

cinidæ. We know that in these latter also the sinistrorsity has only affected the coiling of the spire.

It is easy to explain the transition from a creeping Bulloïd to a swimming Limacinid. Even among the Bulloïdea we observe a great tendency to natatory habits; the margins of the foot (parapodia) extend laterally so far that they can be reflected over the shell, and assist by their movements, in a natation at first imperfect then gradually more complete, in the forms which have become more specialised (*Acera*, &c.), and even carried out to a very high degree in *Gastropteron*.

It is quite comprehensible how, among animals having such tendencies, forms should have arisen having the mantle and shell well developed and with sinistral coiling, which by gradual specialisation have become exclusively pelagic animals, the first rough sketch, as it were, of the Limacinidæ.

If we examine the whole series of the Bulloïdea (or Cephalaspidea), living and fossil, we shall find that the most ancient are forms resembling *Actæon* (these are probably the most ancient of the Opisthobranchia, and their importance with respect to the phylogeny of the Gastropoda cannot be overrated); the organisation of the recent *Actæon* (especially its nervous system, generative organs, and operculum), and its possible relations with the Pyramidellidæ, show that it may be not very far removed from the common stock of the Streptoneura (Prosobranchs and Heteropods) and the Euthyneura.

The genus *Bulla*, however, properly so called, scarcely appears before the Cretaceous period.

The presence of an operculum in the most primitive Thecosomata (Limacinidæ and the larvæ of the Cymbuliidæ) shows that they are descended from operculate ancestors. *Actæon* still retains this operculum (it is the only Opisthobranch which does not lose it in the adult state), and all the fossil Actæonidæ certainly possessed it. The earliest Bullidæ—*sens. lat., i.e.*, comprising the Scaphandridæ and the Tornatinidæ—(derived from the Actæonidæ) must have possessed it also, and the animals of this family will only have lost it subsequently in the adult condition. It is from some of these operculate forms, intermediate between *Actæon* and *Bulla*, that the first Thecosomatous Pteropods have arisen.

If for example we consider such forms as *Globiconcha* or *Hydatina*; if we allow that some of them have become coiled sinistrally whilst retaining the dextrorsal asymmetry in their organisation (as happens in some Gastropods, *e.g.*, *Lanistes*); lastly, if in these animals the lateral margins of the foot, already strongly developed, become still more specialised, we shall have the first Limacinidæ.

A sinistral shell from one of the forms above quoted would, in fact, closely resemble a short-spined shell of one of the Limacinidæ, such as the earliest Eocene *Limacina*. On the other hand, owing to more and more exclusive adaptation to pelagic life, the shell of the Bulloïdea must have become more delicate, and have acquired a structure very similar to that of *Limacina*, as in the case of the shells of the living *Haminea* and