

what chemical structures will be encountered. This is followed by an admittedly superficial but interesting survey of the anatomy and techniques of various pharmacological preparations useful in this work. A long chapter follows (143 pages) in which the various compounds known to have ganglion-blocking activity are discussed. Of course, the material is brought from many sources and comparisons are often difficult. The format reminds the reviewer of the *Medicinal Chemistry* series; the chapter is arranged according to chemical homology and the discussion remains relatively discrete to each chemical group. Most readers will feel quite at home in this chapter. Chapter 4, rather enigmatically titled "The Influence of Ganglion-blocking Agents on the Interneuronal Transmission in Autonomic Ganglia" really amplified a bit on the earlier chapter surveying experimental techniques and provides more interpretive comparison of chemical agents quite diverse in structure. Throughout conflicting opinions are presented clearly and objectively. Chapters 5 and 6 then treat ganglion-stimulating agents in the same format as chapters 3 and 4 treated the blockers, although understandably less space is devoted to the subject. The book is capped off by a summary of the ganglionic activity of a variety of compounds known for some activity other than that on ganglia—for example, narcotics and muscle relaxants.

A few errors in structures are so obvious that they cannot cause trouble. The appendix leaves a little to be desired because of its brevity. A list of references is presented in a usable manner. The book will be valuable to a varied audience. It is sufficiently broad to serve as supplementary reading in graduate courses, and it appears to be commendable to either a pharmacologist or medicinal chemist contemplating research in the area of ganglion-active compounds. For the active researcher in the area, it is a valuable review through 1962 (although the book was ostensibly "brought up to date" for the 1967 edition); for these persons, the book's most valuable asset is the collection of data from Russian sources.

Reviewed by J. C. Kellett, Jr.
National Science Foundation
Washington, D. C.

Mass Spectrometry of Organic Compounds. By H. BUDZIKIEWICZ, C. DJERASSI, and D. H. WILLIAMS. Holden-Day, Inc., 500 Sansome Street, San Francisco, Calif., 1967. xv + 690 pp. 19 × 26 cm. Price \$17.95

This book is aimed at two groups of readers. The first includes students who may wish to become proficient in the interpretation and use of mass spectral data. The second group includes organic chemists who are familiar with mass spectrometry and employ it from time to time in their research. The authors use the "mechanistic" approach to the interpretation of mass spectra and this should be particularly appealing to the modern organic chemist.

A general introduction is devoted to the mass spectrometry aspects of ionization, localization of charge, bond fissions, and metastable peaks. In addition, mention is also made of some specific techniques employed, such as element mapping, the kinetic approach to mass spectra, and the combined vapor phase chromatography-mass spectrometry. Each of the 27 chapters that follow deals with a particular functional group (or related functional groups) in organic compounds. In each chapter, the aliphatic members are first discussed, followed by a discussion of the aromatic members. This organization is a distinct improvement over that of the first volume.

Although this volume appears at first glance to be only a revision of the authors' earlier book, "Interpretation of Mass Spectra of Organic Compounds," the reader soon becomes aware that the extensive revisions and new material discussed, indeed, make this a new book warranting the new title. New material includes lactones (chapter 4), acids and anhydrides (chapter 5), *N*-oxides, nitrosamines, and quaternary ammonium salts (chapter 8), nitrogen-containing carbonyl derivatives (chapter 10), epoxides (chapter 13), alcohol derivatives (chapter 14), carbonates and ureas (chapter 15), sulfoxides, sulfones, and related compounds (chapter 19), organic phosphorus compounds (chapter 26), and organo-metallic compounds (chapter 27). The extent of this new material demonstrates the need for this new volume and is reinforced by the need to update the other topics.

The book is well written and the coverage is thorough and up-to-date. The references listed for each chapter include early 1967 papers as well as several private communications of work not yet published. Such a reference list is extremely valuable to the mass spectrometrists and renders this book a must in his personal library. The book has a few typographical errors which do not detract from its overall value in any way. Another special value of the book is the listing of summaries and conclusions wherever possible. For example, the reader is given general rules for mass spectral behavior for alkyl eliminations (p. 264), hydrogen losses (p. 282), acetylnaphthoquinones (pp. 533-534), and metal complexes of β -diketones (pp. 664-665). These rules should prove to be particularly useful in the general interpretation of mass spectra.

Finally, the authors frequently point out areas requiring additional study either by high-resolution mass spectrometry, deuterium labeling, or the need to study more compounds (or derivatives) containing a particular functional group. The suggestions offered should stimulate further research in these areas.

In summary, this excellent work extends and amplifies the application of mass spectrometry in organic and biological chemistry. The nonexpert in the field will receive an introduction into this dynamic area and those knowledgeable in the field will find this to be a useful reference.

Reviewed by Marvin F. Grostic
The Upjohn Company
Kalamazoo, Mich.