



XVI.—A catalogue of the zoophytes of South Devon and South Cornwall

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the British Museum, adopted the genus, adding to it the *Acanthoderes funestus* of Erichson. *A. funerarius*, however, is a true *Acanthoderes*, having dilated and fringed fore tarsi in the males: it differs from most of the species only in the rounded tips of the elytra, a character presented by many of its congeners; therefore the generic name can apply only to *A. funestus*. *Myoxomorpha*, as thus defined, is very closely allied to *Acanthoderes*, its chief distinction being the simple fore tarsi in the males. The ungrooved antennal joints, the voluminous eyes, narrow prosternum and horizontal mesosternum also separate it well from the majority of the species.

1. *Myoxomorpha funesta*, Erichs.

Acanthoderes funestus, Erichson in Schomb. Reise, iii. 573.

In facies and colours this species has some resemblance to *A. funerarius*. It is black, clothed beneath and on the legs with a fine silvery hoary tomentum. The forehead, vertex, a broad central vitta on the thorax, the scutellum, and the apical half of the elytra are also clothed with a very fine silky whitish pile, —the apical half of the elytra having a large patch on each side, and a number of small rounded spots of a black colour.

Found throughout the Amazon region, sparingly, under the loose bark of felled trees, chiefly of *Inga* and other Leguminosæ, in newly-made plantations. It is very sluggish in its motions

[To be continued.]

XVI.—*A Catalogue of the Zoophytes of South Devon and South Cornwall.* By the Rev. THOMAS HINCKS, B.A.

[Plate VI.]

THE title of this paper requires a word of explanation. The term *Zoophyte* is adopted for the sake of convenience, and is used in the sense in which it was employed by Dr. Johnston, to embrace the Hydroid, Asteroid, and Helianthoid polypes, and the Polyzoa. According to the later and more accurate classification, the beings associated under this common name are thus distributed:—The subkingdom CŒLENERATA has been constituted for the true Polypes and the Medusæ; and in this the Hydroids and the Lucernaridæ rank under the class Hydrozoa, the Asteroids and Helianthoids under the class Actinozoa. The Polyzoa, by virtue of their Molluscan affinities, take their place amongst the Molluscoida.

No apology need be offered for adding one more to the number of local catalogues. Their significance and value, when carefully and conscientiously prepared, are now fully appreciated. My object has been not merely to draw up a bare list of species,

but to embody the miscellaneous observations which have accumulated during many years of study, and so to illustrate to some extent the general history as well as the geographical distribution of these interesting tribes.

The district embraced by the catalogue comprehends the whole of the South Devon coast, and that portion of the Cornish which extends from Plymouth to the Deadman Point, situated about twenty-four miles to the west of the Eddystone Lighthouse. It presents almost all the conditions favourable to the development of marine life, and accordingly there are few portions of the English coast which equal it in fertility and in the beauty of its productions. The climate is genial, and the waters are remarkable for their translucency and purity. The marine vegetation is of the richest character. There is considerable variety in the geological features, accompanied by a corresponding diversity of habitat, which allows of a more varied population. A series of fine bays and estuaries afford the most favourable localities for the littoral and Laminarian species; and in these warm and comparatively sheltered waters many of the most lovely kinds attain a wonderful luxuriance. Torbay itself is a marvellous treasury of marine life. Its ample shores are clothed with a submarine vegetation as rich and beautiful, in its way, as the verdure which here seems almost to mingle with the sand, and affording a home or shelter to innumerable tribes.

The limestone, which borders a considerable portion of the Bay has been hollowed by the action of the water into caves and pools and fissures, which are the chosen retreats of the Actiniæ, and yield a large proportion of the rarer and more beautiful kinds to the careful investigator. Here and there the beach is strewn with large blocks of rock, the surface of which is worn into a multitude of little basins, in which the smaller and more delicate zoophytes find a congenial habitat. Elsewhere the limestone forms a kind of flooring, comparatively level, and intersected by deep and narrow clefts, draperied by the various kinds of weed, whose dark recesses are rich in interesting forms. But nowhere, perhaps, is the profusion of life so remarkable as in the little coves, which are overspread between tide-marks with stones of moderate size, which can be turned over with ease and examined at leisure. The most striking features in such situations are the luxuriant growth of certain Campanulariadae (*Laomedea flexuosa* chiefly), and the wonderful size and beauty of the littoral kinds of *Lepralia* and *Membranipora*. Of the former genus (*Lepralia*) the most characteristic shore species are the *L. unicornis*, *Pallasiana*, *granifera*, and *nitida*. Forests of the *Laomedea flexuosa* invest almost every stone.

In other parts of the Bay, sand is not wanting for the burrow-

ing species of Actinozoa, such as *Peachia hastata*. The dredging is equally productive. The rough ground (at from 15–20 fathoms) yields in rich profusion the various stony Polyzoa (*Lepralia*, *Membranipora*, *Cellepora*, &c.), while under the rocky shores the Vesiculariadae abound; and in certain spots the *Halidrys* is taken up, festooned with the beautiful *Mimosella gracilis*, which has hitherto been found only on the western coast.

The Salcombe estuary, between Torbay and Plymouth (the favourite dredging-ground of Montagu), is also full of attractions for the zoophytologist. It is peculiarly rich in the Laminarian species,—a fine belt of weed edging its rocky shores, and including several large *Zostera*-beds. At the low spring-tides, it is also unsurpassed for shore-collecting. The finer Actiniæ occur in great plenty and splendour. A little way up the estuary there is a Scallop-bed, on which Membraniporidae and some of the Cyclostomata abound. Plymouth Sound and Start Bay are likewise prolific hunting-grounds, while the rocky and precipitous shore in the neighbourhood of Dartmouth yields a rich harvest of Actiniæ.

Through the Brixham and Plymouth trawlers, acquaintance is readily made with the products of the Coralline zone. Their labours are chiefly carried on in about 30 fathoms' depth; and here the larger Sertularian zoophytes are taken up in immense quantity and of most luxuriant growth. The most characteristic species are *Sertularia argentea* and *abietina*, *Plumularia falcata*, *Laomedea longissima*, *Campanularia verticillata*, and *Coppinia arcta*. *Sertularia tamarisca* and *Antennularia antennina* are also abundant. *Plumularia myriophyllum* is of rarer occurrence, and so are *S. nigra* and *pinnata*. *Eschara foliacea* is brought up by the trawlers in great quantity at certain points, and *Gorgonia verrucosa* is common all along the coast at a depth of from 30–40 fathoms. The very rare *Caberea Boryi* belongs to this region, being frequently parasitic on the *Eschara*.

The materials which I have been able to obtain from still greater depths are but scanty. They consist almost entirely of *Pinna*, taken up in a range off the Deadman Point, from about 60 fathoms. They are thickly crusted with various species of *Lepralia* (*reticulata*, *trispinosa*, *linearis*, *variolosa*, *Malusii*, &c.), with *Alecto* and *Hippothoa*, *Diastopora*, and *Tubulipora* (*patina*, *hispidata*, and *serpens*), and bear considerable numbers of the *Tubulipora penicillata*. *Plumularia Catherina* is also found upon them. I shall give a complete list of the species procured from this locality in another portion of this paper.

The wealth of the district now under consideration will be best appreciated if we compare the number of species included in this list with that contained in the largest local catalogue

hitherto published. I refer to Mr. Alder's admirable work on the Zoophytes of Northumberland and Durham. This accomplished observer, by whose labours so many departments of natural history have been enriched, has published 164 species as occurring in his district; and this number greatly exceeds the highest contained in any previous list. In the present catalogue about 230 species will be enumerated (more than Dr. Johnston gives for the whole kingdom), of which a considerable number are either altogether new or new to the fauna of this country. The great deficiency in the North is amongst the Zoantharia, of which 10 only are recorded by Mr. Alder, against 37 in the present catalogue. But the West has also a very considerable majority of species both amongst the Hydrozoa and the Polyzoa.

The following Northern zoophytes appear to be wanting in our district:—*Sertularia fusca*, *S. fallax*, *S. filicula*, *Grammaria ramosa*, *Virgularia mirabilis*, *Menipea ternata*, *Cellularia Peachii*, *Bugula Murrayana*, *B. fastigiata*, *Flustra truncata*, *Carbasa papyrea*, and *Eschara cribraria*. It is hardly probable that any of these would have escaped detection, had they been present.

Amongst the prevalent and characteristic forms of the Western coast are the following:—*Coryne ramosa*, *Halecium Beanii*, *Sertularia Gayi*, *S. nigra*, *S. pinnata*, *Plumularia similis*, *Campanularia Hincksii*, *Laomedea gelatinosa*, *Gorgonia verrucosa*, *Caryophyllia Smithii*, *Balanophyllia regia*, *Hoplangia*, *Sagartia bellis*, *S. rosea*, *S. nivea*, *Bunodes gemmacea*, *Halcampa microps*, *Peachia hastata*, *Zoanthus Couchii*, *Z. sulcatus*, *Tubulipora phalangea*, *T. penicillata*, *Pustulipora deflexa*, *Beania mirabilis*, *Cellepora edax*, *Eschara foliacea*, *Membranipora Lacroixii*, *Lepralia Pallasiana*, *L. Gattya*, *L. adpressa*, *L. Cecilii*, *Scrupocellaria scrupea*, *Caberea Boryi*, *Flustra papyracea*, *Mimosella gracilis*.

Some of these are noted as being extremely abundant, others as having only occurred in the district, or as being confined to the south and west coasts.

As it is important to multiply data for determining the range of geographical distribution, I have inserted in the catalogue any localities for the different species which have come to my knowledge.

Several lists of Devon and Cornish Zoophytes have been printed, the most extensive being the one contained in Mr. Couch's 'Cornish Fauna,' published in 1838. In this work 124 species are recorded. In the 'Natural History of Torquay, Dawlish, and Teignmouth,' by Turton and Kingston, some species are enumerated; and there is a meagre list of about 60 in Bellamy's 'Natural History of South Devon' (1839). Dr. Johnston's 'History of British Zoophytes' contains a good many Devon habitats, chiefly supplied by Mrs. Griffiths and Mr. C.

W. Peach; and a few are given in Mr. Busk's 'Catalogue of Polyzoa.' For the Zoantharia the great authority is Mr. Gosse's 'Actinologia Britannica,' which furnishes a very large number of Western localities. I have availed myself of all these sources of information, so as to multiply the habitats as much as possible, and to include some species which had not come under my own observation.

With respect to classification, I have found myself unable to follow any single text-book. Dr. Johnston's work, admirable as it is, and valuable and attractive as it must always continue to be, has been left behind by the progress of science. Its classification is now obsolete.

I have followed Messrs. Frey and Leuckart, whose views are sustained by the authority of Prof. Huxley, in regarding the true Zoophytes as constituting, with the Acalephs, a new sub-kingdom—Cœlenterata—embracing two classes, the Hydrozoa and the Actinozoa. Of the former, four orders are included in this catalogue, which are adopted from Huxley's great work on the 'Oceanic Hydrozoa'—the Hydridæ, Corynidæ, Sertularidæ, and Lucernaridæ*. For the second of these the name *Tubularidæ* seems to me preferable, but the point is not of sufficient moment to be insisted upon.

Amongst the Sertularidæ I have retained the genus *Plumularia* as it stands in Dr. Johnston's work; but there can be little doubt that it ought to be dismembered, as suggested originally by Prof. E. Forbes. From *Campanularia* I have separated the small sessile or subsessile species (represented by *C. dumosa*) with densely corneous tubular cells, and have constituted the genus *Calicella* for their reception †.

In the classification and nomenclature of the Zoantharia I have followed Mr. Gosse ‡, and for the Polyzoa have employed as a text-book Mr. Busk's admirable 'Catalogue,' the genera in which have been constituted after an extensive examination of foreign as well as British forms.

I must not omit this opportunity of acknowledging the valuable assistance which I have received from my friend Mr. Alder in the preparation of this catalogue. His extensive and accurate knowledge and remarkable skill in the discrimination of species have often been of essential service to me.

I am also much indebted to the zeal and intelligence of Mr.

* In conformity with the recognized principles of nomenclature, I have altered the termination of two of Prof. Huxley's ordinal names from *iada* into *ida*.

† Rep. of Brit. Assoc. for 1858, p. 126.

‡ The excessive multiplication of genera in Mr. Gosse's beautiful work is much to be regretted.

William Laughrin, of Polperro, for the supply of many rare and interesting specimens. To collectors in the various departments of marine zoology I can recommend him as a most efficient ally.

Subkingdom *COELENTERATA*.

Class HYDROZOA.

Order *CORYNIDÆ*, Huxley. Fam. *Coryniadæ*.

1. *CLAVA*, Gmelin.

C. multicornis, Johnston.

Syn. *C. repens*, T. S. Wright, Edinb. New Phil. Journ. for July 1857.
C. discreta, Allman, Ann. & Mag. Nat. Hist. for November 1859.

Between tide-marks; commonly on stones.

Dr. T. Strethill Wright, in his valuable observations on *Clava* in the 'Edinb. New Phil. Journal,' has corrected the error of previous naturalists, who have universally described the polypes of this genus as naked and single. There is great diversity in the size of the cup-like extension of the polypary, which surrounds a portion of the polype-body. Frequently it is nothing more than a very delicate envelope which invests the base, and in this condition may readily escape detection. In other cases it rises to a considerable height, and forms a true hydrotheca, which covers a third or more of the body.

2. *VORTICLAVA*, Alder.

V. humilis, Alder, Catal. of the Zoophytes of Northumberland and Durham, 12, pl. 1. figs. 1-3.

Dredged on *Salicornaria* in Salcombe Bay.

A single polype only occurred. The number of the lower tentacles was nine. They seemed to be slightly enlarged above, though not truly capitate like those of the upper circle.

The *Corymorpha annulicornis* of Sars (Forhandl. i Vidensk. Selsk. i Christiania, 1859) may possibly prove to be a second species of this genus.

3. *HYDRACTINIA*, Van Beneden.

H. echinata, Fleming.

On shells (*Buccinum* most frequently, *Trochus zizyphinus*, *Natica*); common.

4. *MYRIOTHELA*, Sars.

M. arctica, Sars.

Attached to stone, in a rock-pool at Meadfoot, Torquay.

I have only found one specimen; but Mr. Cocks speaks of the species as abundant in Cornwall.

The sporosacs are borne on polypoid supports (blastostyles), which are clustered about the lower part of the body, and exhibit what seem to be three or four rudimentary tentacles at the top. The base of the polype gives off a few radical prolongations, by which it is attached. Dr. Strehill Wright, I am informed by Mr. Alder, is inclined to believe that *Myriothele* possesses a polypary. I have little doubt that this is the case, as I have noticed an appearance as of some horn-coloured substance investing the base of the body.

5. CLAVATELLA, Hincks.

C. prolifera, Hincks, Ann. & Mag. Nat. Hist. for Feb. 1861.

In the smaller rock-basins, between tide-marks, Torquay; not uncommon.

I find in my note-book a rough sketch of a polype obtained at Whitby, Yorkshire, in 1858, which I have little doubt was the *Clavatella*.

6. CORYNE, Gaertner.

1. *C. ramosa*, Ehrenberg. Johnston, Brit. Zooph. pl. 6. figs. 4-7.

Syn. *Syncoryna Listerii*, Van Beneden.

In rock-pools between tide-marks; very common all along the west coast.

This species is a characteristic South-Devon form. Its favourite habitat is amongst the luxuriant vegetation which clothes the sides of the tide-pools, where it attains a great size, and, when laden with its rose-coloured gonophores, adds not a little to the beauty of their scenery. I have a specimen from Torbay which is nearly 4 inches in height.

2. *C. fruticosa*, n. sp. Plate VI. figs. 5, 6.

Polypary delicate, strongly annulated throughout, of a bright horn-colour, much branched; branches ringed throughout, constricted at their origin and widening upward, giving off short ramuli, and commonly folding together on one side of the stem, so as to present a somewhat secund appearance. Polypes elongate, swollen below, tapering and pointed above; tentacles not numerous, short, capitate extremities small, a verticil of about five immediately below the mouth, the rest scattered. Gonophores densely clustered chiefly about the lower part of the body, sessile, non-medusiferous, very large when mature.

This species, which only attains a height of less than half an inch, forms dense, clustered, bushy masses on *Fucus*. It is of very delicate habit, its stems being only about half the thickness of those of *C. ramosa*. Its polypes differ widely from those of

the latter species, which are cylindrical, of great length, and furnished with very numerous tentacles.

Exmouth, on *Fucus*. [Mount's Bay, on the same.]

3. *C. Cerberus*, Gosse, Devonshire Coast, 222, pl. 14. fig. 4, &c.

Torquay. This minute species was found by Mr. Gosse in a glass jar containing Actiniæ, &c., brought from Torquay. Judging from the character and disposition of the tentacles, it should probably be referred to the genus *Stauridia*.

Family Tubulariadae.

1. EUDENDRIUM, Ehrenberg.

1. *E. ramosum*, Linn.

Torbay and Salcombe, dredged on other zoophytes; amongst the refuse of the Plymouth trawlers, sparingly.

2. *E. capillare*, Alder, Northumb. and Durham Catal. 15, pl. 1. figs. 9-12.

Torbay, dredged on *Sertularia argentea*. Mr. Alder has also obtained it from Plymouth.

3. *E. insigne*, n. sp.

Polypary minute, slender, closely ringed throughout, giving off occasionally a short branch also annulated. Polype very large and tall; body somewhat vase-shaped, very opaque, reddish; tentacles about 20. Gonophores produced towards the base of the body, globose, on short stalks, of an orange-colour. Height about a quarter of an inch.

Hope's Nose, Torquay, on rocks between tide-marks, rooted in a mass of sponge.

I know of no species to which the above form can be referred, and have therefore ventured to describe it as new, though it has only occurred to me once. The characters are sufficiently distinctive. The stem is regularly annulated, like that of a *Coryne*, throughout its entire length. The branching is of the simplest kind. The polypes are remarkable for their size and splendour, being much larger and more striking than those of *E. ramosum*. The body is of a pretty shape, and very opaque. There seems to be a membranous extension of the polypary, forming a shallow cup round the base of the polypes.

In one of the specimens I noticed two orange gonophores, placed as described above. In this case the polype itself had almost disappeared. The diminutive size and the littoral habitat are also distinctive points.

2. *ATRACYLIS*, T. S. Wright.*A. ramosa*, Van Beneden.

Torbay, dredged.

This species, figured by Van Beneden ('Recherches sur les Tubulaires') under the name of *Eudendrium ramosum*, has a coarse compound stem, is much branched, and sometimes attains a height of about 3 inches. The ends of the branches are dilated; but the cup is very frail, and soon disappears after the death of the polype.

A form has occurred to me at Llandudno, on the Welsh coast, having a simple stem, of humbler size and less branched than the above, with a well-marked cup at the extremity of the branches, and bearing here and there elongate bodies, supported on separate ramuli. The polype has from 10–12 tentacles.

I am unable at present to decide whether these two forms are referable to the same species.

3. *BIMERIA*, T. S. Wright.*B. vestita*, Wright, Edinb. New Phil. Journ. for July 1859.Syn. *Manicella fusca*, Allman, Ann. & Mag. Nat. Hist. for July 1859.

Torbay and Salcombe, dredged, on other zoophytes; not uncommon. [Whitby, Yorkshire.]

4. *TUBULARIA*, Linnæus.1. *T. indivisa*, Linn.

Common, between tide-marks and from deep water.

2. *T. Dumortierii*, Van Beneden.

Salcombe Bay, dredged; rare.

I do not feel very certain about this species. I have referred to it a very beautiful *Tubularia*, the tubes of which are single, slender, light-coloured, and rise here and there from a mass of sponge.

3. *T. larynx*, Ellis.

Common under stones, in rock-pools.

4. *T. gracilis*, Harvey.

Dartmouth, on the chain of the steam bridge; Devonport, in a similar situation (*J. B. Harvey*).

The British *Tubulariæ* require further examination and more accurate discrimination. There are, I believe, several undescribed species.

5. *CORYMORPHA*, Sars.*C. nutans*, Sars.

A single specimen of a *Corymorpha* was obtained some years ago by Mr. Alder at Fowey, Cornwall, which he has allowed me

to examine. It is very inferior in size to the *C. nutans* of Sars, and the number of tentacles is somewhat smaller; but in all other points it agrees with that species.

[To be continued.]

EXPLANATION OF PLATE VI.

Figs. 1-4. *Halecium tenellum*, natural size and magnified.

Figs. 5, 6. *Coryne fruticosa*, magnified.

Figs. 7, 8. *Sertularia fusiformis*, natural size and magnified: 7 *a*, gonotheca magnified.

XVII.—On the Nomenclature of the Foraminifera.

By W. K. PARKER, M. Micr. Soc., and T. R. JONES, F.G.S.

[Continued from vol. vi. p. 347.]

Part. VI. *Alveolina*.

THE nomenclature of this genus serves to illustrate the confusion of terms in which these and others of the *Foraminifera* have been entangled. Deshayes and D'Orbigny have each given an account, but the following history is fuller and more complete.

Fortis* and Deluc† wrote of fossil *Alveolina* about the same time (1801 and 1802). The former figured and described three varieties (from Gerona, Roussillon, and Grignon), and treated of them as members of his comprehensive group *Discolithus* (*Disc.* xi, xi *a*, & xi *b*). Deluc described and figured one from Bengal‡ and one from Grignon§, and remarked that they must be varieties of one species, which he referred to as "le petit fossile ovoïde à côtes de melon."

In 1802, a short paper appeared in the 'Bullet. des Sciences Soc. Philom.' no. 61. p. 99, signed C. V., noticing two minute shells which Bosc had found in calcareous sandstone near the village of Auvvert (or Anvers), near Pontoise, in the valley of the Oise, and which he referred to Lamarck's *Alveolites* (a genus of Corals, instituted in 1801). These are named|| respectively "Alvéolite grain de fétuque"¶ and "Al. grain de millet." The

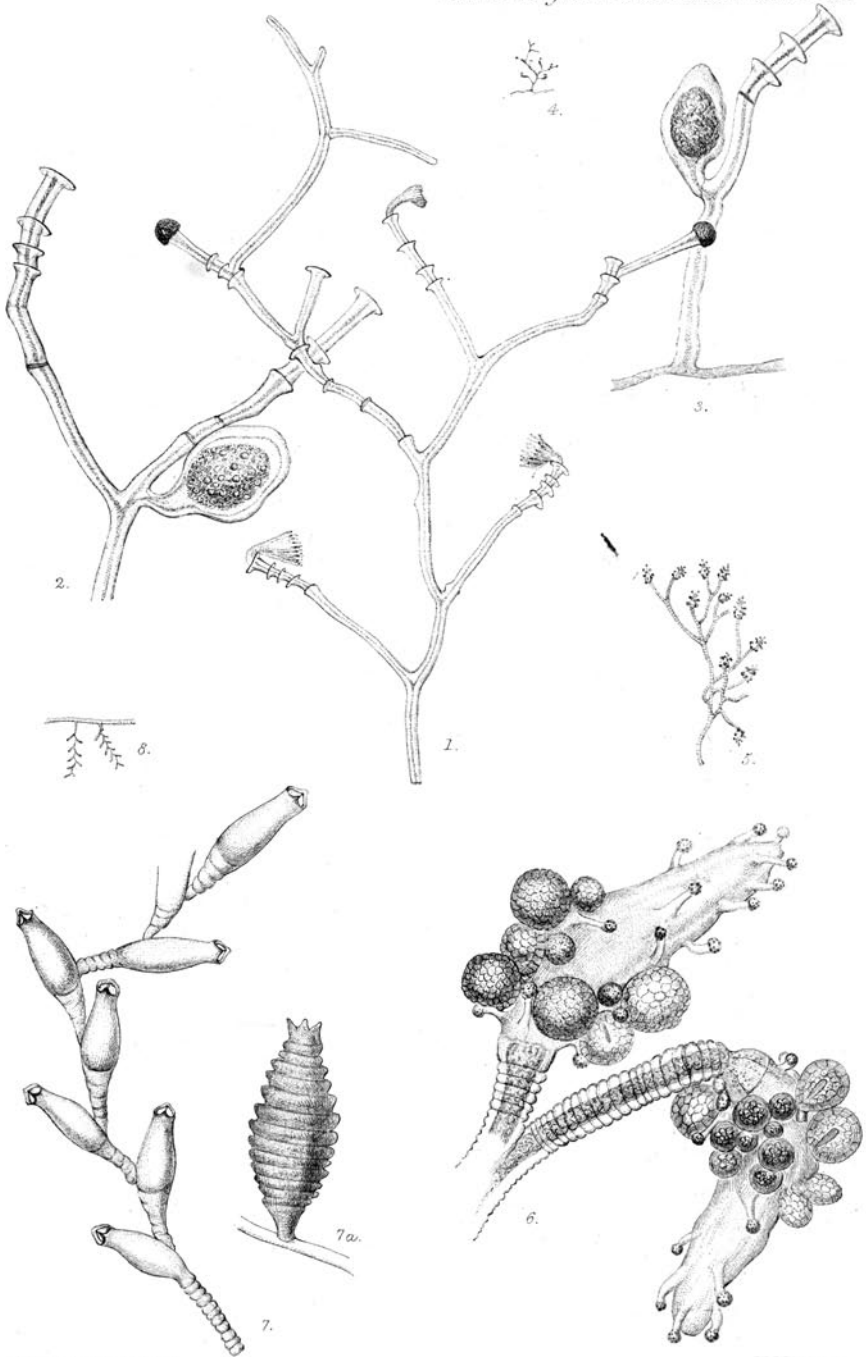
* Journ. de Phys. vol. lii. p. 106 &c. pl. 2. figs. 7, 8, 9, 1801; and Mémoire sur les Discolithes, 1802, in the Mémoires Hist. Nat. Italie, vol. ii. p. 112 &c. pl. 3. figs. 6-11, pl. 4. fig. 4. In 1770, Guettard figured what appears to be a spheroidal *Alveolina* (Mémoires sur diff. part. des Sciences et Arts, vol. iii. p. 430, pl. 12. fig. 15), under the name of "Madrépure globulaire feuillée."

† Journ. de Physique, 1802, vol. liv. p. 176 &c. pl. 1. figs. 11-14.

‡ *Alveolina ovoïde*, D'Orb. § *Alveolina Boscii*, Defr.

|| See also Bosc's Hist. Nat. Coq. 1802 (Buffon de Détéville), and his article "Alvéolite" in the 'Nouveau Dict. Hist. Nat.' 1816.

¶ The figure given of this was subsequently referred to by Brongniart (1822), in Cuvier's 'Ossemens Fossiles,' ii. p. 270, as *Alveolites Milium*, Bosc. It ought to be *A. Festuca*, the other being *A. Milium*.



T. Hincks, del. T. West, sc.

W. West, imp.