BOOK REVIEWS

Angewandte Radioaktivität. By K. E. Zimen, Vorstand des Instituts für Kernchemie, Chalmers Technische Hochschule, Göteborg, Schweden. Springer-Verlag, Reichpietschufer 20, Berlin W 35, Germany. 1952. viii + 124 pp. 16 × 23.5 cm. Price, DM 18.80.

This book provides a short survey of modern applications of radioactivity in many fields of science. Although brief, the material has been well chosen and should be of considerable interest to the general reader or non-specialist. Its principal value for a specialist in applied radioactivity is the references, which are extensive and as recent as late 1951 and early 1952.

Basic concepts and nuclear properties, natural and artificial radioactivity, and the energetics of radioactive disintegration are discussed in the first of three chapters of this book. In addition, this chapter contains sections on α- and β-decay and absorption, the origin and absorption of γ-rays, and several other fundamentals, including nuclear reactions.

Actual applications of radioactivity are discussed in the second chapter. Uses of radioisotopes in biology and medicine are discussed in terms of radiation therapy, radiobiology, bodily assimilation of isotopes, such as P-32, I-131, etc., and the use of these and others as tracers in diagnosis. In the fields of physics and chemistry there are very brief discussions of neutron diffraction analysis, activation analysis, isotope dilution analysis and the use of radioactive isotopes as tracers. Finally, a number of industrial applications of radioactivity, such as γ-radiography and autoradiography, are mentioned.

The last chapter contains a number of useful tables, numerical and isotopic, definitions of radiation exposure terms of the health physicist, and human radiation tolerances.

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Méthodes Et Réactions De L'Analyse Organique (Methods and Reactions of Organic Analysis). Volume I. General Methods. By Maurice Pesez and Pierre Poirier, Heads of Laboratories Français. Masson et Cie., 120 Boulevard Saint Germain, Paris 6, France, 1952. 278 pp. 53 figs. 16.7 × 25 cm. Price, Francs 1800 (approx. $5.00).

This book is the first volume (General Analytical Methods) of a series of 3 (Vol. II: Methods of Characterization and Vol. III: Colorimetric and Fluorometric Reactions) and is divided into 6 parts. Part I contains the methods for the determination of physical constants (m.p., b.p., opt. rot., n_D, densities and solubilities, determinations of mol. wt., colorimetric and fluorometric methods), while Part II comprises qualitative elementary analysis (C, H, O, N, hal., S, P and As).

Part III takes up the quantitative determinations of carbon and hydrogen (method of Pregl) with and without the use of lead superoxide; oxygen (method of Schuetze); nitrogen (micro Dumas and Kjeldahl); halogen and sulfur (methods of Pregl); phosphorus (method of Lieb) and arsenic (method of Leipert). Part IV treats the quantitative structural analytical methods (hydrogenation, active hydrogen, alkoxyl-, hydroxyl-, carbonyl and acyl groups).

In Part V various determinations of water and moisture are given, while Part VI contains purification and desiccation procedures, colorimetric and fluorometric methods for the determination of pH and tables of constants and indicators.

The book is provided with a table of contents, an authors' index, but contains no subject index. The literature cited while not complete, is nevertheless adequate. For the quantitative work the semi-micro balance of Longue (Etablissements Longue, Paris) with a precision and sensitivity of 10 micrograms is introduced recommend'ng sample charges of from 5–15 milligrams. There is no marked distinction between micro- and semi-micro work.

While the book brings no methods not already covered in the American micro-chemical literature, it nevertheless fills an important gap in French, introducing in systematic and lucid form all the more important qualitative as well as quantitative micro and semi-micro organic chemical procedures.

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Traite de Manipulation et D'Analyse des Gaz. By Henri Guerin, Professeur à la Faculté des Sciences de Nancy et à l'École Nationale Superieure des Industries chimiques. Masson et Cie, Editeurs, 120 Boulevard Saint-Germain, Paris 6e, France. 1952. vi + 636 pp. 17.5 × 24.5 cm. Price, Broche 4.500 fr.—Cartonne Toile 5.100 fr.

This book is divided into five main sections. The first is a brief historical survey. The second section deals with the manipulation of gases and is divided into five chapters covering a total of 137 pages. The first of these chapters discusses the collection and sampling of gases. The second chapter describes apparatus such as vacuum pumps, various kinds of pressure measuring devices, stopcocks and valves, and methods of drying the apparatus. The third chapter gives methods for the preparation and purification of gases, the fourth presents devices for storing gases, the fifth deals with the transfer of gases including the measurement of the rate of flow. The third section which presents general methods for the analysis of gases occupies 162 pages and is divided into five chapters as follows: (1) methods for the separation of a mixture into the component gases; (2) analysis by combustion; (3) methods of analysis not involving separation of the components; (4) combinations of methods and their advantages and disadvantages; (5) microanalysis of gases. The fourth section is a single chapter of 180 pages devoted to a description of the methods of preparation, properties and characteristic reactions of a large number of gases. The final section of about 100 pages presents seven chapters on various applications of gas analysis.

In reviewing a book of this type it is well to consider the manner in which the book is most apt to be used. If it is intended that this book should be a guide for a technician, it is this reviewer's opinion that the discussions of analytical methods are not sufficiently detailed to enable such a person to proceed without additional guidance. On the other hand, if it is to be used by one who has at least received a baccalaureate degree in chemistry there is too much space devoted to description of apparatus which should be thoroughly familiar to one with such training. There is much information in the book which would be of value to a competent scientist who wishes to work out a method for the analysis of a gas mixture which he encounters in his work. This is particularly true of the collection of information in the fourth section. On the other hand such a person is apt to have little patience with the detailed descriptions of stopcocks, vacuum pumps, various types of gas burets, etc., which take up a considerable portion of the book.

The extensive tabulation of the properties of gases and the schemes proposed for the separation of some possible mixtures are useful not only as they stand but because they supply information and suggest methods for the analysis of other mixtures which may be encountered either in research or in some industrial situation. This portion of the book could be improved if more attention were paid to the errors involved in the methods and possible causes of difficulty which may arise with unusual mixtures. The specific systems discussed in the section on the applications of gas analysis are useful as illustrative material for the ideas and methods discussed in the earlier sections but this portion of the book could have been omitted without great loss.

The more than three hundred figures in the text are well drawn. The other mechanical features such as the printing

and quality of paper and the binding are satisfactory although not up to the standard usually supplied by American publishers.

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Carbon Dioxide Fixation and Photosynthesis. Number V. SYMPOSIA OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. 1951. vii + 342 pp. 17 × 25.5 cm. Price, $6.80.

This volume records the fifth annual symposium on a major broad field of modern biology. It provides perhaps the most representative and authoritative statement of the current status (July, 1950) of this far-reaching problem on which so remarkable a range of scientific disciplines have been brought to bear. The spokesmen include outstanding biologists, biochemists and physical chemists from most of the leading research centers in the field in England, the United States and the Continent.

Krebs, H. G. Wood, Ochoa and D. Herbert have provided excellent reviews of the elegant enzymology of CO_2 fixation in animal and bacterial cells. From this outstanding work in metabolic biochemistry has only recently come a model photosynthetic reaction mechanism which will undoubtedly greatly influence thinking in the field of photosynthesis.

The role of CO_2 in Crassulacean acid metabolism is discussed by M. Thomas, primarily on the basis of work at Newcastle. Recent studies of the effect of physical and structural factors on leaf absorption of CO_2 are considered by Heath and by Penman and Schofield.

Turning next to the physico-chemical approach, Evans and Uri and Weiss discuss the photochemical aspects of oxidation-reduction reactions in aqueous systems and their relation to photosynthesis. E. J. Bowen considers briefly the resonance transfer of energy, and Franck outlines his views on the kinetic, fluorescence and induction problems of photosynthesis.

The much debated question of quantum efficiency is reviewed in detail by both the Emerson and Warburg groups with extensive critiques of methods on which so much appears to depend. Kok also presents his views on this question and its relation to photosynthesis-respiration interaction.

Three papers deal with the reducing action of illuminated chloroplasts or the Hill reaction. Hill, himself, emphasizes the potential aspect; French and Milner discuss their studies with chloroplast fragments; and Wassink reviews the types of reducing action that are known.

Another much debated issue, the metabolic pathway of photosynthetic intermediates, is ably presented by the two chief contenders, Gaffron's and Calvin's groups. Again the results, and perhaps the interpretations, of these admirable tracer studies seem to depend largely on the precise experimental conditions. However, the reader cannot help but be thrilled as the chase closes in and our understanding of the metabolic aspect of photosynthesis approaches the enzymatic level of the CO_2 fixation picture in heterotrophic cells of the opening papers of this symposium.

This volume should remain a landmark for some time, even in this rapidly changing field, and it will well repay the reading of biologist and chemist alike.

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Polarography in Medicine, Biochemistry and Pharmacy. BY M. BREZINA AND P. ZUMAN. Zdravotnicke nakladatelstvi, Prague, Czechoslovakia. 1952. 528 pp. 18 × 25.5 cm. Price, Kcs 315.

This work presents a complete summary of all polarographic papers related even remotely to the three topics given in the title. The book has been prepared under the direction of Prof. J. Heyrovsky. While the mathematical parts of individual papers are given only in a superficial manner, biochemical and analytical aspects are reviewed with all the details, making reference to original publications mostly unnecessary. This is especially true of the Czech papers published during and after the war, which, as a result of their appearance in obscure periodicals, have mostly escaped notice.

Typical headings of chapters include determinations of inorganic substances in biochemical materials, investigations of biologically important oxidation-reduction systems, aldehydes, tropolones, sugars, vitamins, hormones, enediols and many other topics.

A chapter is devoted to the catalytic waves of proteins and the polarographic cancer reaction. This chapter should be of interest to clinical chemists as it summarizes all the available statistical material and gives practical recipes. Another chapter summarizes investigations done on enzyme systems. It includes the catalytic effects of hemin and hemoprotein in the reduction of hydrogen peroxide, polarography of carbonic anhydrase, the aldehyde and xanthin-oxydase of milk. Finally, tables of buffer solutions useful in polarography and sixty-five pages of tables of half-wave potentials are contained in an appendix. The book has an index according to biological material analyzed, another according to substances investigated, an authors' register and a bibliography of polarographic papers. Both the paper and the binding of the book are of poor quality.

The book should prove an extremely useful addition to polarographic literature.

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BOOKS RECEIVED

May 10, 1953–June 10, 1953

ROGER ADAMS (Editor-in-Chief). "Organic Reactions." Volume VII. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1953. 440 pp. $9.00.

G. P. BARNARD. "Modern Mass Spectrometry." The Institute of Physics, 47 Belgrave Square, London, S. W. 1, England. 1953. 326 pp. 50s. 0d.

WALTER GORDY, WILLIAM V. SMITH, AND RALPH F. TRAMBARULO. "Microwave Spectroscopy." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1953. 446 pp. $8.00.

RONALD W. GURNEY. "Ionic Processes in Solution." McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1953. 275 pp. $6.50.

ROBERT E. MARSHAK. "Meson Physics." McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1952. 378 pp. $7.50.

F. F. NORD (Edited by). "Advances in Enzymology and Related Subjects of Biochemistry." Volume XIV. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1953. 470 pp. $9.25.

MAURICE PESEZ AND PIERRE POIRIER. "Méthodes et Réactions de L'Analyse Organique." Volume II—Méthodes de Caractérisation. Masson et Cie, Editeurs, 120 Boulevard Saint-Germain, Paris 6, France. 1953. 278 pp. 2590 Frs.

LEON VELLUZ (Edited by). "Substances Naturelles de Synthese—Preparations et Méthodes de Laboratoire." Masson et Cie, Editeurs, 120 Boulevard Saint-Germain, Paris 6, France. 1953. Volume V—206 pp. Broche, 2305 Fr.; Cartonne, 2690 Fr. Volume VI—156 pp. Broche 1730 Fr.; Cartonne, 2110 Fr.