

boundary often very indistinct. The cells form in some places much thicker layers than in others. Towards the most internal part of the cœnosarc they become entirely lost, their place being taken on the surface of the thin-walled cyst-like innermost elements of the network by a thin layer of structureless protoplasm (Pl. XIV. fig. 8, B).

Narrow strings of this ectodermic protoplasm (Pl. XIV. fig. 8, S) cross over here and there between adjacent vessels of the innermost part of the network, being possibly the remnants of effete vessels. The ectoderm covering the parts of the network near the surface is much thickened and modified, a large proportion of its cellular elements being there found converted into the parent-cells of nematocysts, and being thus inflated and occupied by nematocysts in all stages of development.

At the actual surface, the ectodermal cells undergo still greater modification, forming a superficial layer of elongate prismatic transparent cells, which shows on the surface a series of irregularly hexagonal areas corresponding with the summits of the cells. These cells contain oval nuclei and nematocysts of both kinds in various stages of development. The most superficial film showing the hexagonal areas separates often in osmic acid preparations as an exceedingly thin membrane, as is shown on the right-hand side of Plate XIV. fig. 8. There is some uncertainty as to the exact structure of the superficial layer of the ectoderm. The figures represent what, after a careful investigation, was concluded to be the arrangement existing. The layer is seen well only in preparations from specimens hardened in osmic acid. The lateral boundaries of the prismatic cells were never seen well defined, but the polygonal areas, corresponding with their summits, were seen well in various preparations. It could not be demonstrated with certainty that this layer extends uniformly all over the external surface of the cœnosarc. It is extremely transparent, and difficult to trace in preparations viewed from the surface, over the cavities caused by the removal of the hard parts by decalcification.

The exact arrangement of the superficial layer in its connection with the mouths of the calices and zooids is also somewhat uncertain. The layer certainly is prolonged into the calicular cavities, and contains the mass of large oval thread-cells which surrounds each zooid. In most preparations the zooids are far retracted through the action of reagents, and the mouths of the calices are closed above by a layer of tissue which shows a radiate striation or slight plaiting around a very small circular central orifice, which orifice leads down a short tubular cavity formed by the superficial layer drawn everywhere inwards to the retracted zooids of the calicle. The layer of tissue thus contracted over the calicle nearly or sometimes completely closes it, and thus usually the zooid can be seen in preparations in which the cœnosarc is viewed from the surface only by focusing the objective into the depths of the tissue. The orifices of the pores of retracted zooids were unfortunately not carefully examined in the living condition of the coral; hence, it is uncertain whether the superficial tissue contracts in this manner in the living condition so as to close the orifice of the pore, and protect the zooid, or whether such extreme contraction