

on the authors' intensive studies off the Carolinas. There is a short discussion of the northeastern Atlantic based on European work in the Bay of Biscay. The chapter titled the southeastern Pacific is based on work on a small number of faunal groupings in samples from a limited area off the coast of Peru. Discussion of the Arctic Ocean is based mainly on the shelf fauna because very few benthic samples have been taken from the deep Arctic basins. The authors reflect the modern view of the deep trenches as geologically unstable areas, which is supported by their low degree of faunal endemism above species level.

The book discusses abyssal biomass and the structure of the abyssal benthic community. Interesting, and previously unpublished, data from deep-sea photographs on spatial pattern of epibenthic species are included, as is some discussion on the measurement of faunal diversity and the interpretation of the results. The little and fragmentary information available on specialization in functional morphology, feeding, reproduction and vision that is associated with the deep-sea habitat is summarized.

The authors finally attempt to classify marine distributions into a scheme relating geographical range, depth zonation and temperature conditions, and then discuss the origin and evolution of the abyssal fauna. However, much of the material appearing earlier could have been more tidily incorporated into these sections. The book as a whole suffers from poor organization and an irritating style which makes it difficult to use for reference. It is a pity that the authors have not restrained their use of unfamiliar and often abbreviated jargon. Although the reader may eventually manage to make sense of sentences such as: "The UAZ always appears to have fewer species than the MAZ but more than the LAZ" (p. 251), he may well have succumbed to a mental constipation before reaching a later section titled "Eurybathial, Eurythermal Eurygraphs" owing to the clumsy style of writing. For example, the caption to Figure 1-22a does not make it clear whether the date of death given refers to the Russian gentleman or to the abyssal sipunculid worm that he is shown examining in the photograph. On page 92 the sentence: "The genera and species considered to be intertidal are those found along the shore between tide marks" would, by any reasoning, seem unnecessary.

Many of the deep-sea photographs reproduced resolve insufficient detail. Drawings depicting the larger animals in their habitat are given but it is doubtful whether they succeed in conveying more information than a good photograph.

There is a heavy emphasis on the Iso-

poda in this book. Although they are probably an important faunal grouping in the deep ocean, the authors might have produced a more useful and certainly briefer text as a monographic treatment of the marine isopods.

JOHN D. GAGE

Ancient Mosses

Bryophytes of the Pleistocene: The British Record and its Chronological and Ecological Implications. By J. H. Dickson. Pp. ix+256 (21 plates). (Cambridge University: London, February 1973.) £12.80; \$37.50.

MOST Quaternary botanical studies have been concentrated, naturally and properly enough, on the vascular plants of the period, and most workers in this field have thus been specialists in the identification of vascular plant remains. Mosses have sometimes been ignored, and some identifications have been amateurish, while others have been made by bryologists unused to naming fragments. In this book, by an authority in the field of Quaternary bryology, not only are the records assembled from a widely scattered literature, but many of the specimens on which they are based have been re-examined and many data are presented.

Introductory chapters covering the present distribution patterns of British bryophytes, geological and vegetational history, and materials and methods, are followed by a systematic survey, species by species, listing all subfossil occurrences and discussing their significance in relation to present-day British and continental distribution. The final chapters treat the subject chronologically, tracing the changes from pre-glacial times onwards. The book is well produced and lavishly illustrated—some reduction in the size and number of both distribution maps and plates could well have been made. The text is not easy reading, and for the non-specialist who does not carry in his head the precise definitions of some of the terms—Hoxnian, Neogene, Devensian, Anglian—a glossary would have been helpful.

Differential preservation makes interpretation of the record difficult. Only eighteen liverworts are known from the Pleistocene, against 179 mosses, and many of the mosses with no sub-fossil records are common ones. Some curious problems are raised. Why, for example, did the late Bronze Age men of the Humber select, of all species, *Neckera complanata* for caulking their boats? The information in this book has been well worth assembling, for the present distribution of British bryophytes cannot of course be understood without reference to their history, but it throws rather disappointingly little new light on the more general problems of the Pleistocene.

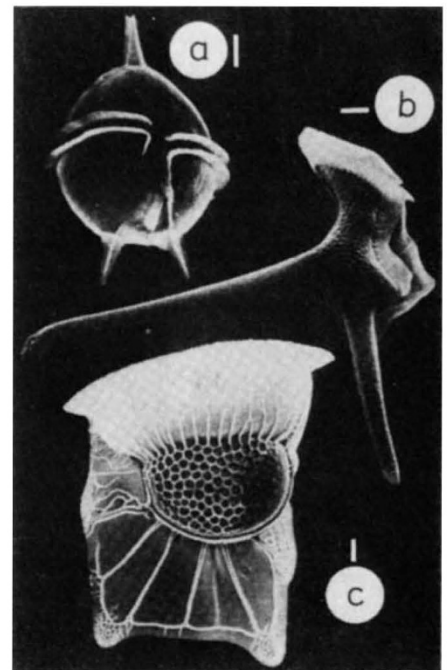
A. C. CRUNDWELL

Memory

Problems of the Psychology of Memory. By A. A. Smirnov. Scientific and Translation Editor: Samuel A. Corson. (Monographs in Psychology: an International Series.) Pp. xi+338. (Plenum: New York and London, 1973.) \$26.

Problems of the Psychology of Memory is a translation of a Russian work on the natural history of the memorization process in the tradition of Bartlett's classic work. The major part is a monograph, originally written in 1945, which has been slightly revised for the translation from the Russian. Its style is very heavy and the experiments described lack elegance. Despite this, if it had been published in English before the early 1960s, during the Dark Ages of the verbal learning approach to memory, it could have had a useful influence. Now, its basic position—the emphasis on the effect of the activity of the memorizer on memory—is standard in cognitive psychology. Much more incisive demonstrations of most of its claims have been produced by Western psychologists such as Miller, Tulving, Mandler and Paivio. The book stresses the importance of comprehension, of planning and of the nature of the orienting task on memory and there is some discussion of visualisation. It contains some protocols of the

Tropical Plankton



Scanning electron micrographs of dinoflagellates from the Indian Ocean. a, *Peridinium latispinium*; b, *Dinophysis miles* var. *schroeteri*; c, *Ornithocercus quadratus*. Taken from *The Biology of the Indian Ocean*, edited by Bernd Zeitzschel (Chapman and Hall: London; Springer-Verlag: Berlin, Heidelberg, and New York, August 1973, £16.35).