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XXX.—On the genera Eleutheria and Synhydra

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in a drop of water and covered with a top glass. Now it is a very great advantage to be able at once to mount anything without being obliged to shift the top glass in order to introduce a different fluid; in doing this the relative positions of parts are frequently changed, or in the case of animalcules the latter may be lost, and many a rare thing have I irrecoverably been deprived of by having recourse to a different fluid before I was led to adopt my present mode. If any person could discover a method of mounting marine Algæ so as to prevent the loss of the beautiful tints in many of the more delicate, he would confer a great boon on microscopists. I regret to say that every method of preserving colour in the *Griffithsia*, the *Calithamnia* and *Cerania* have with me signally failed; their delicate rose-coloured tints are soon lost, even though the cell is allowed to dry and the preparation ever afterwards kept in a dark place.

Inclosed I forward to you a cell, also a slider containing a portion of *Batrachospermum vagum* according to Sowerby, but in my humble opinion a variety only of *B. moniliforme*, together with the spiral vessels of the garden Nasturtium. These are all prepared in the manner detailed above, have been mounted nearly a year, and have suffered no change during this time.

I have the honour to be, Sir, your obedient servant,

WILLIAM RECKITT, M.R.C.S.L.

Boston, Lincolnshire.

XXX.—On the genera *Eleutheria* and *Synhydra*. By P. J. VAN BENEDEN, Professor at the University of Louvain*.

IN order that physiological researches may extend the state of our knowledge in zoology, it is requisite that the limits of the genera and species composing the scale of beings should be well determined. The object of the naturalist should be to become acquainted with the animal in the different phases of its development. A celebrated professor has said, that we do not know a species, if we have not studied it from its exit from the egg up to the period of its decrepitude.

M. de Quatrefages has communicated to the French Academy of Sciences, a memoir on a new animal which he has called *Eleutheria*. While our work on the *Tubulariæ* was in the press, we received this memoir†, and we could not but express a doubt of the zoological value of this new genus. It might indeed be a young animal, we said, which in the adult state would come to

* From the Bulletin de l'Acad. Roy. de Bruxelles, vol. xi. no. 10. Translated from a separate impression kindly furnished by the author.—ED.

† Annales des Sciences Naturelles, 2nd series, tom. xviii. p. 270.

be classed among the *Tubulariadae**. This subject seems to be of sufficient importance for us to recur to it; for the opinion which we then advanced has been confirmed by subsequent researches.

The first idea of M. de Quatrefages, at the sight of the beings which he has called *Eleutheria*, was, that they were in the state of larvæ; but on detecting eggs in the majority of them he had no longer any doubt as to the perfect state of the new polyp; since it is only in the adult state that generally, or rather among the superior animals, reproduction takes place.

If we had only the observation of M. Sars on the *Medusæ*†, which are reproduced by buds in the state of larvæ, the importance of this character would already be considerably lessened; but several authors have pointed out examples of larvæ which produce and lay eggs. It must however be admitted that these facts were badly interpreted. In our memoir on the *Campanulariæ*, and more particularly in that on the *Tubulariæ*, we have endeavoured to explain these phænomena, by comparing the ascertained facts with our own researches.

M. R. Wagner‡, one of the most able naturalists of Germany, inserted in the 'Isis,' in 1833, an observation of this kind which he made on a *Coryne* from the Adriatic. Upon the side of the body, M. Wagner observed a young *Coryne* developed of a form quite different from that of its mother, and which produced eggs.

M. Lovèn§, who has made so many beautiful observations of late years on the inferior animals of the Baltic, has also furnished an example of this kind of reproduction; but instead of taking the animal containing eggs for a young one, he regarded it, with M. Ehrenberg, as an adult female. Figs. 12 and 13 A. illustrating his memoir represent compartments in which are formed medusi-form larvæ, and, even in the midst of these larvæ, ciliated eggs are visible: figs. 2 and 7 B. furnish another example: the first contains also eggs, the second represents a single larva. Cavolini|| had observed the same phænomenon; he saw a young *Pennaria* also produce ciliated eggs.

We thus find several polyps in their young stage containing eggs, and the chief reason which has led the author of this genus to believe his animal perfect loses all its importance. We repeat, with M. de Quatrefages, that we must guard against premature general conclusions, since we every moment see fresh

* Mémoire sur l'Embryogénie des Tubulaires. Bruxelles, 1844, p. 54.

† Ann. Sc. Natur. vol. xvi. 2nd series. [Ann. Nat. Hist. vol. viii. p. 48. —Ed.]

‡ Isis, 1833, pl. 12. figs. 4, 6, 8.

§ Verhand. der Königl. Schwed. Académie, 1835. Wiegmann's Archiv, t. v. 1837. Annal. des Sciences Natur. 2nd series, vol. xv. 1841.

|| Cavolini, Polyp. Mar., Napoli, 1785.

proofs of infinite variety in the works of nature. Although the superior animals are only produced after their complete development, we have thence no right to conclude that the lower animals are similarly circumstanced.

We have no doubt that the new animal named *Eleutheria* is the first stage of a polyp allied to *Tubularia*. Even the other characters peculiar to this genus furnish new proofs in favour of what we have stated.

The *Eleutheria* has the eyes at the base of each of the tentacles. Some years ago importance might have been attached to this character, as in general larvæ do not possess these organs; but the organ of vision has now been observed in several of these, and even solely in this first stage. In the *Campanularia* we have seen as many as eight eyes during the time that the polyp is free, but in its medusa-like form these organs of relation disappear. Thus here the reverse happens of what occurs generally in the other classes. Being young, these polyps enjoy their full and entire liberty; they move about as long as they are larvæ, but as soon as they become perfect they only vegetate; they fix themselves on some body,—their condition becomes wholly passive; and the functions are limited, as in plants, to nutrition and reproduction.

The arms or tentacles have been investigated with great care by M. de Quatrefages. As the author himself admits, they are perfectly similar, with respect to their composition, to those of the *Syncorynes*. These tentacles are bifurcate, and here we find another relation with the *Eudendrium*. They become in fact divided under our eyes in this genus, and the four become eight. The *Eleutheria* approach the larvæ of the *Syncorynes* in general form, but we have observed the separation of the tentacles only in *Eudendrium*.

Each arm terminates in a kind of rounded cushion which we have observed in the genera which we have just cited; but this swelling has, in our opinion, no other object than to permit the extension of the tentacle, and we have always seen them disappear when this organ was completely expanded. They are in reality merely the effect of the contraction and of the agglomeration of the cellules; this is at least the opinion we have come to.

A difference which we have to indicate is, that we have not perceived in any one of the genera the spiculiferous sacs which M. de Quatrefages has noticed on the arms of the *Eleutheria*. He has represented them as seen with a magnifying power of 900 diameters. We have rarely employed a power of more than 300 or 400, and this is probably the reason we have not noticed them.

Whatever be the difference, it does not seem to us improbable

that the *Eleutheria* are the early stage of the *Synhydra* or of an allied genus.

During late years we have seen several examples of animals which, after having escaped the most minute researches of naturalists, are all at once discovered at the same time in countries very distant from one another. We have lately had a very remarkable example of this kind: the *Branchiostoma lubricum*, the most curious being perhaps of the whole animal creation, was discovered by Costa in the Bay of Naples, almost at the same time as MM. Sundewall and Lovèn found it in the Baltic, and Yarrell on the English coast.

We may ask if these animals make their appearance all at once in different localities, as some seem to think, or whether it is the state of science that leads to this result. We confess we are strongly disposed to believe that it is an inevitable result of the progress which science is constantly making. The attention of naturalists is at the present day concentrated on these lower animals which have been so long despised; for indeed their organization and their development must throw an important light upon the obscure functions of the higher animals.

We may point out here a further example of what we have just said. In my memoir on the *Tubulariæ* I established a new genus in that family. In the month of January 1839, I discovered it after a great storm in the midst of many objects cast upon our coast. In the sitting of January 6th, 1841, I mentioned it, and designated it by the name of *Hydractinia*.

After the publication of my notice, my friend M. Gervais recalled to my recollection that we had observed during our stay at Cette in 1838 a very closely allied polyp, probably of the same genus, and of which he had preserved a rude sketch. He had observed it whilst I was engaged in studying the embryogeny of *Aplysia*. He has mentioned it under the article *Zoophyte* in the 'Dictionn. Pittoresque d'Histoire Naturelle.'

In 1842 M. Philippi published a description in Wiegmann's 'Archiv' of a new polyp under the name of *Dysmorphosa conchicola* from the Bay of Naples. It only requires to cast one's eye upon the figure to see that it is the same animal which we observed at Ostend.

At the meeting of the British Association at Cork in 1843, Mr. Allman mentioned a new hydroid zoophyte which formed the link between the *Corynes* and the *Hermiæ*. He calls it *Cordylophora**. The few words of the author leave no doubt that it is the same animal which we had figured.

[* Ann. Nat. Hist. vol. xiii. p. 328.—Ed.]

Just before the publication of my memoir I received the number of the 'Annales des Sciences Naturelles' for October 1843, which contains a memoir by M. de Quatrefages on the *Synhydra parasitica*, a new genus of polyp allied to *Hydra*. M. de Quatrefages has observed this polyp several times at Saint-Vast-la Houque (on the coast of Normandy), and once at Brehat, on the coast of Brittany. This is again the same animal as our *Hydractinia*, and we are surprised that this identity with the animal which we had already figured in 1841 has escaped M. de Quatrefages.

If it is true (and we for our part do not doubt it), that in the *Synhydra* the supposed ovigerous individuals have no mouth, it is only the repetition of what we see in the *Campanulariæ* and in other polyps. There are in fact in this genus compartments which contain only a part of the common substance in which the eggs are formed, and that part has been also regarded, but wrongly, as female individuals without tentacles. The sole difference in this case is, that the stem, instead of being erect and ramified as in the *Campanulariæ*, is spread horizontally, forming a crust, from the surface of which both the tentaculated polyps and the fleshy bodies which produce the eggs rise. It is M. de Quatrefages who observed that the mouth is wanting in those which have eggs. But this fact is not general among the polyps of this family; in the *Corynes* the individuals which bear eggs are as perfect as the others.

Our observations on *Hydractinia* scarcely agree with those of M. de Quatrefages on the *Synhydra*, although it may be the same animal, especially in all that regards reproduction. We shall soon have occasion to return to this subject. The difference in our results probably arises from my having devoted more time in the investigation of the embryogeny of these animals in different genera.

The following is the synonymy of the new genus :—

HYDRACTINIA.

Hydractinia, Van Beneden, Recherches sur la Structure de l'Œuf dans un nouveau genre de Polype. (*Hydractinie*), Bulletin de l'Académie Royale de Bruxelles, tom. viii. 1841, p. 89. pl. 1—5.)
Recherches sur l'Embryogénie des Tubulaires. (Mémoires de l'Académie Royale de Bruxelles, tom. xvii. pl. 6.)

Dysmorphosa, Philippi, Zoologische Beobachtungen, Wiegmann's Archiv, 1842, p. 33. pl. 1. fig. 2—3.

Cordylophora, Allman, Synopsis of the genera and species of Zoophytes inhabiting the fresh waters of Ireland, British Association, Thirteenth Meeting held at Cork in 1843. [Inserted in Ann. Nat. Hist. vol. xiii. p. 328.]

Synhydra, Quatrefages, Mémoire sur la Synhydre parasite. Annales des Sciences Naturelles, Octobre 1843.

We propose to divide the genera and the species of the *Tubulariæ* as follows:—

The *Hydræ* do not belong to this family, on account of their arms or tentacles, which are hollow and in direct communication with the digestive cavity. The tentacles are solid in all the *Tubulariæ*. There are besides differences in the embryo. The *Campanulariæ* are more nearly related to the *Tubulariæ* than to the *Sertulariæ*. Their mode of reproduction is identical.

I. GENUS PENNARIA, Goldf.

Polyps with polypidoms; tentacles of two kinds, of which the superior ones are scattered and in several rows.

P. Cavolinii = *Sertularia pennaria*, Cavol.
Bay of Naples.

II. GENUS TUBULARIA, Pallas.

Polyps with polypidoms; tentacles of two kinds, in two rows.

T. calamaris, Pall. = *Tubularia indivisa*.

Coasts of England and Belgium.

T. coronata, Abildg.

Coasts of Belgium and Heligoland.

T. Dumortierii, Van Ben., nov. spec.

Coast of Belgium.

III. GENUS SYNCORYNA, Ehrenb.

Polyps with polypidoms; tentacles all alike, in several rows.

S. pusilla, Ehr. = *Coryne pusilla*, Gærtner.

Coasts of England and Belgium.

S. Listerii, Van Ben. = *Coryne*, Lister.

Coasts of England and Belgium.

S. ramosa, Sars = *Stipula ramosa*, Sars.

Coast of Norway.

S. Sarsii, Lovèn.

Coast of Sweden.

S. Chamissonis, Ehr. = *Coryne ramosa*, Cham. et Eysenh.

Coast of England.

IV. GENUS CORYDENDRIUM, nov. gen.

Polyps with polypidoms; tentacles all alike, scattered.

C. parasiticum = *Sertularia parasitica*, Cavol.

Bay of Naples.

V. GENUS EUDENDRIUM, Ehrenb.

Polyps with polypidoms; tentacles in one row.

E. ramosum, Ehr. = *Tubularia ramosa*.

Coasts of Ostend and England.

E. brioides, Ehr. = *Tubularia muscoïdes*.

Coasts of Ostend and England.

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E. splendidum, Ehr.

Coast of Norway, by Ehrenberg.

E. racemosum, Ehr. = *Sertularia racemosa*, Cavolini.

Bay of Naples.

VI. GENUS CORYNE, Gærtner.

Polyps without polypidoms; tentacles all alike, scattered.

C. squamata, Müller.

Coasts of Belgium, England, the Baltic, &c.

C. aculeata, Wagner.

Coast of the Adriatic.

VII. GENUS HYDRACTINIA, nov. gen.

Polyps without polypidoms; tentacles in one row.

H. lactea, Van Bened. = *Synhydra parasitica*, De Quatref.

Coasts of Belgium, Normandy, Brittany, the port of Cette? Bay of Naples.

H. rosea, Van Bened.

Coast of Belgium.

We are not sufficiently acquainted with the genera *Echinochorium** of Hassall and *Corimorpha* of Sars† to assign their place. We prefer simply to mention them.

Unless we are mistaken, the two proposed genera (*Eleutheria*) and *Synhydra* should therefore not be inserted in the zoological system, the one being a transitory form, a larva; and the other having been already described under another name.

XXXI.—*Description of a new Species of Pecten.* By THOMAS EDMONDSTON, F.B.S.E. & L.

PECTEN MACGILLIVRAII, *Edmondston.*

Sp. Char.—Shell orbicular, white, the upper valve with twenty, the lower with eighteen ribs, which, with the interstices, are quite destitute of longitudinal or transverse striæ; each interstice terminates in two acute trigonal teeth.

This highly beautiful Pecten, which can never be confounded with any other British species, and which, so far as I can ascertain, is equally distinct from any hitherto described, is of a pure snowy white colour, a slight tinge of pink near the umbo on the upper valve alone excepted; the surface shining with a satiny lustre; the upper valve is more convex than the lower and has twenty ribs, the lower valve has eighteen; in both the ribs are rather depressed and evanescent towards the umbones, which are acute;

* Annals of Natural History, vol. vii. p. 371.

† Beskivelser og jagttagelser. Bergen, 1835.