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 Particles, 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