

and the ducts lead up alongside the rectum just as in *Ascidia*. The ovary shows a mass of ova of different sizes, while the testis has its ducts much branched dichotomously and ending in elongated vesicles united in pairs.

In the *Ascidie Compositæ* the position of the genital organs varies, as Milne-Edwards showed, according to the position of the heart. In *Botryllus* they are placed alongside the branchial sac. In *Didemnum* and allied forms they are, as in *Clavelina*, in the abdomen on the side of the intestine; and finally, in *Amaroucium* and a number of other genera, the genital glands, along with the heart, constitute the long post-abdomen which projects behind the loop of the intestine.

In *Pyrosoma* each ascidiozoid of the colony has a rosette-shaped testis and a female gland or "ovisac," containing a single ovum, and communicating with the atrial cavity by a short oviduct. In *Doliolum* there is a long tubular testis placed ventrally and opening into the atrial cavity. The ovary is small and lies at the posterior end of the testis. In *Salpa* only the forms united in chains develop genital organs—the solitary forms reproducing by gemmation. As in *Pyrosoma* a single ovum is formed in an ovisac united to the atrial cavity by a short oviduct. The testis is a large branched organ forming part of the visceral nucleus. Brooks considers that the *Salpæ* united in chains are the males produced by gemmation from the solitary form, which is the true female, and which has deposited an ovum in the body of each male, where it matures, becomes impregnated, and develops into a female solitary *Salpa*.

In the *Appendiculariidæ* the genital glands lie in the posterior part of the body, behind the intestine, and have no efferent ducts. The testis alone is generally present in this position in the adult. The ovary, which was discovered by Fol, develops later than the testis.

As this section is intended to be merely anatomical, and as the Challenger collection has thrown no direct light upon the embryology of the group, it is considered unnecessary to attempt here a brief account of the process of development in an Ascidian, the more so, as such an excellent epitome of all the best work upon this subject has been published recently in Balfour's "Comparative Embryology," vol. ii. pp. 8 to 19.

Gemmation.

Reproduction by means of more or less complicated processes of gemmation is prevalent in all groups of the Tunicata, with the exception of the *Appendiculariidæ* and the *Ascidie Simplicis*. Among the latter it is found, however, in the family *Clavelinidæ*, where it results in the formation of small societies (Pl. XXXVI. fig. 2), the members of which may either remain connected by a common vascular system, or more rarely (*e.g.*, sometimes in *Clavelina*), may lose this connection and become independent.