To Charles D. Walcott

Souvenir from Jules Marcou

Purchased at the sale of Conybeare's

Library in London in 1857 or 58

DESCRIPTIONS

AND

FIGURES

OF

PETRIFACTIONS,

Found in the

Quarries, Gravel-Pits, &c.

Near BATH.

COLLECTED and DRAWN

By *JOHN WALCOTT*, Esq.

Nor are those innumerable *petrifactions*, so various in species, and structure, to be looked upon as vain curiosities. We find in our mountains, and even in the middle of stones, as it were embalmed, *animals*, *shells*, *corals*, which are not to be found alive in any part of Europe. These alone, were there no other reason, might put us upon looking back into antiquity, and considering the primitive form of the earth, its increase, and metamorphosis.

Of the Use of Curiosity. By *Christopher Gedner*. *Stillingfleet's* Miscellaneous Tracts. p. 175. Ed. 2d.

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PREFACE.

THIS ſmall volume contains deſcriptions, and Figures of ſome, of the many remains of animals lodged in ſtone; and found in almoſt every part of the environs of Bath, in ſo great abundance that every ploughed field produces a plenteous harveſt of them. They are in my opinion undoubted natural proofs of the univerſal deluge, which is circumſtantially deſcribed in the 6, 7, and 8, chapters of Geneſis: nor does England alone poſſeſs theſe

proofs, it being no difficult taſk to bring witneſſes, that they are to be met with in other parts of Europe, viz. Italy,* Germany,** Norway,† &c. nor are the other parts of the world without them, viz. Aſia,‡ Africa,‖ North¶ and South§ America.

In

* Sir W. Hamilton's obſervations on Mount Veſuvius, Mount Ætna, and other Volcanos. p. 116. Ed. 1774.

** Ray's Travels. Vol. I. p. 96. Woodward's Nat. Hiſt. of the Earth illuſtrated and inlarged. p. 21.

† Biſhop Pontoppidan's Nat. Hiſt. of Norway. Vol. I. p. 54.

‡ Shaw's Travels. p. 344.

‖ Haſſelquiſt's Voyages and Travels in the Levant. p. 95. Adanſon's Voyage to Senegal. p. 270.

¶ Kalm's Travels through North America. Vol. I. p. 120.

§ Ulloa's Voyage to South America. Vol. II. p. 257.

In my poſſeſſion are many imperfect ſpecimens of ſhells, which are ſpecifically different from thoſe figured in this volume; this I hope will be an irreſiſtible motive to encourage thoſe who have taſte and leiſure to collect the works of their Creator, to make further reſearches: In this purſuit they cannot fail meeting with ſuch new ſubjects, as will gratify their curioſity, and excite their admiration: for "in the inſtructive book of nature are many leaves, which, hitherto, no mortal has thoroughly peruſed."*

STONES

* Preface to Biſhop Pontoppidan's Nat. Hiſt. of Norway.

STONES

Which repreſent the concave or interior form of bivalve ſhells, in which they were moulded when ſoft.

WOODWARD's* account of their formation is as follows. "That at the time of the deluge, while ſhells, ſuſtained and upheld in the waters, floated, together with ſand, and other the conſtituent matter of ſtone, flint, ſpar, and all other minerals, reduced to their primary particles, the diſſolved matter of theſe, entering the ſhells, filled them up, ſo that they gave their own form, or figure, to the matter ſo received into them, and were as *Matrices* and *Moulds* to it: that of theſe ſhells, whether ſo filled or empty, ſinking together with the matter of ſtone, clay, chalk, and all the reſt that this terreſtrial globe is compoſed of, are made thoſe ſtrata, of which this

* Woodward's Nat. Hiſt. of the Earth illuſtrated and inlarged. p. 27.

this our earth conſiſts: that the ſtrata of mountains afterwards, being laid open by the force of rains, torrents and accidents which often happen in all parts, were broke up, and the ſhells contained in them, which lay uppermoſt, with ſome which lay deeper, were thrown out, and left expoſed at the ſurface: that at length thoſe ſhells, ſo laid open, thrown out, and expoſed, were worn away,* or broke, but the matter encloſed in theſe ſhells, whether ſtone, flint, ſpar, or any other, of a conſtitution firm and ſolid, did ſtill retain, and repreſent the *concave, or interior form* of thoſe ſhells, in which it was moulded."

The figures are of the ſize of the ſubject they repreſent, unleſs where mention is made to the contrary.

F I G. I.

Roundiſh: depreſſed: ſurface unequal: margin, where perfect, ſlightly notched. *Free Stone.*

Found upon the plowed fields.

F I G.

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* The ſhells are often deſtroyed in the ſtrata in which they were lodged by water containing in it vitriol, or other like ſalt, which pervading the ſtrata, it diſſolves them. Woodward's Nat. Hiſt. of the Earth illuſtrated and inlarged. p. 29.

FIG. II.

One end pointed; with a ſhort beak on each ſide: the other end dilated: thickeſt near the pointed end, diminiſhes to the other end: ſurface unequal. *Free Stone.*

Found in a free ſtone-pit, near the Oxford road, about half a mile beyond the monument on Lanſdown.

FIG. III.

Smooth: one end pointed, the other dilated: The ſhell remains on ſome parts, it is very thin, and of a yellowiſh color.

FIG. IV.

Oval: *a* ſhows where the beaks of the ſhell were. The ſurface is often covered with ſpar of a bright gold color. The ſhell in which it was moulded was marked with ſtriæ parallel to the margin.

Found in the lime-ſtone quarries.

FIG. V.

Oval: ſmooth: beaks broad, hooked: formed in FIG. 16.

Common upon the ploughed fields. The quarry men at Warley rocks,* who find it lodged in maſſes of ſtone, call it the *heart of the ſtone*.

FIG. VI.

Oval: ſmooth: beaks broad, hooked. *Free Stone*. Formed in ſome ſpecies of Mya† which are bivalve ſhells gaping at one end.

This is five inches long: and, its ſize excepted, varies little from FIG. 5.

Found with FIG. 2.

FIG. VII.

Nearly rhomboidal: at one of the angles are the beaks, which are hooked.

Length four inches.

Found upon the ploughed fields.

FIG.

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* Three miles and a half eaſt of BATH.

† Linn. Syſt. Tom. I. Pars II. p. 1112. Ed. 13.

FIG. VIII.

Oval: thick: beaks are hooked, and meet: ſeven ridges from the beaks to the margin, they are croſſed with ſmall furrows. *Free Stone.*

Found upon the ploughed fields.

FIG. IX.

Oval: beaks diſtant, hooked: a ſtrait ridge from the beaks to one ſide. *Free Stone.*

Found in a free-ſtone pit near Tog-Hill Houſe.*

FIG. X.

Roundiſh: margin imperfect: beak conic, flat, ſtrait: the ſhell in which it was moulded was marked with concentric furrows. *Free Stone.*

Found at Midford† on the right hand a little beyond the turnpike.

* A Public Houſe five miles from BATH on the Oxford road.

† A Village three miles from BATH on the Frome road.

FIG. XI.

Nearly rhomboidal: at one of the angles are the beaks, which are hooked, their points curved outward: ſtriated from the beaks to the margin. *Free Stone.*

Found with FIG. 9.

FIG. XII.

Oval: beaks-ſtrait, long, conic: the left hand margin is continued up betwixt the beaks. *Free Stone.*

Found in a free-ſtone pit near the Oxford road about half a mile beyond the monument on Lanſdown.

FIG. XIII.

Round: thick: beaks ſhort, hooked. *Free Stone.*

Found with FIG. 9.

FIG.

FIG. XIV.

Round: beaks ſmall, hooked, their points curving outward. *Free Stone.*

Found in many places near BATH.

FIG. XV.

Triangular: beaks ſmall, hooked, their points much curved outward. *Free Stone.*

Found with FIG. 14.

OBSERVATION.

So far as I have obſerved ſhells are never filled with ſtone different from that in which they are lodged.

MYA.

A bivalve ſhell gaping at one end.

FIG. XVI.

Oval: marked with concentric *ſtriæ*: beaks not in the middle, ſhort, hooked. The ſhell is deſtroyed

deſtroyed, but its place is ſupplied by ſpar:* it is filled with *Free Stone.*

This very much reſembles the *Mya pictorum.* Lin: (a ſhell found in great plenty *recent* in the river Avon, which runs between the hills in the environs of BATH) excepting that the ſhell here figured is thicker in proportion to its breadth.

I am not acquainted with any names which I could with propriety give to any of the ſhells from FIG. 17. *to* FIG. 22. *incluſive.*

Valves

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* This happens when *water* containing in it *vitriol*, or other-like *ſalts*, pervades any *ſtrata*; it diſſolves the ſhells lodged in ſuch *ſtrata* by little and little, carries their diſſolved particles away with it, and leaves the *ſpaces*, before filled and poſſeſſed by thoſe *ſhells*, empty; ſo where it happens, that the *water*, paſſing through, carries with it, beſides ſuch *ſalts*, particles of *ſpar*, or other *minerals*, it frequently lodges them in thoſe *cavities*, and there leaves them till at laſt it fills them up. Wherever this happens, it always follows, as of neceſſity it muſt, that the matter of *ſpar*, or other *minerals* ſo *formed*, exhibits and repreſents the very *ſizes*, and perfect *figures*, interior, and exterior, of the *ſhells* whoſe places it had filled. Woodward's Nat. Hiſt. of the Earth illuſtrated and inlarged. p. 30.

FIG. XVII.

Valves thick, round, marked with concentric furrows. The ſhell is deſtroyed, but its place is ſupplied by ſpar.

Petiver* has given a figure of a ſhell very like this: he names it *Pectunculus Americanus cordatus, faſciis craſſis.* He received it from Jamaica.

FIG. XVIII.

Oval: marked with concentric *ſtriæ*: beaks in the middle, ſmall, hooked.

Found on the ſide of the road between Monkton-Farly† and Farly-Wick; among a ſurpriſing quantity of broken ſhells.

FIG. 19, 20, 21, and 22, *agree in having ſhells of equal valves; one ſide truncated; and ſmall ears on each ſide the beaks.*

FIG.

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* Vol. I. tab. 25. FIG. 9.

† About four miles eaſt of BATH.

F I G. XIX.

Round, excepting the dexter ſide, which is truncated: marked with ſmall furrows from the beaks to the margin.

Found at Midford on the right hand a little beyoud the turnpike.

F I G. XX.

Shaped like the laſt: ſtriated from the beaks to the margin: a few *ſtriæ* parallel to the margin: ſome are of a light-brown, others of a blackiſh color.

Found in the lime-ſtone quarries.

Theſe are the ſhells mentioned in the tour thro' the whole iſland of Great Britain,* to be found about Twiverton,† in a field, called Marſ-bury-field, with but little quantity of earth upon the rock; which was full of *foſſil-ſhell*, which had preſerved their natural color of blue and white as perfectly as at firſt.

FIG.

* Vol. II. p. 291.

† A Village about a mile and half from BATH on the lower Briſtol road.

FIG XXI.

This is a full grown ſhell of the laſt, it differing only in ſize; being ſometimes found eight inches and a half long.

Found with FIG. 20.

This is perhaps the large bivalve found by Woodward* "on the ploughed lands, in Weſton fields, about a mile from BATH. There were, as uſual in the ſea, other leſſer ſhells, ſeeming to be of *Balani*, affixed to it."

FIG. XXII.

Oblong oval: about one third of the ſhells ſmooth, the remainder ridged from the beaks to the margin.

MYTILUS.

I have named theſe three ſhells Muſſels, from their reſemblance in habit to ſome of the recent ones; as the principal character the hinge which diſtinguiſhes recent ſhells, cannot be ſeen in foſſil ſhells.

* Catalogue of foſſils. Tom. II. p. 94. c. 1.

FIG. XXIII.

Oval: three very diſtant, concentric *ſtriæ*.

FIG. XXIV.

Shells, oblong oval: thin: of a yellow color: marked with concentric *ſtriæ*: from the wideſt part ariſes a projection which is extended to the beaks.

Found upon the ploughed fields.

FIG. XXV.

Long: rounded at each end: marked with *ſtriæ* parallel to the margin; the back of the ſhells marked with ſhort furrows.

Found at Lyncomb.*

ANOMIA.

Bivalves: with unequal valves, and never eared; the beak of the largeſt or under valve, is greatly produced, and riſes or curves over the beak of the ſmaller or

* A Village about half a mile ſouth of BATH.

or upper valve; and is perforated or pierced through like a tube.

F I G. XXV.*

Pundibs. Shells oval: ſmooth: of a cheſnut color: common ſize little more than an inch in length.

The dimenſions of two remarkable large ones is worth noteing, one found at Hampton rocks is two inches in length, and two in breadth: the other found in a garden at Bathford (perhaps brought there with the gravel for the walks) it is two inches long and but one in breadth.

Found in great numbers upon the ploughed fields. A white variety is ſometimes met with, lodged in free-ſtone.

F I G. XXVI.

Woodward's foſſils, Tome. I. Part II. page 46. f. 215. 216.

Differs from FIG. 25.* the end oppoſite the hinge being truncated.

Scarce. Woodward found them at Tog-Hill, and I have met with one or two nearer BATH.

F I G. XXVII.

Shells ſmooth: of a cheſnut color: margin with five folds.

Common upon the ploughed fields: recent upon the coaſt of Norway.

F I G. XXVIII.

Shells ſtriated both their lenghth and breadth: margin with three folds.

Found amongſt the rubble under the turf upon Hampton-down, and lodged in free-ſtone with FIG. 25* and 30 upon King's-down.

F I G. XXIX.

Upper valve convex: lower valve nearly flat: beak very ſmall: Shells ſtriated from the hinge to the edges.

F I G. XXX.

Woodward's foſſils. Tome I. Part II. p. 50. f. 366, 367, 368.

High waved cockle. Shells with many ribs from the hinge to the edges: beak pointed: margin with a high wave.

Common upon the ploughed fields.

FIG. XXXI.

Ribs ſmaller and more numerous than in the laſt: the edge of the ribs is armed with rows of ſhort ſpines.

Found without the ſpines upon the ploughed fields, with the ſpines when lodged in free-ſtone.

FIG. XXXII.

Shells oval: ribed from the hinge to the edges: margin even: beak imperfect.

Found upon King's-down.

The living Anomiæ have all been found lurking in the nooks between the branchings of corals, or cavities of rocks. They lie therein liſted upon their flat ſurfaces, or horiſontally, without any prop or ſolid body to reſt on; but are upheld or ſuſtained only by a ſtrong adheſion of their tubes or perforated beaks to the ſides of the cavities, as if in the action of ſucking; and

and this poſition is the general one of the recent kinds.

The recent Anomiæ have always a remarkable interior ſtructure:* as have the two foſſil ones FIG. 25* and 33, the former, though found near BATH, filled with a hard clay or with free-ſtone; is found in Hornton quarry, Oxford-ſhire, filled with ſpar; ſometimes ſhot into irregular figures, but for the moſt part forked; the baſis, or place where the branches of the fork are conjoyned, being rooted at the commiſſure or hinge of the valves, and the branches extending themſelves in the broader parts of the ſhells.†

FIG. XXXIII.

Shells with many longitudinal folds, the middle the largeſt: hinge on a perfect ſtrait line: beak of the lower valve does not curve over the upper.

The

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* Da Coſta's Elements of Conchology. p. 258.

† Plot's Nat. Hiſt. of Oxfordſhire. p. 103.

The ſhell here figured was found in a lime-ſtone quarry at Camerton, about ſix miles and a half from BATH on the road to Wells: thoſe found in lime-ſtone quarries 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 ſurface of them are beautifully covered with circular rows of ſmall pyramids of ſpar.

F I G. ——

Shells two inches broad, and near two inches long: ſtriated from the beaks to the edges: a high wave in the middle of the margin: beak of the lower valve does not curve over the upper, but is divided from it by a ſtrait broad furrow: hinge ſtrait.

I have given no figure of this ſhell, as I am not certain it was found near BATH.

It is figured in Plot's Nat. Hiſt. of Staffordſhire. Tab. xi. Fig. 17. to one valve of this ſhell I imagine, (or of Fig. 15, 16, of the ſame plate, which is ſomewhat of this kind, and always found with its valves apart,) was fixed Fig. 13. Tab. XIII. of the ſame work: my reaſons are its being found at the ſame place, viz. at Bereſford in Staffordſhire; and the latter Fig. agreeing very near in ſhape to Fig. 33. A. B. of this work. Plot having with deference to his readers deſcribed a ſtone, as the ſtone of an almond, to which it did not in all reſpects agree; thus writes* of Fig. 13. of Tab. xiii. "And I muſt beg the ſame licenſe for another of this kind, (ſtones formed like the fruits of trees) though one of the greateſt curioſities of this nature I ever met with, for notwithſtanding it repreſents in general the true ſhape of the bicapſular ſeed veſſel of *Digitalis ferruginea*, or of ſome of the *Verbaſcums*, having that patilous fiſſure at the top, which the ſeed-veſſel of that plant naturally has when it is ripe; yet in the moſt protuberent part near the bottom, it is perforated with a ſmall hole, round which there are ſeveral *ſtriæ* or lineations bent (not equidiſtant) but accord-

ing.

* Page 196 of the Nat. Hiſt. of Staffordſhire.

ing as the form of the ſtone does permit, which indeed are not found in the ſeed veſſels of that plant, but in all other matters it truly reſembles them, both in ſhape and magnitude."

FIG. XXXIV.

Woodward's foſſils. Tome I. Part II. p. 44. f. 192.*

*Crow-ſtones.** Upper valve flattiſh: lower concave, the beak of which is much hooked over the upper valve: ſhells thick, formed of ſeveral imbricated plates: the beak is not perforated.

Da Coſta† ſays this ſhell is by all its characters a true oyſter. Linnæus‡ places it in his 314 genus, he calls it *Anomia Gryphus.*

The Scotch call this ſhell *Clach Crubain*; value it as an amulet, and attribute to it the virtue of curing all pains in the joints.§

C OSTREA.

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* Merret's pinax rerum Natur. Brit. p. 216.

† Elements of conchology, p. 254.

‡ Linnæus's ſyſtema naturæ. p. 1151. Vol. I.

§ Pennant's tour to the Hebrides. p. 232.

OSTREA.

Bivalves; with unequal valves; viz. one flat, the other concave.

* *Without ears. Oyſter.*

FIG. XXXV.

A. B. Crooked near the hinge, then dilated; lower valve with ſeveral ridges parallel to the margin.

Found in clay banks on the ſides of hills: commonly with their valves apart.

FIG. XXXVI.

A. B. Round: lower valve very concave; formed of one or two imbricated plates.

Found with FIG. 35.

Mr. Jos. Glanville, in an account of the Baths in Somerſetſhire, ſays, it is affirmed here, (in the city of BATH) that the town for the moſt part is built upon a quagmire, though the places all about it are very firm ground. Some workmen, that have been employed in digging, have

have found a mire ten feet deep, without the north gate, the higheſt place of the town, at ſeven. The earth between is a kind of rubbiſh; ſometimes they find pitching a man's length under ground, and paſſages for the water to paſs; ſeven or eight feet down they have met with *Oyſter-ſhells.**

** *With ears. Scallop.*

F I G. XXXVII.

A. B. Upper valve with five rows of ſmall erect ſcales, from the hinge to the margin: Lower valve marked with fine concentric *ſtriæ.*

Found in clay on the ſide of the road leading from Claverton-down to a village of that name. Single valves are alſo met with lodged in ſtone at the quarries near Kings-down.

F I G. XXXVIII.

Valves equal; with about twenty ſharp ribs radiated from the hinge to the edges.

* Philoſophical tranſactions abridged by Lowthorp. Vol. II. p. 336.

I am aware that this ſhell contradicts the character I have given of the genus; the hinge is the eſſential character of the recent ſhells of the oyſter and ſcallop; but as the hinge cannot be always ſeen in foſſil ones, it is placed here from its agreeing in habit with ſome recent ſpecies of ſcallops which have equal valves.

FIG. XXXIX.

A ſingle flat valve, marked with a few concentric *ſtriæ*: ears equal.

Found in a ſlaty loom at the lime-ſtone quarry near the Creſcent.

AMMONIA.

Univalves, whoſe inſide are divided into many regular and nearly equidiſtant cells or chambers, the partitions of which are not roundiſh and with an even edge, as thoſe of the Orthoceros and Nautilus; but are flaſhed, or jagged, into proceſſes or appendages, which laid together tally and cloſe into one another ſo ſtrongly and curiouſly, that, when joined, the flats or ſurface of the whole Cornua Ammonis are embelliſhed with a beautiful leaved work, exactly ſimilar to that on the ſkulls of animals: and this by foſſilogiſts is called the foliaceous ſutures of the Ammonites. The cells have a pipe or ſiphunculus, that opens into, and communicates from chamber to chamber.*

The ſpires are cylindric, and connected to each other: they gradually diminiſh or taper (on both levels equally alike) from the circumference to the center; ſo that by the gradual tapering of the ſpires to the center, the centers of both flats are concave.†

* *With*

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* The name originates from their reſemblance to the ram's horns wherewith the antients repreſent Jupiter Ammon: whoſe celebrated temple was ſituated in the burning ſands of Libya.

† Da Coſta's elements of conchology, p. 154, &c.

* *With a plain prominent ridge on the back between two furrows.*

F I G. XL.

Camden's Britannia. by Gibſon. Vol. I. p. 93. 1722.

Woodward's Foſſils. Tome I. part II. p. 28. d. 74.* 82.

Owen's obſervations on the earths, &c. about Briſtol. p. 192.

Snake-ſtone. With large tranſverſe ribs, whoſe ends bend towards the mouth of the ſhell: the volutions are marked in ſome places with a foliage like the ſinuated edge of the leaves of ſome plants: varies in ſize. viz. from five inches and under, to two feet and an inch in diameter; and eight inches thick: ſhell very thin of the color of mother of pearl. B. a ſection.

Found in the lime-ſtone quarries near BATH and at Keynſham† a Village ſeven miles from BATH on the road to Briſtol. So far as I have obſerved the flats of this ſhell lay parallel, and conformable

† Formerly the credulous inhabitants of this Village believed theſe Snake-ſtones to have been real ſerpents, changed into ſtone by one Keina, a devout Britiſh virgin,

conformable to the ſurface of the ſtratum in which they are encloſed.

The recent ſhell has not yet been diſcovered, one reaſon given for their not having been found is, that they are bred in the inmoſt and deepeſt parts of the ſea; where they have their abode, and never of themſelves come near the ſhores, nor are flung out of their native ſeats, even by the violence of tides, or ſtorms. Moſt of thoſe ſhells which are caſt upon the ſhores, by tides, or ſtorms, are ſuch as were bred not far off, and among the ſhallows and flats. The diſturbances given by tides, or tempeſts, never reach the inner and deeper receſſes of the ocean.* It is therefore leſs to be wondered at, if the ſhells produced in thoſe places, and there reſiding, are ſeldom found caſt upon the ſhores.†

FIG.

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from whom they likewiſe denominated the name of the place.

A tour thro' the whole iſland of Great Britain. By a Gentleman. Vol. II. p. 291.

* Boyle's works epitomized. Vol. I. p. 271. octavo, 1699.

† Woodward's Nat. Hiſt. of the earth illuſtrated and inlarged: as alſo defended. p. 12. octavo. 1726.

FIG XLI.

The outward volution for half its breadth next the back is tranſverſely ribbed, their ends bending towards the mouth of the ſhell: the inner volutions, and the outward one for half its breadth next them, are ſmooth: diameter near two inches: ſhell thin of a brown color.

** *With a plain furrow or channel along the back.*

FIG. XLII.

Volutions tranſverſely ribbed: thoſe of the outward volution alternately ſimple; the intermediate ones for half their length ſimple, then bifid.

Found at Midford.

*** *Whoſe backs are ribbed.*

FIG. XLIII.

Volutions tranſverſely ribbed: thoſe of the outward volution at firſt ſimple, then bifid; paſs the back and unite again before they reach the inner volution.

This

This is of free-ſtone: it is ſmall when compared with one I have, which I am informed came from the iſland of Portland; it is near thirteen inches in diameter, and near five inches thick.

NAUTILI.

Univalves; whoſe inſide are divided into many regular and nearly equidiſtant cells or chambers, the partitions of which are roundiſh and with an even edge: in the center of the ſpires is a pipe or ſiphunculus, that opens into, and communicates from chamber to chamber. The ſpires never appear externally, but lie latent or quite hidden within the body of the ſhells.

FIG. XLIV.

Round: ſmooth: a round mark in the center of each ſide. *Free Stone.*

FIG. XLIV.*

Oval: nine inches long; ſeven and a half broad; near five thick. *Lime Stone:* alſo of *Free Stone.* B. a ſection.

Found frequently in the lime-ſtone quarries where the workmen call them *Lobſter Tails*; they are alſo met with in free-ſtone pits.

They were moulded in the common thick Nautilus which is found recent in the Archepelago, and in the Eaſtern ſeas: this proves the vaſt diſtance to which creatures were carried, from the place of their original reſidence, at the time of the univerſal deluge.

BELEMNITES.

Strait; one end pointed; at the other a conic cavity; which is divided into many chambers or cells with a ſiphunculus upon the verge of the partition of each cell: When broken (FIG. A.) *appears to be compoſed of horizontal fibres, radiated from the center to the circumference.*

FIG. XLV.

Thunder-bolt. Two inches and a half in length: it terminates at one end in a blunt point, from whence it gradually ſwells to about one third of its length, where it is near three eights of an inch in diameter; thence gradually leſſening to near one fourth of an inch in diame-

ter; where there is a conic hollow three eights of an inch deep.

FIG. B. Is part of a *Belemnite* lodged in free-ſtone. The conic cavity was filled with the ſame ſtone, which is divided into many round joints FIG. *b*. that are at one ſide concave; the other convex.

The following attempt to account for the origin and the formation of the extraneous foſſil commonly called the *Belemnite*, is taken from the Philoſophical tranſactions Vol. LIV. being part of a paper by Mr. Joſhua Plott.

" The *Belemnite* belongs to the teſtaceous part of the animal kingdom, and to the family of the *Nautili*. The ſiphunculus is always upon the verge of the chamber, or cell; and in the ſiphunculus is a little gut or ductus, proceeding from the body of the animal, by dilating or contracting of which the animal, it ſhould ſeem, may go out or into its cell at pleaſure. This is the only ſtay, which the animal has to ſecure its retreat: nor does the gut or ductus paſs through all the cells to the end of the ſpiral cone, either in this ſhell or the *Nautilus*: For the ends of the ſpiral cone of concamerated ſhells are ſhut up in the

ſame

ſame manner with thoſe of the turbinated kind: and it is common for all turbinated ſhell-fiſh, as they increaſe in bulk, and enlarge their ſhells, to leave their bottom or firſt formed convolutions. Therefore I make no doubt but the ſame is done by the concamerated tribe; for if the gut go through only one or two valves, it will be a ſufficient ſtay to the animal, and being contracted or dilated, will ſerve all the purpoſes above mentioned. How far this is practicable by our little inhabitant, cannot abſolutely be determined; but if it be conſtantly fixed by the gut to the ſiphunculus, it has a ſurpriſing power of contracting and dilating its body, to extend ſo far as the bottom or point of the *Belemnite*, which is more than thirty times the length of the cell, into which it returns. I am apt to think, this gut or ductus, as well as the body of the creature, is capable of being extended very conſiderably, to ſerve all the uſes of forming the *Belemnite*, without leaving the ſiphunculus; and that the gut ſerves for the ſame purpoſes with the tendons of the oyſter; the latter to open and ſhut the ſhell; the former to allow the animal to go out and in at pleaſure. And as the oyſter feeds altogether in the ſhell, by opening the verge, the *Belemnite* (whoſe reſidence is in the great deep, which is ſeldom diſturbed) very

very likely goes out in queſt of food, but travels only upon the guard, or rampart, leaving a trail behind, as all land ſnails do; which hardening into a teſtaceous ſubſtance, increaſes the dimentions of the outer wall, both in length and thickneſs, from the cell or chamber, to the bottom or point of the whole *Belemnite*. The animal in its progreſs and return claſps the whole guard, as a ſnail does a ſmall branch of a tree in the gardens; and where the two ſides meet, there the ſulcus is formed, as is evident from the laminæ.

Fig. C. repreſents the *Belemnite* ſplit up the middle, with the ſiphunculus in the front: *a*, *b*. exhibit the firſt formed cell, or ſeat of the animal ab ovo. As the animal grows larger, it forms a ſecond cell or chamber *b* to *c*, at the ſame time covers the firſt cell, by forming the appendage or guard *c*, *i*, which is the firſt ſtage of the *Belemnite*. In forming the third cell *c*, *d*, freſh laminæ or coverings are carried on from *d*, to *k*, and ſo of the reſt, *e*, *f*, *g*, *h*; or *l*, *m*, *n*, *o*. The conical cavity and its nucleus are always proportioned to the bulk of the *Belemnite*, but not to its length: ſome are four times longer in proportion to the alveolus than others; the apex of the conical cavity, where

where the alveolus is firſt formed, in ſome runs up about half the length of the whole *Belemnite*, in others not the ſixth part of the whole: but the aperture, or upper chamber is equally proportionable to the bulk, or circumference of the *Belemnite*, of whatever ſize or ſhape; and is the ſeat or dwelling place of the animal, that forms the *Belemnite*.

Fig. D. Shews the *Belemnite* in the moſt perfect ſtate we ever find it.

Fig. E. Is the fuſiform *Belemnite* found in chalk, and the pricked lines. *b*, *c*. *b*, *c*. ſhow what the fuſiform *Belemnite* was, when perfect, with the alveolus *d*, *e*,——*a* ſhews where the alveolus terminates."

Fig. F. Is part of a *Belemnite* with the *Angular Serpula*. *Serpula Triquetra*, *Lin.* adhering to it: marine bodies attached to the *Belemnite* clearly prove it to be of marine production.

It was found near Lanſdown in the lane leading from the down to Langridge, Wolley, &c.

Fig. 45. and B. Were found in a free-ſtone pit near the Oxford road, about half a mile beyond the monument on Lanſdown.

The

The *Belemnite* receives its Engliſh name *Thunder-bolt*, from the vulgar, who ſuppoſe it to be indeed the darts of heaven. The *Belemnite* if rubbed will take up chaff, and other light bodies like amber. Burnt or ſcraped with a knife, they yield an odour like raſped horn. After calcination, has all the properties of the *Bolognian Stone*, which, if expoſed a few minutes to the ſun, and immediately taken into a dark room, will ſhine like *Phoſphorus* for ſome time; and when the light diminiſhes, if again expoſed to the ſun, its ſplendor will be renewed.

STONES.

Which repreſent the interior form of univalve ſhells; in which they were moulded when ſoft.

FIG. XLVI.

Of a cylindric form rounded at one end, at the other four ſpires. *Free Stone.*

FIG. 47. Is a recent ſhell of the ſame genus with the ſhell in which this ſtone was formed.

FIG.

F I G. XLVIII.

Volutions three, their ſides roundiſh.

Formed in a trochus or top ſhell. The ſhell (as may be ſeen by an impreſſion taken in the hollow made by the ſhell which is deſtroyed) had the ridges of the ſpires riſing into blunt diſtinct tubercles, with intermediate *ſtriæ*.

Found in a lime-ſtone quarry.

F I G XLIX.

Volutions four, their ſides flat.

This was formed in a trochus with a perforated baſe: the ſhell was ſtriated, parallel with the volutions.

Found in a free-ſtone quarry.

F I G. L.

Somewhat depreſſed: three inches in diameter: volutions four, their ſides flatiſh: baſe perforated.

Found in a free-ſtone quarry.

FIG. LI.

Volutions four, not joined to each other. *Free Stone.*

FIG. LII.

Number of volutions uncertain, all I have met with being imperfect: ſpires marked with ſeveral ſmall ridges: largeſt volution an inch and half broad. *Free Stone.*

FIG. LIII.

Oval: volutions four, ſmooth.

The figure is ſomething larger than the foſſil. *Free Stone.*

FIG. LIV.

Taper: five volutions, which are diſtant from each other. From Fig. 48. to Fig. 54. incluſive are called by the quarry-men *Screws.*

Found in a free-ſtone quarry.

FIG. LV.

Depreſſed: volutions two, round, diſtant from each other. *Free Stone*

FIG. LVI.

Depreſſed: volutions three, a ſharp ridge runs in the center of the upper ſurface of the volutions. *Lime Stone.*

SERPULA.

Tubular ſhell adhering to other ſhells.

FIG. XLV. F.

Angular Serpula. A triangular ſhell: irregularly twiſted.

Adheres to (in a creeping form) part of a *Belemnite* and frequently to FIG. 27. In a recent ſtate adheres to ſtones and other ſubſtances upon the coaſt of Great Britain.

MADREPORA.

Coral, with cavities lamelloſo-ſtellated.

FIG. LXII.

Porpita. Button-ſtone. Round: one ſide flat, the other convex: finely ſtriated from the center to the circumference. The *ſtriæ* are cauſed by the edges of the thin perpendicular plates of which this coral conſiſts, and which are radiated from the center to the circumference.

E. a variety of a conoid ſhape: there is another variety both ſides of which are nearly flat.

Found in the gravel-pits: and upon the ploughed fields.

FIG. LXIII.

The ſurface elegantly marked with quinquangular cells, which are formed by perpendicular thin plates, radiated from the center of each cell to their edges which are a little prominent: the lower part is of a conoid ſhape marked with fine circular *ſtriæ*.

Found beneath the turf upon Hampton-down.

Mr.

Mr. Pennant has given a figure and deſcription of this *Coral* in the Philoſophical Tranſactions for 1756. Vol. 49. Tab. 15. Fig. 5. p. 514. He received it from Italy, under the name of *lapis ſubluteus Veronenſis ſtellis majoribus.*

BONES, &c.

FIG. LXIV.

At one end are two vertebræ, three inches in diameter, and a little more than an inch thick: one of them has ſlid a little from beneath the other.

At the other end is a bone an inch and a half thick, and four inches broad at bottom: the upper end is round and about three inches in diameter.

Found in a lime-ſtone quarry near the Creſcent.

FIG. LXV.

Six inches long: triangular: the two broadeſt ſides are flat, and fluted: the other ſide is roundiſh, ſmooth, except near the top, where there are a few tubercles.

FIG.

ECHINUS.

Shell hemiſpherical, or nearly ſo.

FIG. LVI.*

Five double rays (each compoſed of two lines of very ſmall holes) proceeding from the center of the top of the ſhell, to the aperture in the middle of the baſe; between the rays there are many very ſmall tubercles. One inch in diameter.

Found upon the ploughed fields, in the gravel pits, &c.

This is perhaps the *Echinite* valued as an *Amulet* which Mr. E. Lhwyd mentions in his obſervations in natural hiſtory, &c. in Scotland:*

" *The Cock-knee ſtone* is an *Echinites pileatus, minor* of flint; which they firmly believe to be ſometimes found in the knees of old cocks; and a fellow in Mul proteſted to me, (though I was never the nearer believing him) that he had with his own hands taken one of them out of a cock's knee;

* Philoſophical tranſactions abridged by Jones. Vol. V. p. 123.

and named two or three others who had done the like."

F I G. LVII.

With many rows of ſmall equal-ſized tubercles, proceeding from the center of the top of the ſhell to a large aperture in the middle of the baſe.

Found in a free-ſtone pit near Tog-hill houſe.

F I G. LVIII.

Half the ſhell is lodged in free-ſtone; the other half has four nearly equal diſtant rows of round tubercles, with ſeveral ſmaller between them: in the center of the top of the ſhell is a large aperture: the bottom of the ſhell is covered with the ſtone: the ſides are round.

Found near Mr. Keynton's houſe in the bank of the road leading from BATH to Claverton-down.

F I G. LIX.

Woodward's foſſils Tome I. part II. p. 67. h. 58.

Five

Five double rays (each compoſed of two rows of very ſmall holes) proceeding from the center of the top of the ſhell, to a ſmall aperture in the baſe: near the center of the top of the ſhell is a ſmall aperture, from which to the margin there is a broad channel: the baſe is a little concave; the aperture in it is not in the center.

Not uncommon upon the ploughed fields near the brow of the hills; and in the gravel and ſtone-pits.

ASTERIA COLUMNARIS.

FIG. LX. A

Starſtone. Cylindrical, but pentangular, often crooked; a cinquefoil at each end compoſed of very ſhort tranſverſe ridges: it conſiſts of ſeveral joints: a piece of fourteen joints is exactly an inch long. Single joints are ſometimes found.

Pieces about an inch long are not uncommon in the lime-ſtone quarries near the upper Briſtol road.

The animal to which this belongs is found recent on the coaſt of Barbadoes: Mr. Ellis has given

given a figure and deſcription of it in the Philoſophical Tranſactions for 1761, p. 357. He names it

Encrinus, Capite ſtellato, ramoſo-dichotomo;

Stipite pentagono, equiſetiformi.

ENTROCHUS.

FIG LXI.

A conoid body of ſeven joints. B. C. two views of one of the joints, except a ſmall breadth from the edge, which is flat, both ſides are concave, which makes the edge of the hole in the center very thin.

D. *St. Guthbert's beads.* A ſmall ſingle joint: thin: round: the utmoſt round ſmooth: a round hole in the center, from which to the circumference are drawn ſmall rays: when two joints are joined together the rays of one enter into the furrows of the other.

Found in the pits from whence they dig ſtone to make the new road leading from King's-down to Bradford, &c.

MADREPORA.

FIG. LXVI.

Part of the under jaw of ſome quadruped: *a*, *b*. two cutting teeth; they are round where lodged in their ſockets, compreſſed towards the top. *c*, a canine tooth pointed and ſharp-edged at top; it has two fangs: *d*, *e*, *f*; three grinders, their tops riſing into conic projections: *d* has two fangs: *e* five: thoſe of *f* are broke off, and the tooth is ſunk into the jaw. At* part of the jaw is broke off, and the teeth that were lodged in it are loſt, all the teeth are figured out of their ſockets: *g* a tooth belonging to the ſame animal. *h* a bone found near the jaw, and probably belonging to the ſame animal.

Found at Midford on the right hand a little beyond the turnpike, lodged in loom about four feet deep.

FIG. LXVII.

A ſingle tooth: the top is divided into four conic parts: ſeveral very fine ridges from their points to the baſe: it is quite black: the tooth is imperfect.

Found in a lime-ſtone quarry; in a piece of which ſtone it is lodged.

FIG. LXVIII.

Conſiſts of ſeveral oblong black bodies; in the middle of each runs a very ſmall ridge; from which to their margin are numerous, very ſmall ridges: five of the largeſt of theſe bodies are in a row at bottom; two of which next each other are ſmooth in their middle: above theſe are ſix ſmaller placed in a row, one of them has its middle ſmooth, it is directly above thoſe two in the bottom row whoſe middle is ſmooth: above theſe two lower rows is a row conſiſting of three of theſe bodies of a rhomboidal ſhape. On the other ſide of this maſs (which is not in its thickeſt part above an inch) are three more of theſe bodies; two of them are even with the bottom row on the oppoſite ſide; they appear to have ſlid: one of them, (which is neareſt thoſe on the other ſide) has its middle ſmooth: the third on the ſame ſide is even with the ſecond row on the oppoſite ſide: theſe bodies lay length ways of each other, and quite cloſe: and are joined in a maſs by a very hard bone.

This was found (as I am informed) in a lime-ſtone quarry near the Briſtol road, about ſix miles from BATH: at the ſame place was found another

another maſs* conſiſting of 25 of theſe oblong bodies placed in four rows. The maſs here figured had another row, as appears from part of one of theſe bodies which remains fixed at the bottom.

The quarry-men call them *Leeches*. Woodward† ſuppoſes them to be the palates of ſome fiſh, and that the ſmooth part of them was worn by long uſe in grinding and breaking of ſhells.

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* Now in Sir Aſhton Lever's Muſeum.

† Catalogue of foſſils, Tom. I. part II. p. 85. n. 100.

N O T E.

Fig. xxxiv. p. 25. is found in great numbers in the Lime-ſtone quarries.

F I N I S.


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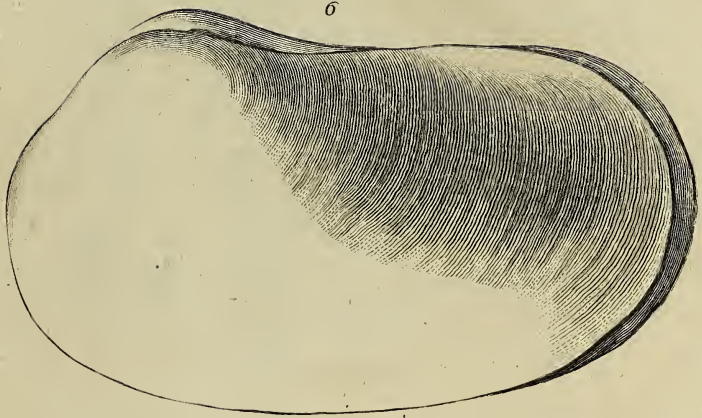

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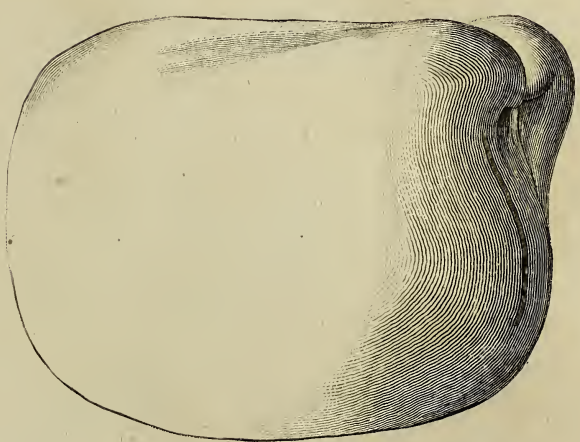

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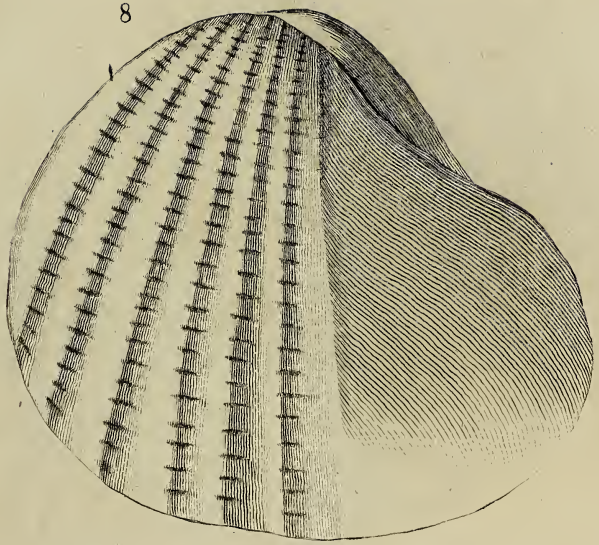

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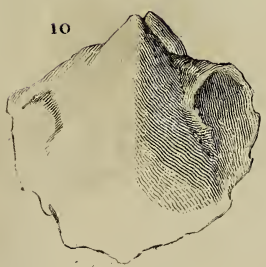

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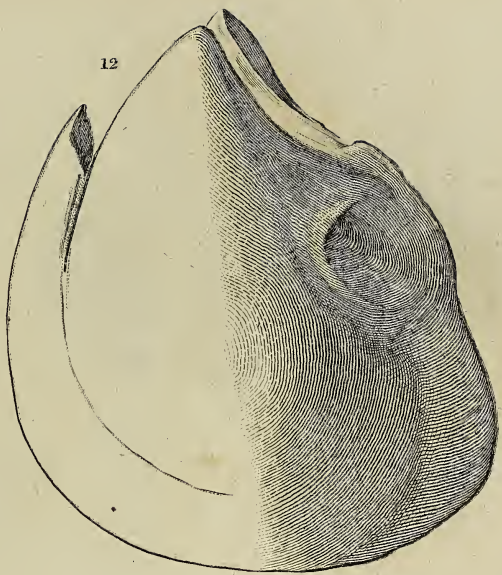

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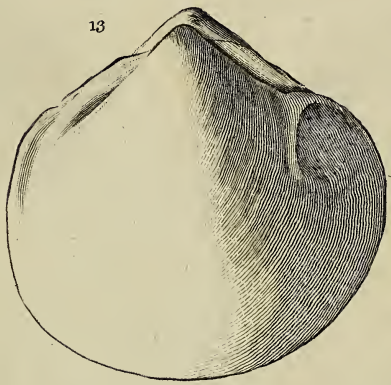

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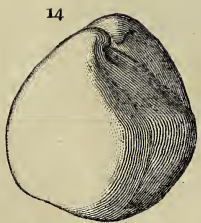

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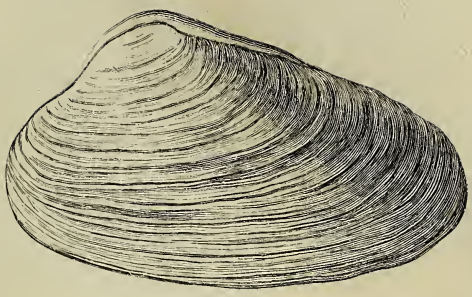

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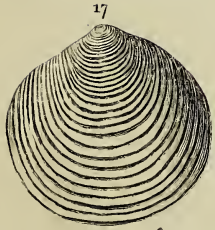

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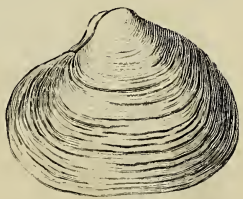

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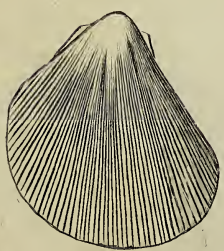

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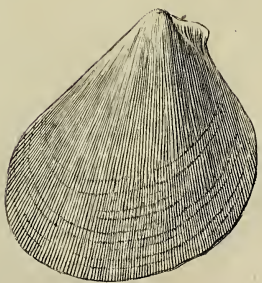

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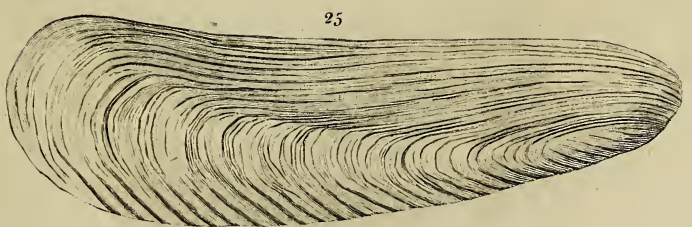

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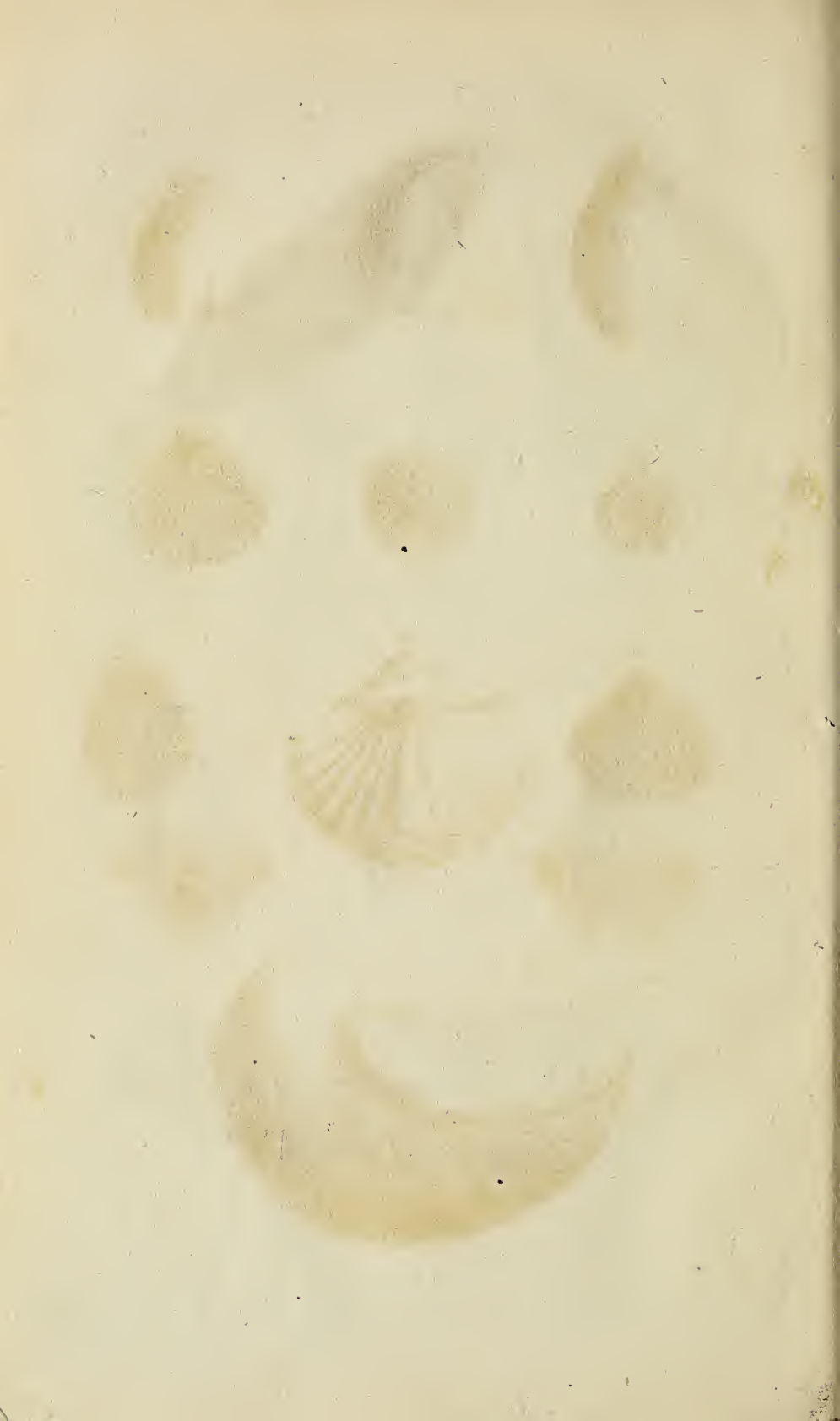

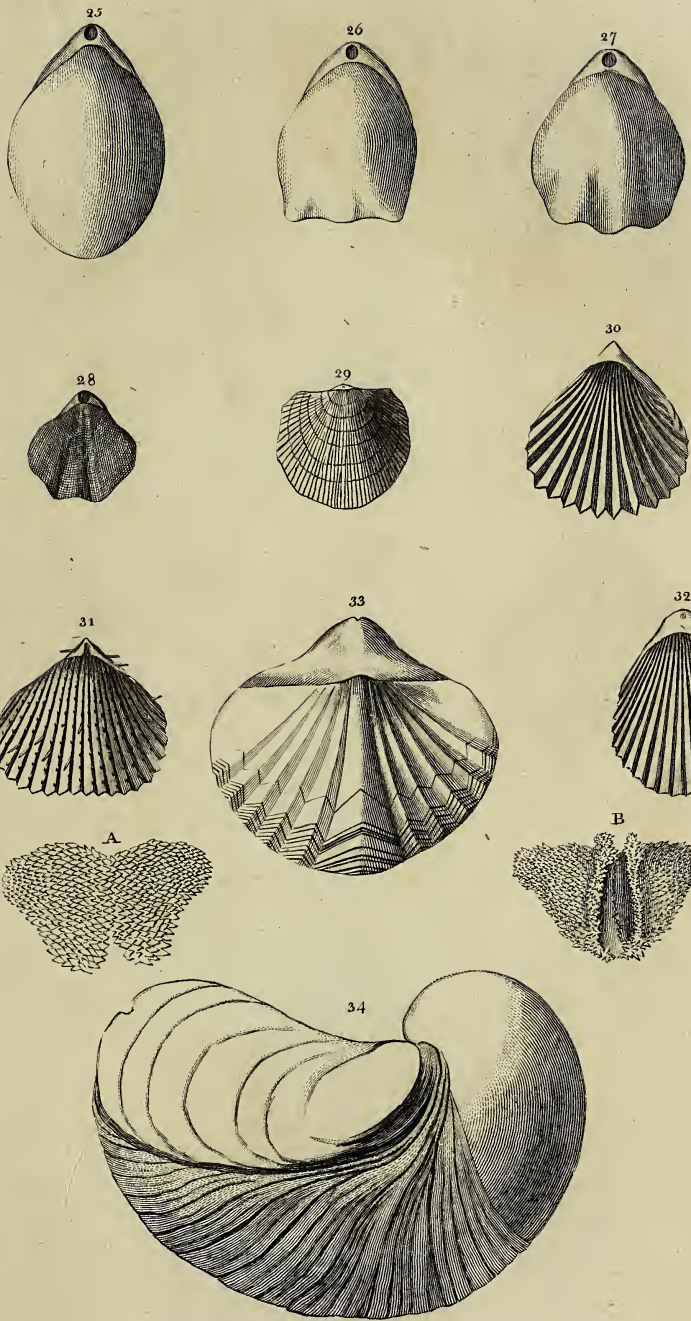
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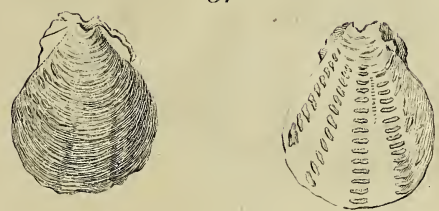

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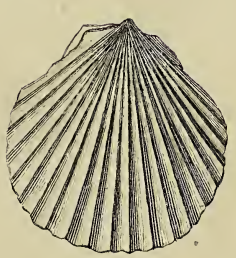

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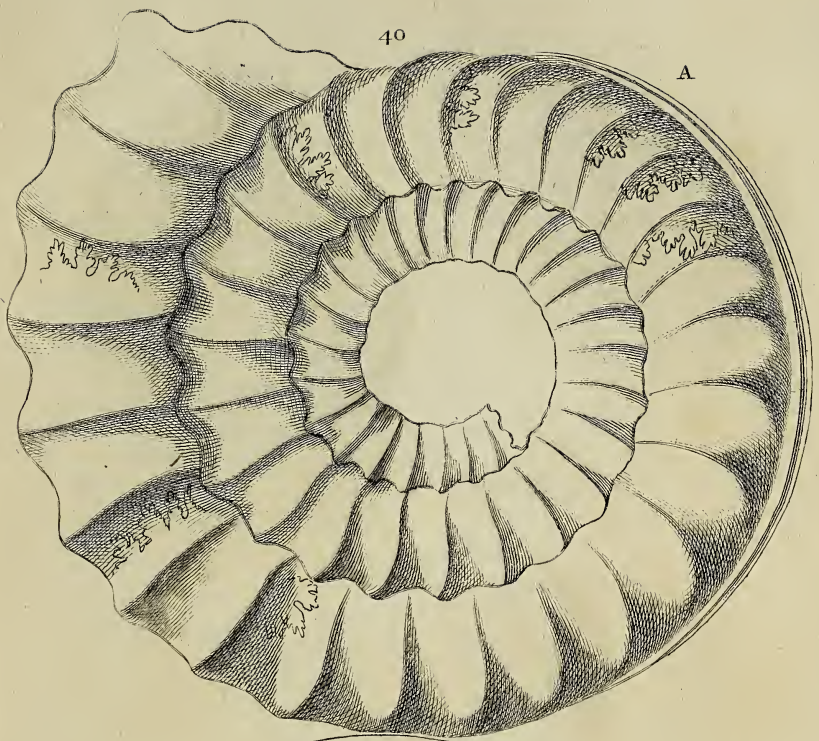
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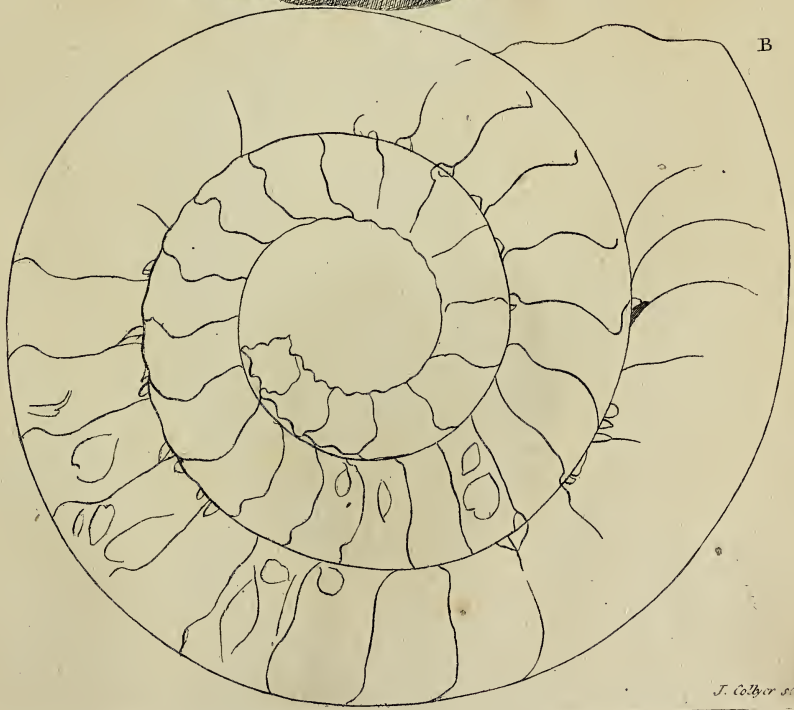
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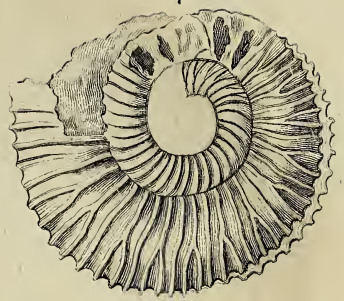

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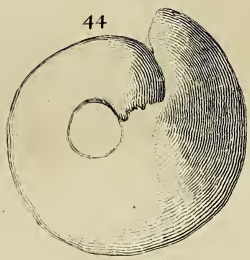

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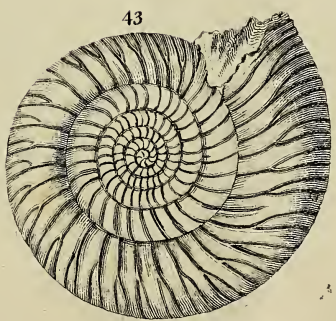

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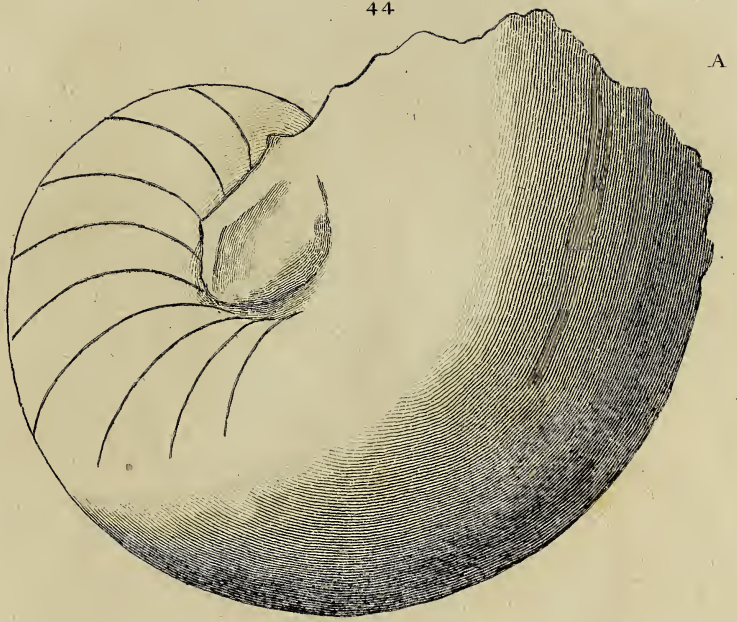

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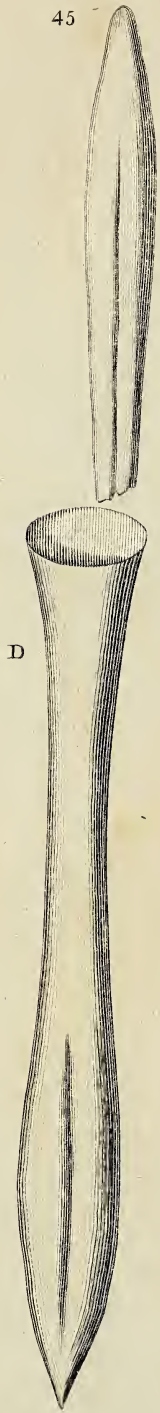
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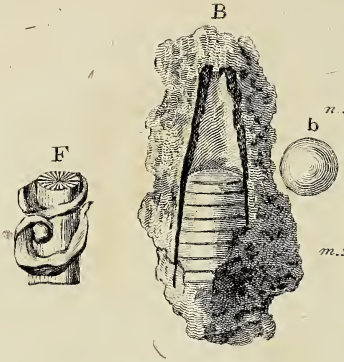
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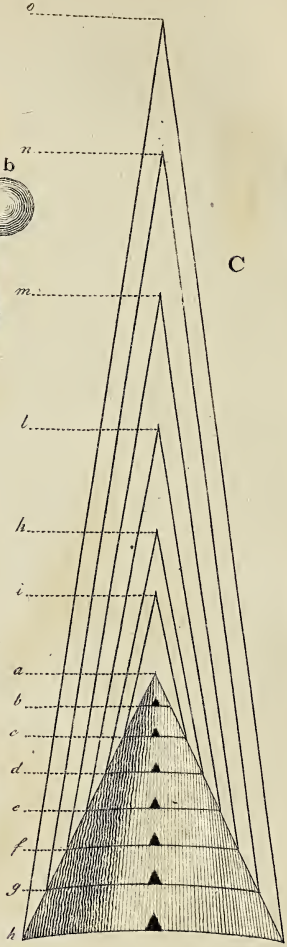
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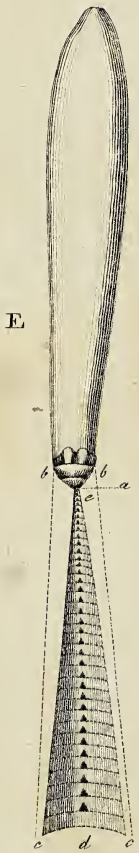
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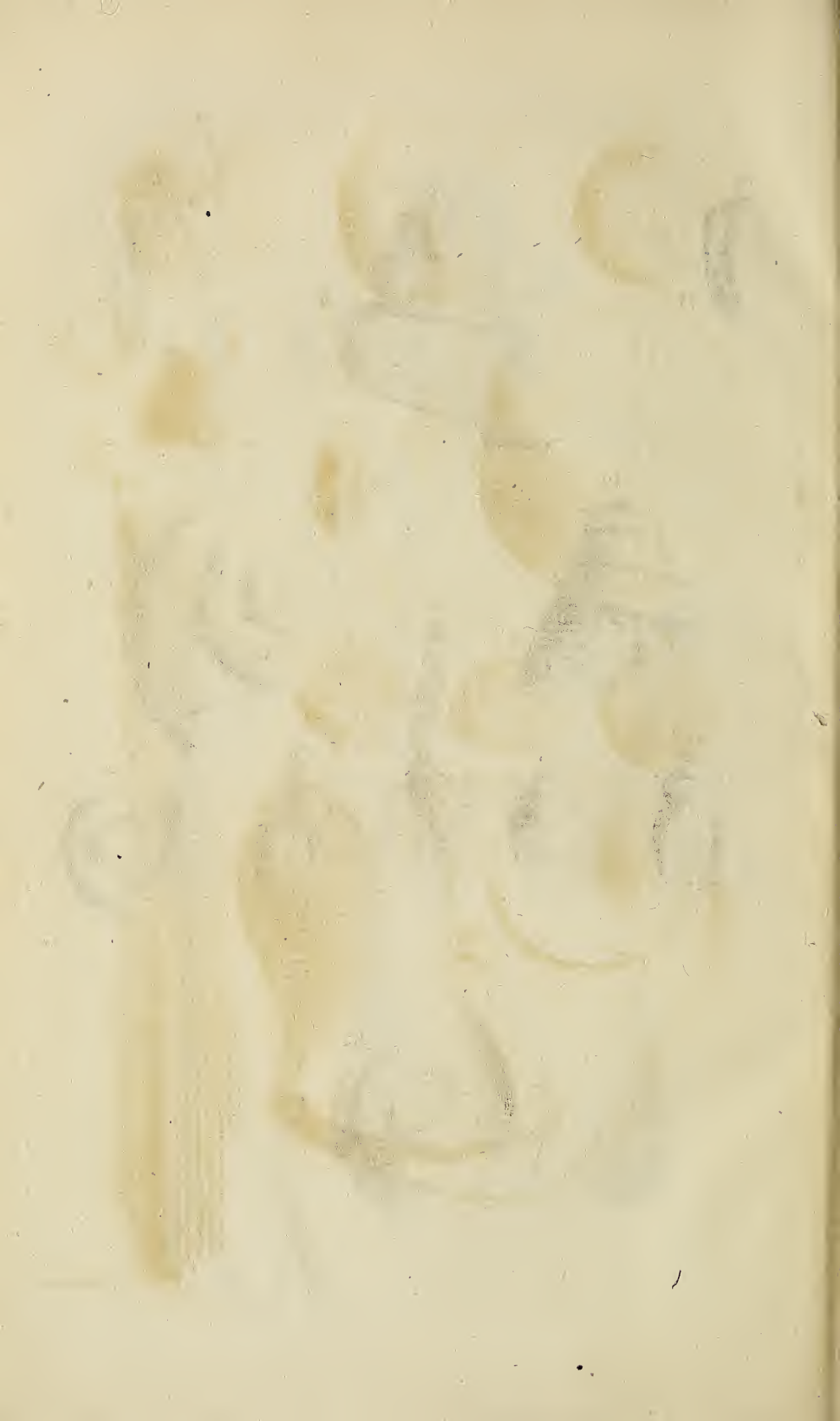

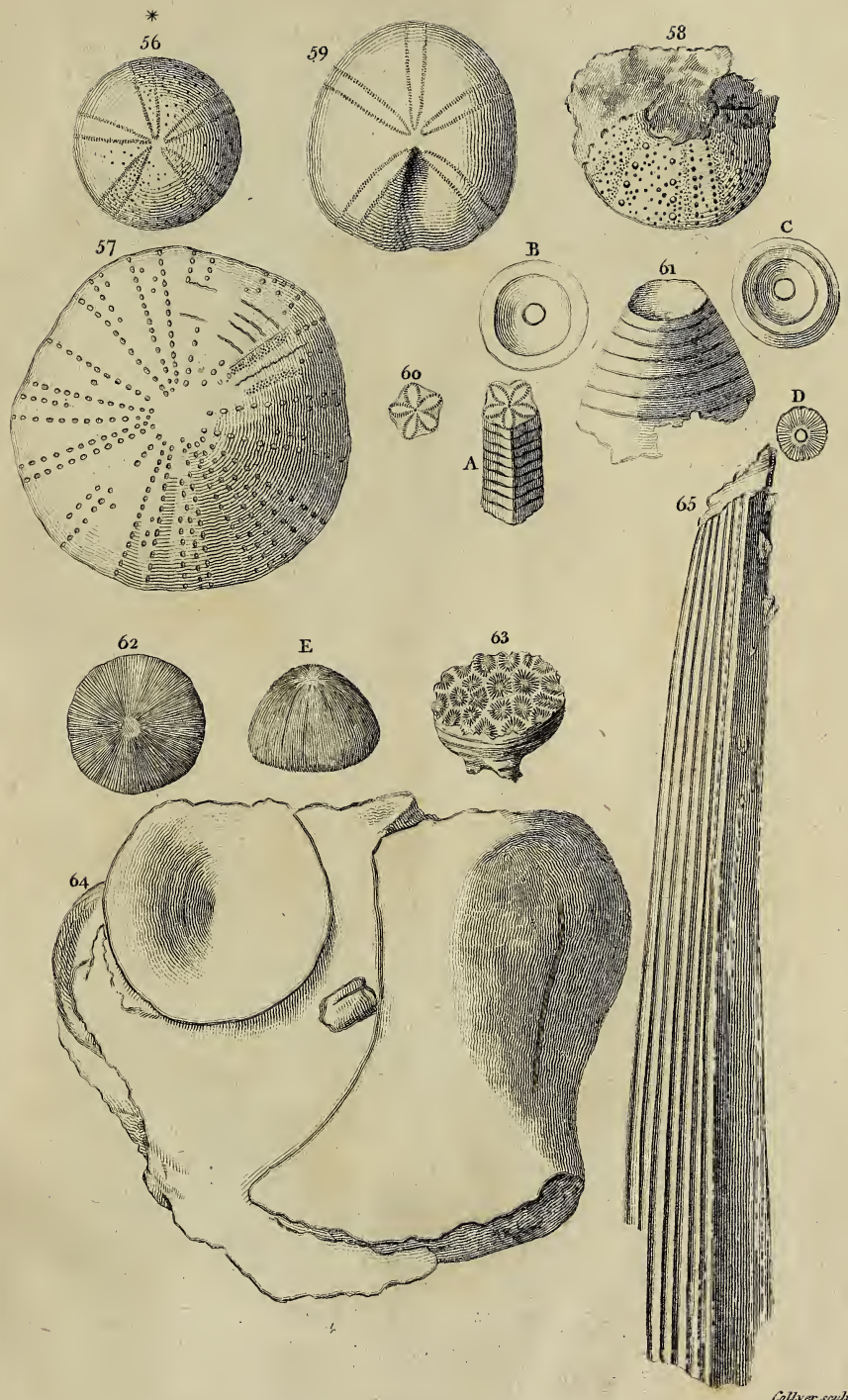
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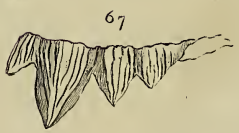

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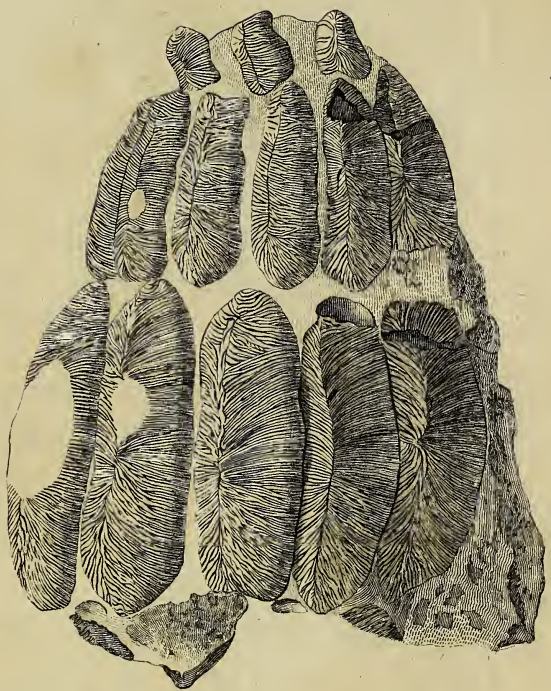

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