

appendages of the Ascidiozooids above. These are at first few in number, and are chiefly in the central part; but as they descend through the colony their number increases till at the base of the head they are found throughout the whole extent of the central mass of test (Pl. V. fig. 9 and Pl. VIII. fig. 11).

The canals containing the vascular appendages are continued down into the stalk. At the upper end they are very numerous (Pl. VIII. fig. 10), but as they descend they gradually decrease in number, till at the base of attachment a section shows nothing but the test substance.

The masses of embryos referred to as seen in sections of the head appear in the form of spirally coiled sacs lying one alongside each Ascidiozooid, and attached to it by a narrow pedicle (Pl. V. fig. 13).

In sections of the stalk the yellow bodies mentioned above as being visible externally are seen imbedded in the ground tissue (Pl. VIII. figs. 1-9). They are largest and most numerous near the upper end of the stalk. They will be minutely described further on (page 90).

The outer layer of the stalk is seen in sections to form a kind of cuticle, to the surface of which sand, &c., is sometimes attached, and which is of a firmer nature than the spongy central part. To this cuticle is due the yellow or brown colour of the stem, the inner part being of a grey colour.

HISTOLOGY.

Investing Mass or Test.—This is the grey substance or ground mass out of which the greater part of the colony is formed, and it is homologous with the "test" of the Simple Ascidian. Its structure is well seen in a section of the bare patch at the top of the colony (Pl. V. figs. 14, 15). It consists of a hyaline homogeneous matrix in which cells are imbedded. These are of two kinds, of which one is very remarkable. They are very large (0.04 to 0.08 mm.); oval, spherical, ellipsoidal, or polygonal in shape; hollow inside, and suggest at once the name "bladder cells," having in fact only a thin layer of protoplasm lining the inner wall, against which the nucleus lies. The nuclei are very distinct (the largest being about 0.008 mm. in length), they are round, oval, or fusiform in shape, stain readily with carmine, and are always situated close to the inner wall of the cell. There is often a little mass of protoplasm at the point where the nucleus lies. The outlines of these cells are very delicate, but distinct and beautifully regular (Pl. V. fig. 15). They are very numerous, forming by far the greater part of the tissue. Even in the places where they are least numerous they encroach so much on the matrix as to reduce it to a strongish network between the bladder cells. In other parts the matrix exists only in the form of delicate threads and membranes surrounding the large vesicles, while in some places the latter have increased to such an extent that no matrix