

been accompanied by the loss of the operculum ; in the large adult *Limacinæ* (in *Limacina helicina*, for example) the tendency is already observed to lose the operculum, and even the partially uncoiled embryonic shell of *Gleba* has none, nor have the embryonic shells of the Cavoliniidæ.

3. The most primitive of the straight Thecosomata (subgenus *Creseis* of *Clio*) are circular in section, and have retained certain traits of the *Limacinæ*; thus *Clio virgula* has the initial part of the shell coiled dorsally, indicating a former coiling. These forms of *Clio* have also on the dorsal margin of each fin the same small tentacular lobe as is found in certain *Limacinæ*. It is easy to see how the forms compressed dorso-ventrally and with lateral keels (*Clio* properly so called) have originated from these species of *Clio* which are circular in section.

4. From these latter the *Cuvierinæ* have arisen by constriction behind the aperture, and by the formation of a diaphragm about the middle of the shell, behind which the initial part of the shell may become lost.

5. Finally, those forms of *Clio* which are compressed dorso-ventrally, in which (as in *Clio cuspidata*, for example) the lateral margins have diverged almost in opposite directions, the aperture being produced into a narrow slit at either side, have given rise to the most primitive *Cavolinæ*, which, as in the case of *Cavolinia trispinosa* and *Cavolinia quadridentata*, still retain some of the characters of *Clio* or other primitive characters, such as a well-marked embryonic shell, fins distinct from the rather narrow ventral lobe of the foot, ganglionic elements of the visceral commissure still separated into two halves, &c.; and from these forms the passage is easy to all the other *Cavolinæ*. Embryology confirms the view that the *Cavolinæ* are the most specialised in this sense; in fact Fol¹ remarks in this connection, “. . . les Hyalécées sont un extrême.”

This account of the phylogeny of the Thecosomata, drawn up from comparative anatomy and based upon embryology, is also found to agree with palæontology, which gives it additional support. We find *Limacina* in the most ancient Tertiary deposits, and also forms resembling *Clio*, with circular transverse section (*Euchilotheca*), as well as nearly related forms which lead on to *Cuvierina* (*Tibiella*). *Clio*, properly so called, however, and *Cavolinia*, do not appear until the Miocene. As for the Cymbuliidæ, it is hardly possible that their “cartilaginous shells” should be preserved.

As regards the fossils considered to be Primary Thecosomata (*Creseis*, *Cleodora*, &c.), and the larval shells of Cymbuliidæ described by Ehrenberg, we shall soon see the slender basis on which rests the systematic position assigned to them.

From what has been stated above, it is easy to see the importance of the position occupied by the Limacinidæ in the morphology of the Thecosomata. By means of the knowledge of *Peraclis* they enable us to understand the relations of the Cymbuliidæ, which were extremely difficult. Wagner² even considered them as the most primitive

¹ *Loc. cit.*, p. 206.

² *Die Wirbellosen des weissen Meeres*, Bd. i. p. 119.