

Ascidians.¹ Huxley² and Kowalevsky³ have both described in an admirable manner the process by which buds are developed upon the stolon of *Pyrosoma*.

The reproductive organs are formed in diverticula of the posterior median part of the peribranchial cavity, the testis on the left side, the ova on the right. The testis is a lobed organ, which was regarded as the liver until Huxley showed its true nature in 1851. It remains in a rudimentary condition until after the ova have matured. Thus the Ascidi-zooids of *Pyrosoma*, like so many of the Compound Ascidians, are protogynous, and self-fertilisation is prevented.

The ova are produced one at a time. After fertilisation the development takes place in a diverticulum of the peribranchial cavity, called the ovisac by Huxley, and comparable with the incubatory pouch found in the genus *Colella* amongst Compound Ascidians.⁴

The segmentation is meroblastic, and an elongated blastoderm is formed on the surface of a mass of yolk. This becomes converted into an embryo, with a tubular alimentary canal, a dorsally placed neural tube, and a pair of laterally placed atrial cavities. This embryo then divides into an anterior and a posterior part. The anterior segments into four pieces, which afterwards develop into the first Ascidi-zooids of the colony, while the posterior part remains in a rudimentary condition, and was called by Huxley the "Cyathozoid;" it eventually atrophies. As the four Ascidi-zooids increase in size, they grow round the Cyathozoid and soon encircle it. The Cyathozoid absorbs the nourishing yolk upon which it lies, and distributes it to the Ascidi-zooids by means of a heart and a system of vessels which have formed. When, finally, the Cyathozoid atrophies and is absorbed, its original atrial aperture remains and deepens, to become the central cavity of the young colony which now consists of four Ascidi-zooids placed in a ring around where the Cyathozoid was, and all enveloped in a common test.

The colony gradually increases by the formation of buds from these four original Ascidi-zooids.⁵ Although in most of the species the Ascidi-zooids are placed with their ventral surfaces towards the closed end of the colony, and gemmation takes place only from the ventral surface of the Ascidi-zooids, still the younger members of the colony are not found, as would be expected, mainly at the closed end of the colony. In most specimens besides those scattered irregularly through the colony, a number of young Ascidi-zooids are found round the edge of the common cloacal aperture, while the closed end of the colony, on the other hand, is occupied wholly by adult and, in fact, old-looking Ascidi-zooids, not very closely placed. Possibly, as Huxley has suggested, this state of affairs may be brought about by a migration of the young

¹ See further on p. 24.

² *Trans. Linn. Soc. Lond.* 1862, p. 211.

³ *Archiv f. Mikr. Anat.*, Bd. xi.

⁴ This Report, Part II. p. 72.

⁵ For further details as to the embryology of *Pyrosoma*, see Huxley, *Trans. Linn. Soc.* 1862, and Kowalevsky, Ueber die Entwicklungsgeschichte der *Pyrosoma*, *Archiv f. Mikr. Anat.*, Bd. xi. 1875, p. 597.