

mesenterial filaments hang down in the fresh condition of the coral. On further simple growth the tube of the calicle becomes elongated, and receives a new uniform bottom in the shape of a tabula. As the calicle approaches maturity, the tubes immediately around it become nearly occluded at their mouths by increased development of calcareous matter at its margin. In older parts of the corallum the mouths of all the tubes are rendered very small by the excessive thickening of their walls and of the beams of hard tissue which bear the projecting points. On a quickly expanding frond of the coral the mouths of the rows of cœnenchymal tubes, which are rapidly increasing in length, are disposed in almost regular straight or curved lines directed towards the points of extension. In this condition the lateral walls of the tubes of each line frequently fuse, and become common to the line, and being more fully developed and prominent than the transverse walls, come thus to form long delicate ridges with projecting points on their edges, running almost parallel to one another, and with troughs between them. In these troughs calicles may arise, being most irregular in outline at first but gradually becoming shapely by taking in surrounding cells. In some cases the point-like prominences at the margins of the walls of the cells included within a newly formed calicle may be seen at the bottom of the calicle, maintaining a disposition parallel to that of the trough in which the calicle has been formed.

These lines of tubes may be termed lines of growth. The calicles show a more or less marked disposition in transverse curves, cutting the lines of growth at right angles.

The development of the *Heliopora* colony probably takes place somewhat as represented in Plate II. fig. 9. The original calicle (A) increases in length and forms successive chambers, A', A'', A''', A''''', by developing tabulæ in its interior. It gives off a series of buds from its margin, which become elongate tubes divided into compartments in the same manner, and which in their turn give off buds. New calicles are formed as at B in the figure.

Mode of Deposition of the Hard Tissue in *Heliopora cœrulea*.

Everywhere in the living portions of the coral applied to the surface of the hard tissues is found a layer composed of elongate connective tissue cells. The cells are nucleate and are finely granular in appearance, and are frequently drawn out into fine filaments at the ends. These cells occur only in connection with the hard tissue, excepting in the superficial layer of the mesoderm beneath the epidermis, Plate II. fig. 4. In the median plates of the mesenteries, for example, where no calcareous matter is formed, they are wanting, and homogeneous connective tissue alone present. It seems hence almost certain that they are the instruments of formation of the calcareous tissue. The newly-formed and growing points of the corallum yield much more organic remains after treatment with