

mostly a more or less vertical direction and communicate directly with the deep canal system. These superficial canals anastomose with one another by horizontal offsets. A series of horizontally extended canals of this system may be seen to surround each polyp, when in the contracted condition, the canals having then a radial arrangement. One such canal is shown in vertical section in Plate II. fig. 1, and the appearance of the summits of the canals as seen from the surface of the coral is shown in Plate I. fig. 5. The superficial canals are not only lined by, but also always more or less filled with endodermal cells, at least in hardened specimens of the coral.

Openings to the exterior other than those of the polyps were carefully sought for over the surface of *Heliopora*, but without success. The spots from which, by decalcification, growing tips of corallum have been removed, often form themselves into apertures in horizontal sections, and are apt to mislead the observer.

Nematocysts.—Nematocysts occur, as already described, amongst the cells composing the ectoderm, and also in the layer of mesoderm lying immediately below the ectoderm. They were not observed in the tentacles of the polyps or elsewhere. They are extremely small, measuring only .009 mm. in their longest diameter. They are of an ovoid form, and contain a single filament within, wound in a spiral, the axis of which corresponds with the long axis of the cell. They are often to be seen with the thread emitted and twisted in a loop against the side of the cell. The cell after the ejection of the thread often assumes a reniform shape (Pl. II. fig. 7, b, b'). They are so small that they might readily be overlooked, and a very high power is required to determine their structure. They appear to be not very abundant. They are shown *in situ* in Plate II. fig. 4, NN.

Structure of the Polyps.—The polyps of *Heliopora* have been examined by me only in a contracted condition.

When the contracted polyps are viewed from the interior, they show (Pl. I. fig. 5) eight symmetrically and radially disposed lobes, which form a covering closing the mouth of the calicle. The lobes are separated by deep sulci corresponding to the insertions of the eight mesenteries into what would be, in the expanded condition of the animal, part of the lateral wall of the polyp. They show a distinct striation in the direction of their length, indicating probably the presence of fine muscular fibres in their substance. At their inner region the lobes show, near their common centre, a number of extremely small nuclei upon their surface. As may be seen in Professor Lacaze Duthier's memoir on *Corallium rubrum*, the contracted polyps in that species present externally at the surface eight red coloured lobes, closely similar in form to those of *Heliopora cœrulea*. When the polyps are expanded these lobes form a coloured cup with eight dentations at its margin, which cup surrounds the lower part of the expanded colourless polyp.¹ The

¹ H. de Lacaze Duthiers, Histoire Naturelle du Corail, pl. ii.