

the layer are to be found nematocysts. The ectoderm is prolonged to form the lining of the stomachs of the polyps; otherwise it is superficial only.

The mesoderm consists of three different histological structures:—(1) A nearly homogeneous transparent connective tissue; (2) layers of connective tissue cells; and (3) masses of finely fibrillar tissue.

(1.) Beneath the ectoderm is a thick layer, of a mean thickness of about .07 mm., likewise extending over the whole surface of the coral, which consists of a highly transparent connective tissue, which is almost homogeneous, but in which faint lines indicating slight fibrillation may here and there be seen.

Extensions of this homogeneous layer form the central layers of the membranes lining the cœnenchymal tubes and calicles, and the median plates of the mesenteries, part of the wall of the stomach, &c. The layer of mesoderm immediately beneath the ectoderm is pierced by the superficial system of canals and traversed by the projecting points of the corallum (Pl. II. fig. 4).

(2.) Imbedded within the superficial homogeneous layer of the mesoderm occur also fusiform and branched connective tissue cells, which are associated together in elongate, often nearly linear groups (Pl. II. fig. 4). Many of these cells are branched, throwing off fine filamentous processes in various directions. Layers of similar cells lie everywhere next apposed to the hard tissues of the living corallum, as has already been described. These cells do not compose any portion of the polyps themselves, but merely line the calcareous calicles.

(3.) In decalcified preparations of *Heliopora* enclosed within the layers of connective tissue cells, at the places before occupied by the growing points of the corallum, occur the masses of very finely fibrillar calciferous tissue already described (Pl. II. fig. 4, P). Both this and the corallum itself belong to the mesoderm.

*Endoderm.*—The endoderm consists of spherical cells, each with small transparent nucleus, and contents consisting of irregular yellow pigmented masses and dark coarse granules. They have a mean diameter of about .014 mm., but vary much in size. They are most probably ciliated in the fresh condition, as are the closely similar endodermal cells of other Alcyonarians. I have not been able to see cilia in the hardened specimens which I have examined; nor have I in these specimens been able to detect differences between the endodermal cells lining the cavities of the calicles and tubes and those lining the canals. Some of the cells show a division of their contents into four (Pl. II. fig. 7, a, a'). The endodermal cells form layers lining the canals, the cœnenchymal tube cavities, the cavities of the calicles, and interseptal spaces.

*Soft Tissues of the Tubes and Calicles.*—The cœnenchymal tubes in their upper cavities are thus lined throughout by a membrane consisting of three layers, viz., an outer layer of connective tissue cells, a middle layer of homogeneous connective tissue, and an inner lining layer of endodermal cells. The calicles are lined throughout in like