

These are the only connective cords visible externally, the others (cerebro-pedal: *cpc.*; cerebro-pleural: *cchc.*; pleuro-pedal: *pchc.*) being hidden under the cellular coating of the centres. It is true, however, that the shrunken part binding together the brachial and pedal ganglia, which are far apart from one another, may be called the brachio-pedal connective cord, as in the *Ægopsids*. But these brachial centres (innervating the arms by their anterior part) and pedal centres (innervating the funnel by their postero-ventral part) only constitute a single pair of ganglia as has been already proved by the development.¹

In the pleuro-visceral centres should be distinguished:—

- A. The pleural (lateral), from which arise the pallial nerves (*pl.n.*);² and
- B. The true visceral ganglia, from which arise the visceral nerves (Pl. III. and Pl. V., *v.n.*).

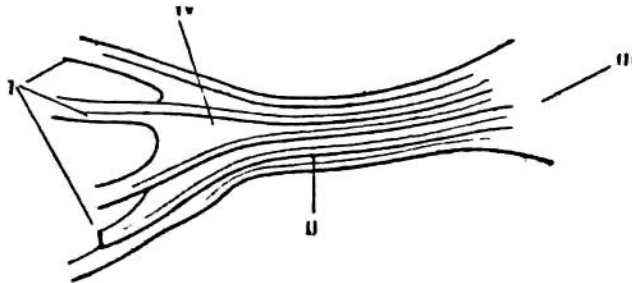


FIG. M.—Pedo-brachial connective of *Ommatostrephes pteropus*; left-hand side view, magnified. i, brachial nerves; ii, part of a brachial nerve coming from the pedal ganglion; iii, pedal ganglion; iv, brachial ganglion.

These latter nerves, which arise separately (Pl. V. fig. 2, *v.n.*), could not be followed in *Spirula peronii*. In *Spirula reticulata* it has been shown that they are closely united (Fig. S, xi) to the back of the anus, in the same manner as in the *Ægopsids*, and not by a long "commisure" as in *Sepia*. They do not, however, at their point of junction form a true ganglion, as in the first mentioned. From this junction arise

¹ In *Ommatostrephes pteropus* and *Illex coindetii*, examined for comparison with *Spirula*, are found, at the surface of the pedo-brachial connective, ten nervous bundles coming from the pedal centres properly so-called, and going each to be joined to one of the brachial nerves (Fig. M). There is then no need of histological researches (like those of Owjannikow and Kowalevski, Ueber das central nervensystem und das Gehörorgan der Cephalopoden, *Mem. Acad. d. Sci. St Pétersbourg*, sér. 7, t. xi., 1867; and of Jatta, La innervazione delle braccia dei Cefalopodi, *Boll. Soc. Natur. Napoli*, anno 3, 1889) to show that the pedal ganglion (or of the funnel) contributes to innervate the arms. A similar disposition has already been observed in other *Ægopsids* by Hancock (On the nervous system of *Ommatostrephes todarus*, *Ann. Mag. Nat. Hist.*, ser. 2, vol. x., 1852, p. 2), Posselt (*Todarodes sagittatus* [Lamk.] Stp., *Vidensk. Meddel. naturh. Foren.*, 1890, p. 238), and Appellöf (*Teuthologische Beiträge*, ii., *Bergens Museums Aarsberetning*, 1890, p. 8).

² In the paper: Pelseneer, Sur la valeur morphologique des bras et la composition du système nerveux central des Céphalopodes (*Arch. de Biol.*, t. viii., 1888), the ganglionic swellings from which arise the pallial nerves have been interpreted as anterior visceral (p. 752), and the value of pleural centres was refused to them (p. 749). A re-examination has made evident that all the visceral ganglionic elements form a single median mass and that the pleural centres are indeed those from which arise the pallial nerves.