

Snails, slugs . . .

Pulmonates. Volume 1: *Functional Anatomy and Physiology*. By Vera Fretter and J. Peake. Pp. xxix+417. (Academic: London and New York, April 1975.) £13.20; \$35.

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Mary Evans Picture Library

Snails meeting on a vine branch, from an etching by M. Giacomelli

FROM the title, I wondered momentarily whether Fretter and Peake have produced a pulmonate sequel to the superbly integrated and illustrated Ray Society volume, *British Prosobranch Molluscs* (Fretter and Graham, 1962). Time is perhaps not ripe for such a volume. Considering the present state of our knowledge of the pulmonates, a challenging and daunting task has been undertaken in producing the present work.

In her introduction Fretter compares some aspects of the functional anatomy of prosobranch, opisthobranch and pulmonate gastropods and briefly considers their possible relationships and the origin of pulmonates from prosobranch stocks. She draws attention to the frequent differences in terminology used by prosobranch and pulmonate workers.

This volume brings together eight reviews covering the fields of locomotion, respiration, alimentary canal, water relationships, nervous system, endocrinology, reproduction and development. These reviews have been contributed independently by different authors and thus differ in form, in the selection of their content and in the period of time over which the author ranges; and several concentrate on research of the last ten years, that is, subsequent to the writing of Wilbur and Yonge's *Physiology of Mollusca*. Often, more and clearer illustrations would have been welcome, but all authors provide extensive reference lists—surprisingly without titles.

A valuable feature of this book is the systematic index. Within the context of the book, it pinpoints those species for which substantial data now exists, whilst indirectly indicating the limited number of pulmonate species on which some physiological work has been carried out. Sadly we must await volume 11, which deals with "the ecology of the group, some aspects of its economic importance, systematics and evolution", to relate the species utilised and the results they yield to their ecological niche and their systematic position. For convenience, a summary of the classification of pulmonates should have been included in this volume.

The authors are frank when presenting conflicting results—for example, page 291 ". . . contradictions can be expected by considering that not only different species were used, but that also the experimental conditions were not uniform . . .". Comments on problems, and the vast amount of work still necessary to unravel the complexities of functional anatomy and physiology among the pulmonates certainly make this book a stimulant to further research. As a record of what has been achieved in many areas and a pointer to what can be done, this book should take its place on the shelves of research departments.

Joyce E. Rigby

. . . and worms

The Locomotion of Soft-Bodied Animals By E. R. Trueman. Pp. viii+200. (Edward Arnold: London, June 1975.) Boards £8.50; Paper £4.25.

LIFE became mobile when animals evolved. Their movement, however, brings to mind the flight of birds or insects, the speed of horses, the mastery of swimming by fish and whales. But such creatures with highly efficient muscles working in antagonism to rigid internal or external skeletons are final productions of evolution. Humbler animals must be contemplated if we are to appreciate how mobility evolved and is still practised by major sections of the animal kingdom searching for food or seeking protection.

This book deals with movement in coelenterates, in worms from turbellarians to polychaetes, with some concern for echinoderms and much for molluscs. In evolution of the Metazoa, the solid flattened body suitable for progression with cilia over hard surfaces gave place to a rounded form with fluid-filled cavities—coelom, haemocoel or pseudocoel—before soft substrates could be penetrated. An infauna exploring new

sources of food and avoiding the attention of evolving carnivores came to supplement the original epifauna.

A muscular system acting in antagonism to a fluid skeleton provided a capacity to burrow—most simply exhibited by anemones such as *Peachia*—and more elaborately in various worms, and to the highest degree in the segmented polychaetes. Protrusion of the muscular foot with extensive haemocoelic cavities has enabled molluscs, primarily bivalves but also scaphopods and various gastropods, most efficiently to progress through soft substrates.

The process of movement in surface-crawling worms and snails has long been studied but the interpretation of movement within the substrate had to await elaboration of suitable measuring techniques, notably the Statham pressure transducer. So equipped, Professor E. R. Trueman and co-workers have revealed the sequence of events in the subsurface movements of representatives of all types of soft-bodied burrowers. Certainly to this reviewer, their success seems to be greatest where knowledge was least, in the interpretation of the digging cycle in bivalves leading to boring into rock or timber. The supreme achievement of movement in soft-bodied animals is, however, the jet propulsion of the molluscan squids, involving an elaborate system of antagonistic muscles under precise nervous control.

This concise, well written and illustrated book associates and interprets a range of experimental data to provide functional interpretation of much invertebrate structure. No one can read it without gaining a better understanding of the animal kingdom, surely the prime aim of the study of zoology.

C. M. Yonge

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Schistocerca gregaria (desert locust). Taken from Borne on the Wind: the Extraordinary World of Insects in Flight. By Stephen Dalton. Pp. 154. Hogarth: London, October 1975.) £5.00.