

is ventral in the Limacinidæ (the Cymbuliidæ, in which the calcareous shell falls off at the end of embryonic development, have of course no retractor muscle.)

5. The fifth large gastric plate, which is dorsal in the Limacinidæ, is ventral in all the straight forms.

6. The aperture of the bile-duct, which is at the right in all the straight Thecosomata, is at the left in the Limacinidæ.

7. The intestine, which ends at the right of the pallial cavity in the Limacinidæ, ends at the left of the same cavity in the straight forms.

8. The genital duct, which arises from the dorsal edge of the gland in the straight Thecosomata, springs from the ventral side in the Limacinidæ.

9. The shell, in those straight forms which have any curvature, is bent towards the dorsal surface, whilst in the Limacinidæ the shell is twisted ventrally.

Thus on comparing these two groups it appears that, taking one of them as a standard, the anterior part of the other has rotated upon the posterior part through a half revolution (180 degrees) upon the longitudinal axis or *vice versa*.

Now since we have seen that each of the two families of straight Thecosomata has clear affinities with the Limacinidæ, without their exhibiting any relationship to each other, we have still to show which of the three families is the most primitive, and what has been the line of their descent.

I. As regards the Cymbuliidæ and Limacinidæ, there can be no doubt that the Limacinidæ are the more primitive and have given origin to the Cymbuliidæ. The development of the latter furnishes in support of this view excellent arguments which have not hitherto been sufficiently appreciated:—

1. The embryonic shell of the Cymbuliidæ is a coiled one, whence these forms are classed by Fol¹ among his "Campyloconques" in opposition to the Cavoliniidæ, which he terms "Orthoconques"; but neither Krohn² nor Fol³ state whether the shell is dextral or sinistral, and it is impossible to ascertain this from the figures given by Krohn.⁴ I have seen many embryonic shells both of *Cymbulia* and *Gleba*,⁵ and all were sinistral like the shells of the Limacinidæ.
2. In the older embryos, which yet bear shells, the pallial cavity is dorsal⁶ and the anus to the right,⁷ just as in the coiled Pteropods.
3. These same embryos then carry an operculum on the foot, which is multispiral as has already been pointed out by Krohn,⁸ who, however, did not notice the direction of the spire. The examination of numerous specimens with the operculum *in situ* enables me to affirm that its spire is always sinistral. Now this

¹ Sur le développement des Pteropodes, *Arch. d. Zool. Expér.*, sér. 1, t. iv. p. 178.

² Beiträge zur Entwicklungsgeschichte der Pteropoden und Heteropoden.

³ *Loc. cit.*

⁴ *Zool. Chall. Exp.*, part lxx. pl. ii. figs. 14, 17.

⁵ Krohn, *loc. cit.*, p. 20.

⁶ *Loc. cit.*, pl. i. figs. 12, 14.

⁷ Krohn, *loc. cit.*, p. 19.

⁸ Krohn, *loc. cit.*, pl. i. fig. 15.