obtained. To prepare larger quantities, successive portions of saponification mixture may be extracted with the dil. petroleum ether extracts from the earlier extractions, to economize in the use of solvent. For purification, the alcohol is best converted to the acetate (by passing dry hydrogen chloride into a warm solution in 2 to 3 molecular equivalents of acetic acid), and this fractionated at reduced pressure, yielding cetyl acetate; m. p., 22.7°; b. p., 184° (5 mm.) (corr.). Partial purification is possible by several recrystallizations of the spermaceti from acetone before saponification. The alcohol cannot be purified by recrystallization except with considerable loss.

CONTRIBUTION FROM THE
RESEARCH LABORATORY
STANDARD OIL COMPANY
WHITING, INDIANA

MERRILL A. YOUTZ

RECEIVED MAY 21, 1925
PUBLISHED AUGUST 5, 1925

NEW BOOKS

The Effects of Ions in Colloidal Systems. By Dr. LEONOR MICHAELIS, University of Berlin. At present, Professor of Biochemistry at the Aichi Medical University in Nagoya, Japan. Williams and Wilkins Company, Baltimore, Maryland, 1925. 108 pp. 7 figs. 13 × 19 cm. Price $2.50.

This little book is based on a series of lectures given by the author last year in this country. It deals with the colloid chemistry of aqueous solutions, largely from the viewpoint of the adsorption of ions. Some of the topics considered are the origin of electric double layers, the adsorbent properties of charcoal, the flocculation of colloids by electrolytes, the Donnan equilibrium and the lyotropic effects of ions. The discussion is based on experiments taken, for the most part, from the author's own work.

One source of confusion in colloid chemistry has been the danger of generalizing from experiments made with material whose nature was too little understood. Thus, a difference of opinion between Michaelis and Bayliss seems to have been due to the latter's failure to recognize the presence of calcium in filter paper. Some of Michaelis' own generalizations about adsorption by charcoal have had to be qualified in the light of recent American work with pure-sugar charcoal instead of blood charcoal. The classification of agar as electrically indifferent is not in accord with recent work indicating that it behaves as an ionizable calcium salt of a carbohydrate-sulfuric acid.

Apparently it was impossible for such productive workers as Professor Michaelis and Jacques Loeb to keep fully posted on each other's writings. Thus Loeb's suggestion concerning the possible capillary activity of hydroxyl ion turns out to have been made by Michaelis several years before. In criticizing Loeb's attempt to identify cataphoretic potentials with mem-

brane potentials, Michaelis fails to mention that Loeb's later experiments led him to publish his change of opinion on this point. It is interesting to note that the Hofmeister series actually occurs in the swelling of certain colloids in high concentrations of salt, while valence effects may predominate in lower concentrations. Unfortunately, however, the complete explanation of such ion series is not yet available; different series are found in different cases.

The book represents a good attempt to bring order out of chaos in a field where order is greatly to be desired. It should be of value to all those, whether their interests are mainly biological or inorganic, who are trying to apply chemistry to the study of colloids.

DAVID I. HITCHCOCK

Modern Inorganic Chemistry. By J. W. MELLOR, D.Sc. New edition. Longmans, Green and Company, 55 Fifth Avenue, New York, 1925. xx + 1103 pp. 369 figs. 19 × 13 cm. Price, $4.25.

This is a new edition, somewhat enlarged and modernized, of the text which appeared originally in 1912. To the casual glance it has a disarming appearance of smallness; examined more carefully it will be found to be a compendious treatise, thanks to its very fine print and thin paper.

It is written from the inductive and historical point of view, with keenness, breadth of vision and enthusiasm. Moreover, there are hundreds of excellent tables and diagrams, questions and problems, and a wealth of apropos and inspiring quotations. The author is always the earnest teacher, but he is lucid, interesting and astonishingly widely read.

The text assumes no previous knowledge of the subject on the part of the reader; nevertheless, in the opinion of the reviewer it is not suited to the ordinary beginner. On the other hand, the mature student, the advanced student or the teacher of chemistry will find this a most helpful, useful and interesting book.

ARTHUR B. LAMB

College Chemistry. By LYMAN C. NEWELL, Professor of Chemistry, Boston University, Boston, Massachusetts. D. C. Heath and Company, Boston, New York, Chicago, Atlanta, Dallas, San Francisco; London; 1925. vi + 645 pp. 213 figs. 20.5 × 14 cm. Price $3.00.

"This book is based on the courses in general chemistry as given by the author at Boston University during the last ten or more years. Throughout its preparation the need of the student has been kept constantly in mind, particularly his need of a book from which he can readily learn the fundamentals of chemistry. This thought has determined largely the style, arrangement and scope, especially in the first half of the book."

This paragraph from the preface explains the origin, the purpose and the aim of the book. It is evident that the author has succeeded admirably in living up to the standards he has set for himself. The book

throughout is written in language the beginner can understand, yet the treatment is thorough and up-to-date. It is a splendidly written book prepared by a successful teacher.

The order in which topics are discussed departs somewhat from the conventional sequence of the textbooks. After an introductory chapter and one on oxygen, there is a discussion of carbon and its oxides. The order of the Periodic Table is disregarded pretty generally throughout the volume. Nitrogen precedes sulfur; fluorine, bromine and iodine are far removed from chlorine, and the order of treatment of the metals indicates a desire to maintain interest rather than to follow a hackneyed order.

All the fundamental theories are taken up and the explanations are particularly clear and concise. The theoretical considerations are well intermingled with descriptive chemistry, so the student should tire of neither. Some of the basic theories are introduced rather late in the development of the course. For example, the discussion of atoms and the atomic theory is placed after the first fifth, valence is withheld until after the first quarter and the systematic presentation of the periodic system comes after the volume is more than two-thirds complete.

At the close of each chapter there follows a set of problems based on the principles involved in the chapter. In addition some chapters have a set of exercises which are intended to give a thoughtful review of the important principles which have been discussed. All of these questions are well selected and valuable aids to the teacher.

Probably the most striking feature of the book, so far at least as its contents are concerned, is the omission of the usual brief discussion of organic chemistry. In its place there are chapters on fuels and illuminants, plant life and its products and animal life and foods, in which the significant organic compounds are given a natural setting in relation to life. The last chapter is devoted to a brief discussion of the structure of atoms.

The book is freely illustrated with half tones of some important commercial processes and line drawings of pieces of apparatus. The author's interest in historical chemistry is revealed by the frequent use of photographs of prominent chemists. The illustrations have been wisely chosen and skilfully used, adding much to the interest and value of the book.

The mechanical features of the book are excellent. The type is clear and both fine print and bold face have been used effectively and with discrimination. Cross references are frequent, and errors, inherent in first editions, are remarkably few. The appendix is brief and the index full and complete. The laboratory manual is being prepared.

The author has kept constantly in mind the development of his student readers. Nowhere does this fact stand out more clearly than in the closing sentences of the book: ".....chemistry is not a static science. It keeps pace with the discovery of new facts. Our aim should be two-fold—*first,*

acquire a broad fundamental knowledge of well-established facts, principles, and theories, and *second,* be ready to modify our knowledge with the progress of science."

B. S. HOPKINS

Allen's Commercial Organic Analysis. Vol. III. Hydrocarbons, Asphalt, Phenols, Aromatic Acids, Modern Explosives. Fifth edition, revised and in part rewritten. Edited by S. S. SADTLER, E. C. LATHROP AND C. A. MITCHELL. P. Blakiston's Son and Company, 1012 Walnut Street, Philadelphia, Pennsylvania, 1925. ix + 732 pp. 36 figs. 24 × 16 cm. Price $7.50.

The first and second volumes of this new edition have been reviewed in the April, 1924, and July, 1925, numbers of THIS JOURNAL. Much of the description of the work and the praise for the thoroughness of the revision in these earlier reviews apply equally to this volume. The third volume includes Hydrocarbons (except benzene and its homologs, but including coal-tar and pitch), Bitumens (including petroleum and its products), Naphthalene and its Derivatives, Anthracene and its Associates, Phenols, Aromatic Acids, Gallic Acid and its Allies (not including tannic acid and tannins), Phthalic Acid and the Phthaleins, and Modern Explosives. The arrangement and classification of the materials seem to have been less well worked out in this volume than in the earlier volumes of the set. In parts of the volume there is a classification by use and in other parts by chemical composition. Although there is a chapter heading "Hydrocarbons," we are informed that "Benzol and its Homologs" has been transferred to Volume VI to bring it in the same volume with "Dye Intermediates and Dyes," and yet this volume includes Naphthalene and Anthracene and many of their derivatives which are primarily dye intermediates. The naphthols and their sulfonic acid derivatives are discussed, but not the naphthylamines and their sulfonic acid derivatives. The chapter on Explosives describes the testing and analysis of explosives of very varied chemical nature. But in the chapter on Aromatic Acids, chemical relationships serve to bring together many substances of quite varied industrial use including, among others, phenol sulfonic acids, benzoic acid, benzaldehyde, oil of bitter almonds, acetophenone, saccharin, cinnamic acid, oil of cinnamon, coumarin, balsams (but not other oleoresinous exudations), salicylic acid, oil of wintergreen, oil of sweet birch, salol, aspirin, salicylates of alkaloids, vanillin. The user of the book would probably prefer to have these essential oils classified with the other essential oils. This lack of a more definite scheme of classification has even resulted in some duplication which has escaped both editor and indexer, as may be seen by a comparison of p. 236 with pp. 367 and 368. These defects, however, are of relatively minor importance.

Authors, editors and publishers deserve the thanks of the profession.

GRINNELL JONES

Organic Medicaments and their Preparation. By ERNEST FOURNEAU, Head of the Laboratory for Therapeutical Chemistry in the Pasteur Institute. Authorized Translation by W. A. SILVESTER, with Prefaces to the French Edition by EMILE ROUX, Director of the Pasteur Institute, and to the English Edition by GEORGE BARGER, D.Sc., Professor of Medical Chemistry, University of Edinburgh. P. Blakiston's Son and Company, 1012 Walnut Street, Philadelphia, 1925. x + 262 pp. 22 figs. 24 × 16 cm. Price $4.25.

This fascinating book is a translation of the French volume containing the lectures and the practical training in the synthesis of organic medicinals that M. Fourneau organized and presented in Madrid in 1917, at the request of the *Junta para Ampliacone de Estudios*. The English edition has been brought up to date by appendices to each chapter.

The book does not pretend to cover completely the field of synthetic organic medicinals, but merely summarizes the knowledge along several lines in which the author has been particularly interested and in which he has had much experience.

It is not an ordinary text for it contains, in addition to the general and specific discussion of synthetic medicinals, information of all kinds; the calculation of costs, details on the uses of the medicinals, a chapter of general remarks about the relation of physiological action to chemical constitution, a few pages on the elimination of medicinals by the organism and on disinfection.

The last third of the book is devoted to the practical part which covers in a thorough manner the common laboratory apparatus and procedures used in organic chemistry, and directions for the synthesis of various medicinal compounds, starting with very simple organic substances. The preparations are of special interest to the student because in every instance they lead to compounds of practical value.

The book has an appeal to any who have a scientific interest in drugs, whether they are primarily organic chemists, pharmacologists, pharmacists or even manufacturers of medicinals.

ROGER ADAMS