

reproductive organs and the heart (see fig. 3 on p. 16). The length of the post-abdomen is very variable (compare Pl. XXVIII. fig. 2 with Pl. XXX fig. 13), and as pieces may become detached from its end in the form of buds, it is obvious that the size may vary not only in different Ascidiozooids of the same colony, but even in the same Ascidiozooid at different times. The post-abdomen is composed of an outer layer of ectoderm covering a narrow sac-like prolongation of the connective tissue and muscle bands of the mantle. This sac contains a mass of mesoderm cells, and is divided into two parts by a double median partition or septum (Pl. XXIX. fig. 11), which, according to Kowalevsky,¹ is a prolongation of the posterior end of the branchial sac.

The test varies greatly in its texture. It may be soft and gelatinous as in *Polyclinum molle*, firm and cartilaginous as in *Atopogaster gigantea*, or tough and leathery as in *Amaroucium albidum*. In some cases, when it would otherwise be soft, its appearance and character are totally changed by the numerous sand-grains and other foreign bodies attached to its surface and even imbedded in its interior. A number of the new forms discovered during the Challenger Expedition have the test in this curious condition (see Pl. XXXI. fig. 9). They form the genus *Psammaplidium*.

The mantle is well developed, and the musculature is usually of moderate strength. There is great variability in the arrangement of the muscle bands. In some cases they are all longitudinal in direction, while in others the chief bands run circularly around the thorax. In the post-abdomen they are always longitudinal. The branchial aperture is usually very distinctly six-lobed (Pl. XXXI. fig. 3), rarely eight-lobed (*Morchellioides affinis*, Pl. XXIV. fig. 19) or nearly circular (*Aplidium fuscum*, Pl. XXVIII. fig. 10). The atrial aperture may be six-lobed, but is more usually circular, or provided with a single large lobe placed on its anterior edge and known as the atrial languet (Pl. XXIX. fig. 10, *at.l.*). This languet may be placed considerably in front of the atrial aperture (as in von Drasche's *Polyclinoides diaphanum*, see also Pl. XXXI. fig. 3), and in that case the margin of the aperture is circular and unlobed. There is seldom any well-marked atrial siphon.

The division of the Polyclinidæ into genera is an exceedingly difficult matter. Previous to the publication of von Drasche's short note on *Polyclinoides diaphanum*, in 1883, the family seemed to fall naturally into two groups which have been recognised by most authors as the genera *Aplidium* and *Polyclinum*, but the subgenus *Polyclinoides*, proposed by von Drasche, unites the characters of *Aplidium* and *Polyclinum* in a way which renders it practically impossible to say to which group it really belongs. Von Drasche assigns it to *Aplidium*, but he might, I think, with equal propriety have placed it under the genus *Polyclinum*. Some of the new species described in the following pages also exhibit the same intermediate characters between the two groups, and render their recognition in the wider sense in which they are employed by Giard and von Drasche no

¹ Ueber die Knospung der Ascidien, *Archiv. f. mikrosk. Anat.*, Bd. x. p. 441, 1874.