

It contains numerous tables of comparative rates of hydrogenation of related compounds.

Chapter 5, 148 pages, contains a comprehensive and exhaustive summary of the use of hydrogen isotopes and its relation to the understanding of the mechanism of hydrogenation reactions.

The last chapter, "The hydrodesulfurization of liquid petroleum fractions," 122 pages, seems to be more suitable for a book dealing with petroleum processing reactions.

Volume 5 of "Catalysis" contains an excellent survey of the literature in the various fields of catalytic hydrogenation reactions and as such is highly recommended to those interested in catalysis and particularly in hydrogenations and related reactions.

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Introduction to Protein Chemistry. By SIDNEY W. FOX, Professor in the Chemistry Department, Florida State University, and Director of the Oceanographic Institute, and JOSEPH F. FOSTER, Professor of Chemistry, Purdue University. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. viii + 459 pp. 15.5 × 23.5 cm. Price, \$9.50.

The authors have aimed to provide a text that would be an outline of knowledge for a course in protein chemistry; more time would then be available in class for the elaboration of selected topics. They have gone far in achieving their goal.

Of the 440 pages of text, about 130 have been devoted to a discussion of amino acids, about 60 to peptides and the remainder to proteins. The discussions are both general and specific and are logically and clearly presented. The student who assimilates the information in this book probably will know all that he needs to know about protein chemistry unless he wishes to specialize in the field. The specialist will find the volume a good review of infrequently used information that may have become hazy.

A few inconsequential errors have been noted. The discussion of essential amino acids (top of p. 14) seems to have gone astray. One may question whether a typical hydrolysis with hydrochloric acid (p. 75) uses as little as 3 to 5 parts of acid per part of protein. Figure 8-1 (p. 133) shows apparatus for paper electrophoresis not paper chromatography as the text reference states. The structure of phenyl isothiocyanate (p. 152) is incorrect.

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Cahiers de Synthèse Organique. Méthodes et Tableaux d'Application. Volume II. Elaboration des Structures. 3. Alcoylation en série aliphatique. 4. Alcoylation en série aromatique. 5. Arylation en série aromatique. By JEAN MATHIEU et ANDRÉ ALLAIS, Ingénieurs-Docteurs. Published under the direction of LÉON VELLUZ. Masson et Cie., 120 Boulevard Saint-Germain, Paris VI^e, France. 1957. 322 pp. 16 × 22.5 cm. Price, broché: 4,000 frs.; cartonné toile 4,400 frs.

The series by Mathieu and Allais represent probably the most up-to-date volumes on Organic Synthetic Reactions which are available in the French language today. This volume is organized according to the types of bonds which are formed in particular reactions, much along the lines of Theilheimer and Weygand's classification. The present volume is concerned mostly with alkylation reactions with a small additional section on arylation. The organization consists usually of a review of the various types of reactions which are available for a particular goal. This is followed by a general consideration of mechanisms and then examples are given of the application of the particular reaction under discussion. The good points of the book include mention of reagents and conditions as well as yield, and the references include a large number to the recent literature and an unusual number to the English literature in contrast with other French chemistry books. The volume certainly represents a useful and interesting survey of many

of the methods which are available without attempting to be exhaustive in considering any of them. At least a general idea is given of the variety of methods which might be employed in a given synthetic scheme. One might have wished a more thorough interweaving of the qualitative mechanisms of the reactions under consideration with the description of the particular method. It is true that, as has been mentioned above, some discussion of mechanism precedes the various sections of the book but this is not nearly as effective as would have been treatment of mechanisms together with the particular reactions under discussion. A number of synthetic reactions of considerable importance have been left out, such as the alkylation of enol ethers by alkoxyocations which has been so successfully used in recent syntheses of vitamin A; the Wittig reaction which is proving of considerable interest in the synthesis of complex olefins; and the alkylation of ketones through their enamines.

The examples are, in general, well chosen and useful. There are, however, a few cases where the reviewer would take exception with statements in the book. For instance, the difficulty involving enol ether formation in the Stetter synthesis of long-chain fatty acids is not mentioned (page 60). The suggestion on page 61 that formylation of a ketone is a useful device to achieve monoalkylation should be qualified with the statement that this is, in effect, only useful for the specific case of methylation. The mechanism given for the Carroll reaction which is cited as an example of base alkylation of β -ketoesters is incorrect on page 76 but is more properly illustrated on page 122. The example of alkylation by β -aminoesters is poorly chosen (page 81), since the particular illustration involves neither elimination nor direct displacement of an amino group. This is better treated on page 221.

The reviewer feels that, all in all, this is an interesting addition to the library of an organic chemist involved in syntheses and, in particular, it should prove an extremely useful volume for those who wish to learn chemical French in a profitable way.

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GILBERT STORK

Tracer Applications for the Study of Organic Reactions
By JOHN G. BURR, JR. Atomic International Division, North American Aviation, Inc., Canoga Park, Calif. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1957. x + 291 pp. 15.5 × 23.5 cm. Price, \$7.50.

This book was written with the intention of presenting to the organic chemist a picture of the broad capabilities of isotopic tracers in investigating organic reaction mechanisms and other aspects of theoretical organic chemistry. It is essentially a mammoth review article, giving references to and discussions of a great many of the reports of applications of tracers in these areas. The applications are classified according to the type of compound or type of reaction studied. The book is not intended to serve as a laboratory manual or a guide to techniques, but rather as an exposition of the kinds of information which may be gained using isotopic tracers, and as a guide to the design of experiments.

The subjects covered include, by chapter: general considerations for the use of isotopic tracer methods; a discussion of isotopic exchange reactions; proton transfer in nonaromatic systems; nucleophilic displacements in nonaromatic substances; exchange reactions in aromatic systems; free radical processes; carbonium ion processes; molecular rearrangements with specific mechanisms; reactions of the carbon-oxygen bond; the oxidation of aliphatic molecules; polymerization reactions; miscellany (here are included discussions of papers on the Fischer-Tropsch synthesis, the Fischer indole synthesis, the Mannich reaction, the Elbs reaction, and assorted others); and the structure of molecules and stable intermediates. There are appendices containing lists of general references and references which appeared after the text was complete. There is also an author and a subject index.

Part of the value in this book lies in the assembly in one place of leading references to and brief abstracts of papers in a number of fields where the literature has been until now poorly indexed. The worker interested in the application of tracers in one of these areas will find the book attractive for

this feature. The value is reduced, however, by the large number of typographical errors which are scattered throughout the book and references.

A second valuable contribution which might well be expected from such a book is a critical discussion of the collected data. In a few instances this has been given. The discussions on deuterium solvent isotope effect and on intrinsic migration aptitudes, for example, are clear, concise and cogent. Much of the reporting, however, is uncritical and occasionally observations which are open to serious question are presented without editorial comment. A fairly broad grounding in theoretical organic chemistry on the part of the reader is assumed. Because of these two circumstances, the book cannot be recommended for the unsophisticated student of organic chemistry. The drawbacks are less serious for the advanced worker or specialist who intends to use the book as a guide to the literature of isotopic tracing through 1952.

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AKSEL A. BOTHNER-BY

Gmelins Handbuch der Anorganischen Chemie. Platin. Teil D. Komplexverbindungen mit Neutralen Liganden. System-Nummer 68. E. H. ERICH PIETSCHE (Editor). Verlag Chemie, G.m.b.H., Weinheim/Bergstr., Germany. 1957. lix + 638 pp. 18 × 25.5 cm. Price, \$90.00.

This is the final portion of the treatment of the element platinum. It covers, through 1953, the literature on complex compounds of platinum with neutral ligands. Following 38 pages of general introductory discussion, 425 pages deal with complexes of divalent platinum and 150 pages with those of the quadrivalent element. Compounds containing both divalent and quadrivalent platinum, divalent palladium and quadrivalent platinum and platinum organic compounds not containing neutral ligands occupy the remaining 15 pages. There is a convenient index in which the complexes are classified by the kind and number of ligands.

There is every evidence that the encyclopedic coverage characteristic of other parts of the great Handbuch has been maintained in this volume.

NATIONAL BUREAU OF STANDARDS
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EDWARD WICHERS

Elements of Classical Thermodynamics for Advanced Students of Physics. By A. B. PIPPARD, M.A., Ph.D., F.R.S., Lecturer in Physics in the University of Cambridge and Fellow of Clare College, Cambridge. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. 1957. vii + 165 pp. 14.5 × 22 cm. Price, \$4.75 (cloth); \$2.75 (paper).

Pippard attains the fine level of excellence one is accustomed to find in books from the Cambridge University Press. Succinct but not brief, thorough but not boring, instructive but not pedantic describe the general tenor.

In the author's words, "... this is probably not a suitable textbook for the beginner, but I hope the more advanced student will find here a statement of the aims and techniques which will illuminate any specialized applications he may meet later." Both the text and the set of 14 rather difficult exercises are gauged for this level.

Little mention is made, as the title would indicate, of statistical ideas. The first three laws are stated and developed from a classical viewpoint, and then applied to many of the most interesting simple systems and their changes. Little attention is paid to chemical systems and changes as such, for the book is written largely for students of physics and mathematics. Applications to adiabatic and isothermal changes, to phase equilibrium, to radiation, to magnetic fields, to phase transitions of various orders, are well done. The thermodynamic inequalities concerning the increase in entropy, the decrease in availability (free energy), and the conditions of equilibrium are given good coverage.

The terminology is, of course, not that used in this country. Perhaps the book should be read by American students just to acquaint them with the provincialism of our scientific language. It might also remind ever more Americans of the desirability of international agreement on scientific

terminology. The needs may not be as pressing as in the political arena, but each added area of mutuality should be a step in the right direction.

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J. A. CAMPBELL

The Chemistry of the Steroids. Methuen's Monographs on Biochemical Subjects. W. KLYNE, M.A., D.Sc., Ph.D., Reader in Biochemistry University of London (Post-graduate Medical School). John Wiley and Sons, Inc., 440 Fifth Avenue, New York 16, N.Y. 1957. 216 pp. 12.5 × 19 cm. Price, \$3.50.

One of the aims of this book is "to provide an outline of the chemistry of the steroids for the non-chemical readers... to enable him to discuss his problems with chemists better." This aim was not quite achieved for the truly non-chemical reader for he will find some parts of this book hard to follow. Some of this difficulty lies in the authors' use of chemical terms before they are explained.

The author "hoped that the book may also be useful to chemists whose special interest lies in another branch of the subject." Although there are a few elementary passages, this group will find this book valuable in obtaining a rapid introduction to steroid chemistry. Both groups will appreciate the difficulty in presenting the subject matter to two groups with different background.

The book opens with a brief but interesting chapter on the history of the steroids. The stereochemistry of the ring junctions and the various positions of the steroid molecule is discussed with a short description on the concept of conformation of ring systems. The most vital subject of nomenclature is clearly presented. The application of ultraviolet and infrared spectrometry and optical rotation on structure determination comprises the chapter on physical properties. There are two excellent chapters on the chemical properties of the functional groups on the steroids which will be particularly instructive to the non-chemical reader. The other chapters cover the naturally occurring steroids with brief discussions on the isolation and pertinent chemistry of the more important compounds. The basic methods of separation of the steroids are considered in the last chapter. Only an outline of the methods of determination of steroids is presented since this subject will be covered by a companion book.

This book is written in a very readable style and the text is amply supported with structural formulas and tables. There is a bibliography for each chapter. The references are principally to review articles which make further information on the subjects more accessible to the non-chemical reader. The book is recommended for both the non-chemical reader and the non-steroidal chemist who wish to obtain an introduction to steroid chemistry. It will also be a useful addition to the steroid chemists' library.

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Metallurgy of the Rarer Metals. General Editor of Series, H. M. FINNISTON, B.Sc., Ph.D., A.R.T.C., Head of Metallurgy Division, Atomic Energy Research Establishment, Harwell, Berkshire. No. 2. Zirconium. By G. L. MILLER, Ph.D., B.Sc., A.R.I.C., M.I.Chem.E., M.I.M.M. Academic Press Inc., 11 Fifth Avenue, New York 3, N. Y. 1957. xxi + 548 pp. 14.5 × 22 cm. Price, \$12.50.

This second edition of Dr. Miller's book on zirconium cannot be regarded as a mere up-dating of the first edition issued 4 years ago, but rather as a new book which illustrates, by its 50% greater length and coverage of items not even mentioned in the first edition, both the exuberant growth of zirconium technology during the past 4 years as well as the expanded declassification policy of the USAEC. This volume, therefore, as the third and most recent major text on zirconium to appear within the past 4 years, must be reviewed within the present context of the existence of a voluminous literature as well as of a flourishing technology.