

De Blainville criticises the figure of Péron and Lesueur,¹ and affirms that the animal is turned in the wrong direction in relation to the shell. He figures *Cymbulia* with the animal turned in the opposite direction.² But his characteristic love of criticism is in this instance at fault, for it is in his figure that the animal is inverted. The uncertainty as to the orientation of the animal in relation to the shell is doubtless due to the readiness with which shell and animal are separated, and the difficulty of preserving the specimens in their natural position. The same reason has led some authors to assert in regard to *Cymbulia* what has been affirmed of the female *Argonauta*, that the shell was not produced by the animal at all.³

In regard to the position of anterior and posterior extremities of the shell and of the animal, Woodward's Manual of the Mollusca, which has been followed by all subsequent treatises, represents the pointed extremity of the shell of *Cymbulia peroni* as anterior, and the truncated end as posterior. Macdonald,⁴ however, does not accept this statement, but gives a diametrically opposite interpretation. According to him the truncated extremity is anterior. Both these conclusions are inaccurate.

The source of error lies in the external differences between the shell of Cymbuliidæ and those of Cavoliniidæ, and in the great elongation of the dorso-ventral axis, which has led to its being regarded as antero-posterior.

To elucidate the true orientation of the shell, it is necessary to make an examination of the animal itself. An investigation of the latter shows that the pallial cavity, which in all the Thecosomata (except the Lima-cinidæ) opens ventrally, in consequence of a secondary process to be explained in the Anatomical Report, opens in *Cymbulia peroni* in the direction of the truncated extremity of the shell. This extremity ought therefore to be considered as ventral. On the other hand, the dorsal portion of the animal, as determined by the position of the tentacles, is situated on the side of the pointed end. This extremity is therefore to be regarded as dorsal, and the antero-posterior axis of the shell is the short axis at right angles to the surface of the fins.

Among the forms referred to this genus only one is well known. There is also a second new form of which unfortunately only the shell is known.

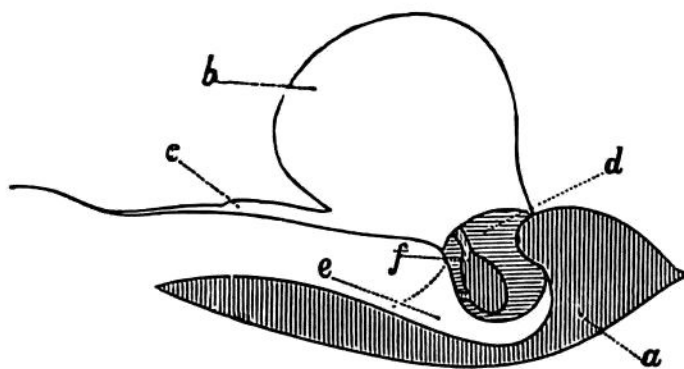


FIG. 1.—Sagittal section of a *Cymbulia*; a, shell; b, fin; c, ventral lobe of the foot and its whip-like process; d, visceral mass; e, pallial cavity; f, alimentary canal.

¹ Histoire de la famille des Mollusques Pteropodes, *Ann. Mus. Hist. Nat. Paris*, t. xv. pl. iii. fig. 10.

² Manuel de Malacologie, pl. xliii. fig. 3.

³ Cantraine, Malacologie méditerranéenne et littorale, *Mém. Acad. Sci. Bruxelles*, t. xiii. p. 35.

⁴ On the General Characters of the Genus *Cymbulia*, *Proc. Roy. Soc.*, vol. xxxviii. p. 251.