BOOK REVIEWS

SILICATE SCIENCE, Volume II—GLASSES, ENAMELS, SLAGS, by WILHELM EITEL. Academic Press, New York—London, 1965, xxi+707 pages, $6\frac{1}{4}\times9\frac{1}{2}$ inches. Price $26.00, by subscription $23.00.

The first volume of this series appeared in 1964 and was reviewed in these pages recently (*Am. Mineral.* **50,** 524). The appearance of the second volume after about four months indicates that the series is to be completed quickly. All of the general remarks made in the review of the first volume apply equally to this one.

The second volume is divided into three sections corresponding to the subtitles. The more extended designations of these sections are: Section A. Properties and Constitution of Silicate Glasses (347 pages), Section B. Industrial Glass and Enamels (224 pages) and Section C. Industrial Slags (74 pages).

The interest for mineralogists is partly indicated by the fact that the mineral index contains entries for 226 minerals and rocks, with many references for some. However, it turns out that some of the "mineral names" are names that have been used to designate artificial phases found in slags. Material of mineralogical or geological interest is scattered throughout the book. So, for instance, section A contains 9 pages devoted to the "Importance of viscosity in natural silicate melts" and 68 pages devoted to the "Theory of the structure of liquids and glasses" and to "Experimental results of structure investigations of silica and silicate glasses," section B includes an extended discussion of work on devitrification, and several of the phases and systems dealt with in section C are of mineralogical importance.

Judging from the general titles and subtitles this is one of the more technologically oriented volumes of the series and it may be expected that forthcoming volumes will be of even greater interest to mineralogists and geologists.

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CRYSTAL STRUCTURES, by RALPH W. L. WYCKOFF. Vol. 1, Second Ed., Interscience Publishers, New York, London, Sydney, 1963, 467 pp., $17.50.

Crystal Structures is, of course, an old friend to those even remotely associated with structural crystallography. It is a standard reference as a compilation of data on known crystal structures of both organic and inorganic compounds. The previous edition was in the form of five bulky loose leaf volumes which permitted the addition of page supplements as additional structural data became available. The new edition is in a much more convenient hard-bound style. The plan is to issue about one volume per year, each volume equivalent in coverage to the old loose leaf volumes.

Those familiar with this reference work will surely be most pleased with the new edition. The usefulness of the first edition was severely limited by the indexing system required by its style. Many an occasional user was frustrated by the apparent complexity in retrieving information. The format is essentially unchanged, but seemingly much simplified. This volume (which deals with the elements, and compounds of formula type RX and RX_2, as before) contains both name and formula indexes which permit easy reference to both the text description and to a bibliography table included for each chapter. As in the previous edition, a bibliography by year and author is included for each chapter. Diagrams of structures, of the easily visualized packing type, are now included with the text descriptions, as are all tables with data on related structures. A principal change for this edition is in the omission of data concerned only with lattice parameter definitions.

The inclusion of all pertinent data in sections without supplements, which permits the

organization of all data on a single compound in a single place, makes this new edition very easy to use and its utility is correspondingly increased. Most crystallographers should be very pleased to replace their older volumes with this new edition.

DONALD R. PEACOR
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STRUCTURAL GEOLOGY, Second Edition by L. U. DESITTER, McGraw-Hill Book Company, 1964, pp. xii+551, 310 figures, 16 tables, $12.75.

In its second edition, *Structural Geology* has been extensively reorganized and updated to make it a continuingly useful text and reference for graduate courses in structural geology. Basic format of the book remains unchanged; it is still subdivided into three parts: part one, Theoretical Structural Geology; part two, Comparative Structural Geology; and part three, Geotectonics.

Part one (7 chapters and 88 pages) has been shortened by 24 pages. This mainly reflects the shift of discussion on subjects such as boudinage, cleavage, ptygmatic structures, and schistosity to more appropriate places in part two. In general the context of the discussion on theory remains unchanged; a few sections are expanded to include more recent data—fossil deformation (Breddin) and experimental studies in rock deformation (Griggs and Handin, Heard) are examples. The revision failed to clarify the author's understanding of how the fields of deformation relate to observed structures (foliation, cleavage, etc.).

Part two (17 chapters and 242 pages) covers the wide range of structural features observed in the field, with discussions of their origins. Generally it is a well-balanced discourse of natural occurrences (hand sample to regional scale), results of experimental studies, and theoretical considerations. Especially informative are the several chapters on folding and fold types: examples are principles of folding, cleavage and shear folding, cross-folding of the paratectonic type, and disharmonic folds. Vertical tectonics receives an inadequate treatment in the chapter unfortunately named "Upthrusts and Downfaulting." Parts of the chapter entitled "Diapiric and Collapse Structures, Domes, and Cauldrons" need improvement. Graben structures produced by salt dome uplift are misleadingly referred to as collapse structures; localized disturbances which are currently under intensive investigation are dismissed as cryptovolcanic (Bucher, 1933) with no mention of a possible meteoritic impact origin. other possible origins.

Part three (12 chapters and 172 pages) is a discussion of structures on a world-wide scale and delves into the nature and possible causes of orogeny. Although informative and useful as an introduction to many subjects, the treatment of some is incomplete. Sixteen pages are devoted to the chapter on "Island Arcs and Deep-sea Troughs"; in contrast continental drift is limited to two pages, earth expansion to one page, and convection currents to three pages, restricted to Griggs' work. The chapters entitled "Relation in Time and Space of Orogenies" and "Basin Structures" are particularly shallow. But the author's intent is to present a broad view of tectonics and this has been admirably achieved. One marked exception is the failure to mention aerial photograph investigations of geologic structures, either in relation to studies of jointing or of lineaments and large-scale fractures.

A considerably expanded reference list (579 entries) affords a convenient start for literature investigation on many subjects discussed or referred to in the book. Generally the list is representative; omissions include Carey's discussions of the orocline and rheid concepts, the work of Dietz and others on meteoritic impact structures, recent work in the Apennine gravity structures (Maxwell; Merla; Trevisan; Page), investigations by Mackin and others in Basin and Range structures, and Moody and Hill's work in wrench-fault tectonics.

Perhaps the most refreshing aspect of the book is the new and varied type face which enhances readability. Printing of the illustrations with sharper contrast is another distinct

improvement. Typographic errors are few, although "Martic" is (still) misspelled, both in the text and in the reference citation.

The revision is in general a creditable one and certainly needed for a text concerned with fields of much current research and rapid development of ideas.

ROBERT E. BOYER
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MINERALOGY FOR AMATEURS, by JOHN SINKANKAS. D. Van Nostrand Co., Princeton, 1964, 585 pp., $12.50.

This work is meant to be a bridge between those available for the beginning amateur mineral collector and the professional mineralogist. In this it succeeds admirably. It is really a very elementary text book, modeled somewhat along the lines of elementary college-level text books. For example, chapter headings include Atoms and Minerals, Classification of Minerals, Crystal Growth, Geometry of Crystals, Physical Properties, Specific Gravity, Optical Properties, The Formation and Association of Minerals, Identification Procedures and Tests, and there is a lengthy section describing the properties, etc., of the most common species.

The overall impression of the book is that it is a first-rate introductory text for amateurs. Explanations require no other background for understanding, yet they are clear and concise. Much of the material comes up to the level found in some "advanced" texts, yet retains simplicity with the emphasis always on the points of interest to collectors. Even the physical form of the text is attractive. Figures are well drawn and clearly labeled and the general format makes for easy reading. There are some minor miscues here and there (such as the use of brackets around form indices), and the short identification tables appear to have little, if any, value. These are of little importance relative to the fine overall job that has been done in presenting technical mineralogy in an interesting and understandable form.

This book should be highly recommended to amateurs, and particularly to those younger inquiring collectors who would find this the attraction leading to professional mineralogy.

DONALD R. PEACOR
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A RANGE GUIDE TO MINES AND MINERALS, by JAY ELLIS RANSOM. Harper and Row, New York, Evanston and London, 1964, 305+xi pp., $5.95.

This work is designed strictly for the non-professional. The author has intended it for both the mineral collector and amateur prospector and it seems evident that the ideas of collecting minerals simply for their specimen value and for their commercial value are closely related in the author's view, simply through the enjoyment in getting out onto outcrop with pick and hammer. For example, there are short chapters entitled "Your Mineral Collection" and "The Making of a Small Mine." The bulk of the book (202 pages) is taken up with a listing of the more important mineralized areas and mines, by state. Minerals are listed from both commercial and collection specimen localities.

It is difficult to imagine this book as being of value even to a beginning amateur. The short introduction to general geology and mineralogy suffers from the usual faults of such descriptions in most books for non-professionals. An understanding of the material is difficult to obtain, at best, and such a treatment may even be misleading. The lists of minerals by locality, in particular, have little value except perhaps for the most obvious neophyte. There are compilations, necessarily incomplete, and misleading without supplementary information which, fortunately, the reader is urged to obtain. Some 32 pages is devoted to a

listing of the properties, formulas, etc., of minerals, which should be of little, if any use in this form.

A professional geologist or mineralogist should find little of value in this book. It is difficult to find reason to recommend it to non-professionals.

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COSMIC DUST, by A. DAUVILLIER. 167 pp., 8 plates, 31 figures. Philosophical Library, New York. $15.00, 1964.

Anyone expecting a comprehensive and accurate account of cosmic dust will not find it here. This book is mistitled; it is not really about cosmic dust at all, about half of it being devoted to a discussion of comets. It abounds in the most remarkable statements, some erroneous, some pure speculation masquerading as fact, of which the following are but a few examples:

The surfaces of the Moon, Mercury, and Mars are covered with dust and cinders.

——— the Moon and Mercury, whose surface is of the nature of stony meteorites
——— the elements Te, Ta, Hg, Tl, Bi do not seem to have been detected (in meteorites)

One Canyon Diable siderite contains 3.8 per cent gallium.

The Italian siderite of 1890 contained 0.8 per cent palladium.

——— the meteorites of Canyon Diable contain numerous microscopic diamonds, to the high proportion of 1 per cent—Magnetic prospecting and sounding have revealed the presence there of millions of tons of buried nickel-iron.

Thus, the serpentine of the Urals Carboniferous is encrusted with chrome-iron containing 10 per cent platinum.

(The Orgueil meteorite) detonated at 20 km up, covering a vast region with several tons of stones.

Certain meteorites contain as much as 10 per cent carbon.

In the final sentence of the foreword the author expresses his gratitude for the quality of the translation; I fear he is as poor a judge of English expression as he is of scientific facts, since the book is not well written. However, this objection is minor in comparison to the other defects. I am relieved to see that it is not included in the publisher's list of "Books of Lasting Value" on the back of the dust cover.

BRIAN MASON
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TEKTITES, JOHN A. O'KEEFE, editor. The University of Chicago Press, Chicago and London, 1963. xii, 228 pp. Illus. $10.95.

In his foreword to *Tektites*, John A. O'Keefe, its editor, points out that "In the tektite problem we are still in the stage of attempting to find out what it is all about . . . and the outlines of the answer are beginning to loom up out of the fog." Considering this book as a whole, the novice to the study of tektites might well come to the conclusion that the "fog" comes through more clearly than the "outlines of the answer" to the problem. This is not to be construed as faultfinding. O'Keefe, a man with definite and controversial ideas on tektites, is to be congratulated for his part in bringing about this timely work that summarizes the thinking of a number of leading students of these enigmatic natural glasses. Controversy exists over the origin of tektites, and the book is a product of this situation.

Tektites is another book in which leading workers contribute chapters dealing with their specialities. A listing of these is undoubtedly the best way to demonstrate the scope of the book: "Form and Sculpture of Tektites," George Baker; "Tektites Strewn-Fields,"

Virgil E. Barnes; "The Petrographic and Chemical Characteristics of Tektites," E. C. T. Chao; "The Chemical Composition of Tektites," C. C. Schnetzler and W. H. Pinson, Jr.; "The Physical Properties and Gas Content of Tektites," Irving Friedman; "Isotopes in Tektites," J. Zähringer; "Aerodynamic Analysis of Tektites and Their Hypothetical Parent Bodies," Ernst W. Adams; "The Origin of Tektites," John A. O'Keefe; "Asteroid- or Comet-Impact Hypothesis of Tektite Origin: The Moldavite Strewn-Fields," Alvin J. Cohen.

The various chapters are characterized by lack of uniformity in concept of presentation and originality of material. Several are primarily review papers, whereas others contain some new data with summaries of previously published data and interpretations. Chao's chapter presents many new data from the laboratories of the U. S. Geological Survey, and O'Keefe's is a persuasive presentation of his thinking on tektite origins. The book's major fault in this reviewer's opinion is the unfortunate absence of a chapter dealing with the important experimental work of Dean R. Chapman and his associates.

Tektites was published concurrently with the holding of the Second International Tektite Symposium at the University of Pittsburgh in September, 1963. When it is combined with the proceedings of that symposium (*Geochim. Cosmochim. Acta* **28** (6), 1964), the interested individual has at hand a relatively up-to-date picture of the tektite controversy and a comprehensive introduction into the older, scattered literature.

ROY S. CLARKE, JR.
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THE COLLOID CHEMISTRY OF PALYGORSKITE, by F. D. OVCHARENKO, translated from the Russian by D. Winograd. Daniel Davey & Co., Inc. New York, 101 pp., 1965, $5.00. The translation is provided by the Israel Program for Scientific Translations.

F. D. Ovcharenko, Academician, UkrSSR, has reviewed his own contributions and those of his collaborators to the exploration for, development of, and technological utilization of important palygorskite resources discovered in the Cherkassy region in the central Ukrainian crystalline massif. The exploited deposit consists of a bed up to 2 inches thick in a heterogeneous bentonitic series in the Lower Miocene, presumed to have accumulated in a landlocked marine basin.

One chapter on the physicochemical properties is presented in the light of the differences which the fibrous, longitudinally-channeled structure of the palygorskite imposes on a nature that is really rather like that of the montmorillonite minerals, but with inhibited expansibility. Lattice dimensions are nearly independent of the nature of exchange base, and heat of wetting and absorption isotherms are but little effected. Organophilic character is developed with dosages of complexing agents far less than exchange capacity, especially as the agents volumes exceed the channel dimensions.

A following chapter is devoted to structural-mechanical properties. Plasticity, although significantly responsive to this identity of exchange base, is more profoundly controlled by anisotropy introduced into bodies by preferential orientation of fibres. Exhaustive studies of the parameters pertinent to performance of palygorskite drilling muds are presented, and are compared with those exhibited by the more generally used bentonite or country rock dispersions.

The presentation concludes with a short series of citations of palygorskite applications as muds, plasticizers, bonding agents and absorbents. The book provides a wealth of general information material of value to interested industries.

W. F. BRADLEY

THE CHEMISTRY OF CEMENTS. 2 Volumes, Edited by H. F. W. TAYLOR. Academic Press, London, N. Y. 1964. Vol. 1, xi+460 pp., 100 shillings, $16.50. Vol. 2, xi+442 pp., 95 shillings, $15.00.

The mineralogist and his techniques for identifying, comparing, and determining the structures of inorganic substances have been important to many industrial operations, but probably none larger in total than the extraction, processing, and utilization of portland cement. These two volumes review the fundamental chemistry of the raw-material processing that produces cement and of its utilization for making structural concrete or other purposes. The interest of the geologist and engineer in the extraction step and the mechanical aspects of processing receives a scant two dozen pages, but the remainder of cement technology is covered in fine detail from the viewpoint of the mineralogist and physical chemist.

The list of 21 contributors includes many of those who have done the most important research in this field in recent years. Seven, including the editor, are from Aberdeen, three from the Building Research Station and five from elsewhere in Britain, four from the Portland Cement Association in this country, and one each from Italy and Sweden. The editor has done well in his job of logically subdividing the field, cutting out repetitions, and enforcing a reasonable uniformity of style. The standard of illustrations, references, and indexes is high. The sprinkling of typographical errors, beginning on page 1, is adequate to keep reviewers alert but never appeared capable of misleading a normal reader.

The first volume is devoted to portland cement, the anhydrous clinker compounds, and the identity and structure of the hydration products. The second volume covers non-portland cements (aluminous, slag, and expanding cements, pozzolans, and hydrated calcium silicate products not made with cements), and a number of the special experimental methods that have been most useful in identification or characterization. In an appendix the optical and x-ray data on 40 of the most important compounds are tabulated.

The volumes constitute the most thorough and up-to-date treatise on the fundamental chemistry of cements now available, and should be the first recourse of any laboratory worker who needs introduction or refreshing as to the current state of research in this field. The chapters on experimental methods are excellent introductions for anyone having technical training but unfamiliar with a particular specialty. They are necessarily inadequate for the specialist. The references cited in each chapter, however, provide ample background.

This book is by and for the research worker; anyone wanting detailed discussion of plant methods and problems should look elsewhere. It should be in the research library. It should be seriously studied by any "R&D" administrator in the industry who wants to know what fundamental research can contribute to the understanding of his technology, and by any scientist entering the field of cement chemistry. Perhaps this book can stimulate the former and lead to more opportunity for the latter.

FRED ORDWAY
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CRYSTALLOGRAPHIC BOOK LIST, edited by HELEN D. MEGAW, with the assistance of H. Curien, E. G. Steward, M. M. Umanskij, J. Zemann. Published by the International Union of Crystallography, Commission on Crystallographic Teaching. (Distributed by Polycrystal Book Service, GPO Box 620, Brooklyn 1, N. Y.) 1965, 83 pages. Paper bound, $3.00.

Anybody who is at all interested in crystals, every mineralogist in particular, will want to own a copy of this book, which tabulates titles of books published on any aspect of Crystallography. Every subscriber to *Acta Crystallographica*, a publication of the I. U. Cr., received his copy free.

The list is an outgrowth of previous lists, by H. J. Milledge and A. Magneli; it has now reached notable proportions. The main list, alphabetical by authors, comprises about 800 titles. A second list indexes the published reports of 53 crystallographic conferences that were held in various countries from 1947 to 1963. Multi-volume compilations, usually remembered by title, rather than by author's name are given in List III. The most useful part of the book, in the reviewers' opinion, is List IV, in which the books are classified under some 22 subject headings, most of them further subdivided into several subheadings. An appendix collects the titles that have appeared too recently to be included in the main lists. Books published prior to 1935 have been included only if of lasting interest. For the period 1935–1950 some of the more ephemeral have been omitted. From 1950 on the list is comprehensive. The only works considered are those written in, or translated into, one of the languages of the Union: English, French, German, or Russian. Exceptions to this rule are other books that have been reviewed in *Acta Crystallographica*. Russian titles are transliterated and translated into English. The editor's approach is eminently practical throughout; her aim is to help people find the books they need. To achieve that aim, no effort has been spared. In the same spirit, bibliographical niceties such as accuracy in counting pages or quoting publishers' names, have been remorselessly shunned. The reviewers agree that this is quite sensible, even though their own first edition of CRYSTAL DATA, a GSA Memoir, has been ascribed to the American Crystallographic Association. Other than that, they have little to complain about: they would prefer "rotatory" to "rotary" polarization and "alphabetize" to "alphabeticize"!

Dr. Megaw and her international team of assistants deserve thanks and congratulations on a most useful guide, very skilfully organized.

DONNAY AND DONNAY