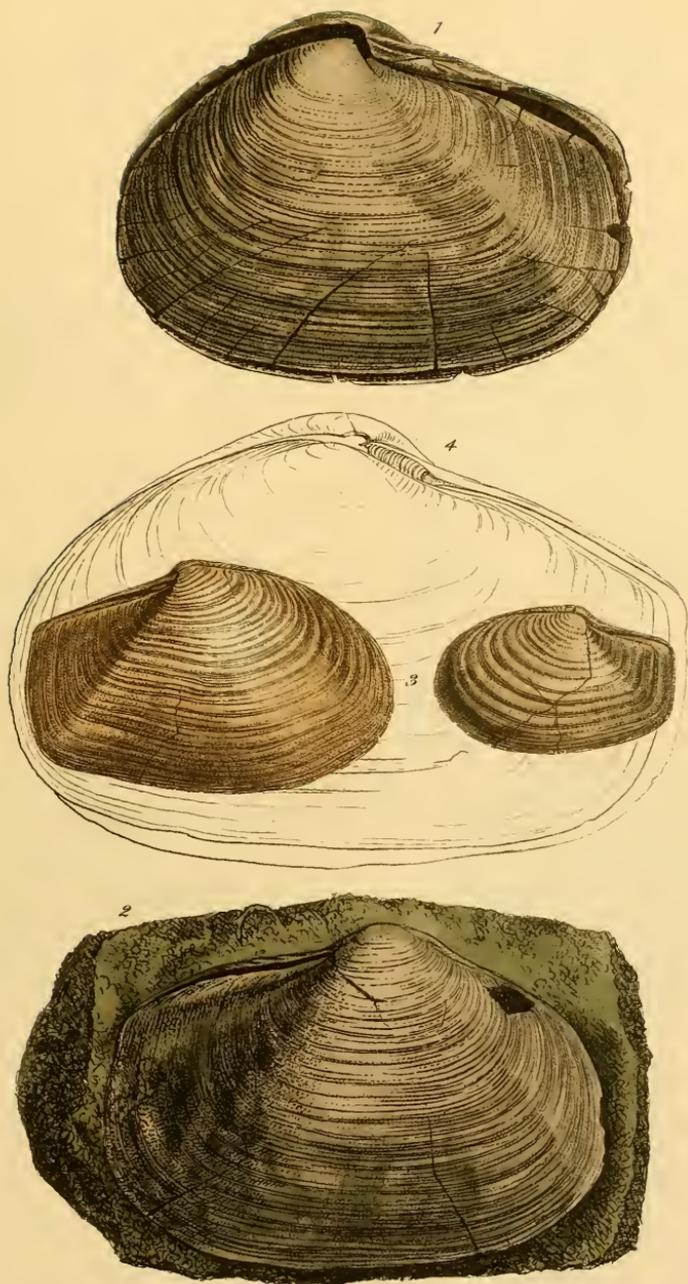


1. *Pholadomya virgulosa*. 2. *P. Dixoni*. 3. *P. margaritacea*. 4. *P. cuculata*.



1 *Thracia pubescens*
2, 3, 4 *inflata*

1854



1. 2. *Thracia oblata*.
 3. *sulcata*.
 4. *pubescens*, recent

Jan 1^{re} 1844.

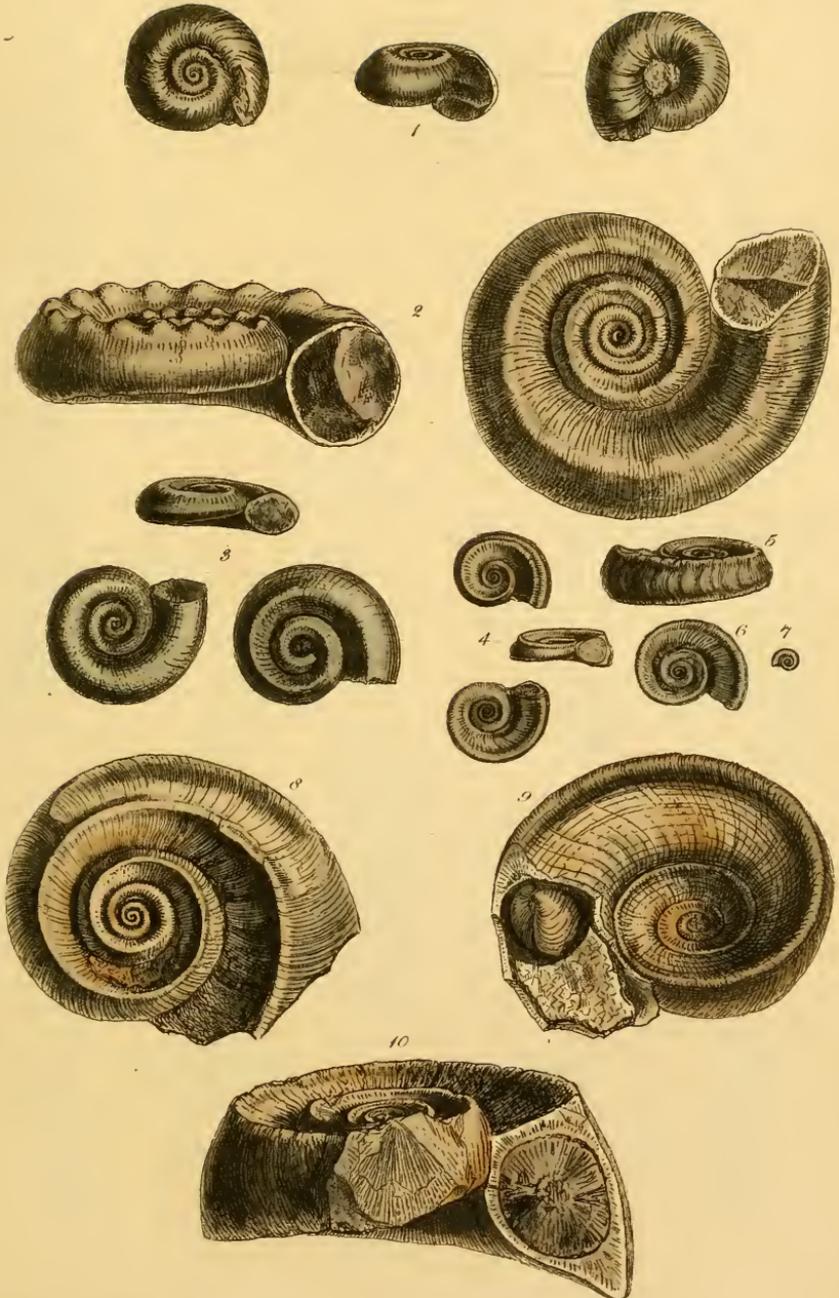
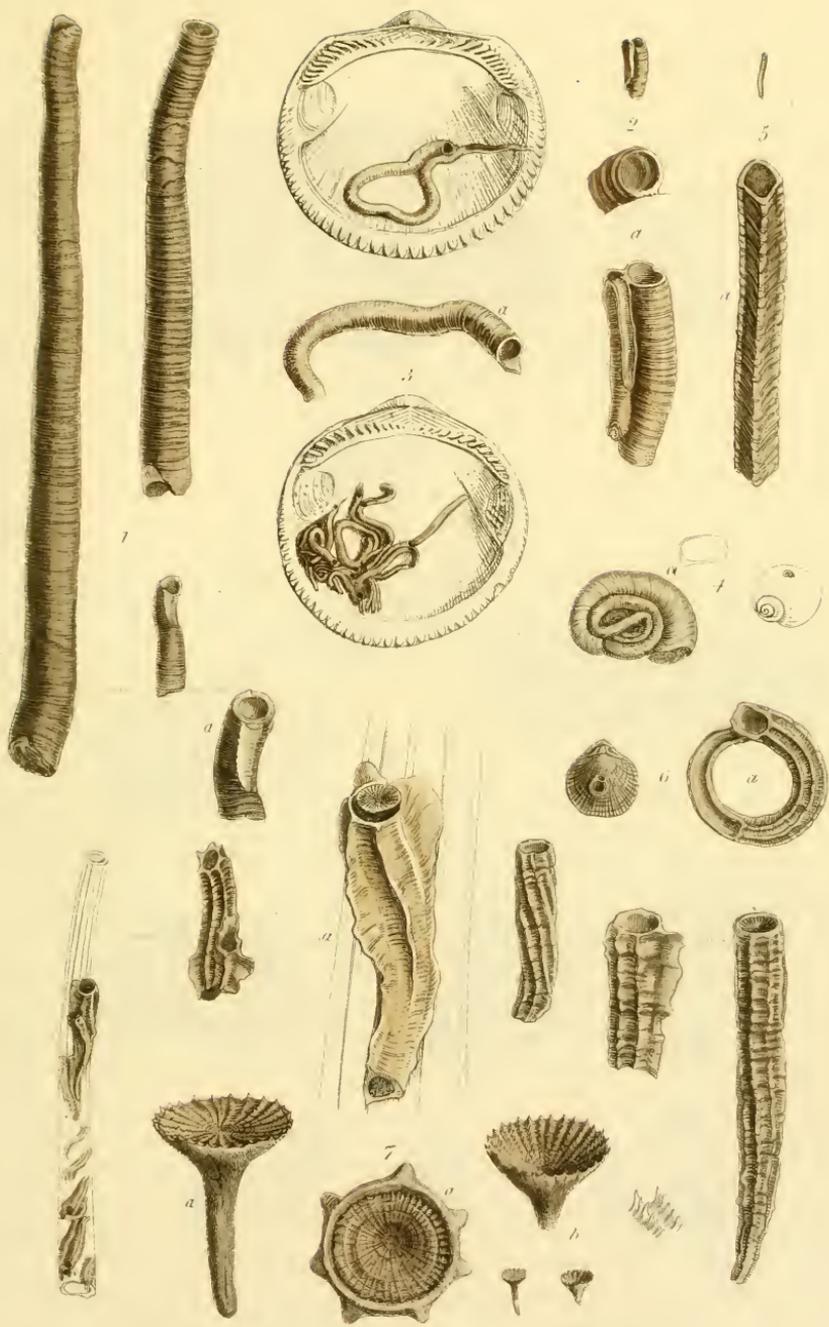
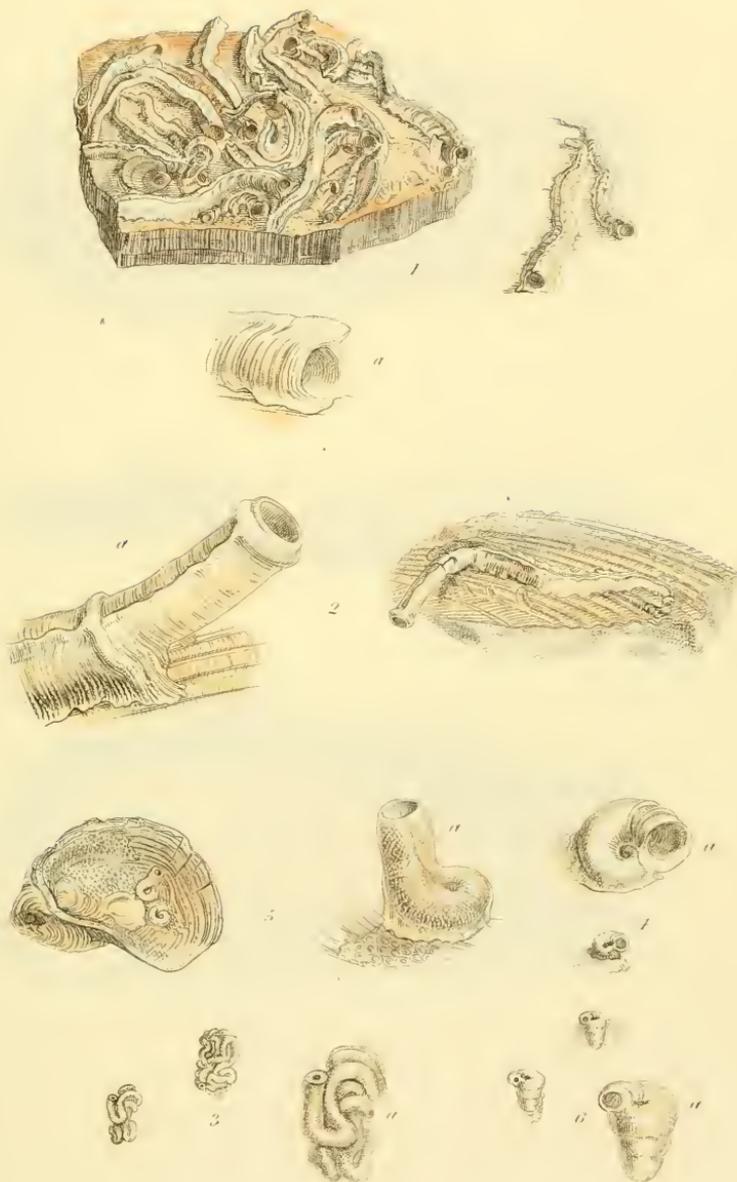


Fig 1 *Euomphalus clausus*.
 2. *Pugilis* var *bifrons*.
 3. *depressus*.

Fig. 4 to 7 *Euomphalus carbonarius*.
 8-10. *Calyx*

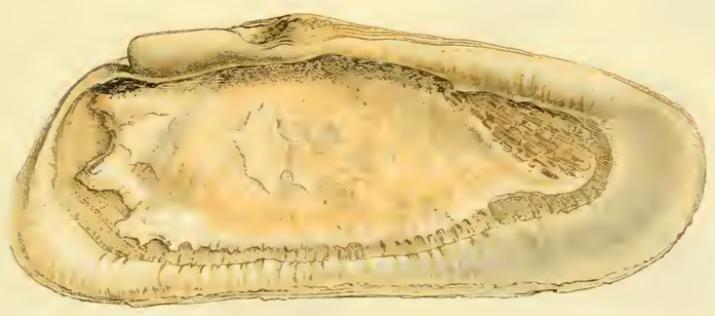


1. *Serpula callosa*.
 2. } *Flagellitornis*.
 3. }
 4. } *antiqua*
 5. *Serpula prismatica*
 6. } *trilobata*
 7. } *inflata*
 a. b. var.



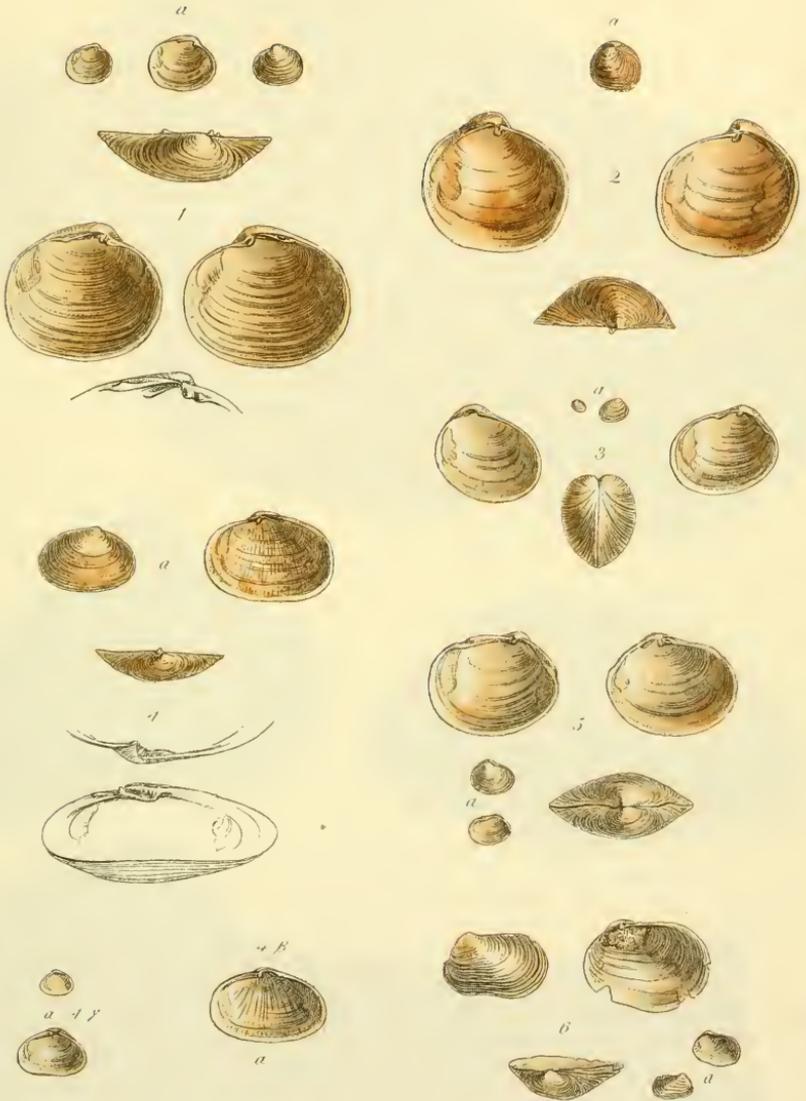
1. *Scapula ovata*. 4. *S. plana*
 2. *Prokus* 5. *pusilla*
 3. *lunata* 6. *Turbinella*

α, magn.
 Mar 1 1845



Gleimeri Vaginæ

Mar. 1. 1844



1 *Kellia suborbicularis.*

4 *Kellia dubia* (L. J. J. Voes.

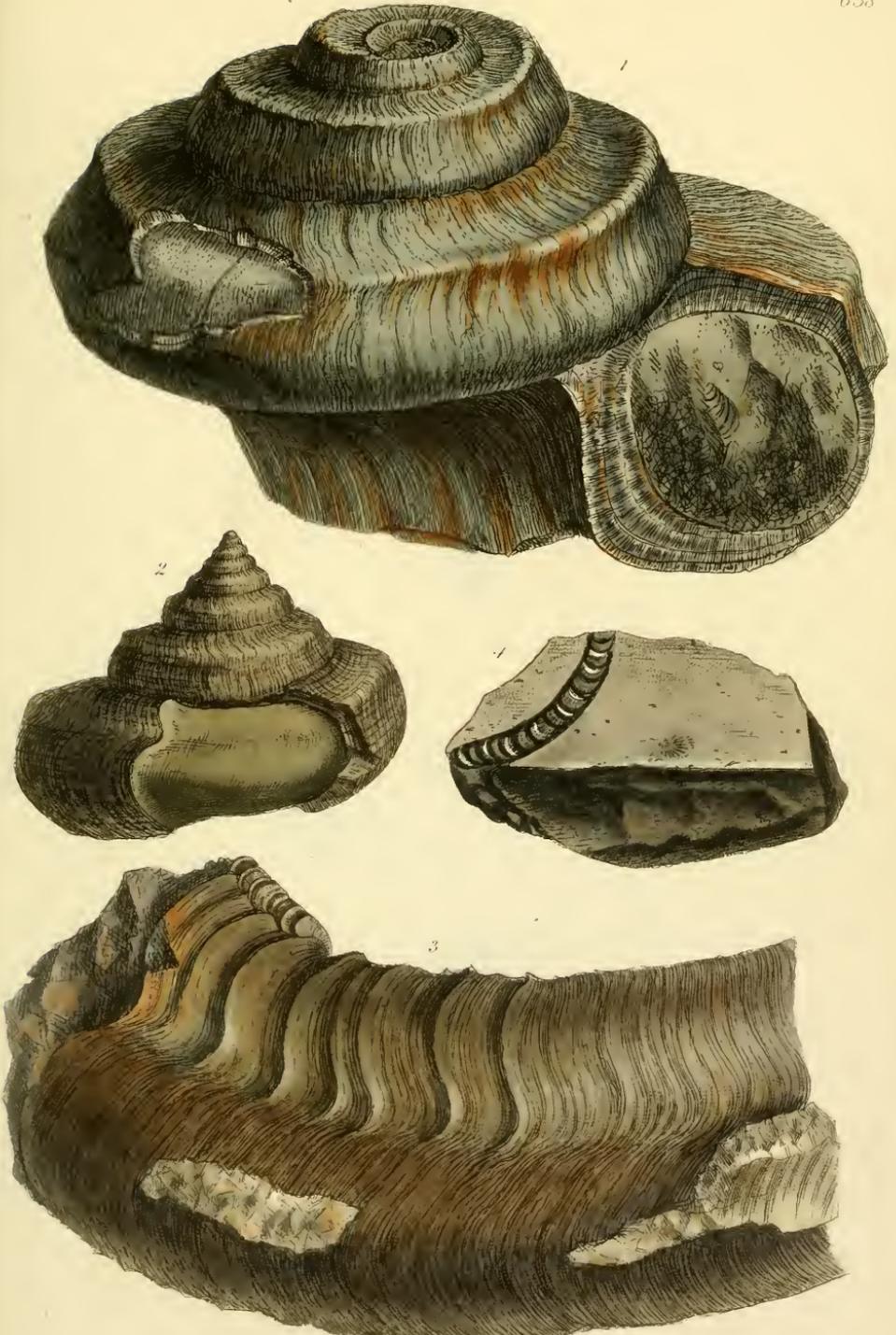
2 *orbicularis.*

5 *flexuosa.*

3 *pumila.*

6 *cyclada.*

a natural size

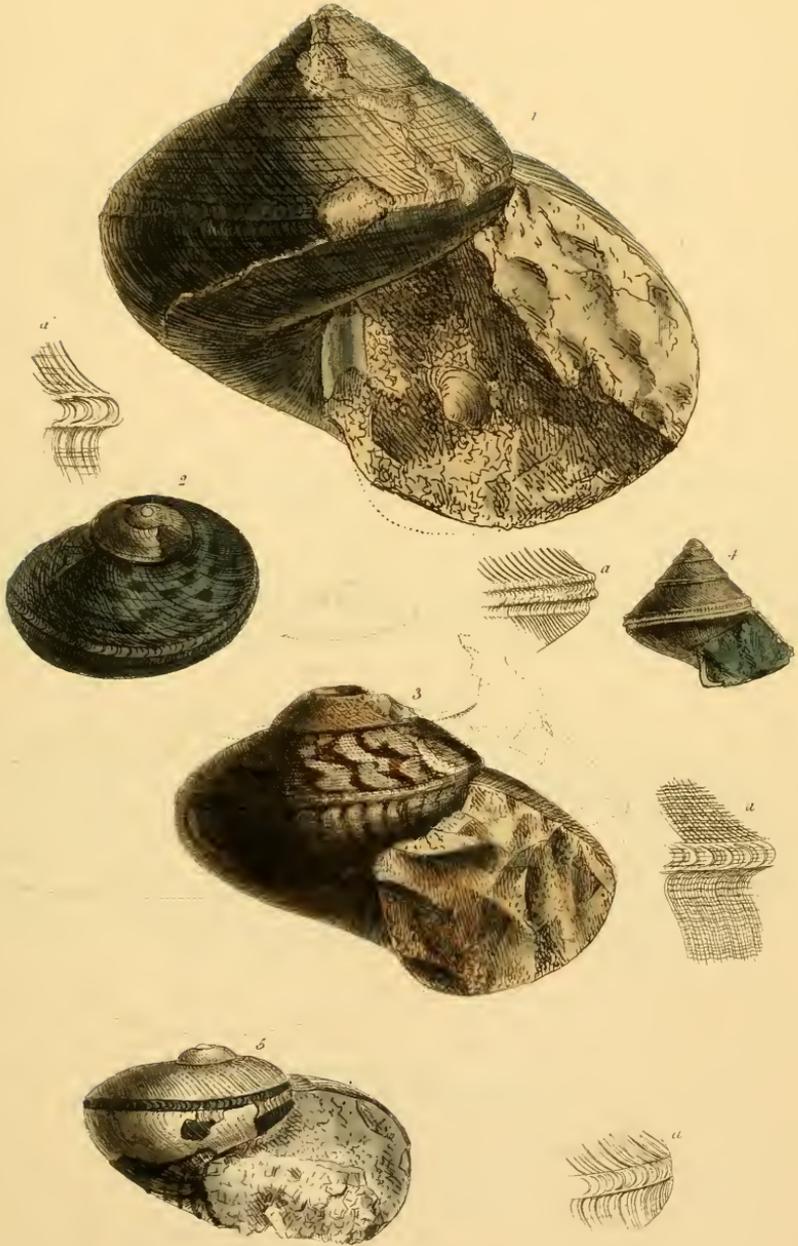


Cirrus tabulatus

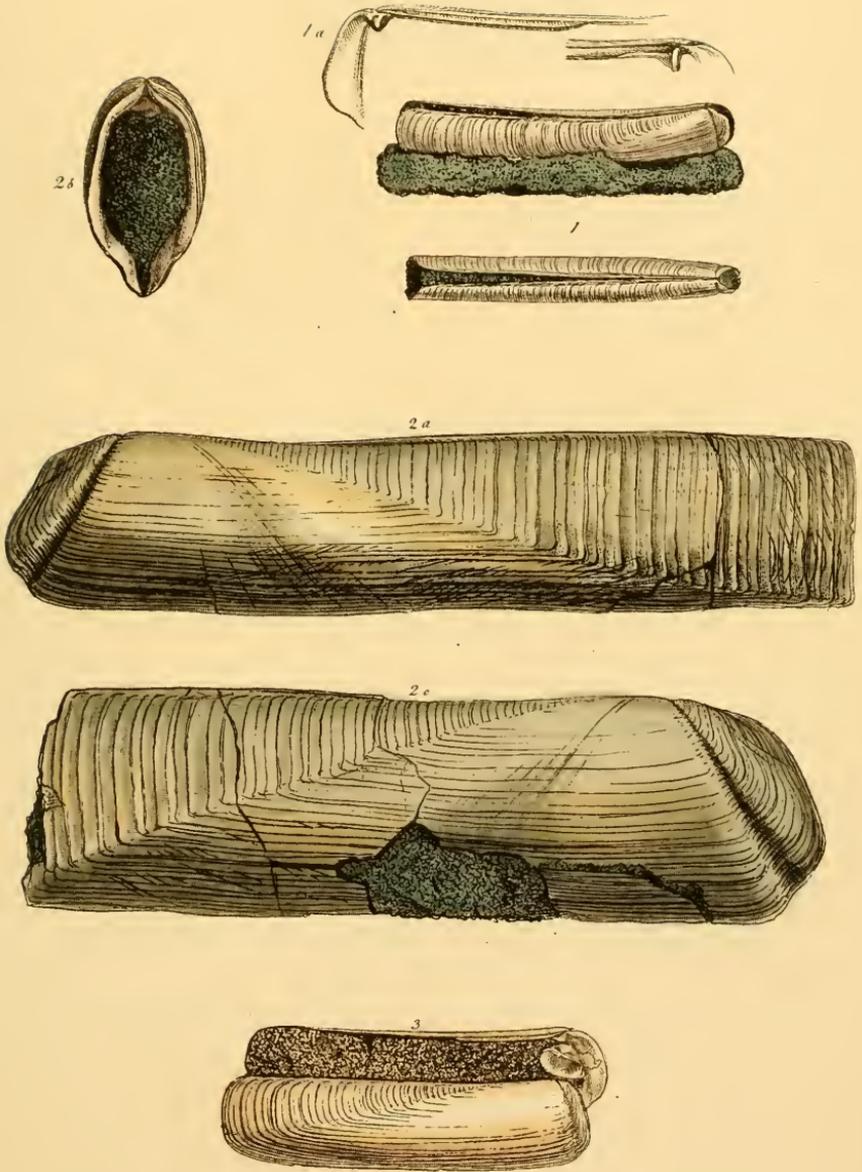
Boet. 1691.



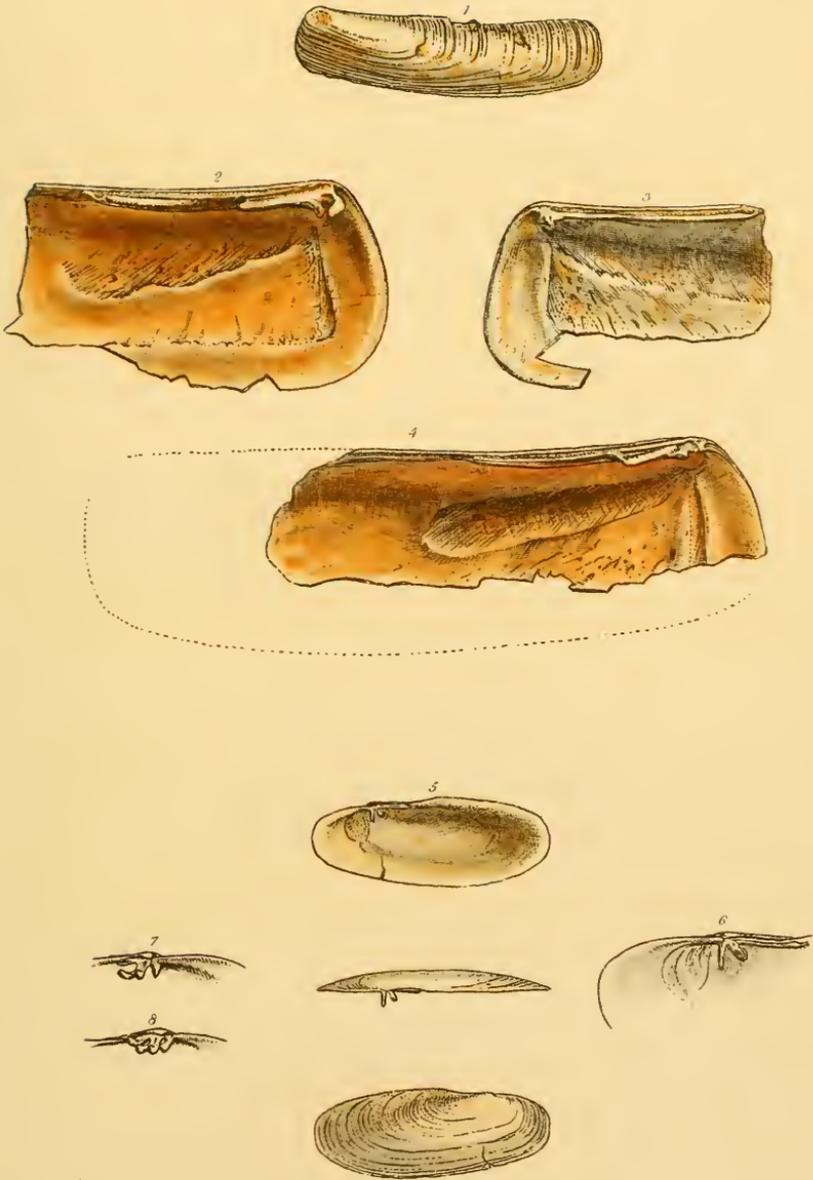
Verticordia cardiformis a. b. c. d. mag^d



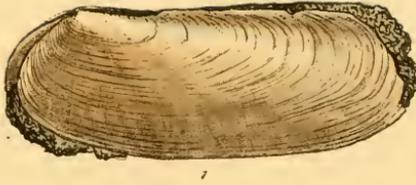
1.2 *Pleurotomana rotundata.*
 3. *carinata.*
 4. *conica.*
 5. *lunata.*



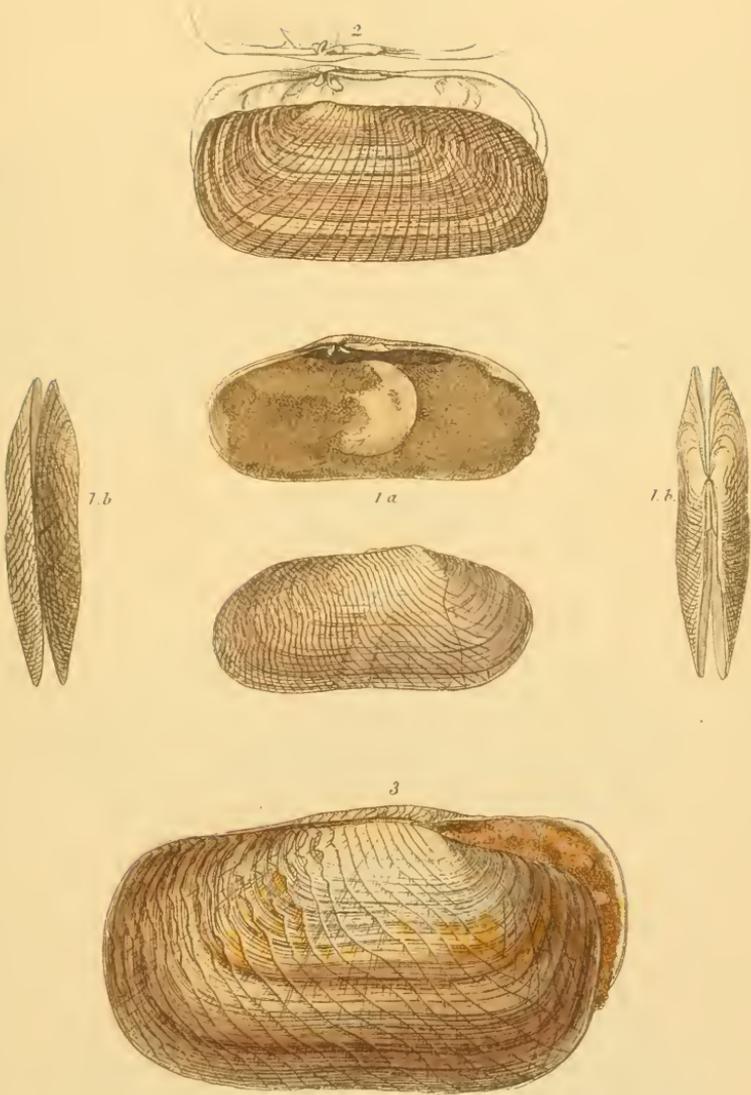
1 *Solen gracilis.*
 2 *Solen obliquus.*
 3 *Solen Duxoni.*



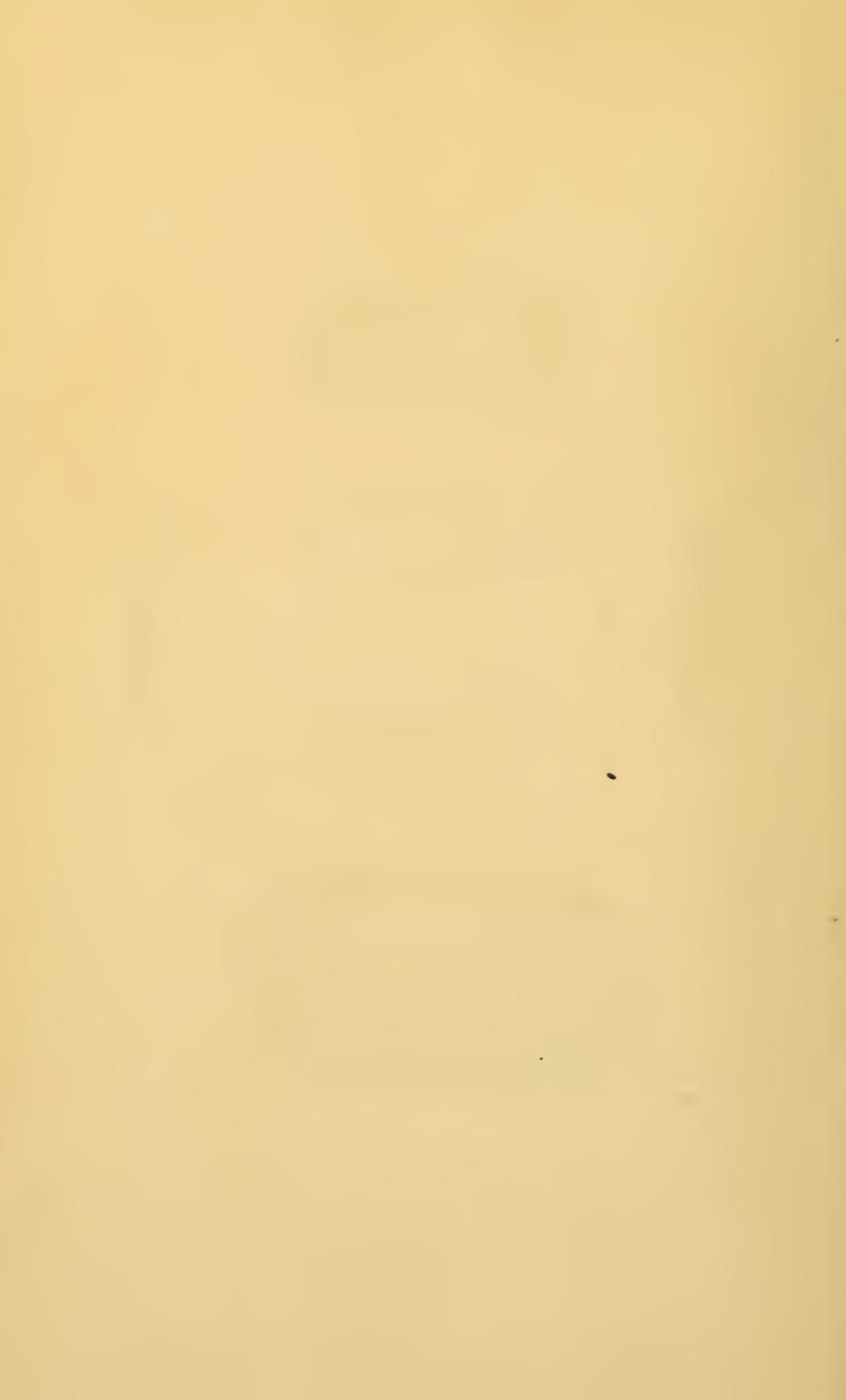
1 *Ensis ensiformis*.
 2 4 *complanatus*.
 5 8. *Cultellus Cultellatus*.

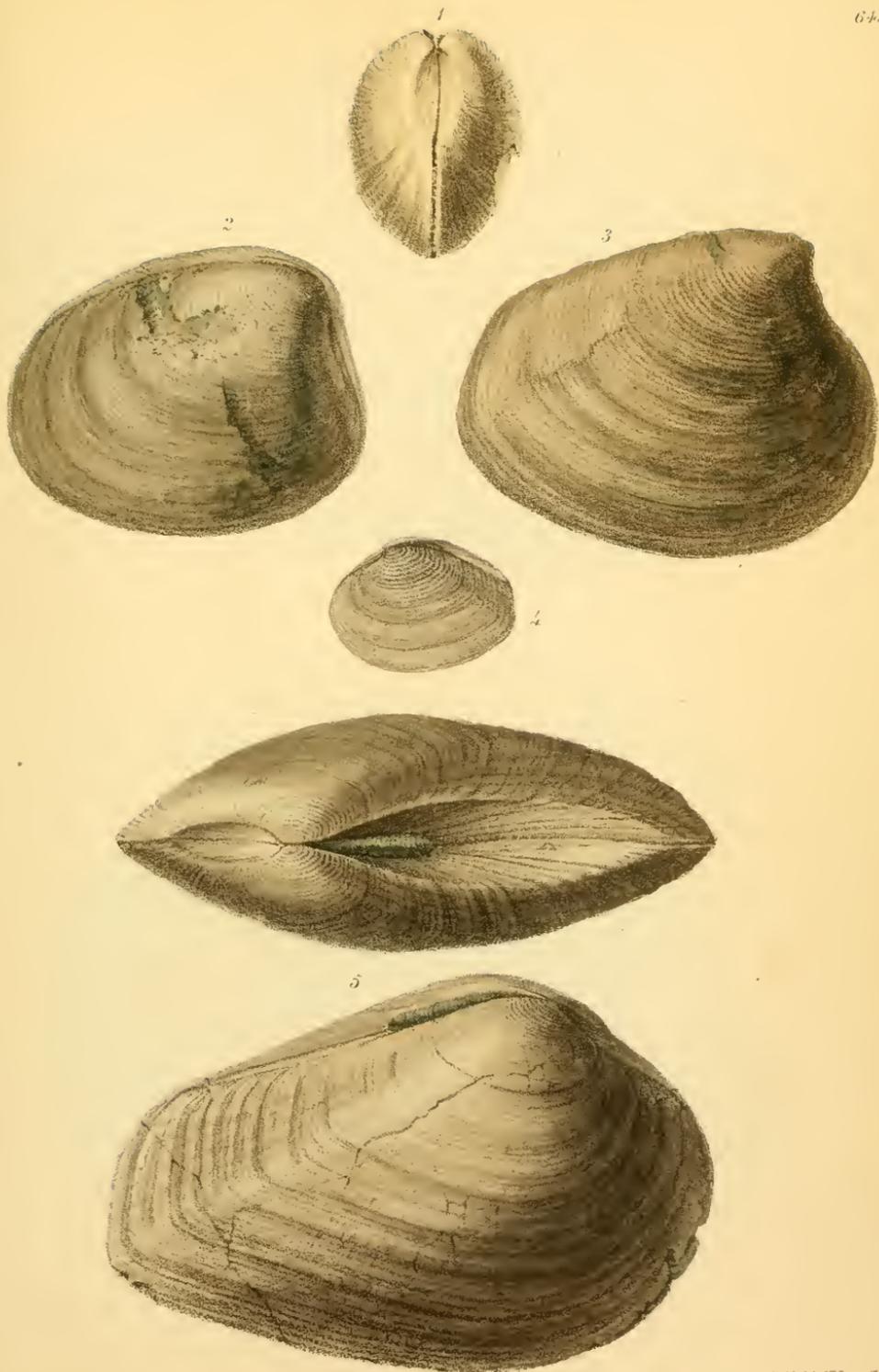


Callulus annis



1 *Solenostoma Parisiensis*.
 2 — *strigillatus*.
 3 — *quadratus* n.s.

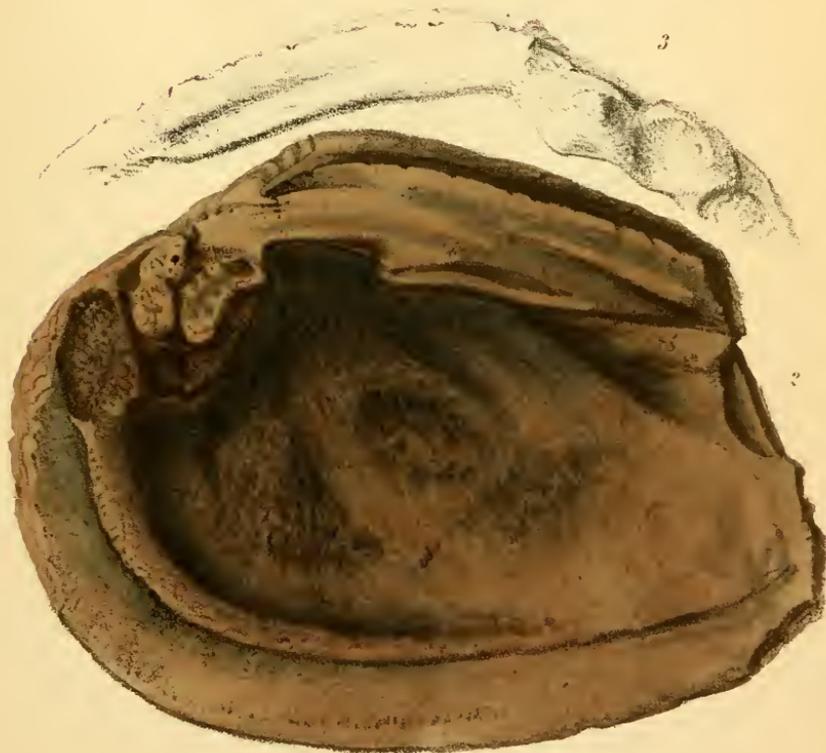




J. Sutter del.

Made by John J. Williamson of Stearns

1 2 3 *Astarte ovata*
 4 5 — *Hartwellensis*
 March 1st 1845



Unio Valdensis

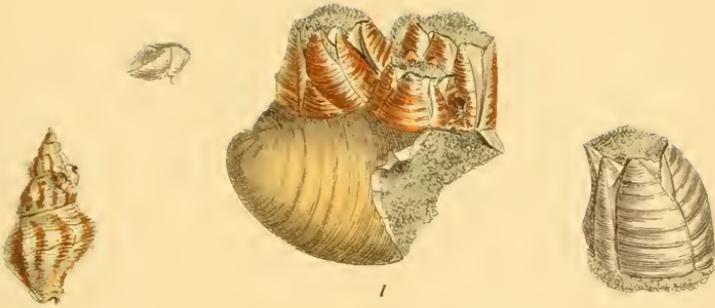
J. Salter, del.

March 19. 1845.

Made by litho. J. Wilkinson, 5, Strand.



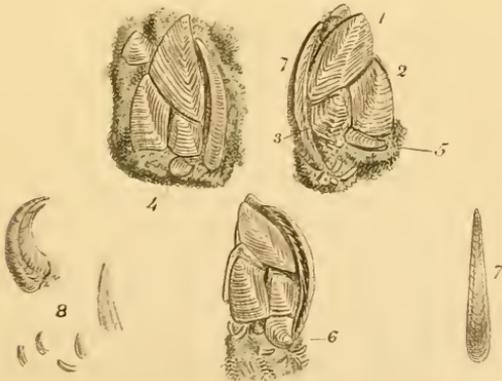
1. *Pollicipes concinnus*.
 2 ——— *planulatus*.



Balanus unguiformis. n.s.



Balanus Erisma. n.s.



Ziphidion quadratum. Deven.

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Tab. DCX.

Fig. 1. *Panopœa gentilis*. Fig. 2. *Panopœa Norvegica*.

Tab. DCXI.

Figs. 1 and 2. *Panopœa Norvegica*. Figs. 3 and 4. *Panopœa Ipsviciensis*.

Tab. DCXII.

Figs. 1—5. *Voluta Wetherellii*. Figs. 6 and 7. *Voluta protensa*.

Tab. DCXIII.

Fig. 1. *Voluta nodosa*, Young. Fig. 2. *Voluta tricorona*.
Fig. 3. *Voluta denudata*. Fig. 4. *Voluta elevata*.

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Tab. DCXV.

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Fig. 3. *Atrypa oblonga.* Fig. 4. *Atrypa fimbriata.*

Tab. DCXVIII.

Teredo articulata.

With descriptions of Tabs. 610 to 614.

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Tab. DCXXI.

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Pseudoliva obtusa.

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Fig. 7. C. velatus. Figs. 8, 9. C. Corculum.

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