

is never met with in the full-grown animals of both sexes; the third pair of appendages at least, the so-called 'ovigerous legs,' are always developed in the full-grown males. The other two pairs may each or both of them be either represented or wanting in the full-grown animals; however, there is not a genus and not even a single species of Pycnogonids in which the three pairs of cephalic appendages, or only one of them, have totally disappeared; they always show themselves during at least one of the first stages of the ontogenetical development.

"I therefore believe that these three pairs of cephalic appendages are an inheritance from the common progenitor of all living Pycnogonids; and so are probably the four pairs of long eight-jointed legs which in all full-grown Pycnogonids are attached to the four thoracic segments. As the rudimentary abdomen never shows traces of appendages, it is best, I think, to admit that the body of the hypothetical ancestor of this group was composed of the above mentioned seven segments.

"The study of the nervous system tended in general to confirm this suggestion; with regard to its structure, special attention was paid to the innervation of the proboscis. A complex nervous apparatus serving for the innervation of the muscles of the proboscis was discovered and described; it probably is not of any primary morphological significance, yet its structure seems highly important, as it beautifully illustrates the great amount of complication which even the nervous system may undergo, when it serves for an organ fulfilling a special and rather important function.

"Except the organs of touch, which are spread all over the body, the eyes are the only organs of sense certainly known to exist in the Pycnogonids. With regard to their occurrence in the specimens inhabiting great depths, I found as a rule that they had either no eyes at all or rudimentary ones without pigment. However, even those which must be called rudimentary, from their want of pigment, often show distinct lenses as rounded spots conspicuous by their brightness. Nor is the want of pigment in the eyes of the deep-sea species a rule without exceptions: *Nymphon macronyx*, G. O. Sars, from 840 fathoms, has distinctly pigmented eyes; *Oorhynchus Aucklandiæ*, Hoek, from 700 fathoms, has them with pigment also; and even *Nymphon meridionale*, Hoek, from 1675 fathoms, has distinctly pigmented eyes. In the case of Pycnogonids we have no reason to doubt that the animal really lived at the depth from which the net in which it was found was drawn up. The fact is also quite in accordance with the occurrence of eyes in deep-sea Crustaceans, fishes, and other animals. Though we do not understand the nature of the light present in the deep sea, it is hardly possible to accept any longer the supposition of the absolute darkness of the abysses.<sup>1</sup>

<sup>1</sup> The result of the earliest deep-sea dredgings carried on in H.M.S. "Lightning" in 1869 was to convince Dr Carpenter, Mr Gwyn Jeffreys, and Prof. Wyville Thomson, who conducted them, of the existence of light in the ocean abysses. They write in their Report: "That there is light there can be no doubt (*Proc. Roy. Soc. Lond.*, vol. xviii. p. 431, 1870), and every extension of deep-sea exploration since that time has confirmed the truth of this assumption.—J. M.