

THE NERVOUS SYSTEM.

The nervous system corresponds fully with that in other Holothurioidea. It consists of a ring (Pl. XLV. fig. 5), which lies superficial to the calcareous ring and to the circular water-vessel, and which sends off five cords, which proceed along the middle line of the longitudinal muscular bands, to the opposite extremity of the body. From the five cords already mentioned branches proceed to the pedicels and processes, while the ring gives off nerves to the tentacles as well as to the mouth. There is no difficulty in following the nerve-branches to the tops of the pedicels and tentacles, but I have not been able to discover in what manner they terminate. It would seem that they divide into fine filaments which are in relation to the more or less elongated cells which are present in great numbers at the ends of the pedicels and tentacles.

In all the Elaspoda there exists a very well-developed delicate peripheral plexus of nerves (Pl. XLV. fig. 1), formed by the branching and interjunction of an indefinite number of larger and finer threads or fibres, which are in connection with numerous ganglionic cells with distinct nuclei, and are often produced into several processes or threads (Pl. XLV. figs. 2, 3); even in the pedicels, tentacles, and dorsal processes such a network is present. The large ambulacral nerves as well as their branches often contain pigment, which is most obvious in *Lætmogone*. Considering the more or less macerated condition of the animals, any closer examination of the histological structure of the nerves has been rendered impossible. What I have been able to distinguish concerning it seems to confirm the correctness of the observations so carefully made by Semper,¹ and Teuscher.² Plate XLII., fig. 1, represents a transverse section of an ambulacrum in *Lætmogone wyville-thomsoni* showing the relative position of the radial ambulacral vessel and the neural canal, &c. Leaving the nerves, I now purpose to treat the sensory organs of the Elaspoda.

There is much reason to believe that the dorsal processes and appendages perform in a similar or higher degree than the tentacles the function of tactile organs. Resembling the pedicels in structure, they differ from them by their position and unusual length, size, and flexibility, as well as by their lack of any terminal sucker, and they seem to be organs particularly suited to bring the animals into relation to surrounding bodies. An unusual abundance of nerves radiating towards the exterior layer of the perisoma is a special characteristic of the processes (Pl. XXXVII. fig. 8).

In the Deimatidæ and the Psychropotidæ I have found only the sensory organs just mentioned, but most representatives of the Elpidiidæ possess, besides these, olfactory organs in the form of auditory sacs. It is an already well known fact that

¹ Reisen im Archipel der Philippinen, ii., 1, Holothurien, Leipzig, 1868.

² Beiträge zur Anatomie der Echinodermen (Jenaische Zeitschrift für Naturwiss., x., Jena, 1876).