and one of them, placed in the mid-ventral line, is always considerably larger than the rest (Pl. I. fig. 2).

The branchial sac occupies about the middle two-fourths of the length of the Ascidiozooid. It is the widest part of the body. The stigmata are very conspicuous; they are transversely directed slits extending along the whole breadth of each side of the sac, and separated by the transverse vessels. These stigmata, therefore, correspond not to the stigmata of the ordinary Simple and Compound Ascidians, such as the species of *Ascidia* or of *Botryllus*, where the slits are elongated antero-posteriorly, and are separated not by the transverse but by the fine longitudinal vessels (Fig. 3, A), but to the rows of stigmata which lie between the transverse vessels, and are divided

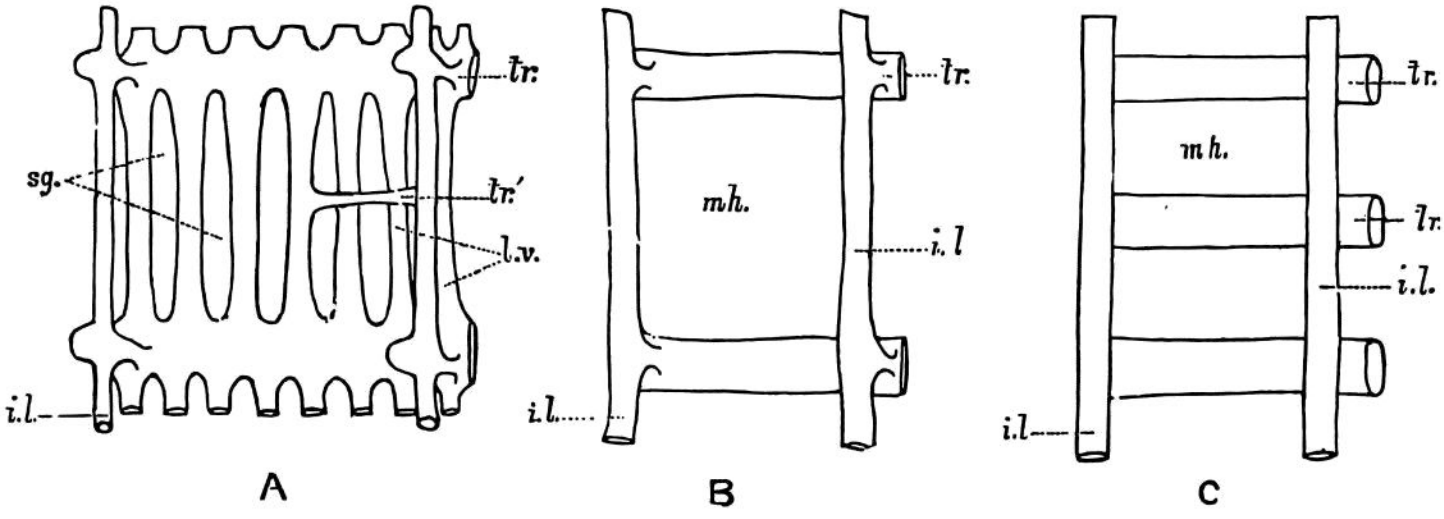

FIG. 3.—Diagrams showing the structure of the branchial sac in :—
A. *Ascidia*, B. *Culeolus*, and C. *Pyrosoma*.
i.l. internal longitudinal bar, *l.v.* fine longitudinal or interstigmatic vessels (in *Ascidia* only),
mh. mesh, *sg.* stigmata, *tr. tr'.* transverse vessels.

into meshes by the internal longitudinal bars,—one complete mesh, divided into six stigmata, is shown in Fig. 3, A.

In the genera *Culeolus* and *Fungulus* and *Bathyoncus*, however, amongst Simple Ascidians,[1] and in *Pharyngodictyon* amongst Compound Ascidians,[2]—all of them deep-sea genera, made known through the Challenger investigations,—we find a condition of the branchial sac similar to that of *Pyrosoma*. In these forms there are no fine longitudinal vessels, and consequently the meshes formed by the intersection of the transverse vessels and internal longitudinal bars are not cut up into stigmata, but remain as large quadrangular spaces (Fig. 4, B). If, now, the transverse vessels become more numerous and more closely placed, so as to reduce the quadrangular meshes to transversely elongated slits, we arrive at the condition found in *Pyrosoma* (Fig. 4, C). In *Culeolus* and its allies, in *Pharyngodictyon*, and in *Pyrosoma*, there are therefore no true stigmata, and no interstigmatic vessels, such as those of *Ascidia*, but merely meshes bounded by the transverse vessels and the internal longitudinal bars.

[1] See Part I. of this Report. [2] See Part II. of this Report.