

another, then the colony may be divided into "systems" or "cœnobii," each system consisting of a group of Ascidiozooids with the surrounding part of the common test or investing mass (see fig. 1, p. 12).

When there are no systems present the Ascidiozooids may either be scattered equally over the colony or be placed irregularly. In the Clavelinidæ, the only Simple Ascidians which reproduce by gemmation, the members of the colony are never arranged in systems. Usually, in the Compound Ascidians, the various Ascidiozooids of a system have their atrial apertures opening into a chamber, the common cloaca, which communicates with the exterior, and thus serves as the common excretory orifice of a number of Ascidiozooids (see fig. 1, where *g* shows the atrial ends of the Ascidiozooids projecting into the common cloaca; see also fig. 3 on p. 16).

### *The Test.*

The ground mass or investing substance of the colony (*c* in fig. 1), in which the Ascidiozooids are imbedded, is homologous with the test or outer tunic of the Simple Ascidians, and ought to be called by the same name. Looked at merely from an anatomical and not from an embryological point of view, a Compound Ascidian colony may be regarded as a number of Simple Ascidians whose tests have completely fused with one another to form a common mass. In some cases this mass in place of being the same throughout is modified in the immediate neighbourhood of the Ascidiozooids, so that each member of the colony seems to have a test of its own, and these tests are then united by the colonial investing mass. Such an arrangement is, however, rarely met with.

In structure, the test of the Compound Ascidians agrees very closely with that of the Ascidiæ Simplices, consequently it is unnecessary to repeat the general characters given in the Introduction to the first part of this Report.<sup>1</sup> In most cases it remains in a comparatively unmodified condition, corresponding to that shown by the Clavelinidæ and the Ascidiidæ amongst Simple Ascidians; and it never assumes the fibrous condition found in most Cynthiidæ. As a rule it is soft, gelatinous, and semi-transparent, and exhibits no differentiation to the eye, except occasionally (*e.g.*, Botryllidæ) when "vessels" are particularly well developed (*f* in fig. 1; see also Pl. I. figs. 2 and 5). It may be rendered opaque by foreign bodies such as sand-grains adhering to or becoming imbedded in its surface (as in the case of many of the Polyclinidæ, *e.g.*, *Psammaphlidium*, p. 237, and Pl. XXXI. fig. 9), or by the formation of pigment or of calcareous spicules in the interior. The matrix is homogeneous, or rarely exhibits a very delicate fibrillation under a high magnification; occasionally the outer layer is found to be slightly fibrous in structure. The cells in this matrix are mostly of small size, but may be of almost any

<sup>1</sup> Vol. vi. part xvii. p. 28, 1882.