

ber that in *Carinella* the passage of strong contractile fibres, even through the substance of the brain, was already known (IX).

Of the cellular elements enclosed in the plexus the nuclei alone are conspicuous, and it is rare to find, either in the plexus or in the medullary nerve, distinct cell outlines (multipolar or other) round these nuclei, such as they are very often found in the brain.

The nuclei characteristic of medullary nerve and plexus have exactly the same dimensions and shape as those that constitute by far the greater portion of the cellular coating, both of the brain-lobes (Pl. XIII. fig. 1; Pl. XII. figs. 1-4) and of the lateral nerve-stems. The direct continuity between the nerve-fibres of the plexus, and those forming the axis of the lateral nerve-stems, can be demonstrated in all well-preserved sections, at any rate in those species where the plexus is well developed (Pl. XII. fig. 2). Nor is the continuity with the fibres of the medullary nerve subject to any doubt (Pl. XII. figs. 3, 4).

This medullary nerve, a dorso-median thickening in the plexus, may be traced backwards down to the hindmost extremity of the body, forwards up to the brain-lobes, and even in front of these. A section of that foremost extremity of the medullary nerve can hardly be distinguished from that of an ordinary cephalic nerve, but for its median situation, and greater size and distinctness. It is here independent, *i.e.*, not enclosed in the plexus, which does not stretch further forwards than the brain-lobes, or than the layer of circular muscles. The latter is known to cease in the region of the brain. The connection of the brain-lobes with the plexus, and with the medullary nerve, is much more intimate than I was hitherto inclined to believe. Certain specimens of *Cerebratulus* collected by the Challenger (Pl. XII. figs. 7, 8; Pl. XIII. fig. 1) permit me to form a definite judgment on this question. We there see that the anterior prolongation of the medullary nerve bends downwards in the region of the dorsal commissure of the brain-lobes, and enters into connection with a nervous stratum which may, in this region, be either considered as a median portion of the brain, or as an anterior thickening of the plexus. Large ganglion-cells can be detected in it, also fibrous nerve-matter, both of them in the most intimate connection with the nerve-cells and nerve-fibres of the brain-lobes (Pl. XII. figs. 7, 8).

From this anterior thickened region of the plexus, in which a transverse core of fibres—the dorsal commissure of the brain-lobes—takes its course (Pl. XIII. fig. 1), other fibres are seen to start in the direction of the body-axis and to arrange themselves into a longitudinal tract, which is also provided with nerve-cells, and which becomes the medullary nerve (Pl. XIII. fig. 2). My former statement (IX), that the medullary or proboscidian sheath nerve emerges from the dorsal commissure (*loc. cit.*, pl. i. fig. 1), although exact, must thus be amplified in the way just described. I may add that a direct passage of fibres of the medullary nerve into those of the commissure, though sometimes noticed, is not always a constant phenomenon. Fig. 1 of Pl. XIII shows a state of things in which the fibres belonging to the plexus and medullary nerve appear to be more or less