MOLLUSCS. By J. E. MORTON. Hutchinson University Library. 232 pp., 23 text-figs. 10*s.* 6*d.*

Dr. Morton's introduction to the Mollusca is an accurate summary of what is known concerning the ways, habits and mode of life of this group, of which the snail, the oyster and the cuttlefish are familiar examples.

No general account of the Mollusca has appeared in English for about forty-five years and a modern text was overdue. Although this volume and its predecessor by B. B. Woodward discuss the same group they are quite different in content, because progress has resulted in many changes in concepts. Here the emphasis in on functional morphology and evolution and this might well have been added as a sub-title to the book.

In the introductory chapters, general morphology, external appearance and habits are described in a broad comprehensive survey of all the classes. Concerning molluscan origins—turbellarian or annelid—the author states: "The dramatic discovery of *Neopilina*, a living monoplacophoran, with five serial pairs of gill-like organs, auricles, coelomoducts and perhaps gonads, will again tip the balance in favour of annelid relationships," but he skilfully avoids a positive declaration in favour of either view.

In five chapters on the various systems (mantle cavity and gills; feeding and digestion; blood, body cavity and excretion; sex and reproduction; nervous system, sense organs and behaviour) form is related to function and possible evolution; this section brings together a great mass of data, admirably presented in summary for the first time for the student. These remarks are applicable also to the splendid account of the evolution of the Gastropoda.

The author has written a thought-provoking chapter on the classification of the Lamellibranchia. The Protobranchia he regards as a rather specialized group, in which, the "Nuculidae and Malletidae, for example, feed on surface deposits by means of peculiar palp proboscides. *Malletia* and *Yoldia* have highly enlarged pumping ctenidia. The Solenomyidae, with their long tubular, mainly periostracal shell have developed a power of darting and swimming with the piston-like foot". Nevertheless, despite these specialized features of the modern representatives, it is among the early protobranchs that we must look for the ancestors of the Lamellibranchs. Even so, Dr. Morton considers that "the protobranchs stand clearly apart from other bivalves; in many ways they deserve to be separated into

their own sub-class ". This view runs counter to present classification, but it is an attractive suggestion, with much to commend it.

The classification of the rest of the Lamellibranchs has been mainly according to gill pattern (Pelseneer's system) or on hinge characteristics, neither system being satisfactory by itself. The author indicates that a more liberal approach is needed, drawing on as many reliable features as possible, and he adopts with modifications, a tentative arrangement first put forward by the French conchologist Douvillé in 1912. Douvillé proposed to recognize three main lineages, based on linking structure with ecology; these Dr. Morton has accepted and related to the modern systematic classification of Johannes Thiele. The oldest or sessile branch, includes the orders Taxodonta and Anisomyaria, that is, the filibranchs and pseudolamellibranchs anchored at some stage in their lives by a byssus. The modern or normal branch (Orders Heterodonta and Schizodonta) are mainly shallow-burrowing forms such as *Cardium*, *Tellina* and the freshwater groups. In Douvillé's third group—an advanced one—are placed the deep-burrowing forms (the Order Adapedonta and provisionally also the Anomalodesmata) including, for example, *Solen*, *Pholas*, *Xylophaga*, *Teredo* and many specialized forms. The highly modified septibranchs are retained in the Anomalodesmata, although the author is inclined to support Pelseneer in maintaining them as a separate order.

The descent of cephalopods from the early Palaeozoic is traced and a brief survey is made of living forms and their adaptations to deep-sea life. Errors are few, but it should be noted that in *Rhiostoma* the breathing tube is never completely closed at the tip (p. 46) and records of the reputedly deep-water squid *Heteroteuthis dispar* (famed for its luminous secretion) demonstrate that it is most frequently captured in the upper 300 metres (p. 210).

As already implied, this book is a notable achievement; its author presents a well-balanced account of malacology in modern dress, bringing together a great deal of recent researches in convenient form. By rigorous selection and skilful planning he has successfully produced a compact volume that is very good value at a price the student can afford.

W. J. R.