

appear to be distinct from the membranous layer of the zooid, though in close relation with it. These bundles of longitudinal fibres are plainly to be seen in preparations of all kinds, and no doubt it is to their presence that the zooids owe their power of almost instantaneous retraction. In several osmic acid preparations an appearance indicating the existence of a set of circularly-directed fibres lying externally to the longitudinal fibres, or possibly of circular fibrillation of the membranous layer, was seen, but the existence of such structure was not determined with certainty.

*Cœnosarc.*—The canals and spaces within the calcareous cœnosteum are occupied, as has already been stated, by a network of soft tissue. This, together with the superficial layer of ectoderm, constitutes the cœnosarc. Only a thin layer at the surface of the coral is living. This layer separates from the underlying dead matter when the coral is decalcified in acids, and appears as a soft membrane about .5 mm. in thickness. When the entire cœnosteum is dissolved away there remains besides this membrane only a greenish gelatinous mass, which consists of the mycelium and spores of the parasitic organisms, which were the sole living occupants of the deep parts of the cœnosteum. The living part of the Hydroid seems to be entirely confined, as is the case in *Heliopora cœrulea*, to the region superficial to the last-formed tabulæ.

The cœnosarc consists of a series of ramifying canal-systems, which occupy in the recent condition the canals already described as existing in the cœnosteum. The branches and secondary branches of the canals are joined by a complex network of smaller vessels, which join in all directions the body-cavities of the zooids (Pl. XIV. fig. 4), and thus maintain a vascular connection of the freest character between the various zooids of the colony. In some cases, comparatively large tertiary branches of the canals join the zooid-cavities directly. The large main canals run sometimes for long distances, and in a species of *Millepora*, obtained at Samboangan, Philippines, their corresponding channels in the hard tissue are plainly visible to the naked eye on the surface of the corallum, extending sometimes for as great a distance as 1½ inch. The ramifications of the cœnosarc are best seen on the under surface of the superficial living film decalcified in chromic acid and viewed by reflected light. The appearance presented in such a preparation is accurately represented in Plate XIV. fig. 4. The appearance of the cœnosarc, as seen in vertical section, is shown in Plate XIV. fig. 2. In the more superficial region of the living-layer, the elements of the network take a direction more or less vertical to the surface. The horizontally directed main canals and their branches lie near the under surface of the layer on a level with the bases of the zooids.

The histological structure of the cœnosarc is shown in Plate XIV. fig. 8. The canals and vessels forming the network are composed of an ectodermal layer, with a membranous layer developed beneath it, and an endodermal lining.

The ectodermal layer consists, in the greater part of the network, of fusiform cells with a finely granular appearance and a well-defined oval nucleus, but with the cell-