
 NEW BOOKS

Amé Pictet, *Souvenirs et Travaux d'un Chimiste*. (*Memoirs and Activities of a Chemist*.) Éditions de la Baconnière, Boudry (Neuchatel), Switzerland. 228 pp., 14 × 19 cm. 9 fr. Swiss (ordinary edition); 20 fr. Swiss (de luxe). Printed October 31, 1941, Journal de Genève Press, Geneva, Switzerland, with the aid of a grant by La Société Auxiliaire des Sciences et des Arts of Geneva.

Amé-Jules Pictet, son of the banker Pyrame-Marc-Ernest Pictet and Gabrielle-Elisabeth Fuzier-Cayla, was born in Geneva, July 12, 1857, and died there on March 11, 1937, honored by his city, his nation, and the scientific world, all of whom he had served long, loyally, and with distinction. Many appreciative biographical notices have appeared since, in various countries and in various languages. But the book under review belongs in another class, for it is essentially Pictet's own personal diary, recording his life work, his interests, his activities and his emotions. From early youth until the close of his life, he kept a regular journal with daily entries, and had preserved an exceptionally rich and noteworthy correspondence.

On April 15, 1932, having reached the age of 75, he was appointed Professor Emeritus of the University of Geneva, and on October 15, 1932, at the end of the academic year, he retired from his chair as Professor of Inorganic and Organic Chemistry and from his laboratories and research work in the School of Chemistry.

Yet the last five years of his busy life were no less active than their predecessors. In his study in the Rue Bellot, he delved into the mass of notes, documents and records he had accumulated, and with characteristic clarity, logical arrangement and devotion to accuracy and truth, edited a series of notebooks of events and memoirs.

This book is prefaced by a sympathetic and eloquent introduction by Paul E. Martin; and closes with a full account of the funeral services on March 14, 1937, including the addresses delivered on that occasion by the Rev. Jean de Saussure; by Dean Tiercy, of the Science Faculty of the University of Geneva; by Professor Cherbuliez, his assistant from 1919 to 1932; and by Professor Fichter, President of the Swiss Chemical Council.

The autobiography itself is divided into Memories (*Souvenirs*), My Laboratory Work and My Other Activities. The first of these is in many ways the most fascinating, as it is the most intimate. You seem to be standing by the side of a friend who is disclosing his rich stores of experience through the years and making to live again the personalities and important events which have constituted the high points in chemical history and in his own career. When his story is concluded and the end of the journal reached, you feel a new and personal acquaintance with many of the distinguished figures mentioned, as well as with the writer of that diary.

The section covering his laboratory experiments explains how he happened to undertake these particular investigations, mentions the observations of special interest made during the progress of the work, the names of those who assisted him, and the significance of the results achieved.

His contributions to the chemistry of the alkaloids and other nitrogen heterocycles, of the sugars and other carbohydrates, are classics familiar to all organic chemists, but here you will find the author's own opinion of them.

Two pictures of Pictet are included. One, taken in 1908, shows him in his Geneva laboratory looking very much as he did when I first met him there a few years later. He was always a distinguished figure at national and international chemical meetings; and the other picture is an excellent likeness of him as we met for the last time, in Paris, on the occasion of the centennial celebration of the birth of Marcelin Berthelot. The representatives of sixty-three nations were gathered at luncheon in the long Galerie des Batailles of the royal palace at Versailles. Pictet, as the one chosen to speak for all the assembled delegates in eulogy of Berthelot, was seated with other notables at a table halfway down this vast hall, and I can still see his spare elderly figure attempting to make himself heard above the noise of the 1200 diners he was addressing.

MARSTON TAYLOR BOGERT, *President*

INTERNATIONAL UNION OF CHEMISTRY

Experimental Electronics. By RALPH H. MÜLLER, Professor of Chemistry, R. L. GARMAN, Assistant Professor of Chemistry, and M. E. DROZ, Assistant Professor of Chemistry, New York University. Prentice-Hall, Inc., 70 Fifth Avenue, New York, N. Y., 1942. xv + 330 pp. Illustrated. 15.5 × 23.5 cm. Price, \$4.65. Special to colleges only, \$3.50.

This book should be welcomed by every chemist who, without benefit of formal instruction in electronics, has ever struggled with the well-nigh mysterious vagaries of electronic devices. Its three chemist-authors approach their subject with the practical needs of the research worker in chemistry, engineering, and allied fields in mind, rather than from the viewpoint of the electronics specialist and radio engineer, and "to supply definite practical information on the characteristics and non-communication applications of electron tubes." They have succeeded well in their aim.

The text is divided into twelve chapters, the first of which comprises a brief but adequate review of fundamental principles relative to d. c. and a. c. circuits, and a discussion of the characteristics of meters and other circuit components commonly employed in electronic apparatus. This is followed by separate chapters on Triodes, Characteristics of Photoelectric Cells, Power Supplies, Multigrid Tubes, Characteristics of Gaseous Tubes, D. C. Electron-tube Voltmeters, A. C. Vacuum-tube Voltmeters, Application of Phototubes, Untuned Amplifiers, Vacuum-tube Oscillators, and The Cathode-ray Tube. Each topic is introduced by a brief theoretical discussion, which is followed by detailed directions, including a list of equipment, for an experiment that illustrates the important characteristics of the circuit or electronic device under discussion. Altogether sixty-nine experiments are described in the

space of three-hundred-odd pages, and most of them are accompanied by graphs of actual experimental data. The text is replete with well executed drawings and diagrams. This experimental presentation is the outstanding merit of the book, and the characteristic that should render it most valuable to the non-specialist in electronics.

Numerous references to the original literature are given throughout the text, and each chapter concludes with a list of Supplementary Literature. Sets of problems are also supplied at the end of most chapters to facilitate the use of the book as a teaching text. The authors' style is succinct and "to the point." The book can be recommended to any one who desires to acquire a basic working knowledge of *experimental* electronics with the expenditure of a minimum amount of time and effort.

JAMES J. LINGANE

Natural and Synthetic High Polymers. By KURT H. MEYER. Translated by L. E. R. Picken. Interscience Publishers, Inc., 215 Fourth Avenue, New York, N. Y. xviii + 690 pp. 180 figs. 15.5 × 23.5 cm. Price, \$11.00.

This volume, the fourth in a series of monographs on "High Polymers," is a translation of Volume II of the second edition of "Der Aufbau der hochpolymeren organischen Naturstoffe," which was published in Germany in 1940. The book is addressed to biologists as well as chemists. It is therefore not surprising that the author, after a relatively brief and cursory consideration of the structure and preparation of inorganic and synthetic high polymers, deals principally with the structure and properties of the natural high polymers, such as cellulose, starch, the proteins and many other biologically important high polymers.

The book is divided into twelve sections. After a brief Introduction emphasizing the importance of correlation of physical with chemical evidence for the structure of high polymers, there is a section of forty-two pages on "The Study of High Polymers," which outlines some of the general physical methods giving useful information about the size, shape and arrangement of polymer molecules. Such subjects as osmotic pressure, ultra-centrifugation, viscosity electrophoresis, birefringence of flow and X-ray analysis are considered. The following forty pages are devoted to a consideration of the crystal structure of a number of "Inorganic High Polymers." The next section of one-hundred-two pages, "High-Polymeric Hydrocarbons and Their Derivatives," is concerned with addition polymers. After a brief consideration of the mechanism of formation of addition polymers, evidence for the detailed arrangement of the polymer chains is discussed and interpreted with particular reference to the physical properties of the polymers, particularly for rubber and gutta percha. A brief chapter of twenty-eight pages, "Polymeric Ethers, Esters, Sulfides, etc.," covers synthetic condensation polymers.

The next one hundred twenty-eight pages deal with a detailed discussion of the physical and chemical properties of "Cellulose" followed by forty pages on "Substances Related to or Associated with Cellulose," such as other polysaccharides, lignin, pectin, gum arabic and chitin, and thirty-six pages on "Starch and Related Carbohydrates."

A chapter on "The Proteins" occupies the next one hundred forty-two pages. The next section of the book "The Properties of High Polymers in Solution" (forty-four pages) gives a detailed discussion of the physical chemistry of polymer solutions. This is followed by a consideration of "Films, Foils and Membranes" (thirty-three pages) and the book closes with a brief discussion of "The Molecular Structure of Animal and Plant Tissues."

In the preface the author states that "The chemist and the biologist will not find in these pages a detailed practical guide to investigations in their specialized field. It is hoped, however, that their attention will be drawn to near and remote parts of the field of high-polymer chemistry, and that the resulting extension in outlook may provide a stimulus to new experimental and theoretical investigations on the part of both." The translator points out that "The common meeting ground of chemists and biologists in high-polymer chemistry is that of morphology. Since the day when, as a result of the development of X-ray analysis, chemical formulas ceased to be symbols on paper and became models in three dimensions, the chemist has come more and more accustomed to think in terms of what may be called morphological chemistry." It is this viewpoint which is most fully exploited by the author, with the ultimate aim of a complete description of the physical, chemical, and biological properties of the various natural high polymers on the basis of a detailed knowledge, not merely of their "chemical" structure, but of the detailed space relationships involved throughout the body of the polymeric material. The present volume offers an interesting presentation and interpretation of this highly significant and rapidly developing aspect of high-polymer chemistry. Author, translator and printer are all to be commended for the successful production of a very useful book.

CHARLES C. PRICE

Elementary Physical Chemistry. By HUGH S. TAYLOR, D.Sc. (Liverpool), F.R.S., David B. Jones Professor of Physical Chemistry, Princeton University, and H. AUSTIN TAYLOR, Ph.D. (Liverpool), Professor of Physical Chemistry, New York University. Third edition. D. Van Nostrand Company, Inc., 250 Fourth Ave., New York, N. Y., 1942. xi + 551 pp. Illustrated. 14.5 × 22 cm. Price, \$3.75.

Although the third edition of this text follows the same organization of the material into chapters as was used in the second edition, the contents of many of the chapters have been subjected to considerable revision. The exercises which appear at the end of each chapter have been changed completely, a revision which will probably be looked on with favor by most teachers who are using the book. One major change in the order of presentation of the material has been made. All discussion of rates of reaction has been collected into one chapter and that is the fifteenth in the new edition, whereas the chapter on kinetics was the eighth in the old edition.

The major changes in content are found in the following chapters: 1. The Atomic Nature of Matter; 8. The Direction of Chemical Change; 12. Electrical Conductance and Ionization; 15. Chemical Kinetics. In the

first of these there has been a considerable increase in the discussion of radioactivity, the separation of isotopes, and nuclear reactions. These sections will serve as a good introduction to this field of work which has attracted so much attention in recent years. The chapter on the direction of chemical change has been expanded to include discussions of the third law of thermodynamics, entropies and the use of statistics in the treatment of thermodynamic problems. The latter subject is presented in a very condensed form and will probably seem like a jumble of formulas to the average student. It should suffice, however, to arouse the interest of the better students. The chapter on conductance and ionization has been rewritten into what the reviewer considers a better order of presentation and considerable additions have been made dealing with the Debye-Hückel theory, concentrated solutions, non-aqueous solutions, and fused salts. The chapter on chemical kinetics, besides including some sections which were in other chapters in the earlier edition, has been amplified to include a discussion of the application of statistical methods to the study of reaction rates.

Some other revisions which are less extensive but nevertheless important are found in several other chapters. The treatment of solutions is begun with a discussion of the vapor pressure relationships instead of osmotic pressure. This change represents a considerable improvement but it is unfortunate that the authors fail to make the correct distinction between Raoult's and Henry's laws. The chapter on ionic equilibria in solutions of weak electrolytes has been rewritten so that all of the discussion of acids, bases and hydrolysis has been expressed in terms of the Brønsted theory.

In spite of the many additions and virtually no deletions the publishers have reduced the size of the book from 664 to 551 pages. In order to do this they have used a smaller type than in the previous edition, a change which makes reading of the book somewhat of a strain on the eyes. Otherwise the make-up of the book is quite satisfactory. All things considered most people will find this edition a considerable improvement over the previous one.

G. K. ROLLEFSON

Ultra-violet Light and its Applications. Including a Description of the Numerous Practical Applications Found for Ultra-violet Light and Fluorescence in the Industries, Sciences, and Arts. By H. C. DAKE, Editor, *The Mineralogist Magazine*, and JACK DE MENT, Associate Editor, *The Mineralogist Magazine*. Chemical Publishing Company, Inc., 234 King Street, Brooklyn, N. Y., 1942. viii + 209 pp. 14.5 × 22 cm. Price, \$3.25.

This is the third in a series of books by the same authors on fluorescent light and related topics. The object, as stated by the authors, is to present the many applications of ultraviolet light. An idea of the scope may be obtained from the following chapter headings: Criminology and

Police Science; Military Applications; Advertising, Display, Theatrical; Medical Sciences; Microscopy; Chemistry; Spectroscopy; Petroleum and Mining. It is obvious that in a small volume of two hundred pages these topics can be treated only in a very brief fashion. The discussion is very general rather than specific. A great number of applications are merely mentioned. Under "Criminology and Police Science," the fluorescence of different parts of the body and body fluids is discussed as well as identification of paints, inks, papers and ceramics. The military applications include among others the use of ultraviolet light in blackout situations and in reading secret messages and identifications.

In the chemistry section fluorescent tests are given for about forty-five elements and eighty-five organic compounds. In many cases these are simply stated without giving quantities, sensitivity or references. Apparently the authors had no intention of listing all of the fluorescent tests for a given element nor of selecting the best available. References are given in some cases.

The authors state in the preface that the book is written in a practical non-technical manner. This has certainly been accomplished and the presentation will not be wholly to the liking of the trained scientist. In reading it one has the feeling of vagueness and sweeping generalities. The chemist must object to the use of "tetrahydroxyflavanol" as a test for aluminum or beryllium without any indications as to which of the tetrahydroxyflavanols is intended.

A glossary of simple terms, a list of dealers in supplies, (chiefly those of the west coast) and a limited bibliography are given.

C. E. WHITE

BOOKS RECEIVED

December 10, 1942-January 10, 1943

L. B. JENSEN. "Microbiology of Meats." The Garrard Press, 119-123 West Park Avenue, Champaign, Illinois. 252 pp. \$4.00.

JOSEPH NEEDHAM. "Biochemistry and Morphogenesis." The Macmillan Company, 60 Fifth Avenue, New York, N. Y. 785 pp. \$12.50.

MARK PLUNGIAN. "Cellulose Chemistry." Chemical Publishing Company, Inc., 234 King Street, Brooklyn, N. Y. 97 pp. \$2.25.

ERNEST POLLARD AND WILLIAM L. DAVIDSON, JR. "Applied Nuclear Physics." John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 249 pp. \$3.00.

H. U. SVERDRUP, MARTIN W. JOHNSON AND RICHARD H. FLEMING. "The Oceans, their Physics, Chemistry, and General Biology." Prentice-Hall, Inc., 70 Fifth Avenue, New York, N. Y. 1087 pp. \$10.00. (Text Edition, \$8.00.)