

## REVIEWS

**Radiology Physics.** By John Kellock Robertson. (Chapman and Hall, Ltd., London), 1941. Pp. 270. Price 18s. net.

The ever-increasing applications of physics in medicine make it imperative that the medical student should have a working knowledge of certain branches of physics. This knowledge would be particularly useful if he later specialises in radiology. The book under review, by Professor Robertson who is well known for his *Introduction to Physical Optics*, provides a suitable medium for the acquisition of such knowledge in branches of physics useful to the radiologist.

The first three chapters deal with an elementary treatment of alternating current theory and the production, control and measurement of high voltages. All that the radiologist need know about cathode rays, positive rays and X-rays find a place in the next five chapters. Chapter IX is devoted to an elementary treatment of diffraction of light, spectra, infrared and ultraviolet radiations and their uses in medicine. Chapter X is about measurement of X-ray wavelengths and the simple theory of the origin of characteristic X-rays. Chapters XI and XII deal with X-ray absorption, production of secondary radiation, the principle of the Potter Bucky diaphragm and measurement of X-ray dosage while Chapter XIII is devoted to radioactivity. The next two chapters are of special interest as they are devoted to recent developments on the production and use of high speed particles. Brief and readable descriptions of the cascade generator, the million volt X-ray tube, the Van de Graaf electrostatic generator and the cyclotron form the subject-matter of Chapter XIV. This is followed up, in the next chapter, on artificial radioactivity, by a brief resume of the applications of nuclear physics to medical and biological problems. Most of the work done on these lines is of recent origin and this makes the book under review all the more valuable. The final chapter of the book is devoted to the production and use of high frequency-currents. The book may be recommended for the use of pre-medical students and radiologists. It is also suitable for general study by physics students of B.Sc. (pass) classes.

S. R. S.

**Annual Review of Biochemistry, Vol. X.** By J. M. Luck and J. H. C. Smith. (Annual Reviews, Inc., Stanford University P.O., California), 1941. Pp. xi + 692. Price \$5.00.

The present review has been published in the second year of war which has extended to yet another European nation. The progress of scientific research, particularly its fundamental aspects, has received a regrettable but inevitable setback in most of the countries affected by the scourge of war. But a preliminary survey of the contents of the volume do not reveal any perceptible slacking of scientific effort during the year. It will, however, be noticed that of the twenty-four subjects discussed in the volume, no less than twenty-three have emanated from the various laboratories in America. This circumstance will not take away from the volume the international character which has constituted a special feature of these Annual Reviews.

The generous extension of American hospitality to European scholars who felt compelled to quit their fatherland, has, by introducing the international element, enriched American science; this is already reflected in the present volume under review.

In reviewing, in the field of Biological Oxidations and Reductions E. S. Guzman Barron refers to electromotively active systems—metalloporphyrins, flavoproteins and the more recently studied echinochromes. Valuable data regarding the oxidation-reduction potentials has been given and their significance in relation to cell respiration discussed. Reference has been made to activating proteins, whose isolation, purification and characterisation are proceeding slowly but steadily. Metalloprotein enzyme systems which include the various oxidases, catalase and carbonic anhydrase are referred.

The remarkable discovery of diphosphothiamin as the coenzyme of carboxylase has stimulated a considerable amount of work on the mechanism of the physiological role played by thiamin. The suggestion that diphosphothiamin might catalyse all the reactions where carbon dioxide acts as the



oxidising agent, opens up one of the most fruitful and spectacular fields of research.

Proteolytic enzymes are discussed by Bergman and his associate, while the non-proteolytic enzymes is reviewed by Tauber. Valuable reviews on the metabolism of carbohydrates, fats and proteins and amino acids appear in the present volume. Special attention should be invited to the reviews on Detoxication mechanisms and Hormones. Dieticians and pediatricians will find the review on Nutrition, illuminating and instructive. Reviews on soil deficiencies and animal nutrition and spectrometric studies in relation to biology, appear for the first time in this series. The latter review is presented in a form so as to be useful to those who wish to interpret spectroscopic data.

Barker's review on the chemistry and metabolism of bacteria discusses the nutrient and vitaminic requirements of micro-organisms and gives a survey of the work subsequently stimulated by the remarkable discovery of Wood and Workman regarding the utilisation of carbon dioxide. Other reviews relate to nitrogen fixation, protein monolayers, mineral nutrition of plants, plant-growth substances, bioluminescence, water- and fat-soluble vitamins, biochemistry of nucleic acids, purines, pyrimidines, creatine and creatinine, sulphur compounds and carbohydrates and glycosides. The usual high standard has been maintained and the principal object of these reviews, a critical appraisal of the year's work, and a speculative but promising forecast of the future, has been more than amply fulfilled. We fervently wish that the present conflict will not in any manner affect the publication of this Annual which has come to be regarded as a landmark in the progress of Biochemistry.

#### Mechanism and Chemical Kinetics of Organic Reactions in Liquid Systems.

A general discussion arranged by the Faraday Society. (Messrs. Gurney & Jackson, Ltd., London), 1941. Pp. 601 to 806. Price 15s. 6d.

The book is a collection of papers contributed to a discussion in September last. Soon after the *Transactions of the Society* for December containing these papers was received in this country, a brief critical

review was published in *Current Science* (Vol. 11, p. 202).

In 1937, the Faraday Society held a discussion on Reaction Kinetics in general and the present publication is a logical sequel. The earlier work dealt largely with the theoretical treatment of activation energy and reaction velocity, while the present one is naturally concerned with the application of these ideas. The fourteen papers that have been presented clearly indicate a unity of purpose, an application of exact technique together with physical understanding. The series of papers also draws attention to the necessity of a theory that envisages both the collision and the transition state methods of interpreting chemical reactions.

The publication is an illuminating work suggestive of further work in a rich field and should find a place in the library of every chemist.

#### Carnegie Institution of Washington:

Year-Book No. 40, 1940-41. (Carnegie Institution of Washington, Washington, D.C.), 1941. Pp. xxxii + 346. Price \$1.00 paper cover, \$1.50 cloth binding.

The Carnegie Institution of Washington, which "occupies a unique and important place in the scientific affairs" of the United States of America, is dedicated to "the extension of man's fundamental knowledge of his environment". The report of the President which prefaces the Year-Book, outlines the way in which the scientific activities of the Institution have been oriented to meet the situation imposed on the Nation by war. "Events of the past two years have profoundly altered the plans and outlook of every scientific institution in the world, and of the great majority of individual scientists." Many of the long-range programmes of research in the field of pure science have now been changed or held in abeyance.

In discussing the function of scientific institutions in relation to the programme of defence the President writes: "There is not complete unanimity in this country as to how, or when, or to what extent the power of the nation should be exerted to defend our way of life. There is substantial unanimity, however, on the thesis that the power of the nation should be increased as rapidly as possible and to the maximum possible extent. Here the Institution has a very