

contrary, the dorsal half of the mass of the arms is sometimes more voluminous than the ventral mass (compare, for example, *Nautilus*), but, nevertheless, the nervous centre which innervates the *whole* brachial mass is situated *exclusively on the lower surface* of the œsophagus. This shows clearly that the brachial mass does not originate from the dorsal, but in the ventral parts of the animal (that is from the foot), and that its two halves have been fused above the head; this view is confirmed, as we shall see in the sequel, by the embryology of these organs.

II. Grobben¹ states that the arms of the Cephalopoda were primitively lateral to the mouth, as are the cones of *Clione*. In the latter, however, all the cones, both ventral and dorsal, are innervated by the supracœsophageal ganglia. If, then, the arms of the Cephalopoda and the cones of *Clione* were morphologically homologous, it would be impossible to understand why, the disposition of these organs being similar, the disposition of their innervating organs should be different. But I have shown that the cones of *Clione* and the buccal appendages of the other Gymnosomata are organs formed on the inner wall of the evaginable proboscis, which is made up of the anterior portion of the digestive tract, and whose cephalic nature is therefore indisputable. The relation of the arms of the Cephalopoda to the anterior part of the digestive tract is entirely different.

Supposing, however, that the arms are really cephalic appendages, primitively situated at the sides of the buccal opening, we might compare them with the absolutely identical arrangement which we see in *Ampullaria*. Here we find on either side of the mouth (not more dorsally than ventrally) a large conical appendage, elongated, voluminous, and relatively as large as several arms of a Cephalopod.

How then are these appendages innervated? By the supracœsophageal or *cerebral* ganglia.² These appendages probably correspond with the labial palps of certain Pulmonata (*Helix*, *Glandina*, &c.), whilst the appendage situated in front of the eye corresponds with the nuchal tentacle or rhinophore of the *Euthyneura*, inasmuch as it encloses the highly ramified olfactory nerve.³

III. In *Vermetus*, on the other hand, we find between the mouth and the foot two long appendages (buccal tentacles of d'Orbigny; tentacular or antibuccal filaments of Quoy and Gaimard), which stand precisely in the same position as the ventral arms of the Cephalopoda, and as far separated from the pedal disc as these arms are from the funnel, upon the pedal origin of which no doubt has ever been thrown.

How then are these appendages innervated? By the anterior subœsophageal or *pedal* ganglia, as has been shown by Lacaze Duthiers,⁴ and as I have been able to convince myself in the case of *Vermetus gigas*.

¹ Zur Kenntniss der Morphologie, &c., *loc. cit.*, pp. 68, 70.

² Anatomie von *Ampullaria urceus*, *Archiv f. Naturgesch.*, Jahrg. xi. p. 200, pl. viii. fig. 3, b.

³ *Ibid.*, pl. viii. fig. 3, e'.

⁴ Mémoire sur l'anatomie et l'embryogénie des Vermets, *Ann. d. Sci. Nat.*, Zoologie, sér. 4, t. xiii. p. 238, pl. vi. fig. 4, e'.