

tions, either between two neighbouring branches or on the connecting nodal points of the network, and then its configuration becomes more irregular (Pl. II. fig. 7, *h*). The meshes of the network are usually roundish or polygonal, sometimes more oblong; their diameter is very variable, but usually small (Pl. II. figs. 5, 6, *h*).

*Perisarc.*—The chitinous tube which surrounds the tubular branches of the reticular hydrorhiza is of special physiological importance to the symbiotic Deep-sea Keratosa, since it replaces the absent strong spongin-fibres. The network of the perisarc tubes forms the firm pseudo-skeleton of the soft sponges, and constitutes the solid framework which supports their canal-system. It is very probable that the absence of the usual strong spongin-fibres in these Deep-sea Keratosa is effected by the association with the symbiotic Hydroids, the growth of which determines the form of the sponge.

*Cœnosarc.*—The soft and delicate epithelia of the cœnosarc (ectoderm and entoderm) hidden in the chitinous tubes of the perisarc were usually scarcely recognisable, and more or less destroyed in the specimens examined; they presented the same difficulties in examination as the epithelia of the sponge itself, being much injured by the conditions of capture and the sudden change of the physical conditions of existence. In a few cases, however, they were tolerably well preserved, and I was able to convince myself that the wall of the tubular cœnosarc possesses the same structure as in the smaller Hydroids. A striking character of these deep-sea Hydroids is the dark coloration of the cœnosarc produced by the accumulation of brown, greenish, or blackish pigment-granules. These are very similar to the phæodella, or the peculiar pigment-granules, which constitute the phæodium, or the extra-capsular pigment-body of the Phæodaria, described in my Report on the Challenger Radiolaria.<sup>1</sup> The striking similarity of these dark pigment-bodies, and their general presence in the cœnosarc and the hydranths of the symbiotic Hydroids, caused some naturalists, who examined these Keratosa, to declare them to be "large-sized Rhizopods with reticular tubes filled up by phæodia." This mistake is the more conceivable, as usually the epithelia of the cœnosarc are destroyed, and their scattered pigment-granules fill up the cavity of the perisarc tubes.

*Hydranths.*—The nutritive zooids of the symbiotic deep-sea Hydroids are small, and were in all the specimens examined highly contracted, usually more or less injured, so that it was no easy task to recognise their true nature with certainty. This was possible, however, in the case of *Stylactis spongicola* inhabiting *Stannophyllum*, and especially in those species in which the pseudo-skeleton is composed of Globigerina ooze. After having dissolved the calcareous matter by hydrochloric acid, I could observe hundreds of hydranths arising from the superficial layer of the hydrorhiza, and prominent on the dermal surface of the sponge. The hydranths were ovate or club-shaped, sessile in *Stylactis spongicola*, shortly pedunculated in *Stylactis abyssicola*, and had a diameter of 0·2 to 0·3 mm. in the former, 0·5 to 0·6 mm. in the latter. The tentacles were

<sup>1</sup> Zool. Chall. Exp., pt. xl. vol. xviii. p. 1532.