

Book Reviews

Reports on Progress in Physics, Vol. XVI. A. C. Stickland, Ed. London: Physical Society, 1953. 407 pp. Illus. + plates. 10s.

This sixteenth volume of the Physical Society's *Reports on Progress in Physics* maintains the high standards of the earlier volumes. The articles are written by experts in their respective fields, but do not require that the reader be a specialist in all the subjects covered. Each report is a useful review for workers in the field and, at the same time, helps the more casual reader in the almost hopeless task of keeping up with progress in physics.

The first five reports deal largely with different aspects of solid state physics and provide a broad summary of recent advances. The first article, Neutron Diffraction, by G. E. Bacon and K. Lonsdale, outlines the principles of neutron scattering by nuclei and magnetic atoms and discusses the fundamental experimental measurements. The applications of neutron diffraction techniques to the study of crystallography and solid-state physics are treated in some detail. The report Physical Properties and Atomic Arrangements in Crystals by W. A. Wooster is a survey of the relations between the magnetic, optical, piezoelectric, and elastic properties of crystals and their structural properties.

In the third article, Raman Effect in Solids, A. C. Menzies summarizes early work in this field and outlines recent advances in the theory of vibrations in crystals; work on the alkali halides is emphasized. Paramagnetic Resonance, by B. Bleaney and K. W. H. Stevens, deals with the theory and application of this particular branch of spectroscopy which has become increasingly important as a method of studying the solid state. The fifth article, Semiconductor Circuit Elements, by J. S. Blakemore, A. E. De Barr, and J. B. Gunn, reviews developments in the theory of conduction in semiconductors and semiconductor-metal systems, and discusses the properties and applications of these systems; the greatest emphasis is on silicon and germanium.

In Electrical Discharges, F. L. Jones deals particularly with the breakdown of gases in static fields, high-frequency discharges, cold emission phenomena in discharges, and the regime of space charges. The seventh article, Fluctuation Theory in Physical Measurements, by C. W. McCombie attempts to give a coherent, elementary account of the methods available for predicting the mean square errors introduced by fluctuations into different physical measurements. The eighth article, Cosmology, by W. H. McCrea, has to do with one of the most fascinating applications of physics—the study of the universe as a whole or of the large-scale properties of the universe. This review is especially interesting because of the way in which the nature, aims, principles, and methodology of the field are summarized.

The last report, The New Unstable Cosmic-Ray Par-

ticles, by G. D. Rochester and C. C. Butler, is a description of the properties of the newly discovered unstable particles with masses between 400 and 2200 electron masses. This excellent article makes clear many of the experimental results which seemed weird and scarcely believable in the original journal articles. The beautiful and clearly explained cloud-chamber and photographic emulsion pictures should serve as models for other workers in this field who wish to make their findings understood by the innocent.

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General Biochemistry. Joseph S. Fruton and Sofia Simmonds. New York: Wiley; London: Chapman & Hall, 1953. 940 pp. Illus. \$10.00.

This textbook is designed for use in graduate courses in biochemistry. It presents a dynamic view of intermediary metabolism with emphasis on mechanisms. Illustrative material is taken from plants, animals, or microorganisms as needed and without prejudice. The word general in the title has the same sense as its usage in "general physiology."

After a brief historical introduction there are six chapters devoted to the physical properties, chemical constitution and structure of the various categories of simple and conjugated proteins. The next three chapters are concerned with the chemical properties of enzymes and with the thermodynamics and kinetics of enzyme catalyzed reactions. Then follow five chapters devoted to biological oxidation including discussion of the dehydrogenases, flavoproteins and metal containing oxidases. The opportunity is taken in this first part of the book to review those aspects of physical chemistry which are pertinent to biochemistry.

The next group of six chapters is concerned with carbohydrate chemistry, including the synthesis and degradation of polysaccharides, anaerobic, and aerobic metabolism of carbohydrates, and photosynthesis. The intermediary metabolism of lipids is covered in the following five chapters, including fats, phospholipids, steroids, carotinoids, terpenes, and anthocyanins. The next eight chapters are devoted to the intermediary metabolism of nitrogen compounds including inorganic compounds and nitrogen fixation, amino acids and proteins, porphyrins, and nucleic acids. The last few chapters serve to coordinate certain topics which would otherwise remain scattered as incidental facts throughout the text. Included here are the role of inorganic ions in metabolism, heat changes, hormonal control in plants, insects and mammals, and an integrated discussion of vitamins and growth factors.

The book is rich in structural formulas, schemes for metabolic pathways, and chemical equations. It contains for a textbook much tabulated quantitative data such as oxidation-reduction potentials, dissociation constants, and thermodynamic data for biologically

important substances. There are many footnote references to the literature, where possible to the most recent good review, and the volume has a competent subject index.

General Biochemistry can be heartily recommended as a textbook for courses devoted primarily to intermediary metabolism on a graduate level. There has been no text suitable for use in an advanced biochemistry course so that this book fills a very real need. It is not intended for courses in medical biochemistry or for use as a reference work. However, it is so up to date and covers such a broad range of biological topics that it might very well prove useful to any biological scientist as a handy desk reference to substances and processes of importance in intermediary metabolism.

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The Earth: Its Origin, History, and Physical Constitution. 3rd ed. Harold Jeffreys. New York: Cambridge Univ. Press, 1952. 392 pp. + plates. \$13.50.

This is the third edition of what is probably the most frequently quoted book on the interior of the earth. It is now twenty-four years since the second edition appeared. When it was written, the book was one of the first systematic attempts to put together the facts of astronomy, geodesy, and seismology to give a coherent picture of the interior of the earth. Perhaps the most remarkable thing about the new edition is its

similarity to the last. The general framework has worn very well. The new results can be fitted into the previous scheme. They give it more detail and more certainty, but there has been no fundamental change. The earth still has a liquid core surrounded by a solid mantle. The crust still has a "granitic layer" and, rather more dubiously, an "intermediate layer." In detail, of course, there has been an enormous advance. The timetables of the seismic waves are now correct to about a second and the radius of the core is known with an uncertainty of a few kilometers. Rather surprisingly, progress has been least marked where it might be most expected, in explaining the processes of mountain building. Jeffreys still firmly supports his previous view that mountains are formed as a result of contraction. All his ingenuity is required to show that this is quantitatively adequate.

The book is little longer than the second edition. This miracle of compression has been achieved by omitting the chapters on the origin of the earth and by an admirable conciseness in the presentation. A geologist might perhaps feel that the elegance and generality of the treatment make a picture of an earth which is only rather distantly related to the one he knows, but it is certain that everyone who is interested in the structure and history of the earth will have this book on his shelves even if he has doubts about his ability to profit from the more esoteric passages such as the appendix on Castiglione's theorem.

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New Books

Léon Fredericq: Un Pionnier de la Physiologie. Oeuvres choisies. Paris: Masson, 1953. 232 pp. Illus. 1,345 fr.

Reptiles and Amphibians. A guide to familiar American species. Herbert S. Zim and Hobart M. Smith; illus. by James Gordon Irving. New York: Simon and Schuster, 1953. 157 pp. Illus. \$1.50.

Quackery in the Public Schools. Albert Lynd. Boston: Little, Brown, 1953. 282 pp. \$3.50.

Steps in Psychotherapy: Study of a case of sex-fear conflict. John Dollard, Frank Auld, Jr., and Alice Marsden White; Dael Wolfe, Ed. New York: Macmillan, 1953. 222 pp. \$3.50.

A Brief Course in Semimicro Qualitative Analysis. William E. Caldwell and G. Brooks King. New York: American Book, 1953. 163 pp. \$2.10.

General Chemistry. An introduction to descriptive chemistry and modern chemical theory. 2nd ed. Linus Pauling. San Francisco, Calif.: Freeman, 1953. 710 pp. Illus. + plates. \$6.00.

Mathematical Methods for Scientists and Engineers. Lloyd P. Smith. New York: Prentice-Hall, 1953. 453 pp. Illus. \$10.00.

Animal Biochromes and Structural Colours. Denis L. Fox. New York: Cambridge Univ. Press, 1953. 379 pp. Illus. + plates. \$11.00.

Fabricated Materials and Parts. Theodore C. DuMond. New York: Reinhold, 1953. 332 pp. Illus. \$6.50.

Living with a Disability. Howard A. Rusk and Eugene J. Taylor. New York: Blakiston, 1953. 207 pp. Illus. \$3.50.

Cocoa: Cultivation, Processing, Analysis. Vol. III of *Economic Crops*; Z. I. Kertesz, Ed. Eileen M. Chatt. New York-London: Interscience, 1953. 302 pp. Illus. \$8.50.

Annual Report of the Board of Regents of the Smithsonian Institution, 1952. Showing the operations, expenditures, and condition of the Institution for the year ended June 30. Washington, D. C.: Government Printing Office, 1953. 461 pp. Illus. + plates. \$2.75.

Symposia of the Society for Experimental Biology, No. VII; ***Evolution.*** R. Brown and J. F. Danielli, Eds. New York: Academic Press, 1953. (For the Company of Biologists on behalf of the Society for Experimental Biology.) 448 pp. Illus. + plates. \$7.80.

Historical Aspects of Organic Evolution. Philip G. Fothergill. New York: Philosophical Library, 1953. 427 pp. \$6.00.

Laboratory Exercises for General Botany. Herbert M. Clarke and Richard I. Evans. Minneapolis, Minn.: Burgess, 1953. 104 pp. Illus. \$1.50.

Mathematics and Statistics for Economists. Gerhard Tintner. New York: Rinehart, 1953. 363 pp. Illus. \$6.50.

Heredity in Health and Mental Disorder. Principles of psychiatric genetics in the light of comparative twin studies. Franz J. Kallmann. New York: Norton, 1953. 315 pp. Illus. \$6.00.