

BOOK REVIEWS

RECURSOS MINERALES DE COLOMBIA (in Spanish). Edited by Raúl Angulo. Instituto Nacional de Investigaciones Geológico-Mineras, Bogotá, 1978. xxxii + 544 pages, numerous maps (two in color) and tables. \$12.50.

This massive (3cm thick) paperback is the last word on the mineral resources of Colombia, a country more than twice the size of France that occupies the northwestern corner of South America. The book will replace the late Roberto Wokittel's well-known but now out-dated work of the same title that was published in 1960 by the Servicio Geológico Nacional, Bogotá.

The new text opens with a compact 16-page introduction by the editor. This includes a reduced version (1:12,000,000) in color of the metallogenic map of the country, a four-page summary table of Colombian mineral occurrences, mineral statistics for the country for the period 1970-1977, and a list of terms in which "shows" (*manifestaciones*), "prospects" (*prospectos*), and "deposits" (*yacimiento*s), used throughout the book, are distinguished from one another and defined clearly.

The bulk of the book is taken up by 40 chapters arranged alphabetically from alumina and bauxite through uranium. Most (34) are single-author efforts, written by a total of 27 individuals. The six other chapters have from two to six authors each. Twenty-one chapters are listed by chemical elements (Sb, As, A, Bi, Co, Cu, Cr, Sn, Fe, Mg, Mn, Hg, Mo, Ni, Au and Ag, Pt, Pb and Zn, rare earths, Ti, W, U), whereas the others are listed either by minerals (barite, emeralds, fluorite, etc.) or by mineral commodities (clay, quartz sand, limestone and dolostone, etc.). Hydrocarbons are not treated. Most chapters include considerable background information on such topics as general geological and/or geochemical setting, worldwide production and reserves, world prices, uses, and so on. Each chapter has one or more index maps (approx. 1:7,000,000) to locate occurrences in Colombia. Large-scale maps of specific important deposits are given in places. The chapters average 14 pages, but range individually from four (rare earths) to 32 pages (coal—not surprising as Colombia possesses the largest and best-quality coal reserves known in South America).

In-country bibliography is decidedly up-to-date; many references are from 1978. Background information is in part based on obsolete references, which only emphasizes the general inavailability of modern bibliographic materials in the Third World. Typographical errors are scarce, but as a Canadian resident, I was not pleased to find British Columbia (on p. 195) and Manitoba (on p. 399) placed in the US.

Recursos Minerales de Colombia will probably be of limited use to most mineralogists, but to economic geologists and mining engineers with specific interests in the northern Andes the book is indispensable.

TOMAS FEININGER
Université Laval, Québec

MENSCHEN, MINEN, MINERALIEN, Mineralogie seit 10 Jahrtausenden. By Werner Lieber. Christian Weise Verlag, München, 1978. 221 pages, ca. 100 figures, 4 color plates, glossary of names. Price DM 28.50, approx. \$15.50.

In his "Geleitwort," Paul Ramdohr notes that this is the first historical account of the science of mineralogy since Paul Groth's *Entwicklungsgeschichte der mineralogischen Wissenschaften* of 1926. As such it is a most welcome addition to the mineralogical literature which covers the subject generally. Lieber writes in an interesting, comfortable style yet manages to compress a large amount of valuable information in surprisingly few pages.

As the title suggests, this is a survey of man's past and present knowledge of mineralogy and its applications in technology and the arts from the Stone Age to the present. The first chapter therefore is strictly historical and liberally studded with references to those persons who have made significant contributions, and is followed in the second chapter by descriptions of our present knowledge and in the third chapter by the methods and instrumentation that are in use today. The fourth chapter is devoted to parallel developments in mining from the earliest times to the present and includes sections on practical mining and prospecting. The last text chapter reviews what minerals and elements were known in the past and present, and what they were and are used for now. A valuable appendix conveniently lists 163 persons connected with mineralogy and mining, giving life dates and brief statements of accomplishments from antiquity to the present. References are divided among those treating history, those on syntheses, and lastly those dealing with economic aspects of mineralogy. There are also indexes to minerals and subjects. Illustrations include photographs and line drawings and are notable for so many portraits of eminent persons as well as reproductions from older treatises such as the woodcuts from Agricola's *De Re Metallica*.

While far from exhaustive, Lieber's book is unburdened with the detail and intricate cross-referencing so beloved of historical scholars, who in attempting to be as thorough as possible all too often bury the romance of the subject beneath a mass of trivia. For the student of mineralogy this book would be a valuable adjunct to required technical readings because it factually yet interestingly tells him where his chosen science has been and where it is going.

JOHN SINKANKAS
San Diego, California

TRACE ELEMENT ANALYSIS OF GEOLOGICAL MATERIALS. By R. D. Reeves and R. R. Brooks. Wiley, New York, 1978. 421 pages. \$27.50.

Trace element analysis of geological materials is rather a broad subject, and a book so entitled arouses one's interest as to how such a broad subject is treated in a 421-page book. The authors, realizing this fact, very elegantly narrowed this broad topic to a mere review, or rather, an introduction to the important analytical techniques for trace element analyses. Perhaps for this reason it would be just as appropriate to entitle this book "An Introduction to Trace Element Analysis of Geological Materials." The authors stated succinctly their objective in the preface: "we have attempted to provide an introduction to trace element analysis that will be of use not only to those with formal training in analytical chemistry and geochemistry, but also to those who are being drawn into this field from many other branches of sciences." On the whole the au-

thors succeeded in providing such an introduction. The wealth of information presented in 18 chapters of necessity is for a general rather than specific nature; however, the use of pertinent tables and good referencing throughout the whole text provides the user with a very useful reference. Each chapter begins with a short and concise summary of the chapter's topic or with the theory for a given procedure. The first four chapters deal with the general introduction and in very practical terms with sampling and physical and chemical sample pretreatment. For example, the importance of proper sampling is stressed by citing a vivid example: "the great nickel deposits of Western Australia remained undiscovered for a long time because geologists had previously chosen fine-mesh material for analysis. The nickel is concentrated in the ferruginous soil fragments coarser than 80-mesh size." This is a rather telling story of one of the most frequent problems and one that never seems to be properly observed. In Chapter 5, elemental abundances are discussed including, very appropriately for this book, a table listing numerous geologic reference materials. The following eleven chapters deal with analytical techniques such as gravimetry and titrimetry, solution absorptometry, molecular fluorimetry, emission spectrochemical analysis, atomic absorption spectrophotometry, flame emission and atomic fluorescence spectrometry, X-ray emission spectrometry, radiometric and radioactivation methods, electroanalytical methods, mass spectrometry and spark-source mass spectrography, and physical and chemical field tests for trace elements. Very useful features in most of these chapters are the tables listing elements that are best suited for analysis by a given method and their detection limits. The chapter on the use of data of trace elements in geological materials is very informative, covering geochemical studies and mineral exploration as well as plant, animal, and human health, environmental chemistry, and archaeology. The last chapter presents a very brief treatment of statistics. The material in this book is well organized, summarized in various tables, easy to read, and well referenced, the latter providing the reader with easy access to additional details. The authors ably emphasize important chemical techniques and briefly discuss those that may be of lesser interest. This book is not only a good introduction for students and graduate students, but also presents useful information for practicing chemists and geologists. It would be a welcome addition to the libraries of students, chemists, and geologists interested in trace element analysis.

EUGENE JAROSEWICH
Smithsonian Institution

CARBONATE FACIES IN GEOLOGIC HISTORY. By James Lee Wilson. Springer-Verlag, New York, 1975. xiii + 471 pages. \$19.80 (soft cover), \$38.70 (hard cover).

This book, published in 1975 in hard-cover edition, has now appeared in paperback form. It is a "Springer Study Edition" intended for the student market. This edition is identical with the original in all respects except for a very small reduction in the width of the page margins and a very large reduction in price.

For those who may have missed the original, Wilson's book was written for the advanced student and petroleum geologist to acquaint them with the principles of carbonate geology, in order to better interpret the depositional environments of ancient strata and better define their sequences and patterns. It is an attempt to bring the concepts of petrology and stratigraphy to bear on the ancient limestones and dolomites. The main part of the book is a synthesis of what is known about depositional patterns of ancient carbonates, beginning with the Precambrian. The end result is the formulation of a general model for shallow-water, marine carbonates. Deep-sea and fresh-water carbonates are intentionally omitted as they play a very minor role in the rock record.

The systematic chronologic treatment can be justified on the grounds that the carbonate deposits—so largely the product of organisms—changed with time in response to the evolving biota. This is, to the best of the reviewer's knowledge, the only book that is thus organized.

James Lee Wilson's lifetime interest in the carbonate rocks, particularly their stratigraphic peculiarities and distribution through time, makes him particularly well fitted to the task of such a compilation. However, as Dr. Wilson is content to write only about those deposits of which he has some first-hand acquaintance, he has omitted Tertiary deposits and those of certain geographic areas such as Siberia and Australia. Your reviewer found the book a useful guide to the vast literature on the subject and a handy place to look up what is known about many classic examples of carbonate accumulation—the Gotland reefs, Walsortian mounds, the Dolomites, and many others.

The references—over 400 in all—are collected at the end of the book together with a subject index and some thirty plates containing over sixty photomicrographs. The text itself is illustrated with an abundance of line drawings.

All in all the Study Edition of Wilson's book is a very good buy, particularly for the student and those who are not carbonate specialists. I cannot close without pointing out that carbonate specialists have presumed that the only carbonates are limestones and dolomites and that they universally ignore the bedded iron carbonates—deposits of no mean size and economic value. Wilson is no exception.

F. J. PETTIJOHN
The Johns Hopkins University

LIST OF BOOKS RECEIVED

BAUXITES OF PENINSULAR ITALY: COMPOSITION, ORIGIN AND GEOTECTONIC SIGNIFICANCE. Monograph Series on Mineral Deposits, No. 16. By G. Bardossy, M. Boni, M. Dall'Aglio, B. D'Argenio and G. Panto. Gebrüder Borntraeger, Berlin, West Germany, 1977. viii + 61 pages, 32 figs., 5 tables. Price not given.

THE EARTH'S CHANGING SURFACE. By M. J. Bradshaw, A. F. Abbott and A. P. Gelsthorpe. Halsted Press, Wiley, New York, 1978. 336 pages. \$14.95.

GEOTHERMAL ENERGY: RECENT DEVELOPMENTS. Edited by M. J. Collie. Noyes Data Corporation, Park Ridge, New Jersey, 1978. xiv + 445 pages. \$36.00.

CONCEPTS OF URANIUM RESOURCES. National Academy of Sciences, Washington, D.C., 1978. ix + 210 pages. \$7.25.

PALEOGRAPHIC PRINCIPLES OF OIL AND GAS PROSPECTING. By N. I. Markovskii, translated by R. Teteruk-Schneider. Halsted Press, Wiley, New York, 1978. vii + 256 pages. Price not given.

COAL AGE OPERATING HANDBOOK OF COAL PREPARATION. Edited by Paul C. Merritt. McGraw-Hill, Inc., New York, 1978. vi + 311 pages. \$19.50.

THE ANTIMONY DEPOSITS IN THE MURCHISON RANGE OF THE NORTHEASTERN TRANSVAAL, REPUBLIC OF SOUTH AFRICA. By Rolf Muff. Gebrüder Borntraeger, Berlin, West Germany, 1978. vii + 90 pages, 12 figs., 9 tables. Price not given.

AN INTRODUCTION TO CRYSTALLOGRAPHY, 4th edition. By F. C. Phillips. Halsted Press, Wiley, New York, 1979. Paperback, replaces 1971 cloth edition. 351 pages. \$15.95.

E/MJ OPERATING HANDBOOK OF MINERAL UNDERGROUND MINING. Edited by Robert Sisselman. McGraw-Hill, Inc., New York, 1979. vi + 448 pages. \$19.50.

INORGANIC CHEMICAL INDUSTRY PROCESSES, TOXIC EFFLUENTS AND POLLUTION CONTROL. By Marshall Sit-

tig. Noyes Data Corporation, Park Ridge, New Jersey, 1978. x + 351 pages. \$42.00.

GEOLOGICAL EVOLUTION OF NORTH AMERICA. By Colin W. Stearn, Robert L. Carroll and Thomas H. Clark. Wiley, New York, 1979. x + 566 pages. \$16.95.

FORMATION AND PROPERTIES OF CLAY-POLYMER COMPLEXES. Developments in Soil Science. Vol. 9. By B. K. G. Theng. Elsevier, New York, 1979. xi + 362 pages. \$64.50.

TRACE CONTAMINANTS FROM COAL. Pollution Technology Review No. 50. Edited by S. Torrey. Noyes Data Corporation, Park Ridge, New Jersey, 1978. x + 294 pages. \$39.00.

CATHODOLUMINESCENCE OF QUARTZ. Contributions to Sedimentology No. 8. By Ulf Zinkernagel. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, West Germany, 1978. iv + 69 pages, 14 figs., 5 tables. DM 54.

NOTICES

Symposium on Rock Mechanics

The 21st U.S. Symposium on Rock Mechanics will be held at The University of Missouri-Rolla, May 27-30, 1980. For further information, contact

David A. Summers
University of Missouri-Rolla
Rock Mechanics and Explosives Research Center
Rolla, MO 65401
314-341-4365

NBS issues new SRM catalog

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AGI Minority Scholarships

The American Geological Institute will again offer scholarships for geoscience majors who are United States citizens and members of the following ethnic minority groups: Black, Hispanic, or Native American. Geoscience majors currently enrolled in accredited institutions as either undergraduate or graduate students are eligible. The term "geoscience" is used broadly to include major study in the fields of geology, geochemistry, geophysics, hydrology, meteorology, oceanography, and space and planetary sciences. Deadline for applications in February 1, 1980; address requests for application materials to:

William H. Matthews III, Director of Education
American Geological Institute, Box 10031
Lamar University Station
Beaumont, Texas 77710