

REVIEWS

REVIEWS: APPROACHES TO PALEOECOLOGY; INTRODUCTION TO PALEOECOLOGY; BIOGEOCHEMICAL METHODS OF PROSPECTING

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APPROACHES TO PALEOECOLOGY, edited by John Imbrie and Norman Newell. Published by John Wiley and Sons, Inc., New York, 1964, viii + 432 pp., illustrated, \$12.50.

Approaches to Paleocology is the published record of the symposium on the principles of paleocology held at Cincinnati, Ohio, during the 1961 annual meeting of the Paleontological Society. Author's royalties have been assigned to the Paleontological Society Publication Fund. Nineteen recognized authorities have contributed twenty distinguished papers to this volume which represents a remarkable review of the broad spectrum of modern paleocology.

The editors' introduction is followed by *Foundations of Paleocology*, the first of five major divisions of this treatise. Four approaches to the theoretical bases of paleocology and its study are presented here.

The next section, *Biologic Approaches to Paleocology*, includes seven more extensive papers which are documented thoroughly with case histories and actual practical examples. Among these, Walton's *Recent Foraminiferal Ecology and Paleocology* is especially notable. This definitive and practical paper will prove to be of extreme value to exploration for petroleum in the Gulf Coast Area. As its significance becomes apparent, it is predicted that it will be studied carefully by Gulf Coast exploration geologists as well as their paleontologist colleagues.

In the third part, *Sedimentary Structures as Approaches to Paleocology*, the importance of both inorganic and biogenic structures is discussed in detail. Next, five papers comprise *Diagenetic Approaches to Paleocology*, in which the effects of the physical and chemical processes involved in diagenesis and alteration of sediments are reviewed comprehensively. The last section, *Statistical Approaches to Paleocology*, consists of a

single paper by John Imbrie on the role of mathematical models as "essential adjuncts to other approaches."

This symposium is not a textbook in paleocology, but it is an invaluable reference work for the professional paleontologist as well as an excellent aid to conducting advanced seminars in this field. In reviewing Ager's *Principles of Paleocology*, this writer (1964, *Tulane Stud. Geol.*, vol. 2, p. 107) observed: "Paleocology has required definition and Dr. Ager provides much to satisfy this demand." *Approaches to Paleocology* complements Ager's book and fulfills the need for definition in paleocology.

INTRODUCTION TO PALEOECOLOGY, by R. F. Hecker [Gekker]; translated and edited by M. K. Elias and R. C. Moore. Published by American Elsevier Publishing Company, Inc., New York, 1965, x + 166 pp., illustrated, \$7.50.

The content of this book is surprisingly good, though it suffers from several defects. The type is unattractive and difficult to read; this distracts the reader and diminishes the usefulness of the volume. There are too many misspelled words.

The first chapter is a survey of *History* [Russian], *Objectives and Methods of Paleocology*. This is well done. The author makes a vigorous and justified appeal that "paleocological and lithological investigations need to be conducted side by side," preferably by a paleocologist and a sedimentary petrologist working together. In a later chapter, he further states the necessity of studying the entire problem, emphasizing paleosynecological investigation—study of the entire biota, rather than a single group of organisms.

Field verification of data, comparative analysis, biocoenose vs. thanatocoenose accumulations, symbiosis and commensalism, borings and other *problematica*, traces of

life processes and behavior, and reef-building organisms are among the subjects discussed in chapter two, entitled *Field Observations*. The author devotes three and one-half pages to *Field Collecting*.

This reader searched in vain through chapter four, *Preparation of Materials*, for specific treatment of this topic. Instead, the author returned to discussion of *Methods of Paleocology* with descriptive material which should have been combined with that in chapter one.

The remainder of the text deals with preparing drawings or other graphic and photographic illustrations for publication and paleocological museum exhibits. Approximately one-quarter of the book consists of full page illustrations of fossils and rock structures. A bibliography, chiefly Russian sources, and a terminal index are included.

This book is not suitable as a textbook in paleocology. It may be useful, however, as collateral reading for paleontology students.

BIOGEOCHEMICAL METHODS OF PROSPECTING, by Dimitrii Petrovich Malyuga. Authorized translation from the Russian, published by Consultants Bureau, New York, 1964, viii + 205 pp., \$27.50.

Biogeochemical prospecting methods consist of analyzing plants and soil samples in order to detect aureoles of disseminated elements emanating from concealed ore deposits. The patterns of distribution of plants sensitive to the chemical content of soils and resulting abnormal varieties or "mutations" may be of assistance in interpreting biogeochemical data. In Europe and especially in the Soviet Union there has been considerable interest in biogeochemical methods for several decades and much research effort has been devoted to attempts to refine these methods.

This book was first published in 1963 for the V. I. Vernadskii Institute of Geochemistry and Analytical Chemistry by the Academy of Sciences Press in Moscow. It is a good

presentation of the current state of knowledge in this area.

The history of development of this method is reviewed in the first chapter. Succeeding chapters deal with internal and external factors affecting and governing the migration of chemical elements, ore deposit dispersion haloes, distribution of heavy metals in soils, and accumulation of heavy metals in plants. The most lengthy discussion is on the application of biogeochemical exploration methods in different areas of the USSR, which is treated in detail with actual examples, tables, and diagrams. The concluding chapters are concerned with practical problems involved in biogeochemical surveys, interpretation of the results, and a critical evaluation of the exploration methods. There is a list of references but no index. The format of the volume is large, approximately 8½ x 11 inches. The type is clear and readable and the general appearance is pleasing.

That the mineral content of the rocks exposed at the surface and prevailing climatic conditions control the chemical content of residual soils and the varieties of vegetation supported by these soils is clearly and generally understood. This requires no documentation. If concealed ore deposits yield chemical elements in sufficient quantities to be detected and recognized by biogeochemical methods, modern prospecting should be revolutionized to a spectacular degree. Despite the intensive interest in these methods, the results do not seem spectacular. In fact, the critical reader may note a curious correlation between the well-defined anomalies which have been detected and recognized and in many cases fully explored ore deposits. Elsewhere, the results generally are equivocal. Are biogeochemical methods useful in prospecting where ordinary physical surface inspection fails? Verification of the approach must await the discovery of substantial ore deposits exclusively with biogeochemical methods.