

central area since that time. This is the period which has witnessed spectacular contributions to our knowledge of protein structure and conformation, to the nature and function of active sites of transferase, dehydrogenase, and transaminase enzymes, to theoretical and practical aspects of multisubstrate enzyme kinetics, to the mechanism of action of a large number of different types of enzymes, and to the coenzymatic functions of biotin and vitamin B₁₂—and this by no means exhausts the list. All these developments would have some bearing on the central topic of this book. No doubt, analogous developments would have occurred no matter when the publication of the volume; there is always a hiatus between the time when of necessity revision must cease and the actual date of publication, as this reviewer knows only too well. But again, perhaps by being less comprehensive, this lag might have been shortened for the most crucial portion.

In summary then this volume will constitute a valuable reference work for anyone interested in inhibitor action, no matter at what level, and no matter what his field; it accounts well for and interprets sometimes brilliantly developments up to 1960, and it will remain a lasting monument to one man's devotion to one important area in molecular biology, with most of contemporary biochemistry as the backdrop.

DEPARTMENT OF CHEMISTRY
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H. R. MAHLER

Handbuch der Analytischen Chemie. By W. FRESENIUS and G. JANDER. **Zweiter Teil, Qualitative Nachweisverfahren, Band IV aα, Elemente der Vierten Hauptgruppe I.** By H. GRASSMANN. Springer-Verlag, VI, Heidelberg Platz 3, Berlin-Wilmersdorf (West), Germany. 1963. 220 pp. 17 × 25.5 cm. Price, steif geheftet DM 57; ganzleinen DM 61.

Quantitative analysis eclipses qualitative, but from time to time every analyst is confronted with detection problems and requires reliable sources of information on procedure. The second part of the admirable Fresenius-Jander Handbuch consists of a series of volumes on qualitative analysis. This volume, belonging to that part, deals with carbon and silicon. Dr. Grassmann meets the difficulty posed by the coverage of the compounds of carbon by limiting his treatment to "seine wichtigsten einfachen Verbindungen." He includes, besides the element itself, carbides, hydrocarbons (methane, ethane, propane, ethylene, acetylene), the oxides, phosgene, cyanogen, cyanide, thiocyanate, formic acid, acetic acid, and some others. The methods described range from simple precipitation and color reactions to those of the modern analytical armamentarium: spectrography in all its forms, mass spectrometry, gas chromatography, neutron activation, etc. The presentation is compact; literature citations are ample.

The section on silicon, approximately 50 pages, deals with the detection of the element, silicic acid, quartz and other oxides, and silicates in general and some in particular. Full use is made of physical methods, but much can still be done by classical slide and color reactions, and these are not neglected.

SCHOOL OF CHEMISTRY
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E. B. SANDELL

Characteristic Frequencies of Chemical Groups in the Infra-Red.

By M. ST. C. FLETT, Research Chemists, Imperial Chemical Industries, Ltd. (Dyestuffs Division), Blackley, Manchester. American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York 17, N. Y. 1963. ix + 98 pp. 13 × 19.5 cm. Price, \$4.50.

The author of this monograph rightly points out in his Preface that infrared spectroscopy is a completely established tool in the armamentarium of the modern organic chemist and that the wide spread availability of simple infrared spectrometers in research laboratories has confronted such workers with the need to reliably translate infrared spectra of organic compounds into useful structural information. This monograph is a contribution designed to aid those to whom infrared spectroscopy is not an end in itself but rather a means to an end, namely structural analysis.

In the opinion of this reviewer the subject monograph, in the main, achieves its author's goal and will be a welcome and much used desk reference in the organic laboratory, especially for those who want quick access to correlation charts of the characteristic frequencies of chemical functional groups or to literature references dealing with the salient spectral features of specific classes of commonly encountered organic compound types.

The advice provided by the author in his Introduction is good and should be heeded by the user. The provision of both wave number and wave length scales throughout the text was wise and allows for easy use by members of both schools of thought. One wonders why the author elected to consider only the carbonyl frequencies of anhydrides and esters as strong absorbers (use of heavy, black, vertical lines) and not such classes as the ketones, carboxylic acids, and amides in view of the fact that later in the text as on pp. 48, 34, and 22, A or ϵ values are provided which show these to be commensurate in intensity with the anhydrides and esters. The degree of precision used in indicating the positions of the absorptions bands throughout the text is often inconsistent, excessive, and certainly unnecessary. Figures good to one part in 8000 are sometimes used in expressing the wave length when the frequency is only known to one part in 1100, e.g., items *d* and *e* on p. 45. Also inconsistent are the references to band ranges as 745–730 (13.4–13.7) in one instance and 1312–1330 (7.62–7.52) in another on the same page (e.g., 43). The characteristic frequency values quoted for the various chemical functions appear reliable and, where uncertainties exist, these are indicated. Considered as a whole, the format of this monograph is good and the text free of typographical errors (only one was found on p. 54 where hydrocarbons was misspelled). The Table of Contents and Index seem adequate and material easily found even without their use. The cost is sufficiently low to make it easily accessible to all having need of it. This monograph, while no substitute for such texts as Bellamy's "Infrared Spectra of Complex Molecules" and Jones and Sandorfy's "Chemical Applications of Spectroscopy," should nevertheless find its way to every organic chemist's shelf as a ready reference.

MERCK SHARP AND DOHME RESEARCH LABORATORIES
DIVISION OF MERCK AND CO., INC. NELSON R. TRENNER
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Progress in Physical Organic Chemistry. Volume 1. By SAUL G. COHEN, Department of Chemistry, Brandeis University, Waltham, Mass., ANDREW STREITWIESER, JR., Department of Chemistry, University of California, Berkeley, Calif., and ROBERT W. TAFT, Department of Chemistry, Pennsylvania State University, University Park, Pa. John Wiley and Sons, Inc., 605 Third Ave., New York 16, N. Y. 1963. ix + 411 pp. 16 × 23.5 cm. Price, \$15.00.

This is the first volume of a new series which aspires to become a forum for exchange of views and for critical and authoritative reviews. Physical organic chemistry is described as being concerned with investigations of organic chemistry by quantitative and mathematical methods.

This first volume comprises five chapters: "Ionization Potentials in Organic Chemistry," by A. Streitwieser, Jr. (30 pp.); "Nucleophilic Aromatic Substitution Reactions," by S. D. Ross (44 pp.); "Ionization and Dissociation Equilibria in Solution in Liquid Sulfur Dioxide," by N. N. Lichtin (34 pp.); "Secondary Isotope Effects," by E. A. Halevi (114 pp.); and "Quantitative Comparisons of Weak Organic Bases," by E. M. Arnett (182 pp.)

These chapters differ in character, from the first chapter's illuminating focus on the main features of a rather new field, to thoroughgoing reviews in the last two chapters. Nevertheless, each is a valuable contribution in its own way. The series is off to a good start. (This reviewer will, however, offer criticism in another context of certain judgments in one of the chapters.)

Clearly, every library with an organic chemistry collection should possess this book.

Despite the quality of this volume, success is not promised either for the volume or for the series. That it will be financially successful for the publishers seems certain. Library sales alone, at this rich price for a slim volume, will no doubt more than cover costs. Perhaps the publishers have thought of this. But that it will be successful as a medium of communication is doubtful.

Were this series the only one of its type catering to the field of physical organic chemistry, it would perhaps become the forum

it aspires to be. But chapters concerning this field also appear in series such as "Advances in Physical Organic Chemistry" (Academic Press), "Advances in Organic Chemistry" (Wiley), "Progress in Stereochemistry" (Butterworths), "Advances in Heterocyclic Chemistry" (Academic Press), and "Advances in Organometallic Chemistry" (Academic Press), as well as in monographs such as Katritzky's "Physical Methods in Heterocyclic Chemistry" (Academic Press) and de Mayo's "Molecular Rearrangements" (Wiley). These volumes are mostly high priced, and few individuals in, say, a university chemistry department are sufficiently affluent and/or interested to purchase private copies of any of them. Consequently, only one to three copies of any book may be extant in the department: the library copy and one or two on professors' shelves. If the library copy is out, none may be available to the graduate student immediately on inquiry. Thus the potential readership for these volumes is not well served, nor are the authors whose contributions fail to be widely read.

It is regrettable that the tradition of publishing excellent review articles in nonprofit review journals such as *Chemical Reviews* has withered in recent years. Such a journal, which in principle can reach the desk of every graduate student as a private subscription copy, can far better serve for the purpose of communication, which is the real purpose of publication.

DEPARTMENT OF CHEMISTRY
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JOSEPH F. BUNNETT

Fatty Acid Metabolism in Microorganisms. By KLAUS HOFMANN, Professor of Biochemistry, University of Pittsburgh School of Medicine. John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1963. xii + 78 pp. 13 × 19 cm. Price, \$3.25.

The material of this book is essentially that presented by Professor Hofmann in the Squibb Lectures at the Institute of Microbiology, Rutgers, in late 1962. The three chapters, "Lactobacillic Acid, A Novel Microbial Metabolite," "Biosynthesis of Cyclopropane Fatty Acids," and "Biosynthesis of Monounsaturated Fatty Acids by Microorganisms" presumably follow the order of the lectures.

In a series of invited lectures it may be assumed that the speaker will discuss principally the results of his own investigations; hence, a book taken directly from the lectures will also deal predominantly with the author's research. This is the case with the present volume, which provides a lucid, detailed review of the very considerable contributions of Professor Hofmann and his group to an understanding of the structure and biosynthesis of the cyclopropanoid and other unusual fatty acids found in microorganisms. These contributions include the determination of the structure of lactobacillic acid, studies of the synthesis of cyclopropanoid acids, a demonstration of the biological conversion of *cis*-olefinic acids to cyclopropanoid acids, and studies of the chain extension of lower molecular weight unsaturated acids to give vaccenic and oleic acids. Earlier portions of the studies dealing with lactobacillic acid have been reviewed elsewhere [*Record Chem. Progr.* (Kresge-Hooker Sci. Lib.), 14, 7 (1953)], but the present volume paints a more contemporary scene.

The author notes in the preface that, "No attempt is made to provide a comprehensive summary of the literature, and . . . contributions have been omitted." This is understandable in a lecture series, but it is also regrettable, since it prevents an author from viewing the field with the sharpest perspective. For example, the ingenious one-step synthesis of *cis*-cyclopropanoid fatty acids by the Simmons and Smith route involving methylene iodide and a zinc-copper couple rates only five lines and no equations, while the vastly more laborious earlier sequence is accorded four pages. Applications of mass spectrometry and nuclear magnetic resonance to proofs of structure of branched-chain, cyclopropanoid and cyclopropanoid fatty acids are not mentioned. The whole subject of fatty acids from *Mycobacterium tuberculosis* is omitted and the chapters dealing with fatty acid biosynthesis in microorganisms neglect recent work of Bloch, Lennarz, Law, and Kodicek. More references to the recent literature would, in general, have been welcome; only six papers appear from 1962.

A minor complaint is that some of the figures and tables are confusing, partly because the same Roman numerals are used

for different compounds in different figures, partly because of space limitations, partly because Table I.3 belongs near p. 28, not on p. 21. The few typographical errors will be apparent to the reader.

This monograph is a very useful summation of the author's work in an active field, but an outstanding book might have resulted from a more comprehensive coverage.

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Reaction Mechanisms in Organic Chemistry. A Series of Monographs. Edited by E. D. HUGHES. **Elimination Reactions.** By D. V. BANTHORPE, Ph.D., Lecturer in Chemistry, University College, London. American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York 17, N. Y. 1963. viii + 215 pp. 14.5 × 21.5 cm. Price, \$8.00.

The idea of a series of monographs, each covering a particular type of reaction mechanism, is a very good one indeed. It is a great pity that Professor Hughes did not live to see the completion of his venture. The quality of the present volume and the caliber of the authors doing the remaining ones make it likely that the series will meet high standards.

Dr. Banthorpe gives very thorough and up-to-date coverage. There are nearly 500 references, many of them as recent as 1962. He covers first the usual E1 and E2 mechanisms, including extended discussions of the effect of structure and environment on rates and product proportions. Following this basic material are chapters on the less usual mechanisms, eliminations in cyclic systems, and other elimination processes such as dehalogenation, alcohol dehydration, and deamination. The book concludes with a long chapter on pyrolytic eliminations.

The general viewpoint is that of the English school, though the ideas of others are, in my opinion, given coverage in reasonable proportion to their importance. There is, for instance, a long discussion of H. C. Brown's steric theories of orientation in eliminations. The conclusions are not sympathetic to Brown, but the facts are there. The presentation is generally clear and well organized. In a few cases too much material is compressed into too little space for the explanations to be sufficiently clear (for example, the paragraph at the bottom of p. 144 on vinylic halides in aprotic media), but such cases are not numerous.

This volume can be recommended warmly to all with a professional interest in elimination reactions, as well as to the general reader who wants a more detailed and critical coverage than is available in the usual textbooks on reaction mechanisms. The size is convenient and the price not unreasonable, though scarcely at the bargain level. If the price could be substantially reduced, a paperback edition of this series should have a wide market among students.

DEPARTMENT OF CHEMISTRY
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W. H. SAUNDERS

Die Rohstoffe des Pflanzenreichs. 2. Lieferung: Antibiotiques
By JULIUS VON WIESNER and CONSTANTIN VON REGEL. Verlag von J. Cramer, 694 Weinheim, Germany. 1963. 272 pp. 16 × 24 cm. Price, F 370.

This survey is a handy, quick reference source for currently known antibiotics, especially for those who read French. The product of a Franco-German effort, the book lists several hundred antibiotics with praiseworthy objectivity. The emphasis given each antibiotic is in reasonable proportion to its clinical or scientific importance while the over-all presentation is a well-balanced one.

The book lists the antibiotics in four classes: those of microbial origin; antibiotics from *Actinomycetes*; those derived from fungi; and, finally, those obtained from lichens, plants, or molds. This classification, together with the further listing of individual antibiotics in alphabetical order, leaves much to be desired. One had wished to see antibiotics of one family (tetracyclines, macrolides, peptide-type antibiotics, etc.) listed together as has been the system in other monographs of this type.

The book is obviously intended as a reference source, and it does not intend to present a critical evaluation of the chemical,