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“MINIUS PARTIBUS, PER TOTUM NATURE CAMPUM, CERTITUDO OMNIS INNITUR;
QUAS QUI FUGIT PARITER NATURAM FUGIT.”—*Linneus*.

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M.DCCC.XLIX.

XXI. — *Observations on the Anguinaria spatulata.*

By GEORGE BUSK, Esq., F.L.S.; &c.

(Read January 26, 1848).

THE very remarkable *Bryozoon*, known under the name of *Anguinaria spatulata*, or the "Snake coralline" of Ellis, is stated by Dr. Johnston to be "not common." I was, therefore, in respect of it, as of the *Notamia bursaria*, fortunate in meeting with this species in very great abundance and perfection, and in the same locality as the former. It is parasitical upon Fuci, and appears to flourish in from three- to ten-fathom water, and is not unfrequently associated with other polypes on the same plant. An instance of this kind is shown in fig. 1, Pl. 26. It is here associated with *Campanularia integra*, and in other specimens I have seen it growing together with *Laomedea obliqua* and other Sertularians. Its character, as given in Dr. Johnston's work, is as follows:—

"Polype cells spatulate, erect, scattered, with a lateral aperture near the apex; originating from a creeping fistular subcalcareous fibre, adnate to a foreign base.—Polypes ascidian." This character, I think it will be seen, is incorrect in several particulars, which it is partly the object of this paper to point out.

The *Bryozoon*, as a whole, consists like all its congeners of two distinct portions, one, usually termed the radical, and another, which constitutes the proper polype cells. In the present instance, the arrangement of these parts is in some respects very peculiar and curious, but it will be found upon strict examination to accord accurately with the universal type. The origin, or base, as it may be termed, of the zoophyte is a more or less rounded disk of small size, probably divided into compartments as in the *Notamia*, from each of which arises a primary radical branch, in this species very short; these primary radical branches or tubes are directly continued into a polype cell, but the cavities of the tube and cell are not continuous, being separated by a distinct dissepiment (fig. 7), so that the

coarsely granular contents of the radical tube have no communication with the polype cell. The polype cell is at first continued in a line with the radical tube from which it originates, but soon turns up at a right angle and stands erect upon the object on which the *Bryozoon* is growing. After ascending in a nearly straight line for a certain distance it curves with a gentle sweep, and terminates in a slightly expanded extremity, at the apex of which, and not at the side, is the opening through which the polype protrudes. The continuation of the radical portion of the zoophyte, or of that creeping fibre, as it appears, which is adnate to the foreign base, is effected by the formation, at the angle where the polype cell turns up, of a bud containing granular matter, which becomes a narrow tube, in all respects similar to the primary radical tube, and which, like it, after running a short distance, terminates in a second polype cell resembling the first, and so on continuously, to an uncertain number. The growth of the polype cell appears to precede in some degree that of the radical tube continuous from it, but it is not necessary that the growth of the former should be completed before the latter makes its appearance. The development of these two parts seems to be carried on in the usual way; viz., first, in the appearance of a rounded bud filled with granular matter, which gradually increases in length, and the contents of which are finally moulded or resolved into the proper contents of the cell, of which the bud constitutes the origin. In some cases more than one bud of a radical tube arises at the angle of the polype cell, and in this way arise the apparent branches of the creeping stem. The walls of the radical tubes and of the polype cells consist of a thin transparent horny material, which is insoluble in weak acids, and strengthened or rendered rigid, except in one part, by the deposit of calcareous matter. In the radical tubes, and on the dorsal or upper surface of the dilated extremity of the polype cell (fig. 4), this earthy matter is deposited in the form of minute angular or rounded particles, presenting faint traces of a linear arrangement, but in the main body of the polype cell, or the upright portion, the calcareous material is arranged in beautifully regular rings, giving that part of the zoophyte a peculiarly elegant appearance under the microscope. This calcareous ingredient is sufficiently abundant to render the contents of the radical tubes and polype cells indistinct, and to obtain a satisfactory view of these parts it is necessary to remove the earthy matter by some weak acid. When this is done it will be found that the contents of the radical portion are, as before mentioned, coarsely granular, and the wall rather thicker than those of the proper polype cell. The latter con-

tains an ascidian polype, which has about twelve tentacula and no gizzard. The polype, so far as I have observed, is always lodged in the upright portion of the cell, but the long retractor muscular fibres arise near the commencement of the horizontal portion of the cell, and from its upper wall, nearly at one point. They consequently turn abruptly round the angle formed by the rising up of the cell, and passing chiefly on the side (the anterior) of the body of the polype, are inserted, some towards its inferior part, and some apparently near the base of the tentacula, as in other polypes of this class (fig. 7). The muscular fibres consequently are of great proportionate length; they are distinctly marked with transverse striæ, and appear to me to be constituted of a delicate diaphanous tube, or sarcolemma, containing the more solid, contractile, sarcous particles. I am led to this conclusion, from observing here and there in some of the fibres, spaces in which the fibre is very transparent and unmarked with striæ, as if a tube were stretched and two portions of its contents drawn apart within it (fig. 8). The tentacula are from ten to twelve in number; they are very long, and have a series of spinous projections, as remarked, I believe, by Mr. Lister, on their outer side. The resemblance of the terminal expanded part of the polype cell to the head of a snake is very striking, and in fact, of the whole cell to the body of a serpent, and thence has arisen its very appropriate generic name. It would appear, from the descriptions heretofore given of this zoophyte, that the form and situation of the aperture have not been rightly apprehended; and as in the systematic arrangement of this class, these particulars will be found of the first importance, it is to this part I would direct attention. The aperture is terminal, and in form crescentic (fig 2), the lower lip being formed of, or strengthened by a cartilaginous or horny half-ring, very nearly resembling a horseshoe in form, and which constitutes the movable part of the rim of the orifice, and to which are attached two pairs of muscles, one for the closure, and the other for the opening of the aperture. I should have stated, in speaking of the structure of the walls of the polype cell, that the upper or dorsal portions only of the expanded extremity were strengthened by calcareous matter, the lower side being filled up by a thin flexible membrane, attached in front to the cartilage of the lower lip of the aperture, and which by its flexibility, allows the latter to be moved with ease. This membranous expansion may be likened to the bag of the pelican's beak, and like it, seems sometimes to be used as a receptacle for food, at all events, it will occasionally be found to contain numbers of *Navicula*

and other Infusoria. The muscles which move the horseshoe-shaped cartilage constitute two pairs, one superior, the occlusors, which are attached by a slender tendon to the upper angle of the expanded base of the horns of the crescentic cartilage, and the other, the inferior or dilators, which are inserted beneath the inferior angle of the same base. These muscles, like the retractors of the polype, are marked with transverse striæ. The expanded portion of the cell, besides these special muscles of the aperture, contains other muscular fibres, in all respects resembling those described by Dr. Farre, as conducing to the extrusion of the polype in *Bowerbankia*, and which are also very distinct in the *Notamia*, but which in the present instance would seem to have for their chief function, the drawing up or corrugation of the membranous portion of the polype cell. These muscular fibres have a distinct central nucleus or thicker portion, as is the case in the analogous muscles in the other cases just cited. It will thus be seen that, in the important particular of the aperture, the received statement that it is "inferior subterminal, oval, and with plain margins," is in every particular incorrect. It is on the contrary terminal, crescentic, and one half of its margin constituted of a movable horny lip, the other half formed by the calcareous wall of the polype cell, resembling in fact, the aperture in *Gemellaria*, *Notamia*, and others, in which part of the wall of the cell near the aperture is filled up by a flexible membrane, attached probably in all cases, though this has not yet been shown, to a movable horny lip with appropriate muscles. This *Bryozoon*, therefore, together with, at all events, *Gemellaria loricata* and *Notamia bursaria*, must be removed from the family *Eucratiadæ* of Dr. Johnston, or the characters of that family must be modified, as respects the situation and construction of the aperture of the cell.

I would direct attention to an appearance not unfrequent in the polype cells, as if they had been repaired after being broken. This appearance is seen in figs. 5 and 6.

Fig. 2

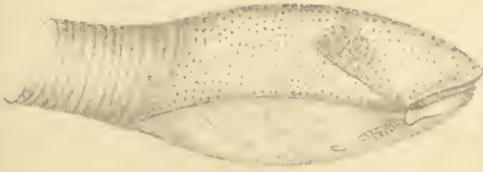


Fig. 3



Fig. 4



Fig. 8

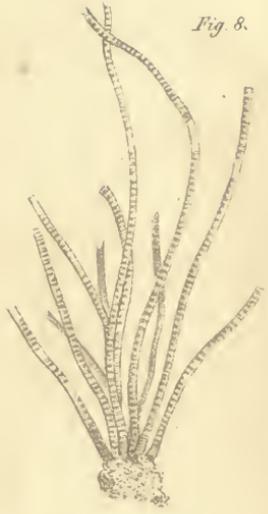


Fig. 6



Fig. 5



Fig. 7

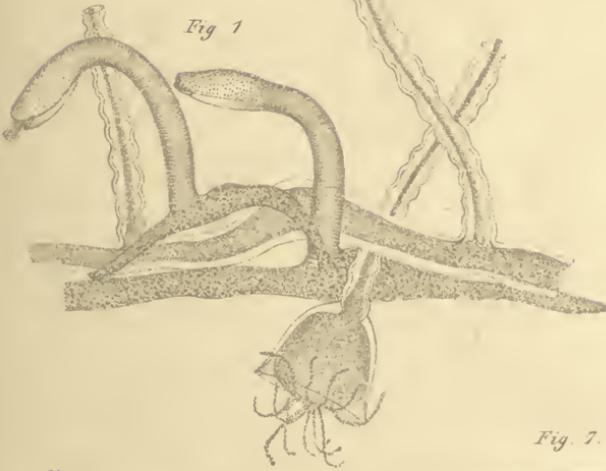


Fig. 7.



Var size

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