

the peribranchial cavity, and forming the "lining membrane" of Hancock (the "third tunic" of Milne-Edwards) (see fig. 9, page 40).

The typical arrangement among Simple Ascidiæ (*e.g.*, *Ascidia mentula*) is for the œsophagus to run posteriorly and ventrally from the branchial sac, to open into the large fusiform, globular, or cylindrical stomach, which extends towards the ventral edge of the mantle cavity (fig. 12). The intestine emerges from the most ventral and anterior part of the stomach, and runs anteriorly for a short distance, and then turns dorsally and posteriorly, so as to point towards the stomach. Before reaching that organ, however, it bends dorsally and then anteriorly, becoming the rectum, which runs forwards near the dorsal edge of the peribranchial cavity to terminate in the anus, usually situated near the atrial aperture (fig. 12, *a*, and fig. 1, page 27).

This arrangement prevails with slight modifications throughout the genera *Ascidia* and *Pachychlæna*. In *Ciona*—a simpler form—the stomach and part of the intestine lie posteriorly to the branchial sac, and the rest of the intestine has a straighter course than is the case in *Ascidia*. In the genus *Corella* the alimentary canal lies at the right side of the branchial sac, and the intestine turns posteriorly on leaving the stomach. After a very short course it bends dorsally, and after running parallel to the stomach and œsophagus it turns anteriorly, and becomes the rectum. Consequently the three genera—*Ascidia*, *Ciona*, and *Corella*—have the relations of the branchial sac and the intestine very different. *Ciona* seems to be the more primitive form, from which the other two may have been derived.¹ In *Abyssascidia* the arrangement is much the same as in *Corella*, but the entire canal is more closely packed at the posterior end of the body (Pl. XXVII. fig. 3).

In most of the Clavelinidæ the arrangement resembles that found in *Ciona*. In the genera *Clavelina*, *Ecteinascidia*, and *Rhopalæa*, the intestine is greatly prolonged posteriorly to the branchial sac, so as to form a fairly distinct region of the body, named by Savigny the abdomen. In *Perophora*, on the other hand, there is no distinct abdomen, the intestine having become drawn up alongside the branchial sac on its left side.

In the Cynthiidæ there is considerable variation in the situation, length, and disposition of the intestine. Probably the simplest condition is that found in *Culeolus* among the Bolteninæ. Here the atrial aperture has retained what is probably its primitive position, at or near the posterior end of the body (Pl. VIII. fig. 8), and consequently the anus opens in that region of the peribranchial cavity, thus dispensing with the long anteriorly running rectum so well developed in *Ascidia*. Consequently the intestine, after leaving the stomach, merely turns forwards and then backwards again towards the atrial aperture.

In the Molgulidæ the stomach and intestine lie upon the left side of the branchial sac, and form a single, transversely directed, narrow loop, the posterior segment of which is

¹ See Herdman, Notes on British Tunicata, Jour. Linn. Soc., Zool., vol. xv. p. 274, 1880.