life the complete asymmetry is very distinct; and if in the adult we have an apparent external symmetry, there is a real internal asymmetry. And, on the contrary, in the Cephalopoda the complete primordial symmetry never disappears for a moment from the youngest embryonic stage to the perfect adult state.

It is not, however, only in the above facts (anatomical and embryological) that we fail to find traces of affinities between the two groups. Even in the three points already mentioned, as indicating resemblances between them, we shall show that the likenesses are not real but merely superficial.

1 and 2. The flexure of the intestine and the position of the pallial cavity certainly constitute one of the most important and most often quoted arguments in favour of the relation between the Pteropoda and Cephalopoda.[1] It is asserted that the flexure is "neural" in the Cavoliniidæ and in the Cymbuliidæ, and that the anus opens in them, as in the Cephalopoda, into a ventral pallial cavity.

The form of the argument is perfectly fair, but yet the conclusion is entirely false, because of the inaccuracy of the premises. The flexure of the intestines and the position of the pallial cavity in the straight Thecosomata, though apparently similar to those of the Cephalopoda, are really due to quite a different process, and that which is primitive in the Cephalopoda is secondary in the Pteropoda, as Grobben[2] perceived, so that the two are not strictly comparable.

The fact is, that a truly primitive neural flexure of the intestine and a primitive ventral pallial cavity only exist in the three classes—Cephalopoda, Scaphopoda, and Pelecypoda. This flexure is brought about by a displacement (considerable in the Cephalopoda and Scaphopoda) of the posterior part of the body—a displacement resulting, in its turn, from a partial rotation in the neural direction about a transverse axis.

As regards a hæmal flexure, it may be said with truth not to exist. In the Gastropods, where the pallial cavity is dorsal, the flexure of the intestine is always *lateral*, in consequence of a movement of rotation (quite different from that observed in the Cephalopoda) of the posterior part about a short dorso-pedal axis, which has been especially studied by Spengel.[3] Further, the terminal branch of the digestive tract may end either above the œsophagus (as in many Gastropods), which gives the appearance of a hæmal flexure, or on the same level with it (as in a good many Opisthobranchs), or even below the œsophagus, which would bring about almost a neural, but still always lateral, flexure.

As regards the Pteropoda, they have the same lateral flexure of the intestine as the Gastropods, the anus opening on the right, below the œsophagus in the Gymnosomata, in consequence of the reduction of the pedal surface, and about on the same level with it, or

[1] Huxley, On the Morphology of the Cephalous Mollusca, *Phil. Trans.*, 1853, p. 44; Gegenbaur, Grundriss der vergleichenden Anatomie, p. 378, fig. 190, 1878.

[2] Morphologische studien, &c., *Arb. Zool. Inst. Wien*, Bd. v. p. 241.

[3] Die Geruchsorgane und das Nervensystem der Mollusken, *Zeitschr. f. wiss. Zool.*, Bd. xxxv.