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BOOK REVIEWS

AN INTRODUCTION TO THE PRACTICAL STUDY OF CRYSTALS, MINERALS, AND ROCKS. By K. G. Cox, N. B. Price, and B. Harte. Halsted Press, John Wiley and Sons, New York, 1973. vii + 245 pages. $10.75, paper. Revised edition.

The Practical Study of Crystals, Minerals, and Rocks is a paperback consisting of ten chapters that fall into three broad groups: morphological crystallography, systematic and descriptive mineralogy, and descriptive igneous, sedimentary, and metamorphic petrology or lithology. Miller indices, stereographic projections, stereograms, the determination of symmetry and axial ratios are well presented in the early chapters. Typical crystal forms of the seven crystal systems are illustrated. Approximately 90 common minerals are described in terms of their physical properties, distinguishing features, and mode of occurrence. A useful chapter titled, "Minerals in Thin section" presents enough optical theory for the beginning descriptive petrographer but does not include discussion of interference figures and compensating plates. Included is an interference color chart simplified to present only the common minerals listed in the text. Good photomicrographs illustrate the feldspars, hornblende, augite, olivine, leucite, garnet, chiastolite, kyanite, staurolite, and biotite.

The final three chapters deal with igneous, sedimentary, and metamorphic rocks. Each chapter presents a discussion of mineralogy, mode of formation, classification systems and tables, and representative chemical analyses. The presentation of textural and structural terms is good and is well illustrated by photomicrographs. Students should find useful the suggested patterns to be followed in describing a rock using both microscopic and megascopic observation.

The authors assume that the user will be receiving more theoretical material in lectures and will have access to laboratory materials. They suggest that the book will serve as a companion or supplementary text—this reviewer agrees. It is suggested that the book will serve as an excellent supplementary text in an introductory mineralogy-petrology sequence especially for instructors who stress morphological crystallography or who introduce petrographic techniques in petrography.

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METAMORPHIC AND PLATE TECTONIC REGIMES. Edited by W. G. Ernst. Benchmark Papers in Geology, Dowden, Hutchinson & Ross, 1975. Distributed by Halsted Press, New York. 448 pages. $27.00.

Metamorphic and Plate Tectonic Regimes is a compilation of classic papers in the series "Benchmark Papers in Geology." Most of the papers chosen for this volume are in the field of metamorphic petrology; a few treat relevant plate tectonic environments. A companion Benchmark collection will be entitled *Subduction Zone Metamorphism* and will deal with specific blueschist terranes.

Metamorphic and Plate Tectonic Regimes is divided into five parts: I. Metamorphic belts in space and time, II. Thermal regimes near lithostatic plate margins, III. Metamorphism related to plate tectonic environments, IV. Petrologic problems (subdivided into eclogites, ophiolite suite, and blueschists), and V. Evolution of metamorphic facies types with time. The editor has provided a brief introduction to the collection as a whole and one or two pages of comment preceding each group of papers.

Miyashiro's and Zwart's papers on the dual nature of metamorphic belts constitute Part I. These papers introduce the concepts of metamorphic facies series, concurrent paired belts, and the different observed characteristics of high-pressure and low-temperature, and low-pressure and high-temperature, regimes. Part II consists of Oxburgh and Turcott's 1968 and 1970 papers describing, respectively, the thermal regimes at a mid-ocean ridge (accreting plate boundary) and an island arc (consumptive plate boundary); these establish an environmental framework for two of the most active metamorphic regions. Part III deals with observed metamorphism near the Mid-Atlantic ridge described by Miyashiro and others and observed blueschist metamorphism described by Coleman.

The eclogite, ophiolite, and blueschist sections of Part IV document natural assemblages and associations and a few experimental assemblages. The papers range from the rather specific problems of the temperature-pressure-water fugacity conditions at which eclogites are stable, through the possible stratigraphic relations of the ophiolite suite, and into the chemical and tectonic environments suitable for blueschist formation. Part V concludes the volume with papers by de Roever and Ernst who use the occurrence and evolution of blueschist belts as evidence for changes in the earth's geothermal gradient through time.

The most common application of this volume will probably be as a text for a graduate course or seminar. Such a volume comprises a critically selected group of papers that the student can take home for careful reading and keep for reference. Ernst has chosen papers that are broad in scope and contain a significant amount of metamorphic petrology. There is perhaps too much emphasis on blueschists, especially since the companion volume will treat that subject exclusively. The selection on the whole is appropriate; I can think of no major papers that have been overlooked. Ernst's introductory and connecting comments are excellent and will help a student to formulate a perspective on a field that is still not well integrated. Too close adherence to this kind of text, however, would limit the flexibility of a graduate course. Most teachers will probably welcome it as core material to be modified and supplemented with assignments from the current literature.

A glaring omission from this volume, through no fault of the editor's, is the regional synthesis of observed metamorphism and tectonism in the broad relatively low-pressure and high-temperature orogenic belts of Miyashiro and Zwart. A large-scale synthesis of this kind does not exist, although the data on the Appalachian and Caledonian belts, for example, are available in bits and pieces. One hopes that the geologists working in such regions will lower their territorial fences, get together, and produce syntheses.

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1975 GLOSSARY OF MINERAL SPECIES. By Michael Fleischer. Published by Mineralogical Record, Inc. Box 783, Bowie, Maryland 20715, 1975. iv + 145 pages. $4.00. Postage free with prepaid orders to: Glossary of Mineral Species P.O. Box 10404, Alexandria, Virginia 22310.

Michael Fleischer's *Glossary of Mineral Species* is the answer to the perennial problem of keeping up with mineral nomenclature. The present revision updates the 1971 edition to January 1, 1975, and incorporates substantial improvements. The *Glossary* is an alphabetical listing of *valid* mineral species which includes the chemical formula and crystal system for each entry. When diagnostic, the color is given. Chemical and structural relations to other species are also indicated. References to articles or abstracts in *The American Mineralogist* are cited for many species which significantly increases the *Glossary*'s usefulness to mineralogists. A typical entry reads:

Buergerite $NaFe^{+3}_3Al_6Si_6B_3O_{30}F$, trig., **Tourmaline** group, *51*, 198–199 (1966)

An appendix listing some two hundred species by mineral (structure) group is an additional feature. The spiral binding is a real convenience for it allows the open book to lie flat.

This is the most current and authoritative reference on mineral nomenclature available. Inexpensive and useful, every mineralogist should have it close at hand.

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SEDIMENTS AND SEDIMENTARY ROCKS 1. By Hans Füchtbauer, Part II of *Sedimentary Petrology* by W. v. Engelhardt, H. Füchtbauer, G. Müller. 2nd rev. ed. E. Schweizerbart'sche Verlagsbuchlandlung, 1974. Distributed by Halsted Press. x + 464 pages, 199 figures, 39 tables. $49.50.

Sediments and Sedimentary Rocks 1 is the second volume of a three-volume series by W. v. Engelhardt, H. W. Füchtbauer, and G. Müller, planned to summarize the entire field of sedimentary petrology, with emphasis on sedimentary processes and mineralogical composition of sedimentary rocks. The first volume, authored alone by Müller, was concerned with methods and techniques of sedimentary petrography. Its German version was published in 1964 and its English translation in 1967. The second volume, co-authored by Füchtbauer and Müller, appeared in the German language in 1970. This second volume, in English, has now been split into two parts. The first part, by Füchtbauer alone, is the volume under review and deals with sandstones, conglomerates, pyroclastic rocks, carbonates, and cyclic sedimentation. Part 2, by Müller alone, concerned with fine-grained terrigenous rocks and authigenic sediments, such as evaporites, phosphates, siliceous sediments, coals, and sedimentary ores, will be published later. The third volume, on the origin of sediments and sedimentary rocks by v. Engelhardt, is now being translated into English.

This book is divided into six chapters, all of which have been written by Füchtbauer, except for one chapter (pyroclastic rocks), authored by H.-U. Schmincke. The first two chapters (Chapter 1, *Exogenous Cycle,* and Chapter 2, *Principles of Nomenclature*) are very brief. They set the stage for what is to follow in subsequent chapters. The third chapter (*Sandstones, Conglomerates, and Breccias*) is an extensive treatment of terrigenous sedimentary rocks and includes discussions of (1) the kinds of particles that compose these rocks, (2) textures and fabrics, (3) geometry of sandstone bodies, (4) facies and depositional environments, (5) sedimentary tectonics, and (6) diagenetic processes, products, and sequences. Chapter 4 (*Pyroclastic Rocks*), a topic which most textbooks in sedimentary petrography de-emphasize, presents classification and processes under (1) subaerial and (2) subaqueous environmental conditions, and a section on alteration of volcanic glass. Chapter 5 (*Carbonate Rocks*) presents a very extensive treatment of (1) particles composing limestones, especially those of skeletal origin, (2) the classification of limestones, (3) diagenesis, including cementation, neomorphism, dolomitization, and silicification, (4) pores, and (5) environmental indicators. Finally, Chapter 6 (*Cyclic Sedimentation*), a brief chapter, discusses vertical sequences.

This book has been written for the graduate student in geology and for research workers and geologists in industry. From personal experience I know that the German version made a great impact on students of geology and on professional geologists in German-speaking countries. The English translation incorporates many new concepts developed since the first appearance of the German edition in 1970.

This comprehensive and competently written and researched book is scholarly, well organized, and well documented; the subject is logically presented. The reference section in the book covers seventy printed pages; research workers in sedimentology and sedimentary petrography will cherish this volume as a source of information and documentation. Excellent photomicrographs are an attractive feature of this book; I wish, however, that the author had attached graphic scales to each photomicrograph.

Although a translation from the German, the style of the book is fluent, and the treatment of the subject matter is easy to follow. This book is a well presented, timely, and uptodate summary. I enjoyed the privilege of reviewing this book.

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SOIL COMPONENTS. Volume 2, INORGANIC COMPONENTS. Edited by John E. Gieseking. Springer-Verlag, New York, 1975. x + 684 pages. $74.80.

Individual chapters treat: The classification of soil silicates and oxides; macroscopic micas; fine grained micas in soils; smectites; the kaolin group; vermiculites; chlorites; interstratified clay minerals; allophane; oxides and hydrous oxides of silicon; feldspars; heavy minerals; bioliths; water in soils; thermal characteristics of soil minerals; and the use of infrared spectrography to characterize soil minerals. Each chapter is well written at a scholarly level by recognized experts. The book should fulfill its intended purpose as a reference text for those soil chemists, agronomists, mineralogists, geologists, and ceramists interested in inorganic soil components. Some chapters demand in places a rather firm grasp of crystallography for full understanding, but, unless its price deters, the book certainly belongs in the libraries of its intended audience. The styling and production are attractive, and relatively few typographical errors occur.

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CARBONACEOUS METEORITES. By Bartholomew Nagy. Elsevier Scientific Publishing Company, New York, 1975. 747 pages, 110 figures. $80.95.

Carbonaceous meteorites are among the most intriguing rock specimens known to science. We live in a predominantly inorganic universe where the moon, most meteorites, and the great bulk of the earth itself, except for a thin surface layer, lack water and organic matter. Nevertheless, 36 meteorites have plunged through our atmosphere bearing carbonaceous compounds from elsewhere in the solar system. Are these compounds (which include hydrocarbons, amino and fatty acids, purine and pyrimidine bases, and porphyrins) of biologic origin? That momentous question has excited the curiosity of scientists since the fall of a carbonaceous meteorite at Alais, France, in 1806. In this book, Bartholomew Nagy, an organic geochemist whose own investigations into the subject aroused a spirited controversy in the early 1960s, has reviewed the pertinent research of the past 170 years.

Nagy's stated purpose was to write a comprehensive and unbiased summary, documenting available data which have formerly been scattered through a great variety of journals. Working within his own guidelines, Nagy has accomplished his task very well indeed. He specifically avoided making a critical evaluation of his sources. The overall effect of Nagy's historical approach, however, is to place each line of research in the context of its time and to show how newer findings have confirmed or invalidated earlier ones.

This book is a minilibrary of information, liberally illustrated with figures some of which are not readily available elsewhere. Each chapter is supplemented by a helpful glossary of technical terms (including structural formulas of organic compounds) and a complete list of references. The opening chapter is a general review of meteorites, their mineralogy, chemistry, ages, orbits, impact phenomena, and possible modes of origin. The remaining four long chapters focus on the so-called carbonaceous chondrites in which carbon occurs in organic compounds. Nagy touches only very briefly on elemental carbon in meteorites, thus a reader will search in vain for a detailed discussion of graphite, cliftonite, diamonds, or lonsdaleite.

In a work of this scope, minor errors and problems in terminology are certain to occur. For example, Nagy's resurrection of the 3-word name "Pueblito de Allende" for the extensively studied Allende carbonaceous chondrite will surely be deplored for years to come by reference librarians and museum curators. On balance, however, Nagy's compendium will prove valuable to a wide variety of investigators including many students and scientists in other disciplines as well as to meteoriticists and organic chemists. The book's main disadvantage is the publisher's outrageous price, which will effectively limit sales to science libraries.

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STRUCTURE-PROPERTY RELATIONS. By Robert E. Newnham. Vol. 2 in the series Crystal Chemistry of Non-Metallic Materials, Springer-Verlag, New York, 1975. ix + 234 pages. $31.00

Structure-Property Relations is the second volume to appear in the projected series of four, after vol. 4, *The Major Ternary Structural Families*, by O. Muller and R. Roy (see *Am. Mineral.* **60**, 490). The two volumes unexpectedly have a wholly different character. The latter is a comprehensive source book of structural data elegantly organized and interrelated, with some 1400 literature references—a valuable reference work. The present slim volume, on the other hand, is a guided tour of crystal physics and materials science, in which the author stops for a glimpse of nearly every phenomenon and property of crystalline materials, but never closely examines any in detail. The literary style is very readable and friendly, on the whole narrative and reportorial. As in a travelog, a brief description of each scene (e.g. thermal expansion, photographic process, ferroelectricity) is provided in one or two pages, giving some idea of how atoms work to produce the effects observed, and some tantalizing suggestions as to how the phenomena mentioned are put to use in industry and everyday life. The book is entirely descriptive, with no data compilations, no mathematics, no development of theory, no analysis of experimental systems.

Unlike the previous volume, therefore, it is not a reference or source book, but rather an elementary survey almost at the lay level. There is perhaps a place for such a work in the library, but if this book is intended for scientists it should at least have provided extensive keys to the literature of this vast subject, especially to other treatises and review articles. Unfortunately, the 20 or 30 references cited at the end of each of the 7 chapters refer mostly to reports on specific examples of studies mentioned in the text, with few guides to the more general literature or comprehensive reviews that would provide the reader with the source material he may well be looking for.

The author is certainly qualified to undertake the more comprehensive technical review that we might have hoped for; at the price it is a pity that he set his sights so low. The book does have a certain charm, however, which is illuminated by the author's preface, and it is clear that he thoroughly enjoys his work. Perhaps we would do well to emulate such a happy man, and not take our science so deadly seriously as most of us do.

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CRYSTAL STRUCTURE DATA OF INORGANIC COMPOUNDS. By Wolfgang Pies and Alarich Weiss. Volume 7, Part b: KEY ELEMENTS O, S, Se, Te. b 1: Substance Numbers b 1 . . . b 1817. Group III: Crystal and Solid State Physics, of Landolt-Bornstein: Numerical Data and Functional Relationships in Science and Technology. Edited by K.-H. Hellwege. Springer-Verlag, Berlin, 1975. xxiii + 674 pages, 23 figures. $229.60.

See review of volume III/7, parts a and g (*Am. Mineral.* **59**, 1142). Part b extends this coverage to oxides and hydroxides and illustrates several systems with phase diagrams. The organization, titles, and costs for these volumes seem formidable.

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CRYSTALLINE BASEMENT OF THE ANTARCTIC PLATFORM. By M. G. Ravich and E. N. Kamenev (Trans. by N. Kaner, trans. ed. by R. Bogoch). Halsted Press (John Wiley & Sons, Inc. distributor), New York, 1975. x + 582 pages, 68 figures, 126 tables, 2 plates. $68.00.

This monograph summarizes 12 years of study by Soviet geologists of the crystalline basement of Antarctica exposed 100-km

wide and over 8,000 km along the coast of the East Antarctic platform from 12° west longitude to 145° east longitude. Exposures consist of coastal areas and "oases," isolated nunatuks, and massifs and ranges. The best exposures are in Enderby Land, a stable crystalline area, and Queen Maud Land to the west, a mobile belt. The geology consists of granulite- and amphibolite-grade metamorphic rocks intruded by large numbers of gabbro-anorthosite and charnockite bodies. The strength of the volume lies in detailed, high-quality petrographic descriptions of those rocks, and includes extensive data on charnockites (hypersthene granites) and the provocative enderbites (hypersthene tonalites) from Enderby Land. The seven chapters detail the petrography of this region by metamorphic grade. A reasonably concise summary by Kamenev of the regional relations is in the first chapter. However, a few simple, schematic diagrams, maps, and stratigraphic sections would have helped immeasurably. The 68 figures consist basically of good photomicrographs showing the textures reasonably well.

In detail, the crystalline basement is more complex than a large, uniform craton, but rather a polystructural and polymetamorphic region that encompasses early Precambrian rock, possibly as old as 3.8 b.y., to late Precambrian rocks.

The predominant rock type, irrespective of the structural setting, accounting for 60-65 percent of exposures is the high-grade basic volcanic rock and associated magnesian schists with interlayered felsic intrusive rocks. Pelitic rocks account for 25 percent, and carbonate rocks, 10 percent. The granulite-facies varieties consist of hypersthene-bearing basic rock with perthitic charnockites and enderbites.

The general thesis for the origin of the felsic varieties of rock is metasomatic alteration, including the addition and subtraction of various constituents. The "shadow granites," or classical migmatites are by far the most wide-spread rocks. Enderbites appear to be granulite-facies trondhjemites. Trondhjemites elsewhere have been ascribed to primary magmatic events based upon trace elements and rare earth studies. A study of rare earth distributions in these units, would clarify their origin.

Mineral resources consist of a wide-spectrum of rare and trace elements (such as pegmatitic deposits of beryl), and possible economic concentrations of various micas. Iron formation, including jaspilites and metasomatic ores, are fairly wide spread. These incidental finds suggest that the Antarctica platform is promising, and is quite similar to basement rocks in other southern hemisphere continents.

In the final chapter, Ravich outlines future programs that well describe geologic goals for the entire continent. He emphasizes that detailed geologic mapping of accessible exposed areas must be continued. This must be coupled with stratigraphic and structural assessments, and radioactive dating techniques. Metamorphic studies must also continue. The goal, of course, is to permit comparisons of the Antarctic platform with other southern hemisphere continents.

With over 95 percent ice cover, geophysical studies are imperative to define and extend relations. Therefore, small-scale areal gravity and magnetic surveys, along with comprehensive programs in seismology are as necessary in Antarctica as geologic mapping is elsewhere.

The 126 tables of major element data for whole rocks and minerals are a useful adjunct to the petrography. The whole-rock data are not incompatible with the modal data. However, the mineralogical analyses should be viewed with caution. For instance, spectroscopic analyses of olivine in Table 111 (p. 447) sum to 88.1 and 90.0 percent, and include 2.5 and 1.4 percent Al_2O_3 and 0.8 and 0.6 percent Na_2O.

My English version, a cover-to-cover, almost literal translation of the Russian original is priced at $68.00. After reading the book, I would purchase it; however, the monograph is a necessity only for petrologists working on Antarctic problems and does not provide data or answers for larger scale petrologic problems.

For the general petrologist, concise summaries of the geology and petrology can be found in papers by the same authors in Adie's (1972) tome: *Antarctic Geology and Geophysics (Oslo Conference)*. Many of the chemical data are found both in this volume and in the Adie volume.

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FLUID INCLUSION RESEARCH. PROCEEDINGS OF COFFI. Volume 5, 1972. Edited by Edwin Roedder. Privately published at Reston, Virginia (Stop 959, U.S. Geological Survey, Zip 22092). 148 pages. $3.00.

A series of abstracts, annotated bibliographic notes, or in a few cases English translations of "papers published during the volume year that either contain inclusion data or are pertinent to inclusion workers. . . . The Editor has revised some authors' abstracts rather extensively, particularly those from foreign language journals, in order to clarify the language." A useful subject and author index is provided.

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METALLIZATION ASSOCIATED WITH ACID MAGMATISM. Symposium, International Geological Correlation Programme, Vol. 1. Edited by M. Štemprok. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 1974. 411 pages, 39 figures, 26 tables. DM 35.

This volume represents a collection of short contributions dealing with tin, tungsten, molybdenum, beryllium, niobium, and tantalum deposits and their relationship to acid magmatism. The papers, selected by members of a working group of the International Geological Correlation Programme, are grouped into seven chapters: (1) distribution of metallogenic units—12 papers, mostly dealing with tin and molybdenum mineralization in various continents; (2) temporal and spatial relations between the formation of acid magmatic rocks and deposits—12 papers, mostly relating tin and tungsten mineralization to granites; (3) geochemical and petrographical characteristics of acid magmatic rocks associated with the respective mineralizations—16 papers dealing with granites and associated metal deposits; (4) physico-chemical aspects of migration and precipitation of the respective elements—8 papers discussing the conditions of magmatism and ore genesis and 3 papers on phase equilibria; (5) tin and tungsten in skarns—3 papers on tin skarns and 1 on tungsten; (6) sources of the elements—10 papers on the sources and the concentration of elements in acid magmas; (7) other subjects—8 papers on analytical standards and specific deposits.

The papers vary considerably in their contribution to the theme of the volume, but are for the most part frustratingly like a mass of long abstracts in that they contain relatively little data, have short

discussions, are very general, and frequently lack references. Unfortunately the printing quality is poor and some figures (there are no photographs) are partly illegible. Nevertheless, the volume does include some useful and informative papers and serves as a small compendium of who is doing what in research on metallization associated with acid magmatism. All-in-all this is a good book to have available in a library but one which would probably see little use on one's own bookshelf.

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THE COLLECTOR'S GUIDE TO ROCKS AND MINERALS.

By James R. Tindall and Roger Thornhill. Van Nostrand Reinhold Company, New York, 1975. 256 pages. $17.95.

Written on the level of a watered-down introductory geology text, this book offers the amateur a slightly challenging overview of geology and general instruction on collecting. The book is divided into sections which deal with the earth, minerals, rocks, and collecting, respectively. The first section briefly treats the gross structure of the earth, stratigraphy, fossils, and the historical geology of Britain. The discussion of minerals begins with elementary atomic theory but moves to more subtle notions such as symmetry, solid solution, and the classification of silicates according to their tetrahedral linkages. In the third section rock-forming processes as well as description and classification of rocks are covered. The final section contains some common sense about field collecting. The backmatter includes excellent mineral tables reproduced from *The Collector's Encyclopedia of Rocks and Minerals,* a bibliography, a glossary, and an index.

With two hundred fifty color photographs and some thirty diagrams, the illustrative material was intended to be an integral part of the book (and to justify its cost?). Although some photographs, notably those of land forms, are lovely, those of hand specimens, which constitute more than half the total, are by and large featureless. Many were poorly selected (*e.g.,* microcline to exhibit triclinic crystal morphology) and others are inaccurately or inadequately described. To compound the problem, many plates are blurred, off-color, or washed-out.

The text too has serious difficulties. Statements such as "The dominant mineral [in limestones] is normally calcium carbonate, which exists in two crystal forms, calcite and aragonite (p. 71)" completely misconstrue such fundamental concepts as mineral specie and crystal form. They also belie the authors' care and competence in the preparation of this book.

To this reviewer's knowledge, no book satisfactorily combines a broad overview of geology with a useful treatment of collecting. The interested amateur is referred to any of the better introductory geology texts for geological background and to *Prospecting for Gemstones and Minerals* by John Sinkankas for genuine insight into collecting.

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THE WAY THE EARTH WORKS: AN INTRODUCTION TO THE NEW GLOBAL GEOLOGY AND ITS REVOLUTIONARY DEVELOPMENT.

By Peter J. Wyllie. John Wiley and Sons, New York, 1976. 296 pages. $12.95 hardback, $7.95 paperback.

This is a textbook designed as an unconventional introduction to geology for nonscience majors in a liberal arts degree program. The central theme is plate tectonics as a unifying and revolutionary theory. As the author comments in the preface "After the global framework . . . a teacher can follow with almost anything: minerals and rocks, geomorphology, historical geology, oceans, atmospheres, planetary sciences, or environmental geology and natural resources." Certainly the book provides a thoroughly up-to-date account of the revolution in geological thought since the revival of continental drift as a respectable theory about twenty years ago. The topics covered include seismology and the nature of the Earth's interior, the geological cycle, magnetic anomalies and sea-floor spreading, paleomagnetism, the Deep-Sea Drilling Project, diversity and extinction of species, and even a chapter on the exploration of the Moon. The book is clearly written and well illustrated, and includes such provocative sections as one titled "The Vine-Matthews hypothesis and how L. W. Morley was screwed by the Establishment." Although written as a textbook, this book can be read with enjoyment and profit by anyone wishing to obtain a balanced view of the present state of global geology.

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