

Another point in the synonymy of this genus has also been cleared up through the transfer of the types of Lepidoptera in the India Museum. Among these we received a Nepal species bearing the type-labels of *B. Wallichii*, Gray, and *B. spectabilis*, Hope, and agreeing perfectly with both descriptions and the figure. The specimen is from the collection of General Hardwicke, as stated by Hope, and differs strikingly, both in coloration and pattern, on both surfaces from the better-known *B. conchifera* of Darjeeling and Silhet.

The true *B. certhia* of Fabricius, which 83 years ago was quoted as in the British Museum, is now also not to be found.

Two examples of *B. Wallichii* in Mr. Dana's collection agree in all important characters with the type.

New Classification of the Crustacea.

By A. S. PACKARD, Jun.

The recent studies on the embryology of the king crab (*Limulus polyphemus*) have shown that there are some unexpected resemblances to the mode of development of the Arachnida; and while in our essay* on the development of this crustacean we attempted to show that the arachnid features were also to be found in certain crabs and shrimps whose development was exceptional, one or two naturalists (as E. Van Beneden and Dohrn) claim that *Limulus* is not a true crustacean, but belongs next to or with the Arachnida. This seems to us an extreme view. Then followed the beautiful anatomical researches of Alphonse Milne-Edwards on *Limulus polyphemus*, in which he showed the singular relation between the vascular and nervous systems, the latter being enveloped by the ventral system of the arteries. The differences between the nervous system of the king crab and Arachnida has been already indicated†. It has not been, we think, sufficiently taken into account that *Limulus* is a generalized or synthetic type, combining with features of its own certain resemblances to the Arachnida and to the normal Crustacea. In its mode of respiration, its external gills, and in its circulatory organs it is, as we have previously stated‡, essentially a crustacean, but should be placed apart from the normal Crustacea, and form the living representative of a subclass, equivalent to all the other living Crustacea. To *Limulus* are closely allied the fossil Merostomata; and we regard, for reasons already stated, the Trilobites as closely allied to the Merostomata.

For this subclass we have proposed the name Palæocarida; and for the normal Crustacea we have proposed the term Neocarida.

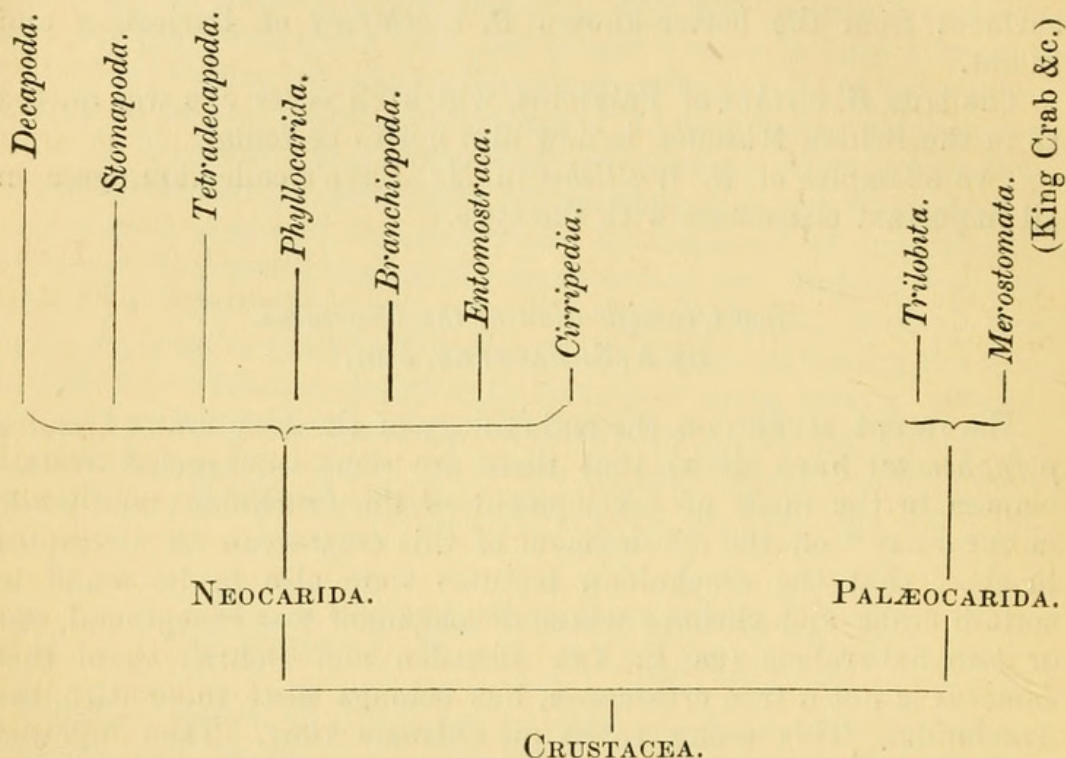
* "The Development of *Limulus polyphemus*," by A. S. Packard, Jun. (Memoirs of the Boston Soc. of Nat. Hist., published March 1872).

† 'American Naturalist,' vol. ix. pp. 422, 423, July 1875.

‡ "Further Observations on the Embryology of *Limulus*, with notes on its Affinities," American Naturalist, Nov. 1873, vol. vii. p. 675.

In order to express the relations of the two subclasses of Crustacea, we have published * the following table, showing the mode of grouping of the different orders of the two subclasses of the class of Crustacea:—

Classification of the Subclasses and Orders of Crustacea.



While the Neocarida are characterized by the well-known features peculiar to all living Crustacea except *Limulus*, the Palæocarida have, among others, the following characters:—Appendages of the cephalothorax in the form of legs rather than jaws; no antennæ; brain on the same plane as the cephalothoracic ganglionic ring, and supplying nerves to the eyes alone; nerves to the cephalothoracic appendages sent off from an œsophageal ring; nervous system ensheathed by a ventral system of arteries; metamorphosis slight. Sexes distinct.

Order 1. Merostomata.—No distinct thoracic segments and appendages. (*Limulus*, *Eurypterus*, &c.)

Order 2. Trilobita.—Numerous free thoracic segments and jointed appendages. (*Agnostus*, *Paradoxides*, *Calymene*, *Trinucleus*, *Asaphus*, &c.; all extinct.)

A further elaboration of this classification, with full references to the labours of others, is to be given in a second memoir on the anatomy and development of *Limulus polyphemus*, in course of preparation.—*American Naturalist*, December 1879.

* Zoology for Students and General Readers. American Science Series. By A. S. Packard, Jun. H. Holt & Co., New York. Published in December 1879. 8vo, pp. 703.



Packard, A. S. 1880. "New classification of the Crustacea." *The Annals and magazine of natural history; zoology, botany, and geology* 5, 189–190.

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