

In *Nymphon* the number of lateral cæca of the alimentary canal is five pairs. Of these the first pair is very wide and directed forwards. At the base of the proboscis it divides into two branches. One (the larger one) is directed upwards and forwards, and penetrates the mandibles; the other one enters the proboscis and divides, in some species (*Nymphon brachyrhynchus*, e.g.), again into two branches. These extend in some species farther than in others, but I never observed them beyond the hindermost half of its length.¹

The groups of comparatively large cells with very thin walls and distinct nuclei, each of them containing, as a rule, one (sometimes more) strongly refracting granule probably have also some relation to nutritive functions. These I observed in *Nymphon*, *Phoxichilidium pilosum*, and in *Colossendeis*, collected in large groups sometimes about fifty in number. They seem not to be limited to any particular part of the body, but I found them always in the neighbourhood of the muscles, between the connective tissue, where fibrous threads keep them in place. I feel inclined to consider them as analogous to the fat-cells of most Arthropods. I figure a group of them in Pl. XXI. fig. 9.

5. *The Circulatory Apparatus.*—The somatic cavity is divided into distinct compartments, by means of sheets and bands of fibrous tissue. One of these, placed between the dorsal wall of the intestine and the dorsal integument of the body, is furnished with contractile walls, and has the function and the structure of a heart. In *Colossendeis* this heart is not surrounded by a pericardial sinus (Pl. XXI. fig. 14, *h*, Pl. XVII. fig. 1). The blood, entering the apertures of the heart, comes directly from one of the longitudinal compartments into which the somatic cavity is divided. The contractile walls of the heart do not enclose it on all sides; for on the dorsal side a part of the integument is used to form the dorsal wall of the heart. The contractility of these walls is due to the presence of muscles, which run in a transverse direction and are not striated. Along both sides of the heart these muscles are inserted into the dorsal integument of the body. As to their structure, I observed their fibres to be extremely thin and slender. When studying them with a strong lens (e.g., 11, Immersion of Hartnack) I observed that they exhibit parallel edges only for a certain distance; for this parallelism almost imperceptibly passes over into an extremely feeble swelling of the fibre, in the interior of which a long nucleus with a distinct nucleolus is observed.

The heart of the Pycnogonids, as a rule,² is furnished with three pairs of apertures.

¹ In one specimen of *Nymphon brachyrhynchus* I observed that one of the branches penetrating the proboscis divided again, so that in the same section, through about the middle of the proboscis, five sections of intestinal cæca were observed. This I consider of no importance at all. It only proves, I believe, that it is almost dangerous to attribute any fundamental value to the number of pairs of cæca arising from the intestine. In a large specimen of *Pycnogonum littorale* a section of the fourth joint of the leg shows two sections of cæca in the same joint: the cæcum has given off a branch. Consequently I believe that the number of these branches depends in general upon the capacity of the different appendages. In *Nymphon* and *Colossendeis* no cæca are observed entering the palpi and the ovigerous legs, only because the capacity of these extremities does not allow of it.

² Not always. *Pallene brevirostris*, Johnston, e.g., has only two of these.