

The opposite half of the system, seen in transparent perspective, as given in the two other figures, is purposely omitted here, because of the asymmetry of *Amphioxus* in this respect.

Now a glance at these figures will convince us that the situation of the Nemertean medullary nerve in its plexus, and with its set of transverse nerves, is directly comparable to the Vertebrate medulla and spinal nerves. The nerve-plexus filling up the intervening spaces in Nemertea is present as a transitory structure in Amphibian embryos.

The ulterior appearance of an anterior enlargement forming the Vertebrate brain; the higher complication attained by the brain and spinal cord when its mass increases, but not its dorsal expansion, by the appearance of medullary ridges; and the formation of a neural canal by infolding of the neural plate, all these are important developmental facts which do not in any way weaken the grounds for comparison of the two structures. They may be looked upon as adaptations to the much more considerable efficiency and concentration that is gradually attained by the central nervous system as we ascend higher in the scale of the animal kingdom.

The fact that the neural ridge in so many Vertebrata precedes the appearance of the spinal nerves, and is inserted along the top of the folds that bend together to form the neural tube, may be thus interpreted, that during the phylogenetic process of infolding, the transverse nerve-tracts (dorsal spinal roots) remain attached in the same way to the medio-dorsal collecting trunk as they did in the ancestral forms, and are dragged upwards by the infolding process. The ventral roots must be phylogenetically linked to the plexus as well; inasmuch as the musculature originally lies inwards of the nervous plexus, their deeper situation is not surprising.

In the points hitherto enumerated there is entire coincidence between *Amphioxus* and the other Vertebrata, as far as their comparability with the Nemertean diagram goes. Another point of coincidence is the way in which the foremost portion of the intestinal canal and adjacent blood-vessels are innervated by visceral nerve-stems, indicated in all the three diagrams by *vi.sy.*

The claims to validity of the comparison here made between the spinal nerves of the Chordata and the transverse stems of the Nemertea, should be again insisted on, now that the researches of Rohon,¹ Freud,² Schneider, Ransom, and d'Arcy Thompson³

¹ V. Rohon, Untersuchungen über *Amphioxus lanceolatus*, *Denkschr. d. k. Akad. d. Wiss. Wien*, Bd. xlv.

² S. Freud, Ueber Spinalgangliën und Rückenmark des Petromyzon (*Sitzungsb. math.-nat. cl. k. Akad. Wiss. Wien*, Bd. lxxviii., Abth. 3, 1878). This author says (p.154): "Ich kann wenigstens von den letzten Wurzeln des Caudalmarks sagen dass ihre Selbständigkeit so gross ist, dass man von vorderen und hinteren Spinalnerven, anstatt von vorderen und hinteren Wurzeln reden könnte"; and Wiedersheim in the 2d edition of his *Lehrbuch der Vergleichenden Anatomie* (p. 321): "Vieles spricht dafür dass die Vorfahren der heutigen Wirbelthiere *getrennte* dorsale und ventrale Nervenwurzeln besessen haben müssen."

³ W. R. Ransom and d'Arcy W. Thompson, On the spinal and visceral nerves of Cyclostomata, *Zool. Anzeiger*, No. 227, July 1886.