

while in *Goodsiria* the test is greatly enlarged, thus rendering the colony thick and massive. In none of the Polystyelidæ have the Ascidiozooids come to be arranged in systems, and no common cloacal cavities have been formed; the atrial apertures of all the Ascidiozooids open independently upon the exterior of the colony. In this respect the colony is in the same stage of differentiation as that reached by most of the Distomidæ, while the other groups of Compound Ascidiæ (e.g., Botryllidæ, Polyclinidæ, Didemnidæ) have advanced a stage further by the formation of systems with common cloacal cavities.

It is possible that the family Botryllidæ may have a closer relationship with the Polystyelidæ than I have assigned to it above (p. 396). The primitive Botryllidæ, in place of arising from the primitive Cynthiidæ, may possibly have been derived from the Polystyelidæ near the point where *Synstyela* and *Goodsiria* diverged, as is shown by the dotted line in the diagram (fig. 15). In that case the evolution of the primitive Botryllidæ would consist in the gradual formation of systems in the colony, and the complete disappearance of all traces of folds in the branchial sac.

Probably the two most important conclusions I have arrived at in these phylogenetic investigations are—(1) as to the relationship of *Pyrosoma*, and (2) as to the polyphyletic origin of the Ascidiæ Compositæ. *Pyrosoma*, although now a pelagic free-swimming organism, was probably derived from the fixed Compound Ascidiæ. The discovery of *Cælocormus huxleyi* shows the relationship between *Pyrosoma* and the primitive Didemnidæ, and the latter in their turn were derived from the primitive Distomidæ; consequently, *Pyrosoma* is directly related to the most typical of the Compound Ascidiæ.

The Ascidiæ Compositæ, or Synascidæ, are really an unnatural assemblage of groups, as they seem to have been derived from the Simple Ascidiæ or their ancestors at two or three distinct points (see fig. 11, p. 388). The result of this is that the so-called Compound Ascidiæ form three¹ groups—(1) the Polystyelidæ, (2) the Botryllidæ, and (3) the remaining families—which are more nearly related to particular groups of Simple Ascidiæ than they are to one another. This conclusion renders it even more difficult than it was before to draw any line of demarcation between Simple and Compound Ascidiæ.

¹ Possibly (1) and (2) may have had a common origin, as is shown in fig. 15, p. 398.