

occurs only through the action of reagents. It seems probable that it does occur in the living animal, since by its means the masses of large thread-cells are brought as a protection directly between the zooid and the exterior. Just as in one small portion of the coral the zooids died in the expanded condition, so more often, in certain specimens, they die and are preserved with the superficial ectodermal layer not closed in over the mouth of the calicle, but with the calicle open, and their retracted tentacles remaining fully exposed to view from above. In Plate XIV. figs. 2 and 3, both zooids figured are shown in this latter condition. The connection between the superficial ectodermal layer within the calicle and the adjacent vascular network of the cœnosarc was not made out. The layer is probably merely the largely developed ectodermal layer of that part of the network, but the connection not having been seen is not indicated in Plate XIV. fig. 2.

The superficial layer of the cœnosarc being a special development of the ectodermal cells of the vascular network, and the interspaces in this network being occupied by calcareous trabeculæ, it follows either that the tips of the trabeculæ at the surface of the cœnosarc must be directly exposed, or that the superficial ectodermal cells of the network must close in over them. The latter arrangement seems to occur; and in vertical sections of the decalcified cœnosarc numerous spaces left by removed calcareous structures are seen in the superficial ectodermal layer (see Pl. XIV. figs. 2 and 8), with the ectodermal cells arching over to cover them. I should have had no doubt in this matter had I not observed that in the living *Millepora* the soft parts of the cœnosarc appear to be retracted below the surface of the cœnosteum when the zooids are in their retracted condition. It can, however, hardly be the case that any part of the cœnosteum is directly exposed to the water. It is probably always covered everywhere by the superficial layer of the ectoderm, which, however, is in the recent condition so transparent as to escape observation. The calcareous tissue of the cœnosteum must obviously be deposited by the ectoderm, with which alone it is in contact. It spreads by extension of the trabeculæ at the surface; and since there it is seen to be often in contact only with the cells of the superficial layer, it seems that these cells must have the power of producing it. The calcareous network undergoes thickening in the deeper parts of the living lamina, as must necessarily be the case, because of the formation of the tabulæ and lines of growth. In these parts no doubt the fusiform nucleated cells of the ectoderm are the instruments of the deposition of the carbonate of lime. No special calciferous tissue was observed, such as exists in *Heliopora cœrulea*.

Beneath the layer of ectodermal cells in the vascular canals composing the cœnosarc lies a layer of apparently homogeneous membrane, which appears to form everywhere a wall to the vessels and canals. The cavities of the vascular network are lined by, and in many places nearly filled with, cellular elements of two kinds—pigmented cells and small transparent globules. The pigmented cells (Pl. XIV. fig. 9) closely resemble those