

## APPENDIX II.

CONTRIBUTIONS TO THE ANATOMY AND EMBRYOLOGY OF THE  
PYCNOGONIDA.

Our knowledge of the anatomy and embryology of the sea-spiders is very insufficient; of those living in shallow water we know but little, and of the deep-sea forms nothing. Whereas *a priori* it is evident, that in general the deep-sea animals will exhibit the same anatomical structure, and pass through the same development as the littoral or shallow-water forms; it is also clear, on the other hand, that a comparison of the anatomy of animals inhabiting very different depths might lead, at least in the case of some organs, to very interesting results.

As the rich material collected during the voyage of H.M.S. Challenger enabled me to study the anatomy of at least some genera (*Nymphon* and *Colossendeis*), I eagerly made use of this opportunity; in the first place, in the hope of increasing our knowledge of the morphological structure of the group, so that the question of their position in the zoological system might perhaps be settled; and in the second place, to try in this way to illustrate the mode of life of those deep-sea animals which belong to our group.

My original intention of going through the whole anatomy of the Pycnogonids I have given up, seeing that, however good the condition of the material might be, yet in regard to some organs,—intestine, heart, &c.,—and for the histological structure of most organs, it by no means takes the place of fresh material. Moreover, as I learned after a great part of my anatomical researches was finished that Dr Dohrn's Monograph is forthcoming, I determined to limit the publication of my researches to those organs which had suffered least from having been in alcohol for so many years. These are the integument, with its glands; the nervous system, with the sensory organs; and the reproductive organs. In regard to the intestine, the heart, &c., only some incidental observations were made, which, in so far as they are thought important enough, will be recorded also.

1. *Integument*.—The integument of the Pycnogonids is only known from the publications of Zenker (1855),<sup>1</sup> myself (1877),<sup>2</sup> and Dohrn (1879).<sup>3</sup> Zenker was the first to observe the numerous cavities in the chitinous cuticle of *Pycnogonum littorale*. I, however, had the good fortune to demonstrate that these cavities communicated by

<sup>1</sup> Zenker.—Untersuchungen über die Pycnogoniden, Müller's Archiv, 1852.

<sup>2</sup> Hoek.—Ueber Pycnogoniden, Niederländisches Archiv für Zoologie, iii., 1877.

<sup>3</sup> Dohrn.—Neue Untersuchungen über Pycnogoniden, Mitth. Zool. Stat. Neapel, i., 1879.