NEW BOOKS

The Condensed Chemical Dictionary. Compiled and edited by the Editorial Staff of the Chemical Engineering Catalog. FRANCIS M. TURNER, Editor. Second edition, completely revised and enlarged under supervision of THOMAS C. GREGORY, Editor, and ISABELLE M. WELCH, Assistant Editor. Book Department, The Chemical Catalog Co., Inc., 419 Fourth Avenue, at 29th Street, New York, U. S. A., 1930. 551 pp. 16 × 23.5 cm. Price, $10.00.

This book is essentially a list of useful chemical materials, the substances employed and produced in the chemical arts and industries, together with such information as formulas or compositions, colors, important properties, constants (d., b. p., m. p.), solubilities, derivations, grades, commercial containers, shipping regulations, fire hazards, etc. The cross indexing is unusually complete. The new edition contains some 12,000 titles as compared with about 7000 in the old. In spite of this very considerable increase in contents the volume is less bulky and more easily handled than the earlier one because of the use of thin paper and smaller type. The preferred usages of the American Chemical Society with regard to spellings and terminology are in general followed, although it is to be regretted that in this second edition as well as in the first, a few obsolescent forms such as sulfocyanide (for thiocyanate) are still used.

The book is especially valuable to the general chemist because of the inclusion of trade and proprietary names in great variety, in spite of the fact that a few common names (vitreosil, chromel, pyrex) for some reason do not appear in their respective alphabetical positions. The relationship of this volume to the bulky Chemical Engineering Catalog issued by the same publishers is close; and, although the general appeal of the Dictionary is to the industries, it furnishes much general information of interest to all chemists and not easily found elsewhere.

WILLIS A. BOUGHTON

L'Ancienne et la Nouvelle Théorie des Quanta. (The Old and New Quantum Theories.) By EUGÉNE BLOCH, Professor of Physics at the Sorbonne. Librairie Scientifique Hermann et Cie., 6, Rue de la Sorbonne, Paris, France, 1930. iii + 417 pp. Illustrated. 16.5 × 25 cm. Price, 90 fr.

This book, based on courses of lectures given by Professor Bloch at the Sorbonne in 1926–1927, 1927–1928 and 1928–1929, furnishes the most satisfactory introduction to the quantum theory that the reviewer has seen. It is elementary, in the very best sense of the word, in that it contains a clear, coherent and detailed discussion of the nature of the fundamental concepts of the old and new quantum theories, and presents simple and important examples of their application, without the burden of more complicated ones. It thus differs from those treatises which appear to contain a hodge-podge of everything the authors have ever heard about, unillumined by any clear understanding of the theoretical basis upon which

they are presumably proceeding. It is written in a French which seems clear and beautiful even to one but meagerly acquainted with that language. Its translation into English to make it more widely available would seem eminently desirable.

After an introductory historical chapter which sketches the course of development both of the old and new theories, the first half of the book is devoted to the exposition of the old quantum theory, including a well-balanced correlation with experimental results. This part of the book also contains a useful chapter on fundamental results of analytical mechanics.

The second half of the book is devoted to the new quantum mechanics, and here the author's clear treatment of fundamental notions is in especially pleasing contrast to the work of minor scientists who hurry into print with the complicated applications of theories that they do not understand. The author first considers the waves of de Broglie and the actual experiments showing the wave character of the electron. This is followed by chapters on the wave mechanics of Schroedinger, and the matrix mechanics of Heisenberg, including a demonstration of their equivalence. Clear expression is given to modern ideas as to the principle of indeterminism, and the fundamental wave-particle duality in nature.

The transformation theory of Dirac and his treatment of the electromagnetic equations are not presented. The book concludes with a very good introduction to the new forms of statistical mechanics. It contains a fairly complete Table of Contents but no Index.

RICHARD C. TOLMAN

Chimica Farmaceutica e Tossicologica (Inorganica ed Organica). (Pharmaceutical and Toxicological Chemistry.) By BERNARDO ODDO, Professor at the University of Pavia. Casa Editrice, Dottor Francesco Villardi, Milan, Italy, 1930. Vol. I, vii + 486 pp. Vol. II, xii + 505 pp. Illustrated. 16.5 × 25 cm. Price, complete, lira 120.

This treatise is essentially a reproduction of the author's course of instruction in pharmaceutical and toxicological chemistry, including a brief exposition of the broader aspects of the subject. Departing entirely from the arbitrary custom of dividing the medico-pharmaceutical products into inorganic and organic groups, the author follows a pharmacological scheme of classification, treating the subject, in Vol. I, under the following heads: antiseptics, caustics, tonics and hematinics, purgatives, emetics, diuretics and uric acid solvents, vermifuges, vasodilators and -constrictors, while Vol. II is given over to antiseptics, anesthetics, sedatives, hypnotics, carbohydrates and artificial sweeteners, active principles of essential oils, alkaloids, glucosides, extractives, biological products, certain highly toxic principles and drug accessories. Throughout the entire work frequent reference is made to structural chemistry as related to pharmacological

action for the proper evaluation of various synthetic drugs, in connection with the reasons for arriving at certain conclusions, and how it is possible to conceive and prepare new drugs to be tested pharmacologically. The treatise concludes with a chapter on toxicological analysis, in addition to a table of atomic weights, conversion tables and a comprehensive index.

W. O. EMERY

Die Kolloide in Biologie und Medizin. (Colloids in Biology and Medicine.) By Professor Dr. H. BECHHOLD, Director of the Institute for Colloid Research, Frankfort-on-Main. Fifth, revised edition. Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany, 1929. xii + 586 pp. 87 figs. 16 × 23 cm. Price, unbound, RM. 32; bound, RM. 35.

In this fifth revised edition, Bechhold's well-known book has been brought up to date. The extent to which the author has mastered the increase in knowledge since the first edition appeared (1912) may be judged by the fact that the present edition, though greatly increased in scope, has almost been maintained in size within the limits of the first edition. This achievement may partly be ascribed to the nature of the recent developments in knowledge, many of which have replaced bulky empiricisms with concise theoretical formulations, partly to the splendidly critical sifting of material practised by the author. Any author who restricts his presentation to the most essential methods of a science which is in rapid development will inevitably stimulate discussion not only of the material included, but of that omitted.

The original subdivisions which proved so fruitful a means of presenting the vast material have remained unchanged. The first part of the book deals with the definitions and methods of colloid chemistry. Here considerable changes over the previous form have occurred and the author has brought the new material into the old plan without giving that feeling of lack of homogeneity which attaches to so many "revised" editions.

The second part is entitled "biocolloids." The main chapters are concerned with carbohydrates, lipoids, proteins, foodstuffs, enzymes and, as a new addition, immunity reactions. This chapter was written in collaboration with Dr. Laszlo Reiner. References to the current literature render these chapters extremely valuable, even though it be impossible to cover the immense field which might be comprised under the chapter heads.

Part three deals with the organism as a colloid system. In this part Bechhold has presented a great amount of histological, physiological and biological material from the point of view of the colloid chemist. To all those who are interested in medical science, this part, written with a profound knowledge of the problems involved, will be very stimulating. This is a clever selection of those fields in which the phenomena can at least be considered at this time.

Part four, finally, gives some of the applications of colloid chemistry to toxicology, pharmacology and microscopical technique. The very complete index, together with the references to the original literature, will be of great value to those who wish to follow the indicated problems.

For the sake of the reader with medical training, Bechhold has avoided, wherever it seemed possible, the use of mathematical formulas. It might be questioned if the medical reader ought not to be educated in the understanding of mathematical formulations through just such a book in which colloid chemistry is brought into contact with biology and medicine.

It may be concluded, I think, that the hope expressed by reviewer L. J. Henderson in these pages regarding the first edition, namely, "that this work will, through future editions, grow up with the subject" is in large part fulfilled by this new edition.

ALEXANDER VON MURALT

An Index to the Chemical Action of Microörganisms on the Non-Nitrogenous Organic Compounds. By ELLIS I. FULMER, Ph.D., Professor of Biophysical Chemistry, and C. H. WERKMAN, Ph.D., Associate Professor of Bacteriology, Iowa State College, assisted by Anella Wieben and Calvin R. Breden, Instructors in Chemistry, Iowa State College. Charles C. Thomas, Publisher, 220 East Monroe Street, Springfield, Illinois, 1930. xiii + 198 pp. 15.5 × 23 cm. Price, $4.50.

When we consider that there is probably no organic compound in nature that is not attacked by some microörganism, we must admire the courage of the authors in undertaking this index. They have delimited the field, however, by considering only "those instances in which a named organism acted on a named substance to produce a named compound." The material is arranged in three tables: Table I featuring the organisms, Table II the substrates and Table III the products. Each table includes the other two subjects and the references to the authorities cited—about 500 in number. The book contains much information in a compact and usable form. Every worker in the field of fermentation will want to have it on his desk for ready reference.

The chief criticism that must be made of the book is its incompleteness. While some subjects are treated rather fully, others are barely mentioned, or entirely neglected. No mention is made of the organisms which Conrad, Wehmer and Henneberg isolated from sauerkraut and to which they attribute the formation of this important food. In listing *Cl acetobutylicum*, the commercial butyl alcohol organism, the authors omit the paper on which the name is based. The fermentation of cellulose is dismissed with three references, while at least a half dozen important papers by Omelianski, Kellerman, *et al.*, Hutchinson and Clayton, Coolhaas, and Itano and Arkawa are omitted. The general occurrence of methane as a fermentation product in marshes, manure piles and the intestinal tract of animals would

certainly entitle it to a place in the products table, but it is not listed, nor is Omelianski's organism, *B. methanigenes*, which produces it, given in the table of microörganisms. Two references are given to the formation of mannitol but the classic papers of Gayon and Dubourg, Van Steenberge and Müller-Thurgau and Osterwalder are left unnoticed. The production of pyruvic acid and acetaldehyde by yeast is well indexed but some reference should also have been made to the equally important intermediate compounds, hexosephosphate and methyl glyoxal.

Some errors in the content of the tables have been noted. On page 73 it is said that propionic acid is formed by *Diplococcus pneumonia*. A careful reading of Brieger's original paper shows that not *Diplococcus pneumonia* but an unnamed short rod was the causal agent. The organism which is called *B. mobilis* on page 22 appears as *B. motilis* on page 84, and in the original paper by Orla-Jensen is given as *B. nobilis*. The reference, Mayer 1898, given in the tables does not appear among the references in the bibliography. Of forty references selected at random, sixteen contained more or less serious errors. The reviewer anticipates for the book a large demand which will call forth future editions and permit correction and expansion of its contents.

W. H. PETERSON