REVIEWS

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TIME IN STRATIGRAPHY, by Alan B. Shaw. Published by McGraw-Hill Book Company, New York, 1964, xiv + 365 pp., illustrated, $10.50.

This book is a startling reappraisal of paleontology and stratigraphic principles and the use of fossils in stratigraphy. It should be read by every geologist who deals with the correlation of sedimentary rocks. A modern perspective of stratigraphy and its basic principles will be gained by the reader together with new and more refined techniques of time correlation with far greater accuracy than previously possible.

The author first considers the conventional view that all autochthonous and allochthonous marine sediments (not including volcanics) deposited in epeiric seas lie essentially parallel to time planes. He offers evidence to show that these are in fact diachronous. Thus, correlations based simply upon lithologic similarity and continuity are not time correlations and result in erroneous geologic interpretations. He demonstrates that paleogeographic maps based on distribution of lithologies lead to a completely reversed sequence of historical events as interpreted in most studies. The first nine chapters deal with these and other basic elements of stratigraphy and are punctuated with distinct, enumerated, and clearly stated "conclusions." These conclusions are reviewed and synthesized into twelve "principles" in the tenth chapter which concludes the first portion of the book.

In succeeding chapters, Dr. Shaw discusses the relationship of organisms and time, practical geochronologic measure, and methods of correlation by fossils, fossil zones, hemerae, epiboles, index fossils, and range of fossils. The concept of "inadequacy" of the fossil record is discredited convincingly.

In the third section, the author's method of graphic expression of correlation is proposed, considered in relation to disturbances in sedimentary continuity, statistically analysed, and explicitly developed with diagrams and examples. A detailed model study using these graphic techniques is presented in appendices A, B, C, and D. A list of references and an adequate index follow.

In summary, though this book is not an elementary text for stratigraphy, it will be an essential reference for advanced students and research workers in paleontology and stratigraphy.

NATURAL HISTORY, by Richard A. Pimentel. Published by Reinhold Publishing Corporation, New York, 1963, xii + 436 pp., illustrated.

Natural history is the study of a single thing, nature. With this statement, Professor Pimentel begins his book. It is written, as he says, with the firm conviction that field geology, field biology, and ecology can be integrated into a single meaningful study.

Far too few students of biology ever encounter the principles of physical geology or even learn the geologic time scale. In *Natural History,* these fundamentals are put in their proper place as a part of the comprehensible whole of Nature. The universe is described, the Earth is placed in perspective and its layers, seasons, magnetism, and other features are reviewed. The atmosphere, weather and climate, structures and features of the oceans, land forms, glaciation, vulcanism, diastrophism, rock types, and soils are among the geological subjects treated and illustrated with clear diagrams.

Organisms, life processes, classification, nomenclature, and principles of evolution are next considered, followed by conventional systematic exposition of the kingdoms of life and their phyla. The concluding chapters deal with environments, population and community ecology, and ecosystems. A useful glossary and an index are included.

This book represents a creditable effort to present the whole of Natural History. It is well written, well illustrated, and surprisingly comprehensive.

INTRODUCTION TO GEOLOGICAL MICROBIOLOGY, by Sergey Ivanovich Kuznetsov, Mikhail Vladimirovich Ivanov, and Natal'ya Nikolayevna Lyalikova. Translated by Paul T. Broneer, edited by Carl H. Oppenheimer, and published by McGraw-Hill Book Company, New York, 1963, xv + 252 pp., illustrated, $8.95.

Geomicrobiology has been the subject of intensive research in the Soviet Union for many decades. This book, the translation of a pioneer Russian work, reviews the basic principles of microbiology, including the geological environment of microorganisms, distribution, physiology and ecology of bacteria in the lithosphere. This is followed by chapters on the role of microorganisms in the formation, transformation, and destruction of fossil fuel deposits and their effect on economic deposits of sulfur, iron, and related minerals. Short discussions of microbiological prospecting for oil and gas deposits and sulfide ore bodies are included. An extensive list of references and an index are present.

This book summarizes the past work and current efforts of Russian scientists in this area of research. It provides an index to the older Soviet literature and a valuable reference for the economic geologist.

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