Structure of the Hard and Soft Parts.

Cœnosteum of *Millepora*.

The structure of the cœnosteum is illustrated on Plate XIII. The cœnosteum has a widely spread encrusting base covering rocks, dead corals, &c., and at its surface presents a series of projecting, short, irregular tubercles and lobules, which never rise to any considerable height. Fig. 3 represents the appearance of two lobules of the cœnosteum and a portion of a third, enlarged two diameters. The surface of the lobules is uneven and covered with slight rounded elevations. The pores of the zooids are dispersed over the entire surface both of the lobules and of the flatter encrusting portions of the cœnosteum, being absent only at the tips of some of the lobules, which are possibly those that are in rapid growth. The pores are disposed in irregularly circular groups, a larger gastropore being in the centre of each group or system with usually from five to eight smaller dactylopores arranged around it. These systems of pores often occupy small rounded prominences on the surface of the cœnosteum, and in parts of some specimens almost every system appears to have its separate small prominence. In some regions of the cœnosteum the systems are scarcely defined, the calicles appearing irregularly placed; but such an arrangement is only exceptional in the present species. An entire system of calicles has been accurately drawn for me by Mr J. J. Wild and is represented in Plate XIII. fig. 4, enlarged eighty diameters. The outlines of the pores are seen to be extremely irregular; their cavities are encroached upon in all directions by projections of the contorted trabecular cœnenchymal tissue of the cœnosteum. The larger central gastropores of the systems measure about 1·5 mm. in diameter.

The main mass of the cœnosteum is composed of trabeculæ of dense calcareous matter, which forms a spongy-looking mass traversed in all directions by tortuous canals. In some species of *Millepora* the cœnosteum is much more dense than in the Tahitian one, and in these might rather be described as a compact mass in which a series of tortuous channels are excavated for the reception of the soft structures. In such species of *Millepora*, in finely-ground sections of the cœnosteum, the tortuous canals become filled with opaque debris, and show out, when the section is viewed by transmitted light, dark on a light ground. In a species of *Millepora* obtained at Samboangan the cœnosteum was of this nature. The appearance presented by a thin section of its cœnosteum is shown in Plate XIII. fig. 7. In *Millepora alcicornis* and in the Tahitian species the canal systems and trabeculæ of calcareous matter seem to form equally complex interpenetrating meshworks. The canal systems correspond to, and in the recent state contain, the ramifications of the soft parts of the cœnosarc. The canals form regular branching systems with main trunks which give off numerous branches from which arise secondary branches and from these again smaller ramifications. The whole canal-system is connected together by a freely anastomosing meshwork of smaller vessels, and communicates freely by numerous offsets