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### VIII.—On Ova believed to be those of the Large Spotted Dog-fish, *Scyllium Catulus*, Linn. (sp.)

Wm. Thompson <sup>a</sup>

<sup>a</sup> Belfast

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VII.—*Characters of a new Species of Axolotl.*

By Prof. OWEN, F.R.S.

Genus AXOLOTES\*.

*Gyrinus*, Shaw ; *Phyllhydrus*, Brooks ; *Siredon*, Wagler ; *Axolotl*, Humboldt and Cuvier.

Sp. 1. *guttata*. *A. fusca*, nigro-guttata, capite antice rotundato, cauda compresso-lanceolata.

Shaw, Nat. Misc. no. 343, *Gyrinus mexicanus* ; Gen. Zool. iii. p. 612. pl. 140, *Siren pisciformis*.

Humboldt and Cuvier, Voyage de Humboldt, Zoologie, 2<sup>eme</sup> partie, Reptiles douteux, p. 109. pl. 12, *Axolotl du Mexique*.

Home, Phil. Trans. 1824, p. 419. pl. 22 and 23, *Mexican Proteus*.

Wagler, Icones Amphib. tab. 20, *Siredon Axolotl*.

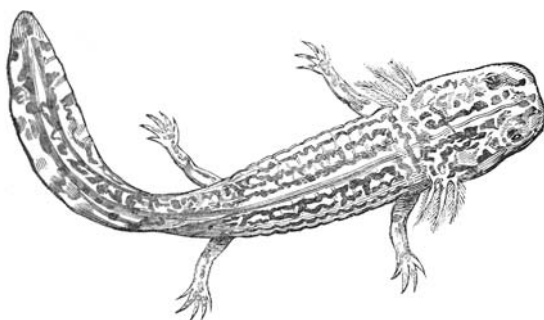
Longitudo 7 unc. ad 14 unc.

*Hab.* In lacu juxta urbem Mexico.

Sp. 2. *maculata*. *A. grisea*, nigro-marmorata, subtus lactea, capite antice truncato, cauda compresso-rotundata.

Longitudo 3 unc. ad 5 unc.

*Hab.* In Mexico, in fluviis Sierræ Madre, Chihuahua, lat. 26° 6' N., long. 106° 50' W.



*Axolotes maculata*, nat. size.

VIII.—*On Ova believed to be those of the Large Spotted Dog-fish, Scyllium Catulus, Linn. (sp.).*

ABOUT the middle of the month of December last, there were sent to the Belfast Museum two plants of the tangle (*Laminaria digitata*),

\* This rendering of the Mexican word, first applied generically by Cuvier, has long been adopted by Mayer and other German anatomists: the word is inflected according to the third declension—*Axolotes*, *is*, *em*, *ibus*. The characters of the first known species, for which the trivial names '*mexicana*' and '*pisciformis*' have ceased to be distinctive, are prefixed to render those of the second species more intelligible.

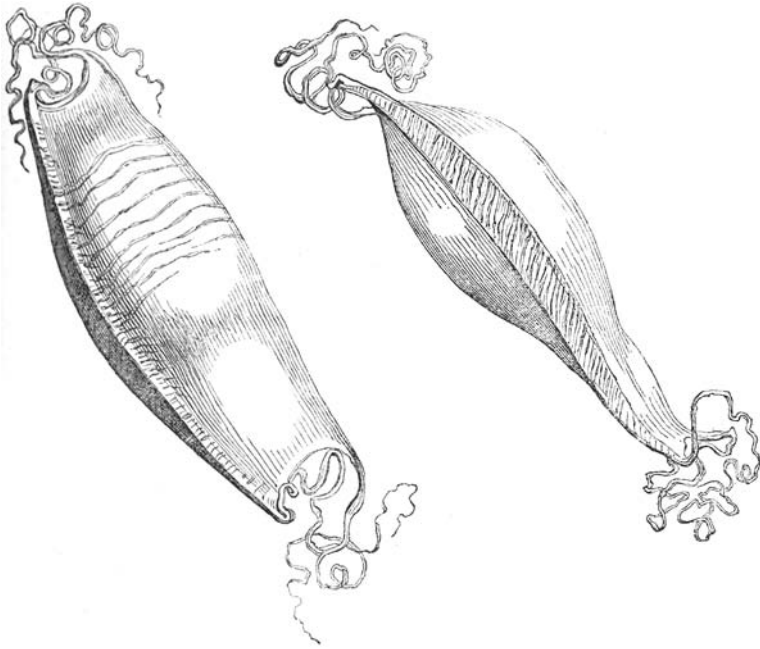
dredged together off Killinchy, Strangford lough, from a depth of between two and three fathoms, and having many large and remarkable ova attached to them by tendrils like those on the well-known "purses," as they are called, of the common dog-fish (*Scyllium Canicula*), though they evidently belonged to a different species. They were new to me and interesting in several respects. To the one plant of tangle were attached fourteen, to the other twelve of these ova: of the fourteen, six were very old, six of "middle age," and two quite fresh—of the twelve attached to the other plant, four were very old, four of middle age, and four quite fresh. Those called fresh had the "white and yelk" as in a newly laid hen's egg; from those termed of middle age, the young fish had probably long since escaped: none remained to bear testimony to its species. The age of the different ova was denoted not only by their own appearance, but by that of the mollusca, zoophytes, &c. parasitical upon them:—on the oldest were *Anomia* an inch in diameter; *Discopora hispida*, *Tubularia ramosa*, *Cellularia reptans*, all full-grown; and on them, and those of middle age, were *Lepraliæ* (Johnston) of various species, *Nulliporæ*, and masses of the ova of *Buccinum undatum*.

The number of ova of different ages suggested certain points of inquiry. Their deposition at three different periods of time on the same plant led to the suggestion that the fish may, like certain birds, as the different species of *Hirundines* for example, return time after time to the same spot to deposit its eggs. We can indeed only infer that the same individual has deposited the ova on the different occasions, but the probability is in favour of such inference. That the salmon (*Salmo Salar*) returns to its native river—if not to the same "bed" to spawn—we have a notable example in the north of Ireland, where, from the circumstance of the fish of the adjacent rivers Bann and Bush being distinguished from each other by certain peculiarities, those of every age from each river in returning to the fresh water from the sea are known always to seek the ascent of their native stream.

Being unable to find any ova described like those under consideration, I made a sketch of one and submitted it to my friend Mr. Yarrell for his opinion, together with several queries, remarking at the same time, that as "the ova are evidently generically related to those of *S. Canicula*, the first impression is, that they are those of the most nearly allied species *Scyllium Catulus*, especially as we find those of the next nearest ally, at least among British species—*Squalus annulatus*, Nils. (*Pristiurus melanostomus*, Bonap.)—to be of a different form; but, that if they belong to *S. Catulus*, which is said not much to exceed *S. Canicula* in size, it will be singular that the ova should so greatly exceed those belonging to that species as to be double their size, and in consequence of their much greater strength, about four times their weight. The transverse markings represented in the drawing denote plaits, which give to the exterior a handsome appearance; but they are not of specific value, the surface of some ova being quite smooth, of others partially or wholly plaited." It was added—"Is it known *how often* the *Scyllia* deposit their ova?

how many are deposited at one time? how long after deposition the young fish bursts its prison?" In the event of Mr. Yarrell's not knowing the ovum (which proved to be new to him likewise), he was requested to send the drawing, &c. for Mr. Couch's opinion. With respect to *S. Canicula* Mr. Yarrell remarked,—

"I never remember to have observed more than one egg in each oviduct ready for exclusion, but there was frequently one other in each oviduct at the upper end, or about to separate from the ovarium, one on each side. How long they are in passing along the oviduct,



how often deposited, and how soon after deposition the young fish leaves his cell, are points unknown to me; but I suspect in reference to gaining his liberty the young fish is rather in a hurry, for I have more than once taken very small spotted sharks swimming at large before the membranous bag of nutriment had been taken up into the abdomen, and before the young shark had begun to take food by the mouth. I will, however, send your sketch and queries to Mr. Couch."

This gentleman replied,—

"Polperro, Jan. 25, 1844.

"DEAR SIR,—I feel an impression that the figure of a 'purse' which I received in your letter of the 24th of December is that of the large spotted dog-fish, *Scyllium Catulus*. Both the British spotted dog-fishes certainly spawn twice in the year, as do many other spe-

cies of fishes that are not commonly supposed to do so, a fact which I have ascertained by observation and dissection. But I have been somewhat unfortunate in reference to the larger spotted dog-fish in not being able to obtain the ova of that fish directly from the body; a circumstance which arises from this fish going into deep water at the spawning time, when our fishermen do not find it convenient to follow them. I have obtained specimens however which I have been given to understand proceeded from this fish, and they very closely resemble the pencil drawing in size, form, the raised ridge at the sides, and in the lengthened tendrils at the corners; the colour a dark brown, but I never saw any specimen with transverse plaits, which may throw doubt on the fact of its appropriation\*.

"The ova of the *Scyllia* are deposited in pairs, an ovum descending at the same time to each corner of the uterus; but I am not able to say how many constitute one laying, except that they are numerous. They certainly remain a considerable time before exclusion; a month or two at least, and perhaps more, for the corals to which they have been attached, and especially the *Gorgonia*, are often seen growing luxuriantly round the tendrils in a manner to show that most of this growth must have taken place since the deposit. Sometimes also their surface is studded with small shell-fish, as *Anomia* and *Pectens*, of a size to render it probable that the time I have assigned to them may even have been exceeded.

"JONATHAN COUCH."

As, reasoning from analogy, I came to the conclusion that the ova must be those of *S. Catulus*, and as Mr. Couch has received similar ones which were stated to be the produce of this fish, I have thought it desirable to publish so much as we know of the subject, and to give a figure of the ovum, although actual proof is still wanting as to the species to which it appertains. Some of my queries to Mr. Yarrell bore on the subject noticed in the conclusion of Mr. Couch's letter. Were it known how long the ova of the dog-fish were deposited before the young fish escaped, we could say that the adherent mollusca, zoophytes, &c. must have attained a certain growth within a limited period, but our information is not yet sufficiently positive on this head. The most newly-deposited ova under consideration were externally quite free from all parasitical growth, which was at first sight, or before they were opened, a good indication of their freshness. But whatever the time may be in which the ovum of the allied species *S. Canicula* is deposited before the exclusion of the fish, proof is afforded by one in my collection containing a young dog-fish of this species all but ready for its escape, that before its birth would have taken place, the *Discopora hispida* attached to the outside of its case had arrived at full maturity†.

\* As before mentioned, these plaits are not of specific value.—W. T.

† Since the above was written, I have seen in the collection of Mr. R. Ball, Dublin, a similar case containing a young *S. Canicula*, on the exterior of which were groups of *Leprealia* of the full ordinary size, and two specimens of *Serpula triquetra* nearly an inch in length.

Length of recent\* ovum of *Scyllium Catulus*? 4 inches 6 lines; breadth 1 inch 9 lines; depth 3—4 lines; surface smooth or plaited transversely; sides very strong and closely plaited throughout; tendrils very strong. Colour a uniform brown, but differing in shade in different ova.

Belfast, May 1844.

WM. THOMPSON.

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IX.—Description of a minute Alga from the coast of Ireland.

By WM. HENRY HARVEY, Esq.

[With a Plate.]

RHODODERMIS, Harv. MS.

GEN. CHAR.—*Frons* carnosomembranacea, expansa, crustacea, facie inferiore adhærens, e cellulis polygonis sanguineis minutis formata. *Fructus*? verrucæ pertusæ in frondem sparsæ.

*R. Drummondii*, Harv. MS.

*Hab.* At New Castle, co. Down, spreading over the rocky sides and bases of maritime caves, in places where it is covered by the sea at high water, but exposed, on the ebb of the tide, to the dripping or trickling of fresh water. *Dr. Drummond*, May 1840.

*Frond* spreading in wide, concentric, but not regularly circular patches of a dark blood or brick-red colour, when dry purplish lake, closely adhering to the rocks on which it grows, and to which it is attached by the whole of its lower surface; of a fleshy-membranous, very tenacious substance, glossy, about half a line in thickness in the centre, but becoming gradually thinner toward the margin, composed (as shown by the highest power of the microscope) of strata of minute polygonal cellules closely packed together, and filled with brilliant rosy endochrome. The surface appears marked with wavy interrupted lines, and more or less thickly furnished with wart-like dark-coloured tubercles, which are either scattered or grouped together in linear masses. These tubercles are hemispherical, prominent, of the same structure as the rest of the frond, deeply coloured at the margin, but in the centre colourless, and generally pierced by a hole which goes through the frond. It is doubtful whether they contain the fructification. *Dr. Drummond* was not able to discover sporules in any of them in the recent plant, nor have I been more fortunate with the dried specimen. In outward aspect they much resemble the fruit of *Grateloupia*, but a minute examination shows them to be invariably empty.

Though undoubtedly of marine origin, the presence of some fresh water in the absence of the tide seems favourable to the growth of this Alga, as *Dr. Drummond* observed the colour to

\* The specimens have dwindled in drying to about one-half their original size.