

more "vessels" are continued downwards into the test (see fig. 3, *v.ap.*). The Ascidiozoid is of this form in the family Polyclinidæ. In the group Didemniens there is no post-abdomen. The reproductive organs and the heart are placed in the abdomen alongside the intestine, so that the body consists of two divisions only (Pl. V. fig. 13). The Ascidiozoid is of this form in the following families:—Distomidæ, Didemnidæ, and Diplosomidæ. Finally, in Milne-Edwards' Botrylliens, the body cannot be divided into regions. The alimentary canal, the reproductive organs, and the heart are all placed alongside the branchial sac or project very slightly beyond it (Pl. II. fig. 7). The post-abdomen and abdomen seem to have been drawn upwards into the thorax. The families Botryllidæ and Polystyelidæ have Ascidiozooids of this form.

In some cases the division into the above described regions is very distinct, the body being constricted between them so as to form two (Didemniens) or three (Polycliniens) masses united by narrow pedicles (Pl. XXI. fig. 5); but in other cases, although the regions are anatomically present, they are not apparent without dissection, the body being equally or nearly equally thick all the way down (Pl. XXVI. fig. 4).

The Mantle.

The mantle has precisely the shape of the Ascidiozoid, of which it forms the covering inside the ectoderm. The latter separates it in all parts from the test, with which it therefore never comes into direct contact. The mantle is formed by connective tissue uniting and enclosing bundles of muscle-fibres, nerves, and blood-spaces. In its histology it resembles closely the mantle of the Ascidiæ Simplicis. It varies considerably in its thickness and in the condition of its musculature in the different species of Compound Ascidiens. In some cases, both longitudinal and transverse (circular) muscle bands are present, and the transverse bands are the strongest and the most regularly placed. Figure 10 on Plate X. shows this condition of the mantle. In others they are placed with very great regularity, and the longitudinal bands are almost absent. In other Compound Ascidiens, however (*e.g.*, *Colella ramulosa*, Pl. XV. fig. 17), the longitudinal muscle bands are more marked and more regular than the transverse ones, and, in some cases, the latter are almost absent while the longitudinal bands are then very powerful. In some few cases (*Tylobranchion speciosum*, see Pl. XXII. fig. 4) the muscle bands over the branchial sac are strong, and branch like those of a typical *Ascidia*; usually they are more delicate than in any of the Ascidiidæ. The muscle fibres in the mantle are always unstriped. The sphincters surrounding the branchial and atrial siphons (where the latter opens independently) are usually well marked in Compound Ascidiens.

In some forms (*e.g.*, *Colella pedunculata*, see p. 89) the median dorsal part of the mantle near the anterior end of the peribranchial cavity is prolonged to form a diverticulum which varies in size from a scarcely perceptible enlargement to a long spirally coiled