

while in others they are absent from the pereion, or attached to the pleon also; consequently nearly every carcinologist who has attempted to construct a natural classification has made use of characters founded upon the branchial apparatus.

The broad division in the general structure of the branchial organs has long been recognised, and its full value appreciated. Dana¹ says, "The branchial system is one from which we should particularly expect important distinctions and valuable characteristics of the highest significance, and such distinctions exist. They are at the basis of some of the primary subdivisions, as exhibited in the systems of Milne-Edwards, and to a large extent also in the system of De Haan."

It is, however, very remarkable that, with this full conviction and desire, Dana has not utilised his observations beyond those of previous writers, who divided the Decapod Crustacea into two groups,—one having the branchiæ protected by a carapace, the other having them uncovered and pendent. Dana's terms of "Eubranchiata" and "Anomobranchiata" are synonymous with "branchies cachées" and "branchiogastres," the first and second orders of the Malacostraca of Latreille's earlier classification, and the Decapoda and Stomapoda of his later.

The system of De Haan is based on the arrangement of the branchiæ to such an extent as to divide the Macrura into two portions, separating those in which the organs consist of a series of long cylindrical filaments from others in which the structure is foliaceous, consisting of a series of leaf-like plates.

But De Haan appears to have appreciated the numerical value of the branchial character rather than the position of the plumes in relation to the general structure of the animal.

The great object of a natural systematic arrangement is to determine the internal structure by external evidence, without which it appears to me no classification can be perfect, especially in the future, when extinct forms must be studied in their relation to existing species, and this can only be done in the Crustacea through the preservation and knowledge of the harder or external parts.

The classification of Latreille separates the Macrurous Crustacea, in which the branchiæ are attached to the anterior limbs, and protected by the carapace, from those which have the branchiæ attached to the posterior limbs, or unprotected; that is, those in which the branchiæ belong to the pereion from those in which they are attached to the pleon, or absent.

This general arrangement has been adopted by Milne-Edwards and Dana with scarcely a variation in the general outline, and the subdivisions of their classifications also closely correspond. Thus the "Astacini" of Latreille agree closely with the "Astaciens" of Milne-Edwards, and the two tribes, Thalassinidea and Astacidea of Dana, correspond respectively with two divisions of the "Astacina" of De Haan.

¹ United States Explor. Expedition, vol. i. p. 61.