BOOK REVIEWS

DIE ERZMINERALIEN UND IHRE VERWACHSUNGEN by PAUL RAMDOHR. 2nd Edition. 875+xvi pp., 543 illustrations. Akademie Verlag GmbH, Berlin W 8, Mohrenstrasse 39, Germany. 1955. (Price not known.)

This is a most welcome second edition to what rapidly became one of the foremost reference works in the field of ore microscopy. The book not only has been considerably expanded, but many sections have been reorganized and rewritten. Over 200 of the illustrations are new, increasing the original total by about 100 and replacing approximately one-third of the original. Most of the photomicrographs are at least excellent; many are superb. An improvement in the quality of the paper over the first edition also has permitted the reproduction of finer detail.

Since the first edition was not reviewed in *The American Mineralogist*, a résumé of the scope and contents of the revised work is in order. Edition two follows the arrangement of its predecessor: it is in two parts, a general part and a part of systematic mineral descriptions. Major subdivisions in part one are:

1. Genetic classification of ore deposits.
2. Intergrowths.
   (*a*) Textures considered by form (single grains, polymineralic intergrowths, aggregate forms).
   (*b*) Textures of genetic significance (colloidal, sedimentation, exsolution, replacement, etc., textures).

In the second part are presented descriptions of about 250 metallic and semimetallic minerals of the groups: native elements, alloys and tellurides, sulfides and sulfosalts, and oxides. The descriptions of the species are broken down under: general (chemistry and crystallography), polishing behavior, properties in reflected light, etch tests, physico-chemical relations, textures, identification, genesis and paragenesis, localities studied, references, and *x*-ray powder patterns.

No review can adequately describe the excellence of the book with regard to the wealth of authoritative detail that it presents, in text and illustration, on both common and rare ore minerals. It is an indispensable tool for all who concern themselves with ores, from the advanced student, to the practicing geologist and mineralogist, to the teacher.

E. WM. HEINRICH,
University of Michigan,
Ann Arbor, Michigan

ERZMIKROSKOPIE by S. A. WAKROMEJEV. Translated from the Russian by Wolfgang Oestreich. 240 pp. 19 text figures, 28 appended photomicrographs, 15 text tables, 3 tables in rear pocket. VEB Verlag Technik, Unter den Linden 12, Berlin NW 7, Germany, 1954 (price not stated).

The first edition of this manual appeared in 1937 at the Mining Institute at Sverdlovsk to serve as the basis for an introductory course in ore microscopy. It touches upon almost all aspects of the field, many, however, but briefly. Topics include: the reflection microscope; preparation of polished sections; photomicrography of polished sections; reflection and bireflection; color of ore minerals; internal reflection; polarized light; hardness; magnetism and electrical conductivity; etch tests; microchemical tests; mineral tables and very brief descriptions of 141 species; textures and structures of ores; quantitative microscopic measurements; and organization of an ore study program. Many of the chapters conclude with a brief section of practice exercises. The last chapter ends on a completely pedagogical note.

listing the equipment and material, in units, necessary to outfit an ore microscopy laboratory for 25 students. The photomicrographs are fair, but no localities for the ores are given.

It is difficult to believe that this manual will be widely adopted in Germany, freewillingly, especially wherever are available the two authoritative works in this field: Erzmikroskopisches Praktikum by Schneiderhöhn and Die Erzmineralien und Ihre Verwachsungen by Ramdohr.

E. Wm. Heinrich,
University of Michigan,
Ann Arbor, Michigan

MINERALS FOR ATOMIC ENERGY, by Robert D. Nininger (Second Edition) xvi+399 pages, black and white and color plates; charts and identification table D. Van Nostrand Company, New York, 1956. Price, $8.00.

The main part of the text has been changed very little from the first edition (Reviewed *Am. Mineral.*, **40**, 781–782, 1955), the numbers of pages in the various parts remaining unchanged.

Some 32 pages have been added to the appendices. Most of the added material has to do with (1) recent changes in mining laws and changes in the policies, regulations, and procedures of the Atomic Energy Commission; (2) summaries of the mining laws of states where there have been new finds of uranium, and (3) addition of recently described uranium minerals and new color plates of uranium minerals.

Nininger's book continues to give a broader coverage of matters related to prospecting for uranium, thorium, etc., than any other single volume and so should continue to be a very useful handbook and reference work for layman, prospector, or geologist.

Earl Ingerson,
U. S. Geological Survey,
Washington, D. C.

ECHT ODER SYNTHETISCH?, by K. F. Chudoba and E. J. Gübelin. Octavo, 156 pp., 1 colored plate, 117 illustrations in the text, and 11 tables. Rühle-Diebener-Verlag KG Stuttgart, Germany, 1956. Price, bound, 18.50 marks.

With the increasing interest in recent decades in the production and use of synthetic gem minerals and materials, much attention has been directed toward the developing of methods for accurately distinguishing the natural gems from their synthetic counterparts. This comprehensive text by Chudoba and Gübelin is the first to be devoted entirely to this problem. It should prove to be very useful, especially to all interested in gemology.

In the introduction the various attempts which have been made to produce synthetic gems are briefly described, and the need to apply appropriate names to them which will readily distinguish the natural from the synthetic counterparts is emphasized.

The methods now in use for the production of the synthetic gems—corundum, spinel, emerald, and diamond—and of synthetic rutile, and silicon carbide and strontium titanate, which have gem properties, are reviewed. The special features and physical properties of the synthetics are then discussed in detail. The value of recognizing the differences in the structural features and in the inclusions in both the natural gems and the synthetics is stressed in an extended and a well illustrated discussion of 40 pages. The differences in the optical anomalies, and in the luminescence and absorption properties are also referred to.

The various tables list the properties which are most helpful in accurately distinguishing the synthetic from the natural gems. The short, selected bibliography consists of twelve

publications, of which eight are German, three British, and one American. The book is well printed and bound. The price, 18.50 marks, is moderate.

EDWARD H. KRAUS,
University of Michigan,
Ann Arbor, Michigan

LA GENÈSE DES SOLS EN TANT QUE PHÉNOMÉNE GÉOLOGIQUE, by H ERHART (Soil genesis as a geologic phenomenon), 23×14 cm.; pp. 90. Paris, Masson et Cie., 1956.

This little paper-covered book makes a plea for the study of soil formation from the geologic viewpoint. It is meant as a preliminary outline or "programme" the author will treat in a forthcoming multi-volume treatise. Accordingly it does not offer any specific data —numerical or otherwise—but contains only generalizations. In its present state the booklet is neither fish nor fowl.

M. W. SENSTIUS,
University of Michigan,
Ann Arbor, Michigan

CLAYS AND CLAY MINERALS, Edited by W. O. MILLIGAN. National Academy of Sciences, *National Research Council Publ.* **395,** vi+566+index, Washington, D. C., 1955 (1956), $7.00. (*Proc. 3rd Natl. Conference on Clays and Clay Minerals, Houston Texas, Oct. 26–29, 1954.*)

In addition to papers presented at the conference in Houston, this volume contains seven papers presented at the Pacific Coast Regional Conference on Clays and Clay Technology, Berkeley, California, June 24–26, 1954.

The volume contains 43 papers (5 of which are represented only by abstracts) that discuss topics ranging from theoretical deductions on the crystallography of clay minerals to methods of testing applicable in engineering practice. Unfortunately, it also contains summaries of elementary material that has been covered more thoroughly in textbooks.

Sixteen of the 38 complete papers have designated portions on *Conclusions* and some of the statements contained thereunder indicate a loose interpretation of what is encompassed by the *scientific method.* For example, several "conclusions" completely fail to eliminate alternative possibilities on the basis of data presented or cogent discussion of theory. One group of authors substituted "Inferences" for "Conclusions," and several other authors might have been equally candid.

In this collection of papers, familiar methods of investigation have been meticulously applied and the accumulation of data has been extended. For example, Bates and Comer present some excellent electron micrographs which show details on the surfaces of clay crystals. Some experimental techniques have been improved to the extent that more precise measurements can now be obtained. Many wiggly lines (thermograms and *x*-ray diffractograms) and a few *x*-ray diffraction powder photographs embellish the papers of numerous authors. Very close inspection of some of these diagrams is required in order to discern minor features which presumably influenced the authors' interpretations. Some of the *x*-ray diffraction results were recorded at such a high instrumental sensitivity that diffraction maxima are not clearly distinguishable from "background," and other diagrams are "smoothed" in such a manner as to eliminate any indication of the required instrumental sensitivity.

A paper on weathering by Keller *et al.* (p. 415) represents the composition of a granite (through the use of subscript numbers) as though a single phase (or a single mineral) were involved. This is, indeed, peculiar from the standpoint of both chemical and mineralogical

symbolism, and merely adds to existing confusion on this topic, in the opinion of this reviewer.

The proceedings comprise the works of 69 contributors and represent, taken collectively, the status of the art and science of clay mineralogy in America as of October, 1954. (H. Heystek appears to be the only non-American to contribute to this conference.) Where these highly intensive investigations of certain particular properties of a very small number of mineral species will ultimately lead, or what will be the contributions to the broader science of mineralogy, is difficult to appraise at this juncture. Ready access to this book—as well as two earlier volumes—will be essential to persons who intend to remain informed on these rapidly moving subjects.

DUNCAN MCCONNELL,
Ohio State University,
Columbus, Ohio