

The next process revealed by the sections is the longitudinal division of the archenteron into three cavities by the formation of two laterally placed lines of constriction. These cut across the cavity and unite with the opposite wall, separating off two lateral thin-walled spaces from the central much stronger sac (Pl. IX. fig. 7; Pl. VIII. fig. 8).

While this division has been taking place, or possibly before the process began, the neural tube has been formed. Unfortunately none of the specimens throw any light on its origin. This I more especially regret, as from Kowalevsky's observations it appears that in *Didemnum styliferum* and *Amaroucium proliferum* the neural tube is derived from the dorsal wall of the central compartment or mesenteron, an origin which, on theoretical grounds, seems very improbable. It is first observed (in my transverse sections) as a small but thick-walled tube, lying close under the ectoderm in the dorsal region, formed of a single layer of wedge-shaped nucleated cells and having a very small lumen (Pl. VIII. fig. 8). I am inclined to believe (although I have no specimens which prove it) that the neural tube arises, as in the development of the Ascidian from the egg, by the formation of longitudinal dorsal ridges of ectoderm which grow up, arch over, and coalesce, thus forming an ectodermal canal which occupies the dorsal region of the perivisceral cavity (the space between the primitive ectoderm and endoderm, not the future peribranchial cavity).

In sections where the archenteron is completely divided into three cavities the neural canal is always seen. It afterwards increases in size and the lumen enlarges; it also separates farther from the ectoderm and takes up a position nearly equidistant from the two primitive layers, or in some cases nearer to the endoderm (Pl. IX. fig. 8, *n.t.*). The bud as a whole has now grown considerably, and the ectoderm has changed its appearance. The number of cells is much greater, and individually they are longer, having a distinctly columnar form and a yellowish colour.

The three cavities into which the archenteron was divided also continue to increase in size, especially the central one, which is destined to form the alimentary canal, and chiefly the branchial sac. The two lateral cavities are not nearly so large, and their walls are composed of smaller cells. They tend to apply themselves to the outer wall of the central cavity and to curve round its ventral and dorsal edges; eventually they unite at the latter and form the peribranchial cavity or atrium.

An important process may be seen taking place in the ventral region of the primitive branchial sac. Soon after the division of the archenteron, two longitudinal lateral ridges grow inwards along the ventral part of the central division, leaving a deep groove between them. This is the origin of the endostyle. At one time it occupies nearly the whole breadth of the ventral region of the future branchial sac (Pl. IX. fig. 8, *en.*), and the cells of which it is composed are considerably larger than those of the rest of the wall.

Two buds which were cut in longitudinal section show (Pl. IX. figs. 9, 10) a further stage of development, in which three points of interest are seen, viz., (1) the