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A

CORNISH FAUNA;

BEING A COMPENDIUM

OF THE

NATURAL HISTORY

OF

THE COUNTY,

*Intended to form a Companion to the Collection in the Museum of the Royal
Institution of Cornwall.*

PART III.

containing

THE ZOOPHYTES AND CALCAREOUS CORALLINES.

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By RICHARD Q. COUCH, M.R.C.S.L.

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TRURO :

Printed for the Royal Institution of Cornwall,

By L. E. GILLET.

1844.



tentacula, where they are frequently found, or into the stomach. On many occasions, when forcibly pressing the *A. Mesembryanthemum*, several of the young have been forced through the tentacula. The ova which are yellowish, are clothed with cilia, and become frequently developed into the polype internally. It would be out of place here, and tend to increase the size of this work too much, to enter into this and several other particulars more minutely. As they would be of interest only to the Anatomist and Physiologist they are passed lightly over. The first and most common mode of reproduction is by ova, the second by budding, as is observed only in the *Zoanthus*. In this genus the trailing fleshy band which connects the different polypes becomes enlarged at intervals into papillary eminences, and afterwards becomes developed into polypes.

Another mode of reproduction sometimes takes place by division. Having kept some specimens of *A. dianthus* in confinement, it was found that they would occasionally divide at the base, and the division would proceed upwards to the oral disc. In this state they look just like what the Abbè Dicquemare describes as the union of two individuals from contact. Possibly such an union may take place, as they are so gregarious as to be actually in contact, and double mostrosities occur at birth; but I have not seen it.

The *Zoanthus Couchii* is the only compound species of our shores. It may be characterized as a number of small actinæ united at their bases by a trailing fleshy band. It is a very limited genus and till the discovery of a species on our shores a short time since, had no representative in Europe.

The next genus *Lucernaria* is a remarkably pretty one, and from its activity and transparency, a very interesting one. In form, it very closely resembles the old fashioned conoidal wine glasses; having a round disc-like base, a round columnar stalk, which terminates superiorly in a free campanulate expansion; around the margin of which are eight separate tufts of tentacula. I never could find that Lamouroux' assertion, that they perceived their prey at a distance and pursued it, was correct, though I have watched many scores in their natural situations for that purpose. They only seem conscious of the presence of food when it impinges on the tentacula. The ova are developed about April, May, and June, either in loops from tuft to tuft, or in lines from the tentacula to the base, and are frequently there united in pairs. They are subject to a great many variations of colour but are generally brownish, brownish-green or brownish-red. Their food consists chiefly of small crustaceans.

The only calcareous species we have, is the comparatively insignificant one, the *Caryophyllia Smithii*. It is common at

all depths to a little beyond low-water mark. The animal, when expanded, resembles in form the naked Actiniæ; when contracted it retires from sight into the calcareous cup. It is to be found of all sizes from a mere speck to an inch in height. In a very young state it is sometimes found parasitical on the *Alcyonium digitatum*, on shells, and the stalks of sea weed; but as these substances are very perishable in their nature, and offer no solid foundation on which to stand, large specimens are never found on them; on rocks and stones, however, they are frequently large and in great profusion. In the youngest state the animal is naked, and measures about the fifteenth of an inch in diameter and about the thirty-second of an inch in height. In the earliest state in which I have seen the calcareous polypidom, there were four small rays, which were free or unconnected down to the base; in others I have noticed six primary rays, but in every case they were unconnected with each other. Other rays soon make their appearance between those first formed; They are mere calcareous specks at first but afterwards increase in size. The first union of the rays is observed as a small calcareous rim at the base of the polype, which afterwards increases both in height and diameter with the age of the animal.

In taking a review of the polypes of this order, we find that though there is a considerable resemblance in their general anatomy to that of the Asteroid polypes; yet there is also a considerable advance in the complication and elaboration of their various parts. In both there is the radiate form of tentacula, the central membranous stomach, the intervening space between the stomach and sides of the polypes, the dividing the space by longitudinal septa, and one opening serving both for the reception of food and ejection of the undigested remains. In this there are permanent organs set aside for the developement of ova, forming well defined ovaries; the structure of the septa and the sides of the animal are of a muscular kind; and here also are said to be the first traces of a nervous system; all of which show a considerable advancement on the two preceding orders; and their habits and intelligence also exhibit a correspondent elevation.

The comparative smallness and simpleness of the only calcareous species of our shores, has not allowed many observations to be made on the vitality or non-vitality of the polypidom. But few as they have been they greatly affect the question. In young specimens the polypidoms are very small and increase in size with the age of the polype; so that the base of an old specimen is five, six and sometimes eight or nine times larger than young ones. From

which we may conclude that a continual absorption and deposition goes on in this apparently inorganic mass. That a vital action does take place in this calcareous base is confirmed by the collateral evidence of what takes place in the larger species of other climates. Mr. Stutchbury in his valuable paper on the growth of young corals of the genus *Fungia*, proves that the young are thrown off from the parents, and that the cicatrices are afterwards filled up with a fresh deposit of calcareous matter.* De la Beche also, in his Manual of Geology† quotes Mr. Lloyd as detaching some "polypifers" from their place of growth on the Isthmus of Panama, leaving them behind in pools for a day or two, and as finding them afterwards fixed to the spot by a fresh secretion of calcareous matter. These and other observations scattered through numerous papers in the transactions of learned societies, scarcely leave a doubt on the subject.

Though these beings are of so low a grade in the scale of life; yet they have exercised in ages past, and still continue to exert a great influence in the history and economy of the earth's surface. Though so insignificant and apparently, even contemptible in themselves; yet by their combined energy and imperishable masonry they have raised

A new creation in the secret deep.
Omnipotence wrought in them, with them, by them;
Hence what Omnipotence alone could do
Worms did :

and islands of importance and great beauty are every where scattered through the South Seas; coral reefs are still forming, and extending even to the waters edge, waiting for some upheaving to convert the Ocean into dry land. The Geologist tells us that in the earliest ages they had a more extended range than at the present time. He considers them as indices to the revolutions which the earth has undergone since the Creation. Whether these speculations be true or false, yet we must all confess that these worms have always held a situation of vast Geological importance:—a situation, the more we contemplate, the more miraculous it seems.

MADREPHYLLÆA.

Body cased with a solid calcareous cupped polypidom, lamellated internally.

CARYOPHYLLIA. Lamarck.

Generic Character: Animal like the Actinia; polypidom permanently fixed, simple, cylindrical or conoid, striated externally in a longitudinal direction, the top hollowed into a lamellated stellular cap.

* Lin. Trans., vol. 16.

† Geol. Manual, p. 151, 1832.

C. SMITHII. Polypidom cylindrical, lamellæ entire, arched, finely crenate, from three to five smaller ones between the larger, centre tubercular. Pl. 12, fig. 3.

Madrepora cyathus, Ellis and Solander's Zooph., p. 150, tab. 28, fig. 7. *Caryophyllia cyathus*, Fleming's Brit. An., p. 508. *Caryophyllia sessilis*, Bellamy's South Devon Nat. Hist., p. 330, tab. 18. *C. Smithii*, Harvey in Mag. Nat. Hist., vol. 1, new series, p. 474, fig. 55, (the figure of the animal inaccurate.) Johnston's Brit. Zooph., p. 207, fig. 30, p. 206.

Hab. On stones from deep water, abundant. Polperro, Goran, Mevagissey, Veryan.

There is scarcely a stone drawn from deep water, but has several specimens of this species attached to it, and in many cases so many as sixty, or even more.

The height of this Zoophyte varies from one-eighth of an inch to an inch; it is calcareous, cylindrical or conical, longitudinally striated externally, and firmly united to the rock. Superiorly it is cupped or concave, and lamellated. The lamellæ may be divided into three kinds; first, the primary or larger ones, which rise above the rest and extend from the circumference two-thirds towards the centre, and vary in number from twelve to twenty, and Dr. Fleming says to forty; this number does not depend on the size of the specimen. Between these primary ones are three smaller ones, the centre one of which is the largest, and extends from the circumference halfway towards the centre, where it apparently ends, but soon after rises into another gill, forming an inner series, lying between the primary ones and the tuberculated centre. The external longitudinal striæ, are formed by the attachments of the gills inside.

The animal is an Actinia, and when expanded is delicately beautiful. In expanding, the mouth is first elevated, and is about one and a half lines in length, surrounded by a light yellow or brown rim, marked transversely by rugæ, as if it was formed of lamellæ, but when fully expanded it becomes smooth and polished. Beyond this labial rim are two or more series of tentacula, similar in form to the horns of a snail, light brown at their bases or origins, with white rounded ball like extremities, made more conspicuous by each having a vermilion circumference. The colour of the animal however, is liable to great variation; it is sometimes red, yellow, orange, or brown, but the white rounded extremity of the tentacula is constant.

I have obtained specimens on this coast from the thirty-second of an inch to one inch in height; from having only four primary rays, up to twenty.

The shape of this species is subject to variation, being either conical or cylindrical. The cylindrical, the *C. Sessilis* of Bellamy, is low and may be said to be blended with the rock on which it stands: while the conical ones, which have a foot-stalk, when arrived at a certain size, may frequently be removed by the fingers. This I considered to be the *Turbinolia Borealis* of Dr. Fleming, which is described as being "widely conical and slightly bent," and said to become detached by age, but Dr. Johnston tells me it is the *C. Smithii* of his work.

ZOANTHUS. Cuvier.

Generic Character: Polype mass compound; polypes distant, united at their bases by a trailing fleshy band, or broad fleshy base. Animal an Actinia.

ZOANTHUS COUCHII. *Johnston*. Polype-mass compound; polypes distant, when contracted hemispherical, when expanded, pedunculated, united at their bases by an encrusting fleshy band; tentacula in several circles. Pl. xv., fig. 2.

Hab. On flat slates and rocks in deep water from one to ten leagues from the shore, throughout the Cornish part of the British Channel. Common.

This, in being compound, differs from all other European species of the order, and approaches very closely in form to the *Actinia sociata* of Ellis. It is a very small species, and composed of a number of Actiniæ united together at their bases by a thin, encrusting fleshy band. It is of a light sandy or opaque red colour, and its surface is minutely glandular. In its contracted state it is sub-conoidal; resembling both in shape and size a split pea. When living, except that it is glandular, its surface is plain, but when preserved it becomes corrugated. When semi-expanded, which is its favourite state, it elevates itself to about twice its former height and becomes contracted about its middle into an hour glass form. The upper portion is lighter than the lower, and the superior or oral surface is marked by a central depression or mouth, and from it radiate to the circumference, numerous rows of whitish glandular looking bodies, which are the tentacula in a contracted state. When the creature is fully expanded, the tentacula become distended and elongated to about the length of the transverse diameter of the body; and they are generally darker at their extremities than towards the base. Like all the Actiniæ, the present species possesses a power of considerably altering its shape; most frequently it is in the shape of an hour glass, at others the oral surface is contracted to a mere point, and then occasionally, is again enlarged to nearly twice the size of any other part; sometimes the mouth is depressed, and at others is elevated into an

obtuse cone. This species in addition to being rooted is one of the most inactive of its order; for whether in a state of contraction or expansion it will remain so for many days or even a week without apparent change. If it should be in an expanded state, a touch will make it contract, and it will, most commonly remain so for several days. Its most favourite state, is the semi-expanded in which it will sometimes remain from a week to a fortnight without change.

The trailing connecting band is flat, thin, narrow and of the same texture as the polype and glandular. It frequently gets enlarged into small papillary eminences, which as they become enlarged, become developed into polypes.

This species and the *Actinia sociata* of Ellis are very closely allied to each other; this, however, is shorter, smaller and not so much pedunculated as Ellis figures his to be, and the fleshy band also appears to be thinner and wider.

Having communicated specimens to Dr. G. Johnston, he is of opinion that it is distinct from Ellis' species, and has done me the honour to give it the name quoted above.

ACTINIIDÆ.

Body naked, fleshy, contractile, locomotive.

ACTINIA, Linnæus.

Generic Character: Body conoid or cylindrical, adhering by a broad base: the space between the mouth and the rim of the upper disc, occupied by one or more series of conical undivided tubular tentacula, which are entirely retractile.

SEA-FIG MARYGOLD; SEA-ANEMONE; COWS.

A. Mesembryanthemum. Body conical, smooth; tentacula in several rows; around the oral disc a row of azure blue tubercles. Pl. iv., fig. 1.

Hydra Mesembryanthemum, Stewart's Elem., vol. 2, p. 451. Actinia Equina, Fleming's Brit. An., p. 497. A Hemispherica, Pennant's Brit. Zoology, vol. 4, p. 50. Templeton in Mag. Nat. Hist., vol. 9, p. 303. A. Rufa, Stewart's Elem., vol. 1, p. 393. Actinia Mesembryanthemum, Johnston in Mag. Nat. Hist., vol. 8, p. 81. fig. 12; Brit. Zooph., p. 211, fig. 31, p. 210. Ellis and Solander's Zooph., p. 4. Turton's Lin., vol. 4, p. 104. Sea-Anemone, Roget's Bridgewater Treatise, vol. 1, p. 198, figs. 86, 87.

Hab. On rocks and stones between the tide marks; abundant all along the coast.

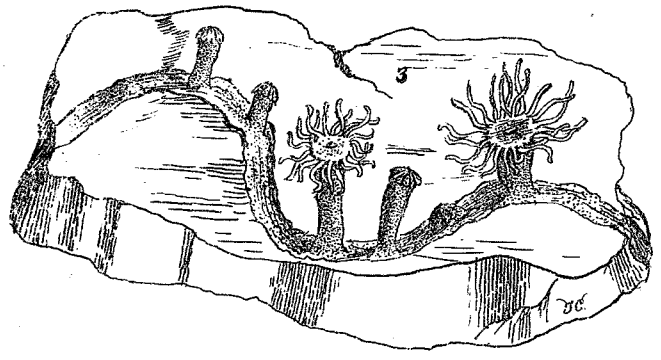
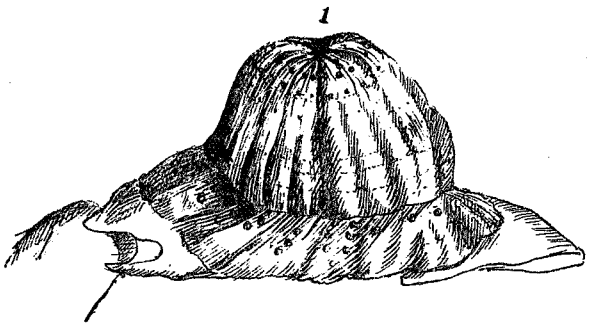
This species is so common on all parts of our coast, that it is hardly necessary particularly to describe it. It is generally of a reddish brown, liver, or olive green colour, and lives in a very scattered manner in pools and on the

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1.2. *Actinia Parasitica.*
3. *Zoanthus Couchii.*