

## MORPHOLOGY.

Milne-Edwards laid it down in his earlier writings that the type of the Decapod Crustacea consists of twenty-one somites, of which the anterior seven belong to the cephalon or head, the posterior seven to the pleon or abdomen, and the intermediate seven to the pereion or thorax.

Dana admits that there are normally twenty-one segments, and twenty-one corresponding pairs of appendages, the posterior seven of which belong to the pleon. But he says that of the remaining fourteen pairs, only five are subservient of locomotion, the other nine being organs of special sense or in relation to manducation and placed about the mouth. In reaching this conclusion, Dana was guided by the results of his examination of the Brachyura and higher Macrura, in which the nervous system is most highly centralised.

From the study of development as well as of the adult structure of the more simple forms of Crustacea, I previously adopted and maintained the view put forward by Milne-Edwards. But since then, from the examination of extensive series of Crustacea of all groups and types, and of many forms in different stages of development, I have been led to reconsider this conception of the structural relationship of the several parts.

If we turn to the development of the Synaxidea we find some of the most instructive examples of crustacean form. In this group the animal leaves the egg far advanced beyond the Zœa stage, and exists in what Anton Dohrn calls the Megalopa stage; although in character it is far below the form to which Leach originally gave that name, and which was ultimately shown to be an advanced stage of a young Brachyura. It is extremely thin and very translucent, and a more advanced form has been named *Phyllosoma* by Milne-Edwards. At the period when it is hatched it is about 2 mm. in length (Pl. XIII. figs. 1, 2), and is distinctly divided into three separate parts. The anterior portion or cephalon is broad and shield-like, and represents the future carapace of the adult; the second portion or pereion is also broad and disc-like, and it was upon the characters of these two divisions that a supposed family was established by Milne-Edwards under the name of Bicuirassés; the third portion or pleon is a narrow terminal process.

The cephalon consists of the ocular, the two antennal, the mandibular, and the first post-oral somite (Pl. XII. fig. 1; Pl. XIII. fig. 2). The two anterior somites, as shown in the adult animal, are separate from those which form the large dorsal shield or carapace. Studying the development of the *Phyllosoma* still further in various species, we find that the succeeding somites are distinct from the cephalon and together compose the pereion; consequently the whole of the appendages attached to this division must be