

The test is large in amount relatively to the size of the colony, and it is rather hard and quite opaque. The test cells are few in number. They are seen best in the layer of test which forms the upper surface of the colony (Pl. XXXV. fig. 2, *t.m.*), and which is in most places free from spicules. The test cells are mostly fusiform, and are placed with their long axes parallel to the surface.

The spicules are very abundant, but not large. The general form is stellate (Pl. XXXV. figs. 2, 3, *sp.*), but they are characterised by their irregularity. The rays are of unequal length, and are frequently as thick near the apex as at the base, or even thicker (Pl. XXXV. fig. 4). In some cases smaller spicules with very short rounded rays, or having merely a knobbed spherical form, are seen (Pl. XXXV. fig. 4).

As this species, on account of the comparatively simple structure of the test, and the large number of very distinct spicules present, seemed to be a favourable object for an investigation into the relation between the calcareous spicules and the surrounding test matrix and the mode of formation of the spicules, I cut a large number of thin sections and examined them after various methods of treatment, with the following results:—

When a section of the test is treated, under the microscope, with a drop of hydrochloric acid, the spicules are seen to be dissolved out with effervescence, and after a short time they completely disappear, leaving a large number of rounded or polygonal vacuoles in the test (Pl. XXXV. fig. 10) which were not visible before. In many of these vacuoles distinct thickenings are seen at the angles, and in some cases the angles are produced outwards to form a rudely stellate figure (Pl. XXXV. fig. 10,—notice the vacuoles marked 1, 2, 3).

When a specimen prepared in this manner is stained with aniline blue solution a delicate membrane bounding the vacuole is brought into view by its taking on the stain more deeply than the surrounding test matrix, and the angular points, which were just visible before, now appear as distinct thickenings on this membrane (see Pl. XXXV. fig. 5).

When a small piece of the test is teased (before decalcification) so as to release some of the spicules, and these are then stained in aniline blue, in some cases a delicate membrane enclosing the spicule can be made out. It is seen best where it stretches across from one ray of the spicule to the adjacent one, as it sometimes does without dipping completely into the angle between (see Pl. XXXV. figs. 8, 9).

When a section of the test is treated with very dilute hydrochloric acid, which is washed off when the spicules are only partially solved, and is then stained in aniline blue or in eosine, spicules in all stages of solution are found, and they are seen to lie each in one of the rounded or polygonal vacuoles which have made their appearance, and the outlines of which are distinctly stained, and it is also now seen that the thickened angles of the vacuoles correspond to the apices of the rays of the contained spicules (see Pl. XXXV. fig. 7, 1 and 2).