

differs from the Ascidiidæ in having no internal longitudinal bars in the branchial sac; while it differs from all the Clavelinidæ, and agrees with all the Ascidiidæ, in not reproducing by gemmation. It probably separated from the main branch earlier than *Ecteinascidia*, as it has not acquired internal longitudinal bars; and it lost the property of gemmation after its origin, since that property was found in the ancestral forms occupying the main branch as far along as the position of *Ecteinascidia*.

Following now the important branch given off at F. (see table, p. 120), which leads to most of the groups of Compound Ascidians, it is found that at an early period two main lines of descent were formed (G. in table), the one leading to the Polyclinidæ, and the other, I believe, through the Distomidæ to the Didemnidæ, the Diplosomidæ, *Cælocormus*, and finally to *Pyrosoma*. In both of these lines, and in their common ancestors occupying the line from F. to G., the power of reproducing by gemmation was retained and even increased, and the members of the resulting colonies became more closely united with one another than is the case in the Clavelinidæ.

The line which leads from G. to the existing Polyclinidæ (on the right hand side of G. in the table, p. 120) must have been occupied by a series of forms in which the body became gradually more and more elongated antero-posteriorly, and finally divided more or less distinctly into three regions—(1) an anterior part, the thorax, containing the branchial sac and other organs; (2) a middle portion, the abdomen, containing the stomach and the intestinal loop; and (3) a posterior region, the post-abdomen, containing mainly the reproductive organs and the heart (see Fig. 21 on next page).

Large colonies now became formed, and the Ascidiozooids (produced by gemmation from the post-abdomen) composing the colony were so closely placed that their tests became united to form a continuous investing mass. On account of several young Ascidiozooids being usually produced from a single older Ascidiozoid in the colony, a more or less regular grouping into systems naturally took place, and then the atrial apertures of the various Ascidiozooids in a system coalesced to form a centrally placed common cloacal aperture (Fig. 21, *cl.*, and Fig. 26, p. 141). The branchial sac also went a gradual degeneration, resulting in the complete disappearance of the system of internal longitudinal bars inherited from the ancestral forms at F.

The central axis of the Polyclinidæ, extending from G. to H. in the table (p. 120), was composed of a series of ancestral forms in which these and some other less important changes were gradually being affected, but from this axis a few short side branches were given off at different periods. First, not very far from G., a line of descent diverged leading to *Pharyngodictyon*, the most remarkable of the deep-sea Compound Ascidians¹ obtained during the Challenger Expedition. The ancestors of this form must have diverged from the axis of the Polyclinidæ while internal longitudinal

¹ This Report, Part II. p. 152.