

*depressa*, Alder), a series of smaller intermediate and alternating papillæ is present on the internal longitudinal bars in addition to those at the angles of the meshes.

In the simplest condition the transverse vessels are all of one size, and the interstigmatic vessels connecting them are placed in one plane, forming a continuous row (fig. 20); but in many species (e.g., *Ascidia meridionalis*) there are two or more distinct sizes of transverse vessels, which are usually placed so as to alternate regularly; and in some species the fine longitudinal or interstigmatic vessels are arranged so that their line of insertion into the transverse vessels forms an undulating in place of a straight line (fig. 21), or is even more irregular (Pl. XXIX. fig. 4).

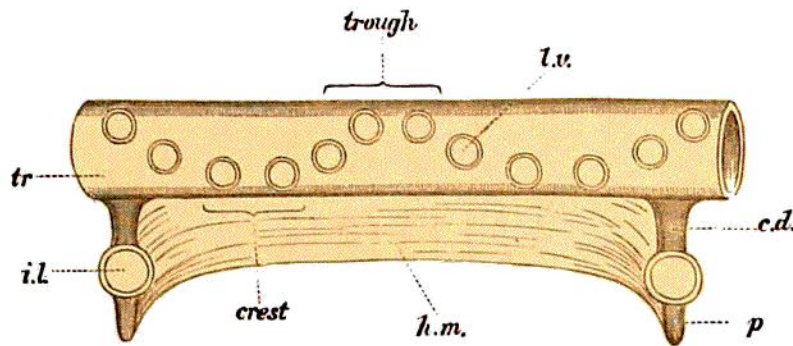


FIG. 21.—Diagrammatic horizontal section through a Mesh of the Branchial Sac of *Ascidia*, showing the arrangement of the fine longitudinal vessels which causes "minute plication."

*tr.*, transverse vessel; *l.v.*, fine longitudinal vessel; *i.l.*, internal longitudinal bar; *c.d.*, connecting duct; *p.*, papilla; *h.m.*, horizontal membrane. "Crest" indicates the highest, and "trough" the lowest part of the undulation.

The result of this arrangement is that the sac, when seen from the inside, or still better from the outside (Pl. XXXI. fig. 5, and Pl. XXXIII. fig. 3), where there are no internal longitudinal bars to obscure the view, seems to be thrown into a series of minute crimps or plaits, and this is the structure which has been called "minute plication."

Verrill,<sup>1</sup> in 1872, suggested that *Ascidia complanata*, Fabricius, should form the type of a new genus, to which he gave the name *Ascidiopsis*, on account of the remarkable structure of its branchial sac; but from the figure given, this structure seems to be merely the above described minute plication which is found in *Ascidia mentula*, *Ascidia virginica*, and a number of the oldest known and most typical species of the genus *Ascidia*. The plication varies considerably in the degree to which it is present, and also in its regularity. Usually when the sac is plicated there are several sizes of transverse vessels, and the smaller sizes may enter into the undulations of the stigmatic vessels, while the larger ones do not. In this case the appearance of the outer surface of the sac, when the plication is regular, is that of a number of alternately placed projections and

<sup>1</sup> Descriptions of some imperfectly known and new Ascidiæ from New England, Amer. Journ. Sc. and Arts, ser. iii., vol. iii., No. 16.