

more important by reason of its volume than the thin supracæsophageal thread mentioned by Dietl in *Eledone* alone.

I will also add that probably in all the Opisthobranchia (Bullidæ,¹ Umbrellidæ,² Pleurobranchidæ,³ Aplysiidæ,⁴ many Nudibranchia,⁵ &c.), as well as in the Gymnosomatous Pteropoda,⁶ there is an infracæsophageal cerebral commissure, which von Jhering has called subcerebral. It is much more slender than the supracæsophageal cerebral commissure, but no one has ventured to suggest in consequence of this, that in the Opisthobranchia the cerebral ganglia were primitively subcæsophageal.

So far as I can see, the supracæsophageal brachial commissure of *Eledone* is of no more morphological value than the subcæsophageal cerebral commissure of the Gastropods just mentioned.

Nothing is further from complete demonstration than the hypothesis according to which the brachial ganglia are cerebral in origin. On the other hand, many proofs show that they are only a segmented part of the pedal ganglia.

Such transverse segmentations of ganglia are not rare among the Mollusca. In addition to the instance already quoted of the pedal ganglia of *Natica* and those of the Marseniidæ,⁷ we may mention the siphonal ganglia of *Cypræa*,⁸ the tentacular ganglion of *Pleurobranchus*,⁹ the siphonal ganglion of many Pelecypoda, &c. Even in the Decapod Cephalopoda, too, there is an instance of the division of the cerebral ganglia, quite comparable to that of the pedal ganglia which has led to the formation of the brachial ganglia. Chéron¹⁰ has shown, and his statement has not been disputed, that the ganglion known as the "superior buccal," and still called by that name by Stieda¹¹ and Bobretzky,¹² is nothing else than the anterior part of the cerebral ganglia. I am able to state further that in the embryos of *Sepia* the formation of these "buccal" ganglia and their separation from the cerebral ganglia takes place in a manner quite parallel to that which has been advanced above as regards the formation of the brachial from the pedal ganglia.

It might be objected that in *Ommatostrephes*, for example,¹³ the brachial ganglia are

¹ Vayssière, Recherches anatomiques sur la famille des Bullidés, *Ann. d. Sci. Nat., Zoologie*, sér. 6, t. ix. pl. vi. fig. 48 (*Gastropteron*), pl. viii. fig. 69 (*Doridium*), pl. ix. fig. 81 (*Philine*), pl. xi. fig. 101 (*Scaphander*), pl. xii. fig. 114 (*Bulla*).

² Vayssière, Recherches zoologiques et anatomiques sur les Mollusques Opistobranches du Golfe de Marseille, i. Tectibranches, *Ann. Mus. Marseille*, t. ii. pl. vi. fig. 149.

³ Vayssière, *ibid.*, p. 144.

⁴ Vayssière, *ibid.*, pl. iv. fig. 94.

⁵ Von Jhering, Vergleichende Anatomie des Nervensystemes und Phylogenie der Mollusken, p. 283.

⁶ Wagner, Die Wirbellosen des weissen Meeres, Bd. i. pl. xii. fig. 1.

⁷ Bergh, Die Marseniaden, *Zool. Jahrbücher*, Bd. i. p. 168, fig. 1.

⁸ Von Jhering, *loc. cit.*, pl. viii. fig. 35.

⁹ Von Jhering, *ibid.*, pl. xi. fig. 8.

¹⁰ Recherches pour servir à l'histoire du système nerveux des Céphalopodes dibranchiaux, *Ann. d. Sci. Nat., Zoologie*, sér. 5, t. v.

¹¹ Studien über den Bau der Cephalopoden, *Zeitschr. f. wiss. Zool.*, Bd. xxiv.

¹² Observations on the development of the Cephalopods, *Proc. Soc. Friends of Nat. Hist. Anthrop. and Ethnogr. Moscow*, 1876 (Russian).

¹³ On the Nervous System of *Ommastrephes todarus*, *Ann. and Mag. Nat. Hist.*, ser. 2, vol. x. pls. i, ii.