

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.

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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.

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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,

biological, or clinical properties of each antibiotic. For the major antibiotics in clinical use and for those studied experimentally in detail, the book lists a summary of pertinent *in vitro* antimicrobial activities, of the pharmacological properties, of activity against susceptible microorganisms in experimental animals, and of clinical usefulness.

Although the book contains much accurate information, some of the information is not up to date and, unfortunately, suffers from several omissions and inaccuracies. For example, on p. 46 the structure of Magnamycin is not given although this structure was established in 1957 only a few months after the structure of Erythromycin (p. 68) was reported. To make matters worse, the empirical formula given for Magnamycin is the 1955 preliminary announcement of $C_{45}H_{69-73}NO_{16}$ instead of the correct formula of $C_{42}H_{67}NO_{16}$ reported in the unlisted, recent (!) publication of 1957.

Again, the subscript to the structural formula of Psicofuranine (p. 133) states that this antibiotic is identical with Angustmycin C, but under the heading of Angustmycin (p. 36) one looks in vain for a cross reference to Angustmycin C or to Psicofuranine; the only entry given being the one for Angustmycin A.

A few additional omissions or inaccuracies follow for purposes of illustration: The clinical use of Actinomycin (which member?) is indicated to be in Hodgkin's disease, but the more specific and important use in Wilm's tumor is not mentioned. Similarly, the specific use of Streptonigrin in Seminoma remains unnoticed.

Again, the section on Chloromycetin contains one line of discussion of the "very rare blood dyscrasias which can easily be prevented by avoidance of excessive, intermittent, or too prolonged dosage regimens." No specific reference to this statement is given, and while this book is obviously not intended as a clinical guide, such statements concerning critical effects of a major drug would greatly benefit from reliable documentation or, preferably, omission.

If references to such scientific aspects of antibiotics as their biogenesis or their mechanisms of action were omitted completely, one might regret this, but one would respect such an editorial policy. But the inclusion of a short statement concerning the mechanism of action of Puromycin, claimed to be a general inhibitor of the synthesis of "nucleoproteins," is too vague, incorrect, and not professional in terms of modern biochemistry.

The authors have not in any way attempted to facilitate the understanding of the family relationships between groups of antibiotics, particularly as it relates to cross-resistance, be it in terms of clinical or laboratory observation or in terms of related molecular structure between members of one family. One looks in vain in the Table of Contents or in the Index for entries which would allow one to group such families together. For this purpose, the Index might simply have listed such entries as "Tetracyclines," "Desosamine," "Inositol," etc., but it does not do so. Thus, the book loses a great deal of potential merit which might easily have been attained with a little extra care and time.

A final but serious objection is the extreme sparsity of references to the original literature and the rarity of recent references since 1960.

In summary, this book may well be useful to those who read French and do not have access to major reference books on antibiotics, but to most American workers in this field, it probably has little of additional value to offer.

The book is bound in sturdy paper.

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Les Réactions Chimiques dans les Solvants et les Sels Fondus.

By G. CHARLOT, Professeur à la Faculté des Sciences de Paris, and B. TRÉMILLON, Maître-assistant à la Faculté des Sciences de Paris. Gauthier-Villars, 55 quai des Grands-Augustins, Paris (VI^e), France. 1963. 602 pp. 16 × 25 cm. Price, 94F.

This book is the third in a series of monographs on special areas of inorganic chemistry being prepared under the direction of Professor André Chrétien of the Faculty of Sciences of Paris. The aim of the series, according to the editor, is to present in a practical and useful manner the fields of research in inorganic chemistry which are of greatest current interest.

As the authors of this monograph state in their preface, "The utilisation of various organic and inorganic compounds and of fused salts as solvents is assuming greater importance from year to year, because of the immense possibilities of new reactions. . . .

The modes of reasoning which have been so efficacious in the case of aqueous solutions may readily be applied to dissociating solvents analogous to water, and, with certain precautions, to all other solvents, including fused salts." In attempting to demonstrate the validity of this last statement, the authors have limited themselves to the discussion of simple chemical reactions in solution, omitting preparative details, problems of structure, and electrometallurgical applications. Within this limited area, they have selected for special emphasis those properties which they regard as of greatest interest especially to the analytical chemist.

The book consists of two major divisions. In the first part, entitled "General Properties" and constituting about one-quarter of the text, the authors consider successively the following general topics: acid-base reactions (considered exclusively as proton transfers), complex formation (including reactions of Lewis acids and bases), oxidation-reduction, and slightly soluble compounds. In each case, a distinction is made between two general classes of solvents: those in which ionic dissociation can take place to a considerable extent, and those in which it is negligible. In the second part, entitled "Chemical Properties in the Several Solvents," each solvent is considered separately. All the pertinent equilibrium constants which the authors have been able to assemble are grouped in tables, and the types of titrations which have been carried out in specific solvents and mixtures of solvents have been indicated.

In general, the authors have satisfactorily fulfilled their stated purposes. In the first part of the book, the significant analogies among reactions of similar classification—especially of the acid-base type—are effectively emphasized. In the second part, individual solvent properties are described—in some cases only in a single sentence, in others at considerable length—for 150 organic solvents, 60 inorganic liquids, and 105 fused salts, including cryolite and a number of mixtures. One cannot but be impressed by the thoroughness with which the literature has been scanned; the bibliography includes no less than 5000 references, arranged in chronological order for each type of reaction and for each solvent. Contrary to what might have been expected, the solvent for which the largest number of references is cited is not liquid ammonia (with 308), but acetic acid (with 370, of which about two-thirds apply to acid-base titrations in this medium).

It is scarcely to be expected, of course, that the execution of an undertaking of this magnitude could be completely flawless. In this reviewer's opinion, a troublesome barrier to complete clarity results from the authors' use of a wide variety of equilibrium constants, distinguished only by subscripts whose significance is not always immediately apparent. In several instances, such constants are defined in a manner which violates the usual convention of placing the concentrations (or activities) of the substances on the right-hand side of the chemical equation in the numerator of the expression for the equilibrium constant. A conspicuous example occurs on p. 4 of the text, where the formation of an ion-pair by the action of the solvent S on a covalent compound AB is represented by the equation $AB + nS \rightleftharpoons SA^+ \cdot BS^-$, for which the equilibrium constant is defined by the expression $|AB|/|A^+B^-| = K_s$. Incidentally, the characterization of this reaction as *solvolysis* is scarcely in accord with the usual interpretation of this term by American chemists.

Although the documentation is in general satisfactory, that of the long series of pK values of bases and acids in Table VI, pp. 81 to 91, is almost unintelligible, in that the reference column contains in some instances the formula for the solvent for which the given value was obtained and in others the number of the appropriate reference in the list following the table, while in many cases it is left blank. Aside from this, only a few minor errors have been noted, perhaps the most serious of which consists in an erroneous definition of molality on p. 10.

There is no general index, but at the end of the book there are provided an alphabetical index of all the organic compounds referred to in the text, and three alphabetical tables of solvents (organic, inorganic liquids, and fused salts), together with their dielectric constants (where these are known) and page references. These are followed by a Table of Contents.

Despite its imperfections, the book constitutes a significant contribution to the literature of nonaqueous solutions, and will be of great interest to anyone pursuing or contemplating research in this field, as well as to the practicing analytical chemist.

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