BOOK REVIEWS

Biosynthesis of Natural Products, P. MANITTO, Department of Chemistry, University of Milan. Ellis Horwood, Limited (distributed by Halsted Press, John Wiley & Sons, Inc., 605 3rd Avenue, New York, NY 10158). 1981. 548 pp. 16x23.5 cm. $114.95.

This book is prepared from the author's lecture notes, that he has used at Milan University since 1970, in a course on the chemistry of organic natural substances for chemistry and biology students. The translation editor, Professor P. G. Sammes, has produced a well written text. The book can be divided into three parts. The first part, chapters one through three, is of an introductory nature. The second part, chapters four through eight, is of an informational character and the third part, appendices one through six, concerns itself with a number of relevant theoretical questions.

Chapter one, entitled "Primary and Secondary Metabolism", contains introductory material and also information on research methods and techniques used in biosynthetic studies. While the introductory material appears sound, the section on research methods and techniques is both misleading and confusing in terms of the description of radioisotope tracer methods. Equally serious is the lack of consideration of methods for using stable isotopes, such as carbon-13, deuterium, nitrogen-15, and oxygen 0–18 or 0–17. The second chapter on enzyme reactions is generally quite adequate and represents a good overview. Chapter three, primary and intermediate metabolism, is a condensation of a traditional biochemistry text which is by necessity brief. Chapters four, five, six, seven, and eight cover the polyketides, the isoprenoids, steroids, the shikimate pathway and phenyl-propanoids. There are some quite serious inadequacies in these chapters as described below. For example, although general references are given up to 1980 the actual material within the chapters is frequently only current up to the early or mid 70's. As an example of the out-of-date nature of the text, the author discusses on page 365 the biosynthesis of tropic acid. He indicates that the transposition of the carboxy group is an unusual process in organic chemistry and needs to be confirmed, but this confirmation was in fact published in 1975 by Professor Edward Leete. I suspect the out-dated nature results from the fact that the author prepared this book over a considerable time period, but did not have the chance or did not take the trouble to up-date chapters, other than to include general references of a more recent nature at the end of each of the sections.

A further serious deficiency in this book is lack of any discussion of alkaloids. The author states in the preface the omission of alkaloids was due to the need for brevity. In the reviewer's opinion, the omission of perhaps some of the other introductory material such as the section on primary and intermediate metabolism and its replacement by a chapter on alkaloids might have been more appropriate. Finally, for a book of this price one would have expected consistent high quality figures. However, quite frequently the figures are of a substandard nature and appear to be smudged so that it is difficult sometimes to decipher the small print.

This book is intended to be used by (a) "chemistry students interested in the biological organic trends (b) graduate students wishing to widen their vision of current biosynthetic problems and methodologies and (c) biologists and pharmacologists with a limited knowledge of organic chemistry yet interested in chemical aspects of secondary metabolism". I am not convinced that it is really appropriate for any of these groups of students. For the chemistry students interested in biological organic trends the text may be too long and spotty in places. For graduate students wishing to widen their visions of current biosynthetic problems and methodologies, it is inadequate since stable isotopes are not given any real coverage at all. For biologists and pharmacologists with a limited knowledge of organic chemistry this book is probably completely inappropriate. In fact, I find it difficult to decide for what group of students this book is appropriate. Other books such as Haslam's Shikimate Acid Pathway or the Specialist Periodical Reviews on Biosynthesis cover this material in a far more thorough manner. The exorbitant price of $114.95 puts this book out of the range of the individual wishing to buy the text and it is of very questionable value to libraries catering to the natural products chemist. I would not recommend this book to my students and colleagues.

LAURENCE H. HURLEY, *University of Texas at Austin*

Recent Advances in Phytochemistry, Volume 14, The Resource Potential in Phytochemistry, edited by TONY SWAIN, Department of Biology, Boston University, and ROBERT KLEIMAN, Northern Regional Research Center, USDA. Plenum Press, 227 West 17th Street, New York, N.Y. 10011. xiii+215 pp. 16 x 23.5 cm. $29.50.

This volume of "Recent Advances in Phytochemistry" continues the series which report the proceedings of the excellent symposia of the Phytochemical Society of North America. The contents of this volume are "Botanochemicals", by R. A. Buchanan, F. H. Otey, and M. O. Bagby (22 pp, 20 refs); "Antitumor Agents from Higher Plants", by R. G. Powell and C. R. Smith, Jr. (30 pp, 98 refs); "Search for Carcinogenic Principles", by J. F. Morton (22 pp, 48 refs); "Glycoalkaloids of the Solanaceae", by S. F. Osman (22 pp, 77 refs); "Corn Kernel Modification", by E. J. Weber (42 pp, 98 refs); "Chemistry and Breeding of Cruciferous Vegetables", by P. H. Williams (18 pp, 23 refs); "Chemical Germplasm Investigations in Soybeans:

The Flotsam Hypothesis", by T. Hymowitz (24 pp, 103 refs); "Citrus, Essential Oils: Effects of Abscission Chemicals and Evaluation of Flavors and Aromas", by M. G. Moshonas and P. E. Shaw (23 pp, 29 refs). The references in each chapter cover a reasonable time span and include citations into 1979.

This book is devoted to critiques of areas of current interest to phytochemists and to the general public. The chapter by Morton is intriguing in that plants which are sources of tannins (tea, red wine, etc.) are suggested as the possible causes of cancer of the esophagus. The chapter by Buchanan, Otey, and Bagby demonstrates the relevance of phytochemical research to the energy problem and the petrochemical industry. The current state of the search for antitumor agent plants is presented in a very instructive manner by Powell and Smith; drugs from plants sources which have reached clinical trails are indicated. The chapter by Osman elegantly discusses the role of glycoalkaloids in plants, and the suggestion is made that it might be possible to incorporate glycoalkaloids as part of a pest resistance program in the future. The chapter on the very important corn plant by Weber presents an overview of corn production and utilization. The chemical composition (carbohydrates, proteins, lipids, etc.) is discussed relative to corn parts and to the type of corn, and a discussion of attempts to improve the percentage of these chemicals in corn by breeding is presented. The chapter by Williams includes a detailed discussion of glucosinolates and crucifer breeding programs. Many glucosinolates are known for their pungency and insect attractiveness, and are implicated in possible metabolic disorders in animals and man. Hymowitz presents a careful examination of the "Flotsam hypothesis" which has been proposed to account for chemicals present in soybean seed which are not apparently necessary for survival. The chapter by Moshonas and Slaw is a well written chapter which discusses the flavoring agents of citrus fruits and the effects upon the flavoring ingredients which are the result of chemical treatment of the crop.

This book contains a wealth of chemical, botanical, agricultural, economic, and practical information which will be of interest to a wide range of scientific disciplines and to the general public. It is easy to read and should represent a rather painless way of keeping up to date in the topics discussed.

D. Howard Miles, *Department of Chemistry, Mississippi State University*