

in America than in Britain, it is rather too much to expect that the wealth of information to be found in the pages of this book can be transferred lock, stock, and barrel across the Atlantic to our own benefit. Be that as it may, the book is well worth a close scrutiny by American readers: agriculturalists, horticulturalists, marine biologists, naturalists, climatologists, economists, and geographers. The problem of climatic change and its manifold effects on food supplies presents a challenge to all mankind. It is no exaggeration to say that man's ability to understand it better and to deal with it foresightedly could appreciably slow his inexorable retreat to the great Malthusian wall.

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Beryllium

A. A. Beus's **Geochemistry of Beryllium and Genetic Types of Beryllium Deposits** (translated by F. Lachman. Freeman, San Francisco, 1966. 411 pp., illus. \$15) is an excellent review of the state of knowledge of the geochemistry and crystal chemistry of beryllium and the mineralogy and structure of beryllium deposits in the U.S.S.R. as of 1960, the year the original work was published. The translation editor, Lincoln R. Page, notes with regret the unavoidable omission of some recently discovered types of deposits, for example, the Spor Mountain deposits.

After an introduction summarizing the history of the study and utilization of beryllium, the author devotes a short chapter to the atomic structure and consequent crystal chemistry of beryllium, especially in minerals. Chapter 2, the longest in the book, is devoted to the mineralogy of beryllium. For each mineral are given the physical and optical properties, unit cell data, and structural details where available, and for most, many analyses drawn from both Russian and foreign literature. The author does not hesitate to disagree with accepted ideas of crystal structure for some of the minerals, and he offers interesting suggestions for further structural work. Regrettably, *d*-spacing data from x-ray determination are not furnished. Chapter 3 discusses the peculiarities of the isomorphous entry of beryllium into the crystal structure

of minerals. The author recognizes four well-defined types of beryllium isomorphism: (i) with substitution of beryllium together with high-valence cations such as rare earths, zirconium, and titanium for silicon, (ii) with substitution of beryllium for silicon together with substitution of fluorine and hydroxyl for oxygen; (iii) with substitution of beryllium and hydroxyl for silicon; and (iv), isostructural isomorphous series of beryllium compounds.

The second section of the book begins with a summary of genetic classifications: "All known beryllium deposits are post-magmatic formations genetically related to the late stages of the pegmatitic process or to the various stages of hydrothermal-pneumatolytic or hydrothermal processes. The overwhelming majority of these deposits, including all industrial deposits, are related to acid intrusive rocks and are the products of pneumatolytic and hydrothermal separations of the granitic magma." In the ensuing chapters the three classes are considered in more detail.

Chapter 4 deals with pegmatic deposits, on which the author is a recognized expert. Seven types are recognized and examples, taken largely from the Russian literature, are described in great detail, with numerous clear maps and diagrams and well-reproduced photomicrographs. Deposits described before 1941 are identified with some precision; those described since then are identified much more vaguely, as is usual in the Russian literature. The zonal classification used in the U.S.S.R. is apparently

even more detailed than that developed in this country during World War II. Some space is devoted to the economically unimportant but interesting desilicated and alkaline pegmatites, both unfamiliar to most American geologists. Suggestions for prospecting for rare elements in pegmatites are included. Chapter 5 is devoted to the hydrothermal-pneumatolytic deposits, including greisens and skarns. (Greisens are becoming economically important in the U.S.S.R.) Chapter 6 considers the hydrothermal deposits, including the famous Colombian emerald deposits.

Chapters 8, 9, and 10 consider the chemistry of the solutions from which the beryllium minerals are deposited in magmatic, pegmatitic, and hydrothermal-pneumatolytic processes and offer a wealth of information on the distribution of beryllium in rocks and rock-forming minerals of the U.S.S.R. Chapter 11 considers beryllium in the hypogene (supergene) processes and in sedimentation and furnishes much statistical information. Chapter 12 concludes that the beryllium in the earth's crust is 3.5 parts per million, approximately equal to the concentration in the crust in the U.S.S.R.

The translation is in nearly idiomatic English, and the number of misprints is moderate. The translation editor has annotated some errors and peculiarities of usage. Seventeen pages of references conclude the volume.

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Fine Particles

Richard D. Cadle, the author of **Particles in the Atmosphere and Space** (Reinhold, New York, 1966. 234 pp., illus. \$10), formerly chairman of the atmospheric chemical physics department at Stanford Research Institute and now a program scientist at the National Center of Atmospheric Research, has excellent qualifications for writing a book on this subject. Cadle says in the preface that his book "is intended to be intermediate in scope between an introduction to the subject and an exhaustive treatise," and in this he has succeeded admirably. He writes in a lucid style and has managed to include a great deal of information in 196 pages of text.

Cadle discusses particles in the tropo-

sphere and in the stratosphere and mesosphere; radioactive fallout; interplanetary dust; the moon; and planets, comets, and galactic dust. The longest chapter deals with radioactive fallout and the next longest with dusts of diverse origins in the troposphere and with cloud physics. Although, as Cadle himself writes, "no attempt has been made to provide an exhaustive review of the literature," there are 344 references conveniently placed at the ends of the chapters, with a separate index of their authors at the end of the book. The book is well illustrated with photographs, line drawings, and graphs.

I once considered writing such a book as this. It is a pleasure to find that someone else has accomplished a better

job than I could. There are some points that I would have discussed, however, which Cadle apparently considered beyond the scope of his book, for he mentions them only very briefly, if at all. These include loess, the movement of soils by the dust storms of the Great Plains, the dry fogs of southeastern Russian and western China, the rains of "blood" recorded from the present back to the Roman period or earlier, and the possible connection between meteoritic dust and rainfall.

The only technical errors I detected were two resulting from new information published too late for inclusion in this book. I regard the book as a welcome and valuable addition to my library.

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Potential-pH Diagrams

The potential-pH diagram, originated by Marcel Pourbaix in his doctoral dissertation, portrays graphically the conditions under which oxidation-reduction reactions of an element and its compounds are possible or impossible in aqueous systems at 25°C. In the *Atlas of Electrochemical Equilibria in Aqueous Solutions* [James A. Franklin, Transl. Centre Belge d'Etude de la Corrosion (CEBELCOR), Brussels; Pergamon, New York, 1966. 644 pp., illus. \$36] Pourbaix and 21 other contributors have provided such diagrams for 91 elements. Introductory chapters have outstanding clarity, and the book is relatively free of errors.

The term "atlas" is apt. If the periodic table of the elements is a globe marking outlines of the chemical continents, a series of potential-pH diagrams becomes a relief map showing great detail. Though not intended primarily as a pedagogical tool, the approach certainly deserves an appearance in chemistry textbooks. The *Atlas* is intended as a working reference for the electrochemist, corrosion engineer, and others. Americans in these categories have the work available in English translation for the first time. They will soon find it practically indispensable.

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New Books

The Artful Practice of Medicine. William B. D. Van Auken. Thomas, Springfield, Ill., 1966. 131 pp. \$6.50.

Atom and Organism: A New Approach to Theoretical Biology. Walter M. Elsasser. Princeton Univ. Press, Princeton, N.J., 1966. 153 pp. \$4.50.

Beyond the Pillars of Heracles. The classical world seen through the eyes of its discoverers. Rhys Carpenter. Delacorte Press, New York, 1966. 287 pp. Illus. \$6.

Bibliotheca Medica: Physician for Tomorrow. David McCord, Ed. Published for the Harvard Medical School. Harvard Univ. Press, Cambridge, Mass., 1966. 266 pp. Illus. \$5.50. Sixteen papers given at the dedication of the Countway Library of Medicine, May 1965.

Book of ASTM Standards: With Related Material. Pt. 6, *Light Metals and Alloys (Including Electrical Conductors)* (518 pp.; \$9, members, \$6.30); pt. 8, *Magnetic Properties; Metallic Materials for Thermostats and for Electrical Resistance, Heating, and Contacts; Materials for Electron Devices and Microelectronics* (790 pp.; \$12, members, \$7); pt. 10, *Concrete and Mineral Aggregates* (606 pp.; \$10, members, \$7); pt. 14, *Thermal Insulation; Acoustical Materials; Joint Sealants; Fire Tests; Building Constructions* (524 pp.; \$9, members, \$6.30); pt. 23, *Industrial Water; Atmospheric Analysis* (902 pp.; \$15, members, \$10.50). American Soc. for Testing and Materials, Philadelphia, 1966. Illus.

The Community Junior College. James W. Thornton, Jr. Wiley, New York, ed. 2, 1966. 312 pp. Illus. \$7.95.

Comparative Osteology of the Snake Families Typhlopidae and Leptotyphlopidae. James Carl List. Univ. of Illinois Press, Urbana, 1966. 120 pp. Illus. Paper, \$3.75, cloth, \$4.75.

John Dalton and the Atom. Frank Greenaway. Cornell Univ. Press, Ithaca, N.Y., 1966. 254 pp. Illus. \$6.95.

Desde un Alto en el Camino: Vision y Examen Retrospectivos. J. Joaquin Izquierdo. Ediciones Ciencia, Mexico D.F., 1966. 542 pp. Illus.

Elements of Probability Theory. J. Bass. Translated from the French edition (Paris, 1962) by W. McKay. A. Jeffrey, Translation Ed. Academic Press, New York, 1966. 263 pp. Illus. \$9.75.

Environmental Biology. Compiled and edited by Philip L. Altman and Dorothy S. Dittmer. Federation of American Societies for Experimental Biology, Bethesda, Md., 1966. 718 pp. Illus. \$15.

Genetik und Zytologie von Antirrhinum L. sect. Antirrhinum. Hans Stubbe. Fischer, Jena, East Germany, 1966. 421 pp. Illus. MDN. 82.

Glossary of Oceanographic Terms. B. B. Baker, Jr., W. R. Deebe, and R. D. Geisenderfer, Eds. U.S. Naval Oceanographic Office, Washington, D.C., 1966 (order from Superintendent of Documents, Washington, D.C.). 210 pp. Illus. \$2.25.

A Guide to Dental Practice. Michael B. Treweeke. Pergamon, New York, 1966. 100 pp. Illus. \$4. Pergamon Series on Dentistry, vol. 5.

A Guide to Science Reading. Compiled and edited by Hilary J. Deason. New American Library, New York, ed. 2, 1966. 288 pp. Paper, 75¢.

Handbuch der Histochemie. vol. 1, *Allgemeine Methodik.* M. Vialli, J. Kruszynski, and H. v. Mayersbach. Fischer, Stuttgart, Germany, 1966 (order from Intercontinental Medical Book Corp., New York). 306 pp. Illus. \$23.50.

Introduction to Electronic Systems, Circuits, and Devices. Donald O. Pederson, Jack J. Studer, and John R. Whinnery. McGraw-Hill, New York, 1966. 477 pp. Illus. \$8.95.

Introduction to Fibres and Fabrics: Their Manufacture and Properties. E. Kornreich. Elsevier, New York, 1966. 212 pp. Illus. \$7.50.

Introduction to Solid State Physics. Charles Kittel. Wiley, New York, ed. 3, 1966. 662 pp. Illus. \$12.50.

An Introduction to Transition-Metal Chemistry: Ligand-Field Theory. Leslie E. Orgel. Methuen, London; Wiley, New York, ed. 2, 1966. 186 pp. Illus. \$5.95.

Isobaric Spin in Nuclear Physics. Proceedings of a conference (Tallahassee, Fla.), March 1966. John D. Fox and Donald Robson, Eds. Academic Press, New York, 1966. 910 pp. Illus. \$9. Sixty-four papers.

Laplace Transforms for Electronic Engineers. James G. Holbrook. Pergamon, New York, ed. 2, 1966. 361 pp. Illus. \$10. International Series of Monographs in Electronics and Instrumentation, vol. 10.

Late Eighteenth Century European Scientists. R. C. Olby, Ed. Pergamon, New York, 1966. 217 pp. Illus. Paper, \$3.50. Commonwealth and International Library. Seven papers.

Light and Vision. Conrad G. Mueller, Mae Rudolph, and the Editors of *Life*. Time Inc., New York, 1966. 200 pp. Illus. \$3.95. Life Science Library.

Managerial Power and Soviet Politics. Jeremy R. Azrael. Harvard Univ. Press, Cambridge, Mass., 1966. 270 pp. \$4.95.

Nature's Medicines: The Folklore, Romance, and Value of Herbal Remedies. Richard Lucas. Parker, West Nyack, N.Y., 1966. 224 pp. \$5.95.

Negroes and the New Southern Politics. Donald R. Matthews and James W. Prothro. Harcourt, Brace, and World, New York, 1966. 567 pp. Illus. \$12.50.

Persistent Persecutory States of the Elderly. Felix Post. Pergamon, New York, 1966. 110 pp. \$4.

Perspectives in Modern Physics. Essays in honor of Hans A. Bethe on the occasion of his 60th birthday, July 1966. R. E. Marshak, Ed. Interscience (Wiley), New York, 1966. 685 pp. Illus. \$19.50. Forty-one papers.

Research in Clinical Assessment. Edwin I. Megargee, Ed. Harper and Row, New York, 1966. 718 pp. Illus. \$14.75. Fifty-eight papers.

Semiconductor Devices. vol. 1, *Semiconductors and Semiconductor Diodes.* Max J. O. Strutt. Academic Press, New York, 1966. 331 pp. Illus. \$12.50.

Studying Our Fellow Mammals. Ernest P. Walker. Animal Welfare Inst., New York, 1966. 186 pp. Illus. Paper, \$1.