

place between these walls, and the interspace has been filled with amorphous rather than fibrous calcareous matter. In some cases, in transverse sections, these axes appear as elongated spaces between the adjacent tubes, rather than central canals. The appearance of the axial structures is accurately represented in Plate I. fig. 4. There is always a somewhat opaque, fine, granular area around them, which often shows a series of concentric zones.

The opaque tissue surrounding the axes is continued into the projecting points at the surface of the coral. These points sometimes show a banded appearance, as if they had received in growth successive caps of hard tissue (Pl. II. fig. 5, P).

#### Mode of Growth of the Corallum of *Heliopora cœrulea*.

If a rapidly growing tip of a frond of *Heliopora cœrulea* be carefully protected from injury and macerated in potash, the appearance of its corallum will be that given in Plate II. fig. 10. The tissue at the actual tip is seen to be much more delicate and spongy-looking than in the older parts. It consists here superficially of an aggregation of thin-walled cells, which are mostly multiangular in outline at their mouths, sometimes hexagonal, often pentagonal, often with curved sides, assuming these various forms apparently from mutual appressure in growth. In the angles, where the walls of the adjoining cells meet, are the commencements of new cells,

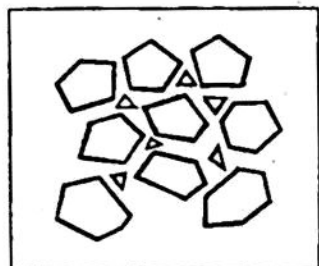


Diagram illustrating the mode of growth of the corallum of *Heliopora cœrulea*.

which in their very earliest stages are often triangular in superficial outline (see diagram). Amongst this mass of polygonal cells new calicles are developed by the arrest in growth of one or more cells after they have reached a certain small height. The arrested cell or cells form a central floor to the new calicle, around which lies a circular zone of contiguous, deeper, and older cells. The inner walls of these cells, *i.e.*, those nearer to the centre of the growing calicle, cease to grow, whilst their outer ones continue to develop, and being fused together form the lateral walls of the calicle. The plications in the wall of the fully-formed calicle are to a great extent the result of this peculiar mode of growth; but not entirely so, for sometimes in a young calicle two plications are present which may be seen to correspond to one lateral tube only. This will be understood by reference to Plate II. figs. 10, 11, and also to Plate II. fig. 9, where at B a section of a newly-formed calicle is given.

From the peculiarity of the mode of growth above described it results that in a newly-formed calicle the cavity is comparatively shallow in the centre, but is prolonged at the bottom all round into a series of tubular offsets. Into these tubular offsets the