

Researches upon some of the lower Marine Animals.

By R. LEUCKART and A. PAGENSTECHER.

Under this title, MM. Leuckart and Pagenstecher have published the results of some investigations made at Heligoland. The following are some of the most interesting of these notes:—

Amphioxus lanceolatus.

The authors, like M. Schultze, have examined immature individuals of this interesting vertebrate animal; but, while the latter observer had only two specimens under his hands, they have been able to collect a considerable number. They were struck by the great want of symmetry which characterizes the young animals,—a want of symmetry of which Johann Müller recognized traces in the adult *Amphioxus*, and which has also been indicated by MM. Schultze and Kölliker. It is manifested principally in the following manner:—the mouth, the anterior branchial aperture, the olfactory organ, and the eye are all situated on the left side; the branchial ridges are differently arranged to the right and left of the median line; and the loop-like organs, of problematical signification, included between them are also different. The dorsal portion of the animal is perfectly symmetrical; and the great development which it acquires in the adult animal gradually renders the want of symmetry in the ventral region less apparent.

The authors have ascertained that the *chorda dorsalis* of the *Amphioxus* is provided with a longitudinal groove on its upper part, so that its transverse section is cordate. In this groove is lodged the inferior convexity of the spinal cord. The anterior extremity of the medulla encloses a small cavity (a kind of ventricle), into which the spinal canal opens. Perhaps, in this arrangement, we may see the indication of a rudimentary brain.

The number of branchiæ varies between eleven and seventeen. The new branchiæ make their appearance behind those already in existence. They are all placed immediately beneath the alimentary canal, without any direct communication with the latter. The ventral wall of the animal is cleft along the median line in such a manner as to allow the branchial apparatus to float freely in the sea. This long fissure, which is called the posterior respiratory aperture by the authors, allows the water which has been employed in respiration to flow off. This respiratory apparatus of the young animal is easily seen to be very different from that of the adult, as described by Johann Müller; it is probable that the respiratory apparatus of the young animal becomes transformed directly into that of the adult by the formation of a cartilaginous branchial skeleton, and the establishment of a direct communication between each branchia and the interior of the intestine. At the same time, the fissure just indicated must be closed in such a way as only to leave a single small aperture—the abdominal pore of Müller. Close to the mouth, on the left side of the animal, there is a fissure imperfectly seen by Schultze, which the authors have ascertained to be the anterior branchial aperture.

The young individuals observed by the authors did not possess the least trace of a vascular system, or of generative organs.

The Pilidia, larvæ of Nemertinae.

The observations of the authors completely bear out those of Krohn, which show that the *Nemertes* (*Alardus*, Busch), which is generally found in *Pilidium*, is not a parasite upon those animals, but that it is produced by them, by means of a sort of gemmation. Besides the common species (*Pilidium gyrans*), the authors have investigated a new species, which they call *P. auriculatum*. They have arrived at highly interesting results; they show that certain worms of the Order *Nemertinae* present a mode of development which may be brought into complete parallelism with the remarkable genetic history of most Echinoderms. The development of the *Nemertes* in its *Pilidium* is precisely the same with that of an *Echinus* or an *Ophiura* in its *Pluteus*. But, whilst in the Echinoderms it is only the stomach of the larva that passes into the perfect animal, not only the stomach, but also the œsophagus and the mouth of the *Pilidium* are preserved in the *Nemertes*.

Tomopteris.

The authors demonstrate that Burmeister was wrong in classing *Tomopteris* among the Mollusca. They are true Annelides, as Grube first maintained. It would even appear that their most natural position is beside *Chætopterus*.

Sagitta germanica.

Although the anatomy and a considerable portion of the development of the *Sagittæ* have been sufficiently made known by the works of Wilms, Krohn, Gegenbaur and others, the recent statements of Meissner (1856) upon the evolution of these little animals give a particular interest to the researches of MM. Leuckart and Pagenstecher. In fact, although most observers are now agreed in classing the *Sagittæ* among Vermes, Meissner succeeded in unsettling the faith of some people, by describing in the young *Sagittæ* of the sea of Heligoland a *chorda dorsalis* and a spinal cord,—in a word, organs which appear to give this animal a place amongst the Vertebrata. The investigations of the authors, made upon the same species that was studied by Wilms and Meissner, show that the older authors were not deceived in placing the *Sagittæ* amongst the true Worms; and these two observers cannot at all account for the evidently erroneous statements of Meissner.

Echinobothrium typus.

This Cestoid worm, which has already been studied by Van Beneden and others, lives as a parasite in various species of Rays. The authors have been able to trace its development, which precisely resembles that of other worms of the same Order. In the least advanced stage observed by the authors, the animal presents the form of a vesicle (embryonal vesicle), of which one of the poles exhibits a

depression or aperture formed by the turning-in of the wall towards the interior; this depression becomes a second vesicle, within the former. It is at the bottom of this second vesicle that the scolex sprouts forth. The latter increases in length until it can no longer find room within the vesicle, when it issues out through the aperture. It then exhibits a division into segments.

The embryonal vesicle contains in its walls a great number of calcareous concretions. The authors found that Claparède was quite right in supposing that the same relations would be found to exist between the calcareous corpuscles and the vascular system of the Cestoid Worms that he observed in the corresponding organs of the Trematoda. These corpuscles are, in fact, lodged in inflated portions of the finest branches of the vessels. The authors appear to think, moreover, that there exist two vascular systems opening into the same principal trunks; one of these being in relation with the calcareous corpuscles, while the other has nothing to do with them. The segments of the *Echinobothrium* separate from each other at a period when the semen is not yet formed, which leads to the supposition that the proglottis-phase is of rather long duration. The cystic form of the worm lives, as indicated by Van Beneden, in the Prawns.

Development of Spio.

The authors describe nearly the whole series of metamorphoses of a larva, belonging undoubtedly to the genus *Spio*. Some isolated stages of these metamorphoses have been observed by Busch and Lovén, and perhaps also by Slabber and Oersted. In its young state the larva has a somewhat elongated body, furnished with two bands of cilia, one placed about the middle, the other towards the posterior extremity. Subsequently the anterior portion is developed, so as to form two ciliated cephalic lobes, between which the mouth is situated; two bundles of setæ make their appearance, and the segments of the body begin to be indicated. Soon afterwards the eyes appear, each segment acquires its bundles of setæ, and the larva gradually approaches the form of the perfect animal. —*Archiv für Anat. und Physiol.* 1858, p. 558; *Bibl. de Genève*, 1859, p. 73.

On a new genus of Goat-sucker, and on a new species of Enicurus, both from Darjeeling, from the Collection of Brian H. Hodgson, Esq. By GEORGE R. GRAY, F.L.S.

OTOTHRIX, G. R. Gray, gen. nov.

This bird differs from the Indian *Batrachostomi* in the smallness of its bill, and in the general markings of its plumage, which agree in some measure with the species of true *Podargus*.

The feathers over the upper mandible in front of the head and above the ears are much prolonged into fine hair-like bristles; they are composed of a long slender stem, having very slender branches springing from the sides at various distances, and thus agreeing



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