

different periods. First, not very far from the point C. (see fig. 12), a line of descent diverged leading to the remarkable deep-sea genus *Pharyngodictyon* (see p. 153). The ancestors of this form must have diverged from the axis of the Polyclinidæ, while internal longitudinal bars were still present in the branchial sac, since these vessels (according to the interpretation of the structure given above, p. 155) are now present in *Pharyngodictyon*. In this 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.

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 Ascidians (see p. 161). *Pharyngodictyon* and *Tylobranchion* then, if the structure of their branchial sacs has been rightly interpreted, furnish us with valuable clues to the process of degeneration which went on in the ancestral Polyclinidæ.

The genus *Atopogaster*, which may be placed upon a third short twig given off from the axis of the Polyclinidæ (see fig. 12), differs very slightly from typical members of the family. The only modification of importance which occurs in this genus 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 its division into two at D. is the line leading to the genus *Polyclinum*, characterised by its smooth-walled stomach, its twisted intestine, and its laterally placed post-abdomen (see p. 186). It is a little difficult to determine the relations between *Atopogaster* and *Polyclinum*. In all probability the stomach in the ancestral Polyclinidæ was smooth-walled, while in all the higher forms of the family it is irregularly thickened either by the formation of a number of short cæca, or by being thrown into longitudinal folds. The first of these conditions is probably derived from the last, consequently the ancestor occupying the point D. (see fig. 12) had a longitudinally folded stomach-wall. Possibly *Atopogaster* diverged from the axis at the period when the tendency towards the formation of a ridged or thickened stomach-wall was being developed, and then after its separation the folds became formed more or less transversely in place of longitudinally. The line leading to *Polyclinum* probably diverged from very much the same point, and then the incipient folds in the stomach-wall were lost, and the other peculiarities of the genus acquired. *Polyclinum* cannot well be a more primitive form derived from the axis at a point before the formation of a thickened stomach-wall, as it shows no traces of internal longitudinal folds in its branchial sac, and