

consider each group separately, taking its own special characters into account, and if in this way we inquire with which of the Tectibranchs each group has the greatest affinity, we shall arrive at the conclusion that the two groups are not so closely related to each other as they are to the particular forms of Tectibranchs for which they have each the closest affinity.

This is an impression which must have been produced upon every zoologist who has examined, even in a cursory manner, the organisation of these animals, for the two groups exhibit such clearly marked differences, and each forms such a homogeneous whole, that it is quite impossible to derive one of them from the other, or to find for them an immediate common ancestor.

It is only by limiting oneself to the study of a single form (as Wagner has done in the case of *Clione*,<sup>1</sup> and attempting thence to construct the phylogenetic history of the Pteropoda, that one can regard the Thecosomata as the ancestors of the Gymnosomata.<sup>2</sup> It is true that by following this method one arrives at the strange result that the Pteropoda have been derived from the Heteropoda, and have given origin to the Cephalopoda.<sup>3</sup>

Boas was the first to formulate the opinion of the separate origin of the Thecosomata and Gymnosomata, and to assert that the two groups are "independent of each other."<sup>4</sup>

There is no need to recapitulate here the distinctions between the two divisions; they have been sufficiently expounded in the Report on the Gymnosomata,<sup>5</sup> and in the Summaries on the Thecosomata and on the Gymnosomata (pp. 37 and 55). But I must dwell for a few moments on the statement made by Boas,<sup>6</sup> "that the fins are not homologous in the two groups." This is an opinion which I do not share. The fins, both of the Gymnosomata and Thecosomata, are the modified lateral margins of the foot, and the differences which they present are almost the same as those which exist between the Bulloidea and the Aplysioidea.

In the Bulloidea the pedal surface is continuous with the natatory lobes, *e.g.*, *Acera* and *Gastropteron*), and there is no special creeping surface. In the Aplysioidea, on the other hand, these natatory lobes are distinct from the rather narrow creeping surface, which is clearly marked off (*e.g.*, *Aplysia*, *Notarchus*, *Oxyñoë*, &c.).

The Gymnosomata also present an arrangement analogous to that of the Aplysioidea, but carried to an extreme; the natatory lobes are quite separated from the portion of the foot corresponding to the creeping surface.

Embryology shows further that these organs (the fins) are homologous in the Gymnosomata and Thecosomata. Fol<sup>7</sup> has shown that the fins of the Pteropoda cor-

<sup>1</sup> Die Wirbellosen des weissen Meeres, Bd. i. p. 119.

<sup>2</sup> Von Jhering, on the other hand, regards the Thecosomata as the descendants of the Gymnosomata (Vergleichende Anatomie des Nervensystemes, &c., p. 273), whilst Grobben holds that the Limacinidæ (Thecosomata) are the most primitive Pteropoda (Morphologische Studien, &c., Arb. Zool. Inst. Wien, Bd. v. p. 240).

<sup>3</sup> Wagner, Die Wirbellosen des weissen Meeres, Bd. i. p. 22.

<sup>4</sup> *Spolia atlantica*, &c., *loc. cit.*, p. 179.

<sup>5</sup> Zool. Chall. Exp., part lviii. pp. 4-6.

<sup>6</sup> *Spolia atlantica*, &c., *loc. cit.*, p. 179.

<sup>7</sup> Sur le développement des Ptéropodes, *Archives de Zool. Expér.*, sér. 1, t. iv. p. 193.