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H. N. Moseley

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THE ANNALS

AND

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[FOURTH SERIES.]

No. 87. MARCH 1875.

XX.—*On Pelagonemertes Rollestoni*. By H. N. MOSELEY,
Naturalist on board H.M.S. 'Challenger.'

[Plate XV. B.]

THIS remarkable form was found in the trawl, together with a number of deep-sea animals, from 1800 fathoms, near the southern verge of the South-Australian current, lat. $50^{\circ} 1' S.$, long. $123^{\circ} 4' E.$, March 7, 1874. Its appearance at once pronounced it a pelagic animal, the body being gelatinous and transparent, as in *Salpa*, with the exception of the alimentary canal, which stood out in relief, being of a deep burnt-sienna colour (as is the nucleus in many *Salpæ*), and the region of the sheath of the proboscis, which was less transparent than the remainder of the body. The animal was living when obtained, and when placed in fresh sea-water gave evidence of life by a feeble irregular peristaltic contraction of the external muscular tunic, which increased on irritation; the proboscis was also protruded and retracted several times.

The animal was about 4 centims. long and 2 broad, and 5 millims. in thickness. Hence its dimensions, and especially its thickness, render it unfavourable for a perfect examination of its structure under the microscope whilst in the entire condition. As only one specimen was procured, and as this was believed to be unique, no dissection was resorted to, excepting the removal of a small portion of the epidermis and external muscular tunic for microscopic examination. Hence the investigation of the structure of this Nemertine necessarily

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remained an imperfect one, and the affinities of the animal amongst other Nemertines could not be determined.

The animal is leaf-like in shape, narrowing to a blunt point at the posterior extremity, and commencing abruptly at the anterior. The proboscis is protruded from the summit of a protuberance occupying the middle region of the anterior extremity. The mouth is situate on the ventral surface of the body, just posterior to the aperture for the proboscis. It is a simple aperture, with a plaited margin composed of five or six folds. It is the commencement of a short muscular tube, the œsophagus, which was seen to pass behind the most anterior prolongation of the main mesial digestive canal, but the communication of which with the latter was not traced. The digestive system stands out very conspicuously in the fresh condition of the animal, from being of the deep burnt-sienna colour already mentioned. It consists of a broad, flattened mesial canal, somewhat broadest in the middle region of the body, anteriorly ending in a bluntly terminated cœcal prolongation, and posteriorly narrowing gradually. As the posterior part of the animal was somewhat injured, it could not be determined whether the canal terminates in an anus or not.

The mesial canal receives on either side lateral tributaries in pairs, which tributaries remain simple for some distance of their horizontal course and then break up into ramifications. The most anterior pair of lateral canals is split up into by far the most ramifications. The ramifications become less and less in each pair towards the posterior extremity of the body, some of the most posterior lateral canals being simply bifurcate, and one merely enlarged at the extremity. There are thirteen pairs of lateral canals in all.

The nervous system was plainly seen in part. A pair of rounded ganglia lie on the ventral and lateral surface of the sheath of the proboscis, being a little posterior in position to the mouth. A commissure passes above the œsophagus and between it and the proboscis-sheath. From the ganglia a pair of fine simple nerve-cords pass in a curved course down to the posterior extremity, where their termination could not be ascertained. The cords cross ventrally the lateral digestive canals about the point where ramification commences. Further connexions of the ganglia could not be ascertained.

The specimen obtained was a female. A series of ovaries, consisting of pear-shaped masses of minute ova, were present, situate between each of the pairs of lateral digestive tubes, immediately external to the nerve-cord on each side. The masses of ova are contained in small cavities in the gelatinous

internal body-tissue. When pressure was exerted, the ova issued from small corresponding apertures on the ventral surface, and the small empty cavities remained. The ova were spherical, about .28 millim. in diameter, and appeared composed of fat-globules and granular matter.

The proboscis-sheath, which is wide and capacious, is very plainly seen on the dorsal aspect of the body, and dimly through the thickness of the body from the ventral aspect. It has a firm muscular attachment at its orifice; and bundles of muscular fibres (apparently retractor) are attached to it here on either side (Pl. XV. B. fig. B, 1). The proboscis itself is, when retracted, coiled up in the usual manner within its sheath, as seen in fig. D. It could unfortunately not be ascertained whether the proboscis is armed or not. It was never entirely retracted; but a small portion of it always remained exerted.

The outer surface of the body of the Nemertine is covered with a hyaline, very thin integument, which is thrown into numerous folds and wrinkles, which are so arranged along certain lines around small spaces nearly free from them as to produce on the surface of the body an appearance of a series of small polygonal areas separated by fine reticular network (fig. D). This condition of the surface was most conspicuous about the anterior part of the body; but the body was much lacerated by the meshes of the trawl, and therefore I cannot say whether the whole integument is in this condition in the fresh state or not. The folds and plaits in the integument are so sharp that they give the appearance, under the microscope, of somewhat spindle-shaped bodies with sharply pointed extremities (fig. C, 1, 2, 3). At first I supposed that these bodies were urticating organs resembling those of *Bipalium*; but on carefully teasing up a portion of the integument with fine needles, and being unable to isolate a single one, I concluded that they were mere folds. They are, however, of remarkable appearance, from their extreme abundance and the manner in which they cross each other at all angles. They are well preserved in glycerine preparations of the skin hardened in picric acid.

Beneath the integument is some granular glandular matter. Immediately beneath the integument, and in close adherence to it, is the muscular tunic, evidently the homologue of the cutaneous muscular system of *Bipalium* and other Planarians. As in these, the outermost fibres are circular in direction, the inner longitudinal.

The muscular tunic encloses the entire body. It is thin, and in the fresh condition of the animal transparent and inconspicuous, but becomes opaque when the animal is hardened

in picric acid. The inner longitudinal layer consists of stout bands of fibres running parallel to one another. The outer circular fibres are far less developed, and are not gathered into bundles, but cross one another slightly obliquely in their transverse course, forming a slight meshwork over the longitudinal fibres.

Beneath the muscular tunic and between its meshes the body mass is filled up with a gelatinous hyaline structureless matter, imbedded in which lie the viscera and the muscles attached about the orifice of the sheath of the proboscis. Internal muscles, except those referred to, were not observed.

No eyes or other sense-organs were found; and ciliated sacs were not seen.

From the circumstance of the only specimen of *Pelagonemertes* having been much lacerated, and from the animal not having been dissected, it will of course require further examination. In the specimen as procured there was a deep constriction of the body at about the junction of the first with the second fourth of its length. This, it appeared pretty evidently, had been caused by the meshes of the net. The posterior extremity was somewhat injured, and its form may not be quite correctly given. Ciliated sacs may be present; and the structure of the proboscis might throw light on the affinities of the animal.

The form of the digestive system is the most remarkable feature about *Pelagonemertes*, in its close resemblance to that of *Dendrocecla*. In other respects *Pelagonemertes* is thoroughly Nemertine in structure, being merely modified for pelagic existence. It is remarkable that the gelatinous hyaline mass of the body is not tegumental in character, but apparently homogeneous with internal structures.

The occurrence of a peculiar burnt-sienna colour in many very different pelagic animals is remarkable. With many the colouring may be explained as protective resemblance to the oceanic seaweeds. For its occurrence in others, such as *Salpa* and *Pelagonemertes*, in an otherwise hyaline body, there may be some common cause, possibly also protective.

Diagnosis of the Genus *Pelagonemertes*, H. N. M.: *Body leaf-shaped, gelatinous, hyaline. The anterior extremity of the body broad and abrupt, the posterior narrowed to a point. The digestive canal with thirteen pairs of lateral ramifications, as in Dendrocecla. Integument thin and hyaline, with a thin muscular tunic immediately beneath it, consisting of external circular and internal longitudinal fibres. The animal free-swimming, oceanic.*

EXPLANATION OF PLATE XV. B.

- Fig. A.* *Pelagonemertes Rollestoni*, from the ventral surface. $\times 2$ diameters. 1, mouth, with œsophagus; 2, partly protruded proboscis; 3, nerve-ganglia; 4, nerve-cords; 5, ovaries; 6, digestive canal. The sheath of the proboscis is seen through the body lying behind the digestive canal.
- Fig. B.* Sketch of the proboscis-sheath and contained retracted proboscis, from the dorsal aspect: 1, retractor muscles inserted into the commencement of the sheath.
- Fig. C.* 1, one of the polygonal areas, enlarged, showing the wrinkles of integument producing the appearance; 2, peculiar appearance of some of the folds of the integument.
- Fig. D.* Reticular appearance of the integument observed in certain parts of the body. Natural size.

XXI.—*Submarine-Cable Fauna.* By J. GWYN JEFFREYS, LL.D., F.R.S., and the Rev. A. M. NORMAN, M.A.

[Plate XII.]

A NOVEL and unusual method of collecting specimens of the marine Invertebrate fauna is by means of the telegraph-cables which are laid down along so many of the great ocean highways. These cables occasionally need repairs, and must be taken up for that purpose. An opportunity has lately occurred, through the kindness of Sir James Anderson, of observing the animals which were found attached to the Falmouth-and-Lisbon cable, laid in June 1870, and taken up last autumn for repairs between N. lat. $47^{\circ} 58'$ and $47^{\circ} 35'$, and in W. long. $7^{\circ} 6'$, at depths ranging from 89 to 205 fathoms on the edge of soundings; bottom sandy. Such depths are now not considered great; but the ground seems to have been hitherto unexplored by the dredge. The accuracy of the communication made by Sir James Anderson is unquestionable, and differs in that respect from the information which misled M. Alphonse Milne-Edwards, when he published a list of the animals attached to a cable which was taken up several years ago between Cagliari and Bône.

The Mollusca thus procured are interesting only for the sake of locality; they will be noticed by Mr. Jeffreys. An account of the other Invertebrates, including some new forms, will be given by Mr. Norman.

