

have been reported. Each chapter and section are provided with an introductory paragraph stating its scope and giving cross-references. The synthetic methods are discussed in detail, followed by mention in smaller type of simple homologs or by extensive tabulation.

This book will be indispensable to anyone working actively in the field and virtually eliminates the need for literature searches through December, 1950, and, for many purposes, for reference to the original literature. Discussion is quite detailed and attention is given to experimental method. Many suggestions for improvement of yields and extensions appear in the text. Some previously unpublished work done in the Quaker Oats laboratories or plants is principally related to process or development research on furfural. A few elucidations or improvements of synthetic methods appear.

Part II (and much related material on furfural in Part I) emphasizes the industrial importance and potentialities of furans. It is authoritatively written and includes physiological properties, uses as an intermediate, solvent applications, and derived resins. An appendix lists resin patents by composition and application.

Little serious criticism need be leveled at the book. The style is excellent and the organization and cross-referencing carefully done. Although coverage is quite complete, the later papers of Morel and Verkade (*Rec. trav. chim.*, **68**, 619 (1949); **70**, 35 (1951)) providing experimental basis for the δ -sultone synthesis of furans (reference to the preliminary announcement appears on p. 38) should be mentioned. The text is relatively free from typographical errors and occasional mistakes in formulas (e.g., furylydantoin, p. 598) will cause no difficulty. It is surprising to see contributing structures for furan called "mirror images" (p. 6), and a decarboxylative nitration explained as involving a "vinylog of a β -nitrocarboxylic acid" (p. 158), in contrast to the original reference. The reviewer feels that much of the discussion is unnecessarily detailed and that a more consistent emphasis of the relationships of chemistry and theory with other aromatic systems would have been more valuable. These limitations seem to decrease the instructional value of the monograph. Many of the postulated intermediates, though taken from or analogous to the literature, lack experimental support and are often speculative. Author and formula indices would have been useful although the subject index is effective.

The typography and binding are excellent although the heavy paper makes the book unwieldy. It is regrettable that it is priced beyond most individuals.

MONSANTO CHEMICAL COMPANY
CENTRAL RESEARCH DEPARTMENT RUSSELL GAERTNER
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Colloides et Gels. By J. DUCLAUX, Chef de Service, à l'Institut de Biologie Physico-Chimique (Fondation Ed. de Rothschild). Gauthier-Villars, Libraire du Bureau des Longitudes, de l'École Polytechnique, Quai des Grands-Augustins, 53, Paris, France. 1953. vi + 292 pp. 16.5 × 25 cm. Price, 2,000 fr. (U. S., \$6.03).

In his introduction the author states that the purpose of this book is to present to the reader a broad understanding of colloid chemistry from the point of view of the available experimental facts, making only indirect reference to theories, and giving little attention to mathematical formulas. The author believes that his book would be useless if it merely repeated the form and content of others.

The author has accomplished his purpose, and this volume presents the essential phenomenology of colloids, especially of the gels, in an interesting manner, and can be read profitably by both beginners and more mature students of the subject. The scholarly treatment is permeated with the author's long experience with the subject dealt with, and with numerous philosophical points of great interest to those who have given considerable thought to the field but, perhaps, not detectable to the beginner. Very few references are given, but this is intentional on the part of the author who does not desire to interrupt the course of his treatment. This is the type of book which can be written only by one who has made the subject his life study.

It is possible to point out a few minor flaws which do not in any way alter the value of this scholarly work. The

author calls specific attention to the correct usage of electrophoresis, but continues to use the term "cataphoresis" for both cataphoresis and anaphoresis. The title of the book implies that colloids are distinct from gels, but the reviewer is certain that the title was chosen to emphasize that gels are given special treatment in the text. The use of the formula $Fe_2(OH)_6$ for precipitated ferric oxide seems somewhat old-fashioned, but this should be the prerogative of any author.

The format of the paper-bound book is excellent, and typographical errors are unnoticeable. However, the publisher of a book on the "glue-like" materials, might be expected to exhibit some knowledge of the subject, and provide better glue to secure the paper cover.

THE RICE INSTITUTE
HOUSTON, TEXAS

W. O. MILLIGAN

Technique of Organic Chemistry. Volume VIII—Investigation of Rates and Mechanisms of Reactions. By S. L. FRIESS AND A. WEISSBERGER (Editors). Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1953. xxiii + 760 pp. 16.5 × 23.5 cm. Price, \$12.50.

It is generally conceded that no single individual can keep up with the literature of modern organic chemistry, and it is becoming more and more fashionable to have advanced works written as collaborative efforts by groups of specialists. The editor of the present series of volumes on the technique of organic chemistry has been particularly successful in coordinating the efforts of a large number of authors, and in the past eight years he has induced about one hundred specialists to turn out eight volumes totaling more than 4,000 pages.

In the opinion of the reviewer, what we might call "common" knowledge as far as most organic chemists are concerned, is that which is obtained from books rather than from the original literature. The need, therefore, is for elementary and advanced books which cover more and different literature rather than what has already been covered by other books. Some collective works like Adams' "Organic Reactions" achieve a remarkable uniformity of scope and style through the efforts of a large and vigorous editorial board. Friess and Weissberger, using more of a catch-as-catch-can approach, have produced an uneven work, which includes everything from somewhat dull abstracts or condensations of other books to superb expositions of material which would require very substantial digging to obtain from the original literature. Furthermore, the chapters range in style from general discussions to detailed and specific directions for special operations.

The book begins with a chapter on the general theory of rate processes which leads into sections on methods of carrying out fundamental operations and special experimental techniques for difficult cases. After consideration of a variety of homogeneous gas- and liquid-phase processes, there is a long section on biological reactions. The book concludes with a chapter on methods for determination of rates of very rapid reactions. As might be expected from a slate of fifteen authors, all of whom are concerned with homogeneous reaction rates and mechanism, there is some duplication among the various chapters. From the standpoint of making available information not readily found except in the original literature, the reviewer was most impressed by the section written by Burnett and Melville on determination of active intermediates in photochemical reactions by the rotating-sector method, the superb section by Leffler and Grunwald on general methods for determination of mechanisms of organic reactions in the liquid phase, and the section on determination of rates of rapid reactions by Roughton and Chance. The chapters by Livingston on general theory of rate processes, fundamental operations, and evaluation and interpretation of rate data, are of considerable importance and will be of substantial help to research workers beginning in the field. However, the viewpoint is that of the physical chemist, and the reviewer thought the author did not fully realize that the modern physical organic chemist almost invariably wants to have more detailed information about organic reaction mechanisms than knowledge of rate laws can afford. Unfortunately, the section which deals with one of the most rapidly expanding of special experimental techniques, isotopic tracer

methods, is uninspiring and out-of-date. As an illustration of the latter failing, the only reference to ionization chamber methods for determination of C^{14} dates from 1946, and there are only four references to papers or books published after the appearance of Calvin's "Isotopic Carbon" of 1949.

Despite its unevenness, there is no question but this volume will be a help to student and research worker alike as a source of information and inspiration for investigations of rates and mechanisms of organic reactions.

GATES AND CRELLIN LABORATORIES OF CHEMISTRY
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Modern Mass Spectrometry. By G. P. BARNARD, B. Sc., Ph.D., A.M.I.E.E., F. Inst. P. of National Physical Laboratory, Teddington. The Institute of Physics, 47 Belgrave Square, London, S.W.1, England, 1953. 325 pp. 16 × 24.5 cm. Price, 50 s. 0 d.

"Modern Mass Spectrometry" was written by Dr. Barnard under commission by The Institute of Physics. As indicated in its title this monograph is of narrower scope than the volume on mass spectroscopy recently reviewed in *THIS JOURNAL*.¹ It is concerned exclusively with the design and application of mass spectroscopes that employ electrical means of ion detection. The purpose of the volume, as defined in the foreword by the Director of the National Physical Laboratory, was to bring together in one place a critical summary of the techniques of application of the mass spectrometer to problems in the various fields of engineering, chemistry and biology. The final monograph turned out to be a critical discussion of the design of mass spectrometers for application to these various fields with a brief discussion of the applications that have been made.

Barnard has done a good job of defining the problems into which the design and construction of a mass spectrometer may be resolved. He has done less well in clarifying the interrelations and particularly the relative importance of these problems. His discussion of the status of the solutions of the design and construction problems has been handicapped by the fact that much useful information acquired in this country during the war years has been inaccessible to him due to the lack of publication of the pertinent results. It may be that the appearance of this volume of Barnard's will stimulate various mass spectrometrists to publish their solutions to some of the problems he has defined. Barnard's clear definition of the problems should furthermore stimu-

(1) D. P. Stevenson, *THIS JOURNAL*, **75**, 3867 (1953).

late workers in this field to seek solutions to the unsolved problems.

The discussion of applications that have been made of mass spectrometers occupies slightly more than the last third of the book—five short chapters. Except for the chapter entitled "Application to Hydrocarbon Analysis," discussions are very sketchy, and the more detailed treatment of hydrocarbon analysis does not add to the extant reviews that have appeared in the last few years in various treatises on physical-chemical methods of analysis.

Workers in the fields of mass spectroscopy will probably want to have a copy of the book readily accessible. Other scientists will find the extensive bibliography helpful in finding answers to their questions with respect to the applicability of mass spectrometer methods to the solution of their problems.

SHELL DEVELOPMENT COMPANY
EMERYVILLE, CALIFORNIA

D. P. STEVENSON

Substances Naturelles de Synthèse. By LEON VELLUZ, Docteur des Sciences Physiques. Masson et Cie, Editeurs, 120 Boulevard Saint-Germain, Paris 6, France. 1953. Volume V: 206 pp. 16 × 22.5 cm. Price, Broche, 2305 Fr.; Carton, 2690 Fr. Volume VI: 156 pp. 16 × 22.5 cm. Price, Broche 1730 Fr.; Carton, 2110 Fr.

These two volumes continue the very interesting series on the preparation of natural compounds and exhibit the excellence that characterized their predecessors. The technical makeup of the books is superb and the subject matter is skillfully handled, covering not only the detailed description of the preparative methods of specific substances such as calciferol, papaverine, histamine, adrenochrome, etc., but offering also a discussion of various topics of general interest to workers in the field of natural compounds such as partition chromatography, ion exchange resins, Diels-Alder addition, synthetic methods for imidazole and benzopyridine systems, etc. It is sometimes difficult to see why specific preparations were selected or the relevance of a particular discussion of a synthetic method to the syntheses described in the text, but this reviewer found the entire approach very fresh and satisfying, perhaps because of the very fact that the topics discussed, although sometimes surprises, are always pleasant ones. The literature coverage appears to be excellent, many references being to original literature published as late as 1952.

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