Science Board of the National Academy of Sciences of the USA with many of the results appearing in the *Atoll Research Bulletin*. Important guidance was provided in the *Handbook of Atoll Research* published in 1953 by F. R. Fosberg and M.-H. Sachet of the Smithsonian Institution who also edited the *Bulletin*.

Today the subject matter has proliferated widely. The mapping of reefs presents unique problems owing to geographical or seasonal inaccessibility and constantly changing pattern. New methods have developed for drilling, for determination of the sediments into which the reef mass disintegrates and for the local determination of sea level. Evaluation of a fauna and flora living on largely three-dimensional reefs with a territorial fish population presents problems not encountered in temperate seas.

In striking contrast to the surrounding oceanic deserts, atolls are oases of high productivity. But they are fragile systems without any sustaining reservoir of nutrients and phytoplankton, dependent on continuous re-cycling. Everything removed, notably fish, affects total production. The influence of the algal zooxanthellae present in all hermatypic corals on both calcification and nutrition awaits final evaluation.

Many working on these problems have devised new methods of attack, and new techniques such as aerial photography have appeared. The whole subject has been critically reviewed by Working Group 35 of the Scientific Committee on Oceanic Research of UNESCO which is responsible for this volume with 43 contributions. These are grouped under Morphology and Structure, Biotic Distributions, and Energy and Nutrient Flux, their value the greater because the two first are edited by D. R. Stoddart and the third by R. E. Johannes, respectively the leading workers on the geomorphology and on the productivity of reefs.

Both field workers and those more theoretically interested in the problems of coral reefs will find this book of the greatest help; it will also have permanent value as a record of the current state of enquiry.

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Marine micropalaeontology

Introduction to Marine Micropaleontology. Edited by B. U. Haq and A. Boersma. Pp.376. (Elsevier: New York and Oxford, 1978.) $24.

It is fifteen years since the English translation of Pokorny's *Principles of Zoological Micropalaeontology* was published. Since that time there has been no new general text in micropalaeontology, despite the major contribution that the study of microfossils has continued to make in world exploration for oil and gas, and the successive achievements of the Deep Sea Drilling Project. It is perhaps not as well recognised as it ought to be that confirmation of the hypothesis of oceanfloor spreading and plate tectonics in the ocean basins is almost totally dependent on micropalaeontological evidence. Also the general application of 'absolute' ages to marine geological events is heavily dependent on the precision with which micropalaeontological biozones have been related to otherwise relatively isolated radiometric and palaeomagnetic determinations. Latterly too, in association with isotopic analysis, micropalaeontology has begun to yield significant new insights into the periodicity and chemistry of major oceanic changes that are themselves linked to worldwide variations in the planetary environment.

During this period of development knowledge of the various plant and animal microfossil groups has been vastly extended, new numerical methods introduced, and new technologies, such as scanning electron microscopy, adopted. Perhaps it is because of all this endeavour that no micropalaeontologists have had time to compile a review of the current state of their science. Here at last, however, Bilal Haq and Anne Boersma have persuaded a distinguished group of specialists to contribute to a pre-arranged pattern, a series of up-to-date accounts of the groups which they study. Thus, we have separate chapters on foraminifera, calcareous nannoplankton, ostracodes (by Pokorny himself), pteropods, calpionellids, calcareous algae and bryozoa—all mainly of calcareous composition; radiolaria, diatoms, silicoflagellates—all siliceous; and conodonts, dinoflagellates, spores and pollen and chitinozoa—of phosphatic and organic composition.

Each account gives an outline of the biology, taxonomy and stratigraphical distribution of the respective groups, but more interestingly usually goes on to consider their palaeoecology and contribution to palaeo-oceanic problem-solving. They therefore serve at the same time the prosaic purpose of imparting technical information to the would-be specialist, and also stimulate an interest in problems of more general concern that can be approached by way of micropalaeontology. Naturally with so many different authors contributing the quality is sometimes variable, and, in spite of the extensive review system adopted, the text (be warned) does contain some unexpected errors. Nevertheless the editors are generally to be commended on what they have achieved in terms of uniformity, quality and accuracy. The whole impact of the book is greatly helped by the generous use by all authors of a variety of types of line and half-tone diagrams and illustrations. Here is a text that fully realises that endless prose is not always the best way of imparting information and understanding.

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Chemistry and metabolism of vitamin D

Vitamin D. Edited by D. E. M. Lawson. Pp. 433. (Academic: London, New York and San Francisco, 1978.) £20.50; $42.40.

Until the late 1960s vitamin D was generally regarded as being a subject of rather academic interest. It was acknowledged to play a role in intestinal calcium transport; and the main symptom of vitamin D-deficiency, a disorder of bone formation, was attributed not to a direct effect of the vitamin but to the secondary disturbance of calcium metabolism.

The past decade has seen dramatic advances in our understanding of the role of this vitamin. It would now be more appropriate to regard it not as a vitamin but as a metabolite and pro-precursor of a steroid-like hormone. The two hydroxylations, one in the liver and a subsequent one, controlled by parathyroid hormone, in the kidney convert the vitamin to an active form 1,25-dihydroxycholecalciferol. This latter compound acts on intestinal cell nuclei resulting in the induction of synthesis of proteins, including a calcium-binding protein, and leading to an increase in intestinal calcium transport; it is also the most potent stimulator of bone resorption yet discovered. The clinical application of this information has been remarkably rapid. Less than three years after the discovery of the role of the kidney in the intermediary metabolism of vitamin D an appropriate analogue had been synthesised and applied therapeutically by clinicians involved with the management of patients in chronic renal failure.