become thinner and thinner, the ganglia smaller, and the lateral branches arising from the ganglia more numerous and much thinner and shorter. This is quite in correspondence with the number of muscles which these ganglia innervate; whereas these in the front part of the proboscis are stouter, and separated by distinct longitudinal intervals, in the posterior part they are thinner, and placed almost in an uninterrupted row.

This brings us quite methodically to the function of these ganglionic nerve-bundles. In the vertebrates we can distinguish by the microscopical structure sympathetic ganglia and nerves from those of the cerebro-spinal system, but in the invertebrata this is by no means so easy. In the first place, we must consider the function of the part of the nervous system in question. The ganglia and the nerves of my three ganglionic bundles innervate the striped muscles of the proboscis. Unstriped muscular fibres are by no means rare in the muscular tissue of Pycnogonids,[1] but even if they were quite wanting, as they seem to be in the muscular tissue of the Crayfish,[2] those of the proboscis ought to be considered as voluntary fibres. Moreover, the action which the food undergoes in the proboscis by means of these fibres is of a purely mechanical nature. Chemical action does not take place in it, therefore comparison of these ganglionic bundles with the sympathetic system of higher animals is impossible.

The morphological explanation of their presence is by no means so easily given. The following reasoning must be considered as an attempt only. The proboscis of the Pycnogonida in the form in which it presents itself should not, of course, be considered as a new organ, only present in this class of Arthropoda. It is only an organ or a combination of organs under a new form, modified under the influence of surrounding conditions. Considering for a moment the supposition right, that it results from the union of three parts, an azygous one placed partly above and partly before the mouth (the upper lip), and two others placed below and behind the mouth, the manducating parts of the mandibles, of which the palpi in that case may be considered as the feelers; then we have in the three nerves, the first of which is given off by the supra-œsophageal ganglion, and the two others arising from the first thoracic ganglion, the normal nerves for the innervation of these parts. With the union of these parts to form a proboscis) and I believe this argument will hold good also if we prefer another homology for these parts), and the predominance of the manducating function of this proboscis, evidently quite a new part of the nervous system, will make its appearance; and it is not difficult to imagine its probable origin.

In the chitinous wall which lines the canal of the proboscis, and which is furnished with rows of very numerous teeth and spines, we have, no doubt (morphologically), a continuation of the integument, so that its inner surface corresponds with the outer surface of the body, while its outer surface, to which the muscles are attached, is the homologue

[1] *E.g.*, in the wall of the vasa efferentia of the males, &c.

[2] Huxley, The Crayfish, p. 181.