cæcum as large as, or even larger than, the body of the Ascidiozooid (see Pl. V. figs. 11, 12, and 13). This is the incubatory pouch, in which the embryos undergo their development. Its wall is usually thin, and its muscle-fibres are few and delicate.

The mantle apparently does not contract so much at death in Compound as in Simple Ascidians, consequently there is rarely any space between it and the test even in spirit specimens. In some cases, however, contraction does take place, which results in the body of the Ascidiozooid being drawn downwards into the test so that the ectoderm (which connects the mantle and the test) is torn, and the branchial siphon is retracted from the surface.

The mantle is sometimes considerably pigmented, just as in the case of some Simple Ascidians, and may in consequence become very opaque (*e.g.*, *Distaplia vallii*, Pl. XVIII. fig. 5); the pigmentation may be due to the presence of blood sinuses filled with coloured blood-corpuscles, or to pigmented connective-tissue cells. The mantle is bounded both externally and internally by an epithelial layer. The outer of these is the ectoderm, usually a very distinct membrane formed of large and distinctly nucleated cells, and the inner is the parietal layer of the lining membrane of the peribranchial cavity. This latter is formed of squamous epithelium, and the cells are not so clearly visible as those of the ectoderm.

The anterior end of the mantle, forming the branchial siphon, is usually divided into six lobes, which may be very distinct (see Pl. XXV. fig. 9), rarely there are eight (*e.g.*, *Morchellioides affinis*). In some cases there are no lobes, or the margin is irregular. When the Ascidiozooids are arranged in systems the mantle at the atrial aperture may be prolonged to form a projection, the atrial languet (see Pl. XXIX. fig. 15) which contributes to form the edge of the common cloacal aperture of the system.

The Branchial Sac.

This organ varies greatly both in size and structure throughout the Ascidiæ Compositæ (see fig. 4, p. 21, *br.s.*, and also the plates). In the Botryllidæ it is nearly as large as the body of the Ascidiozooid, in the Distomidæ, &c., it is usually about half the size of the body, while in the Polyclinidæ it may be less than one-fourth of the length of the body. Usually the antero-posterior extent of the sac is much the greater, but in some cases (*e.g.*, *Polyclinum minutum*) it is as broad as it is long. It is never thrown either into folds or into minute plications, the corrugated condition in which it is found in some spirit specimens being due, I believe, to contraction on death.

The essential structure of the branchial sac is the same as in the Simple Ascidians, and the three chief systems of vessels[1] are recognisable. The internal longitudinal bars are, however, rarely present. They are seen in the Botryllidæ and in *Symplegma.*

[1] See Part I. of this Report, Introduction, p. 32.