

not seem to me quite accurate, although it indicates correctly the practical result of it. The truth is rather that each part (cephalic or visceral) has performed a quarter of a rotation around the longitudinal axis, the cephalic portion from left to right and the visceral portion in the contrary direction. A study of the retractor muscle shows that such has been the case.

In somewhat advanced larvæ of Cavoliniidæ this muscle may be seen to be inserted at the right side of the shell. In the adult condition it is always inserted dorsally close to the middle line, in such a manner that then the muscle is entirely dorsal and parallel to the axis of the body, whilst in the larvæ it is very oblique. According to Boas, of the two subdivisions of the retractor muscle, that which passes on the right side of the œsophagus would be a new formation.<sup>1</sup> The examination of Fol's figure above referred to shows that it is nothing of the kind, and that this right branch is the more primitive, since it passes to the right side of the head and to the *two* fins, whilst the left branch, which passes along the other side of the œsophagus and only supplies the left side of the head, is secondary.

B. The pallial cavity originates on the right side;<sup>2</sup> in the adults it is quite ventral.

C. The anus is displaced towards the left;<sup>3</sup> in the adult it is situated quite at the left.

D. The shield (pallial gland), which is quite symmetrical in the adult Cavoliniidæ, is still asymmetrical and oblique in the older larvæ,<sup>4</sup> its right side being the more developed, which indicates that it originates on this side and is displaced towards the left.

E. The embryos of the Cavoliniidæ, on the appearance of the apex of the shell, curve in order to follow the more rapid development of the right side; there is then a tendency towards the sinistral coiling of the Limacinidæ,<sup>5</sup> a coiling which still appears in the development of the Cymbuliidæ, in which the uncoiling is not brought about so soon as in the Cavoliniidæ.

3. Facts are observed even in the adults which prove the rotation which has brought about the difference between the coiled and the straight Thecosomata—

A. The dorsal groove of *Clio* (*Styliola*) *subula*. This groove is not parallel to the axis of the shell, but oblique; it commences at the left and terminates in the middle line dorsally; it thus describes a quarter of a circle and consequently indicates all the successive positions of the dorsal side during the quarter of a rotation performed by the visceral portion of the body from left to right (regarding the animal from the dorsal side).

<sup>1</sup> *Spolia atlantica*, p. 185, note 3.

<sup>4</sup> *Ibid.*, pl. v. fig. 2, mb.

<sup>2</sup> Fol, *loc. cit.*, p. 175.

<sup>5</sup> *Ibid.*, p. 197.

<sup>3</sup> *Ibid.*, p. 146.