

## BOOK REVIEWS

MINERALS AND MAN. Cornelius S. Hurlbut, Jr. Random House, Inc. New York, 1968, 304 pages. 217 illustrations, including 160 in color, \$15.00.

In his preface the author writes “—I have cherished the hope that some day I would write a nontechnical book recounting the stories of minerals that enthralled me as a student, and adding to them some of the exciting accounts of mineral discovery and exploitation”. His hope has been realized with the publication of this lavishly illustrated volume in large format, manufactured in Switzerland.

The titles of a few of the 19 chapters will serve to suggest the range and tone of the text: 1. Minerals and How to Know Them; 2. Early Use of Minerals; 5. Nature's Treasure House; 12. Minerals that Glow in the Dark, and 19. An Incombustible Fabric and a Stone That Burns. The illustrations are mostly photographs of minerals but there are also a few reproductions of such items as old wood cuts, an ancient Egyptian fresco and Chinese porcelain. With a few exceptions, the full-page color photographs are excellent.

There is an appendix in which “are listed the minerals (148) mentioned in this book with their chemical compositions and some of their physical properties”. The index of 8½ pages is comprehensive, giving references for subjects, places, minerals, including some not in the appendix, and men. References are given for about eighty men. Pliny is cited most frequently, ten times; Dana is not mentioned.

A. PABST

*University of California, Berkeley*

SCIENCE OF CERAMICS, VOLUME 4. PROCEEDINGS OF THE FOURTH INTERNATIONAL CONFERENCE. G. H. Stewart, Editor. British Ceramic Society, Stoke-on-Trent, England, 1968, 481 pages. \$12.60.

Thirty-one papers arranged under headings: The effect of mechanical forces during heat treatment; Fabrication; Reactions during sintering; Reactions in multiphase ceramics during firing; and Development of ceramics for the newest applications, including papers on synthetic silica, magnesite, spinels, baddeleyite, periclase, corundum, uraninite, forsterite, mullite, perovskite, and on very high-pressure polymorphism.

PROCEEDINGS OF THE SYMPOSIUM ON THE GRANITES OF WEST AFRICA, UNESCO. Composite English/French edition, 1968. 168 pages. \$7.50 (paper), \$10.00 (cloth).

Proceedings of a symposium held under the sponsorship of the International Union of Geological Sciences, with the assistance of UNESCO and the Association of African Geological Surveys, in Ivory Coast, Nigeria and Cameroon, in March 1965. The papers are as follows: *D. C. Turner*, Review of the younger granites of northern Nigeria; *M. Arnould*, Les granites de Haute Côte d'Ivoire; *J. Lombard*, Les granites du nord du Cameroun; *G. Choubert*, Note sur le mécanisme probable des granitisations. Application à certains granites africains; *Vladi Marmo*, On the granites of northern Ivory Coast, Jos Plateau of Nigeria, and Northern Cameroon; *E. Raguin*, Sur les granites de l'Ouest Africain en Côte-d'Ivoire, Nigeria, Cameroun; *A. Tugarinov*, Age absolu et particularités génétiques des granites de la Nigeria et du Cameroun septentrional; *A. F. Wilson*, Geological report on granites in West Africa; and *F. F. M. de Almeida*, Precambrian geology of North-Eastern Brazil and Western Africa and the theory of continental drift.

RADIOMETRIC DATING FOR GEOLOGISTS. Edited by E. I. Hamilton and R. M. Farquhar. Interscience Publishers, London, New York, and Sydney, 1968, 506 pages. \$19.50.

A volume of "case histories": *P. E. Damon*, Potassium argon dating of igneous and metamorphic rocks with applications to the Basin ranges of Arizona and Sonora; *S. R. Hart, G. L. Davis, R. H. Steiger, G. R. Tilton*, A comparison of the isotopic mineral age variations and petrologic changes induced by contact metamorphism; *B. J. Gilotti*, Isotopic geochronology of Montana and Wyoming; *E. R. Kanasevich*, The interpretation of lead isotopes and their geological significance; *E. J. Catanzaro*, The interpretation of zircon ages; *S. Moorbath, K. Bell, B. E. Leake, W. S. McKerrow*, Geochronological studies in Connemara and Murrisk, western Ireland; *T. N. Clifford*, Radiometric dating and the pre-Silurian geology of Africa; *R. L. Fleischer, P. Buford Price, R. M. Walker*, Charged particle tracks: tools for geochronology and meteorite studies; *E. I. Hamillon*, The isotopic composition of strontium applied to problems of the origin of the alkaline rocks.

A DICTIONARY OF MINING, MINERAL, AND RELATED TERMS. Compiled and edited by PAUL W. THRUSH AND THE STAFF OF THE BUREAU OF MINES, United States Department of the Interior, 1269 pages, 1968. (Order from Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, \$8.50.)

In December, 1918, the U. S. Bureau of Mines issued its Bulletin 95, "A Glossary of the Mining and Mineral Industry" by Albert H. Fay, a useful work which this reviewer has kept at hand for over 40 years. It ran to 754 pages, was stated to contain "about 20,000 terms" and was referred to as the "first edition." In part it was distributed free and it was sold for 75 cents a copy. It was reprinted in 1947. F. L. Hess, a fellow of this Society, worked on a revision but his untimely death in 1955 prevented its completion.

Preparation of the Dictionary which has now appeared was begun in 1961 under the editorship of Paul W. Thrush. The new work is greatly enlarged. The volume weighs ca. 6½ pounds, its pages are ca. 9×11½ inches, contrasted to the former 5½×8½, and carry about 150,000 definitions of about 55,000 terms in three columns. (The AGI Glossary of Geology and Related Sciences, with supplement, covers "more than 18,000" terms.) The terms in the Dictionary are stated to "apply to metal mining, coal mining, quarrying, geology, metallurgy, ceramics and clays, glassmaking, minerals and mineralogy, and general terminology." "Petroleum, natural gas, and legal mining terminology—has been excluded." Several thousand Spanish-American terms that appeared in *Fay* have been removed, though such terms still used in the southwestern United States have been retained.

Fay took many of his definitions from about 140 listed authorities, including several earlier glossaries and dictionaries, beginning with "The miners' dictionary" by William Hooson, 1747. Among later sources were included textbooks and other works by such giants as Chamberlin & Salisbury, Daly and Lindgren. Only a few official publications were cited. In the current Dictionary over 300 different sources are cited including the latest Standard and Webster Unabridged dictionaries. Many authoritative publications of the type issued by the ASTM and the British Standards Institution are cited. Mineralogical definitions are mostly taken from the 6th and 7th editions of *Dana's System*, the current *Dana-Hurlbut*, George English's "List" (1939), Fleischer's "Index" (1966), Larsen and Berman (1934), Hey's "Index" 1955, and Sinkankas' "Gemstones of North America" (1959). Holmes' "Nomenclature" and Kemp's "Handbook of Rocks," the 1904 and 1940 editions of the latter respectively, are among the few authorities cited in both works. For igneous petrology reliance now seems to be placed on Johannsen but there are also citations to CIPW, ignored by Fay.

The coverage of geological terms is extensive, much material being taken from the AGI Glossary. The number of geologic time terms has been greatly increased. Examples of such terms not covered by Fay but now given include: Helderbergian, Ozarkian, Turonian, etc. Some formation names are also defined but a far greater number omitted, probably depending upon the accident of their inclusion in the sources used. Modern trends are reflected

in the addition of thermodynamic terms, e.g., enthalpy (3 definitions), entropy (4 definitions), entropy change and entropy unit. Many terms are defined both in isolation and in combination, e.g., "heat" and 52 combinations thereof from "heat balance" to "heat work."

Fay included many definitions of mineral names and it seems that an attempt at full coverage has been made in the present work. Unfortunately the intent or policy of the editor in this regard is not stated. However, definitions are to be found from abernathyite to zwieselite. In many cases the definitions are from strange sources. That of animikite is from the Standard Dictionary, 1964, and that of ankerite is in part from the Glossary of Coal Terms, British Standards Institution, 1960, resulting in a somewhat biased definition, "A white, red, or grayish calcium-magnesium-iron carbonate,  $\text{CaCO}_3(\text{Mg, Fe, Mn})\text{CO}_3$ ; commonly occurring in the partings of coal; rhombohedral." Though Fleischer's 1966 list is cited it appears that the cutoff date for inclusion of new mineral names must have been about 1964. Weilitte [*Amer. Mineral.* 49, 816 (1954)] is included, poitevinite [*Amer. Mineral.* 50, 263 (1965)] is not.

Considering the diversity of sources of this compilation and the overwhelming task of the editor a fair degree of consistency has been attained, but some curious lapses can be found. On page 1248 one may find definitions of the following four terms set forth separately and consecutively: "X-ray analysis," "X-ray crystal analysis," "X-ray crystallography" and "X-ray diffraction." The first and last of these are from the "Dictionary of Mineral Technology" by Edmund J. Pryor (1964), the second from Sinkankas (1959), and the third from "Dictionary of Civil Engineering" by Rolt Hammond (1965), surely curious sources for definitions of such terms with the result that there is much overlap and some confusion. Fay took definitions of "negative crystal" and "positive crystal," referring to the concepts of optical crystallography, from Dana's Textbook of Mineralogy, 2nd ed. (1898). The new work contains definitions of "negative crystal" from Fay, "positive crystal" from the AGI Glossary, and of "positive mineral" from Shipley's "Dictionary of Gems and Gemmology (1945), a sad retrogression after 50 years.

In spite of such minor shortcomings this must be regarded as a monumental work. This reviewer knows of no other of comparable scope. The book can be of great value to any mineralogist or geologist who uses it with some discrimination.

A. PABST

*University of California, Berkeley*

MINERALIEN (SAMMLUNG NATURKUNDLICHER TAFELN). By H. SCHROKE AND K. L. WEINER. Kronen-Verlag, Hamburg, 1968. 162 color plates after original paintings by Claus Caspari. In linen case \$38.00. Half-leather case, \$50.50. (Order from Francis Paul, 49-51 Fourth Avenue, Mt. Vernon, New York 10550.)

This volume, No. 7 in the Collection of Natural History Plates published in the series by Kronen-Verlag, consists of 162 plates (only the 72 in Part I were seen by the reviewer), with text on the back of each plate. The only other text is a brief introduction including a list of specimens illustrated and collection to which they belong. The plates are  $19 \times 27$  cm.

The original paintings by Mr. Caspari are obviously very well done and the quality of the reproduction is excellent. The main criticism one can make of the plates is that in many cases specimens of mediocre quality were chosen, hardly worthy of the time and money expended in reproducing them.

The text on the reverse side of each plate gives chemical composition, crystallography, physical properties, occurrence, paragenesis, uses, and in general the same information to be found in any mineralogy textbook. For anyone desiring this information, one (or several) good books would be a far better investment. The volume would seem to have limited scientific and practical value but many of the plates would be very attractive framed.

GEORGE SWITZER

*U. S. National Museum*