

cal systems will therefore find in Boyd's volume on the subject a useful compendium on the properties of photographic emulsions, dealing with both their virtues and their ailments, and a detailed description of histological and photographic techniques best adapted to the study of diverse types of biological tissues. This section of Boyd's book should prove invaluable to investigators approaching the subject with a feeling of timidity and will prove a *vade mecum* to the experienced darkroom adept.

The book contains a comprehensive bibliography of the biological and medical literature containing descriptions of autoradiographic techniques. This section is rendered particularly useful by means of supplementary analytic indexes, which classify the several hundred publications according to the identity of the radioactive isotope employed and the nature of the tissue and animal studied. The book is well printed and handsomely illustrated with numerous autoradiographs.

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Organic Solvents: Physical Properties and Methods of Purification. vol. VII of *Technique of Organic Chemistry*. Arnold Weissberger, Ed. Interscience, New York-London, ed. 2, 1955. vii + 522 pp. \$8.50.

The appearance of the revised and second edition of the book on organic solvents is, indeed, a welcome addition to the reference literature of organic chemistry. The first edition, although ably compiled and presented, has long been out of date, and this second edition increases the usefulness of the reference material. The collaboration of an organic and a physical chemist in the presentation of the material on organic solvents greatly enhances the usefulness of the volume.

Following a simple classification according to organic chemical principles of the compounds indicated as solvents, the authors present a discussion of the properties and criteria of the physical properties and purity of the solvents in question. An adequate discussion is given of the boiling point, vapor pressure, density, refractive index, viscosity, surface tension, heat of vaporization, critical temperature and pressure, freezing-point constant, electric properties, flash point, and spectroscopy as well as the toxicology of the solvents. There then follow the complete data on 254 organic compounds utilizable as solvents under various conditions. Following this, there are tables

arranged according to boiling point, freezing point, dielectric constant, and dipole moment. A useful series of indexes based on increasing boiling points, freezing points, dielectric constants, and dipole moments are included. This type of cross reference will be of considerable help to the researcher.

There next follows a chapter on the criteria of purity of solvent and the drying and determination of water. This will be especially useful for the practicing organic and physical chemists as well as those engaged in industrial work. The chapter containing the methods of purification for the compounds described is again a reasonably complete compilation of the literature. Although no completely critical evaluation of methods for purification have been attempted, there being several references to each compound, there is sufficient information given so that the researcher can consult the original literature. Of equal importance with the data presented in the book is the complete bibliography at the end and before the index. The whole worth of the book may be summarized in the words of the original author, "the aim of this book is to make readily accessible the abundant material which has been accumulated by chemists and physicists in recent years."

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Fluoridation as a Public Health Measure.

American Assoc. for the Advancement of Science, J. H. Shaw, Ed., Washington, D.C., 1954. v + 232 pp. Illus. \$4.50; AAAS members, \$4.

This monograph is opportune and timely. Many of the questions raised by certain opponents of fluoridation have been ably answered with incontrovertible evidence. Twenty-one different scientists from the fields of chemistry, dentistry, engineering, and medicine have collaborated in this effort.

Two chapters—one a 10-year study of the medical aspects of an excessive fluoride intake from a water supply, the other a long-term medical study of a population using a fluoridated water supply—provide valuable information on the frequently posed question of complete medical studies. In other chapters, such subjects as the metabolism of inorganic fluorides, the magnitude of the dental benefits, the public health aspects of water fluoridation, the relative merits of various fluoridation vehicles, and the engineering and water chemistry phases of fluoridation are capably discussed by workers with years of experience in their

respective fields. One chapter is devoted to the external action of fluorides on teeth, the so-called "topical application," of much interest to that portion of the population not using a public water supply.

The book has been carefully edited, and these diverse subjects have been blended into a coherent whole. It is written in an easily readable style of interest to scientists, public health workers, civic officials, and interested laity alike. A second printing would seem to be assured.

In the closing words of the preface, the editor states "... through the providence of nature, no other public health procedure in the annals of history has been so thoroughly tested in field trials under the widest variety of controlled circumstances." This monograph ably summarizes this evidence.

H. TRENDLEY DEAN

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Manganese. Metallurgy of the rarer metals, No. 3. A. H. Sully, Academic, New York; Butterworths, London, 1955. xiv + 305 pp. Illus. \$6.50.

This book, the third in a series, is a summary of the literature on one of the so-called "rarer metals," manganese. Personnel engaged in research or plant operation will find it a well-written and comprehensive reference book.

The book opens with a description of the history of manganese and the worldwide occurrence and distribution of its ores. Following this, the metallurgical processes for obtaining manganese from its ores are discussed. Included are the blast and electric furnace processes for preparing high- and low-carbon ferro-manganese and also the electrolytic process for the commercial production of high-purity, 99.3 percent, manganese. Methods for the recovery of manganese from furnace slags and low-grade ores are described.

Research workers will find the chapter pertaining to the physical properties of manganese of much use. The section on the four allotropic modifications of this metal contains data on the crystal structure, lattice constants, and transition temperatures. The published data on melting point, vapor pressure, specific heat, thermal expansion, electric resistivity, magnetic and other properties of manganese have been compiled and reviewed.

For many years manganese has been used extensively as a minor alloying element in ferrous and nonferrous materials. The commercial production of high-purity manganese has extended its use

as a major alloying constituent. In accordance with these applications, about one-third of the book is devoted to a summary of the literature on the constitution and properties of the binary and ternary alloys of manganese.

The final chapter of the book contains a brief discussion of the limited workability of manganese. Included also are descriptions of the methods for electroplating and vapor-phase impregnation of materials with manganese and the oxidation characteristics of this element at high temperatures.

In view of the rapidly increasing list of publications in the metallurgical literature, one finds it very helpful to obtain such excellent compendia on specific subjects.

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New Books

Nuclear and Radiochemistry. Rev. version of *Introduction to Radiochemistry*. Gerhart Friedlander and Joseph W. Kennedy. Wiley, New York; Chapman & Hall, London, 1955. 468 pp. \$7.50.

Haplorhini: Tarsiodea. vol. II of *Primates: Comparative Anatomy and Taxonomy*. W. C. Osman Hill. Interscience, New York; University Press, Edinburgh, 1955. 347 pp. \$9.50.

The Origin of Vertebrates. N. J. Berrill. Clarendon Press, Oxford, 1955. 257 pp. \$4.

Chemistry of the Solid State. W. E. Garner, Ed. Academic Press, New York; Butterworths, London, 1955. 417 pp. \$8.80.

Vector and Tensor Analysis. Nathaniel Coburn. Macmillan, New York, 1955. 341 pp.

Magic and Schizophrenia. Géza Róheim. Warner Muensterberger, Ed. International Universities Press, New York, 1955. 230 pp. \$4.50.

Biochemical Preparations. vol. 4. W. W. Westerfeld, Ed. Wiley, New York; Chapman & Hall, London, 1955. 108 pp. \$3.75.

Energy and Society. The relation between energy, social change, and economic development. Fred Cottrell. McGraw-Hill, New York, 1955. 330 pp. \$6.

Tungsten. Its history, geology, ore-dressing, metallurgy, chemistry, analysis, applications, and economics. American Chemical Soc. Monogr. No. 94. K. C. Li and Chung Yu Wang. Reinhold, New York; Chapman & Hall, London, ed. 3, 1955. 506 pp. \$14.

Non-Euclidean Geometry. A critical and historical study of its developments. Roberto Bonolo. Trans. by H. S. Carslaw. Dover, New York, 1955. 389 pp. Cloth, \$3.95; paper, \$1.90.

Human Physiology. F. R. Winton and L. E. Bayliss. Little, Brown, Boston, ed. 4, 1955. 616 pp. \$8.

The Negro in Science. Julius H. Taylor, Ed. Morgan State College Press, Baltimore, Md., 1955. 192 pp. \$3.50.

Monographs on Topics of Modern Mathematics Relevant to the Elementary Field. J. W. A. Young, Ed.; with a new introduction by Morris Kline. Dover, New York, 1955. 416 pp. Cloth, \$3.95; paper, \$1.90.

Diffusion and Heat Exchange in Chemical Kinetics. D. A. Frank-Kamenetskii. Trans. by N. Thon. Princeton Univ. Press, Princeton, N.J., 1955. 370 pp. \$6.

Magnetic Materials in the Electrical Industry. P. R. Bardell. Philosophical Library, New York, 1955. 288 pp. \$10.

Contributions to Plant Anatomy. vol. 15. Irving W. Bailey. Chronica Botanica, Waltham, Mass.; Stechert-Hafner, New York, 1954. 262 pp. \$7.50.

Directory of Scientific Research Organizations in the Union of South Africa. D. Ryle Masson, Ed. Van Schaik, Pretoria, 1955. 123 pp. 25s.

Embryologie. Ein Lehrbuch auf Allgemein Biologischer Grundlage. Dietrich Starck. Thieme, Stuttgart, Germany, 1955. 688 pp. \$18.55.

Introductory Nuclear Physics. David Halliday. Wiley, New York; Chapman & Hall, London, ed. 2, 1955. 493 pp. \$7.50.

Hydrodynamics. A study in logic, fact and similitude. Garrett Birkhoff. Dover, New York, 1955. 186 pp. Cloth, \$3.50; paper, \$1.75.

Physics and Microphysics. Louis De Broglie. Trans. by Martin Davidson; foreword by A. Einstein. Pantheon, New York, 1955. 286 pp. \$4.50.

Theory of Groups of Finite Order. W. Burnside. Dover, New York, ed. 2, 1955. 512 pp. Cloth, \$3.95; paper, \$2.

Seven Men among the Penguins. An Antarctic venture. Mario Marrett. Trans. from the French by Edward Fitzgerald. Harcourt, Brace, New York, 1955. 269 pp. \$4.50.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, but to the publisher or agency sponsoring the publication.)

AEC-FCDA Relationship. Hearing before the subcommittee on security, Joint Committee on Atomic Energy, Congress of the United States, Eighty-fourth Congress, first session. The Committee, Washington, D.C., 1955. 57 pp.

Statistics of Public Elementary and Secondary Education of Negroes in the Southern States: 1951-52. Circ. No. 444. Carol Joy Hobson. U.S. Office of Education, Washington, D.C., 1955. 18 pp.

Salaries and Other Characteristics of Beginning Rural School Teachers: 1953-54. Brief report of a pilot survey. Circ. No. 446. Wells Harrington and Mabel C. Rice. U.S. Office of Education, Washington, D.C., 1955. 16 pp.

Man in Cold Environment. A study in physiology. Loren D. Carlson. Arctic Aeromedical Laboratory, Ladd Air Force Base, Fairbanks, 1954. 161 pp. (Available from U.S. Dept. of Commerce, Office of Technical Services, Washington, D.C.)

Georgia Mineral Newsletter. vol. VIII, No. 2. Georgia Geological Survey, Atlanta, 1955. 84 pp.

Organization and Administration of the Military Research and Development Programs. Hearings before a subcommittee of the Committee on Government Operations, House of Representatives, Eighty-third Congress, second session. The Committee, Washington, D.C., 1954. 710 pp.

Proceedings. Thirteenth session, South Pacific Commission, Noumea, 11-28 Oct. 1954. The Commission, Noumea, 1955. 31 pp.

Methods for Determining Lead in Air and in Biological Materials. American Public Health Assoc., New York, 1955. 69 pp. \$1.25.

Ninth Annual Report, 1953-1954. South African Council for Scientific and Industrial Research. Pretoria, 1955. 142 pp.

Studies on Expenditure of Energy and Consumption of Food by Miners and Clerks, Fife, Scotland, 1952. Medical Research Council Special Rept. Ser. No. 289. R. C. Garry, R. Passmore, Grace M. Warnock, J. V. G. A. Durnin. Her Majesty's Stationery Office, London, 1955. 5s.

Psychological Tests for Accident Prone-ness and Industrial Proficiency. Medical Research Council Memorandum No. 31. E. G. Chambers. Her Majesty's Stationery Off., London, 1955. 2s.

Report to the Board of Governors by the Scientific Director, January 1, 1954-December 31, 1954. National Vitamin Foundation, New York, 1955. 85 pp.

Sown Pastures for South-Eastern Queensland. Bull. No. 274. T. B. Palt-ridge. Commonwealth Scientific and Industrial Research Organization, Melbourne, 1955. 108 pp.

Proceedings Volume of the Geological Society of America for 1954. The Society, Baltimore, Md., 1955. 204 pp.

Mechanics of Bottom Sediment Movement Due to Wave Action. Tech. Memorandum No. 75. Beach Erosion Bd., Corps of Engineers, 1955. 121 pp.

Movement of Sand around Southern California Promontories. Tech. Memorandum No. 76. Beach Erosion Bd., Corps of Engineers, 1955. 60 pp.

Water Surface Roughness and Wind Shear Stress in a Laboratory Wind-Wave Channel. Tech. Memorandum No. 74. Beach Erosion Bd., Corps of Engineers, 1955. 42 pp.

Ricerca Scientifica e Produzione del Medicamento in Italia. Atti del I° Convegno della Società Italiana Scienze Farmaceutiche, Rome, 29-30 Oct. 1954, Istituto di Chimica Farmaceutica, Città Universitaria. 176 pp.

Schoolroom Science Center. vol. 49, No. 1, Cornell Rural School Leaflet. New York State College of Agriculture, Cornell Univ., Ithaca, 1955. 63 pp.

Le Phytoplancton Etat Actuel de nos Connaissances sur les Grands Lacs Est-Africains et Leur Phytoplancton. Ludo Van Meel. A, Texte; B, Atlas. vol. IV, fasc. 1. Exploration Hydrobiologique du Lac Tanganika, 1946-1947. Institut Royal des Sciences Naturelles de Belgique, Bruxelles, 1954. 679 pp.

Type-of-Farming Areas in Arkansas. V. B. Fielder. Bull. 555. Agricultural Expt. Sta., Univ. of Arkansas, Fayetteville, 1955. 121 pp.