

bars were still present in the branchial sac, since these vessels are now present in *Pharyngodictyon*. In the side branch leading to *Pharyngodictyon*, however, a remarkable degeneration of the branchial sac took place, resulting in the total suppression of the system of fine interstigmatic vessels. This particular change in the structure of the branchial sac appears to be associated with the abyssal zone, since it has taken place independently in four distinct groups of deep-sea Ascidiæ, viz., *Culeolus*, *Fungulus*, *Bathyoncus*, and *Pharyngodictyon*, and has not been found in any shallow-water form.

The second side branch from the Polyclinidæ, that leading to the genus *Tylobranchion*, appears to have left the main axis just about the point where the internal longitudinal bars in the branchial sac were disappearing, as *Tylobranchion* now shows no internal longitudinal bars, but possesses a system of papillæ which there is reason to believe are rudimentary connecting ducts, and which sometimes give off projections resembling the rudiments of internal longitudinal bars found attached to the free ends of the connecting ducts in some Simple Ascidiæ.<sup>1</sup>

The genus *Atopogaster*, which may be placed upon a third short twig given off from the axis of the Polyclinidæ, differs very slightly from typical members of the family. The only modification of importance which is found, is in the structure of the stomach. The wall of this organ is thrown into a series of more or less distinct transverse folds, a condition never found in the other genera of the family.

The last side branch from the axis previous to H. is the line leading to *Polyclinum*, a form characterised by the smooth-walled stomach, the twisted intestine, and the pedunculated, laterally-placed post-abdomen.<sup>2</sup>

At the point indicated by H. in the table (p. 120) the axis of the Polyclinidæ divided into two lines of descent—the one leading to a series of genera, *Parascidia*, *Morchellioides*, *Synoicum*, *Sidnyum*, and *Morchellium*, in which the stomach wall is curiously and irregularly thickened; and the other to a second series of genera, *Fragarium*, *Circinalium*, *Amaroucium*, *Aplidium*, and *Psammaphidium*, in which the stomach wall is thrown into longitudinal folds. All these genera are really very closely allied, and some species form connecting links between two or more of them.<sup>3</sup> A remarkable modification is found in the branchial aperture of some of the forms from both these groups. As a general rule, amongst Compound Ascidiæ the branchial aperture is six-lobed, but in *Parascidia* and *Morchellioides* in the one group, and in *Fragarium* and *Circinalium* in the other, the branchial aperture has become eight-lobed. *Psammaphidium* is an interesting new genus derived from the old and well-known genus *Aplidium* by a modification of the test, which has acquired the property of taking up

<sup>1</sup> See this Report, Part II. p. 157.

<sup>2</sup> See Giard, *Arch. d. Zool. expér.*, tom. i. p. 641; and von Drasche, *Die Synascidien*, etc., p. 23, Wien, 1883.

<sup>3</sup> See this Report, Part II. pp. 176 *et seq.*