BOOK REVIEWS

Bailey's Industrial Oil and Fat Products, 4th Edition, Volume 2, edited by DANIEL SWERN. Wiley-Interscience, John Wiley and Sons, Inc., 605 Third Avenue, New York, N.Y. 10058. 1982. xi+603 pp. 16 x 23.5 cm. $60.00.

Fixed oils and fats are extensively used pharmaceutically, industrially and as foods. However, there are relatively few books written on vegetable oils and fats from an industrial point of view. Bailey's Industrial Oil and Fat Products is one of the few books that meets the demands of persons interested in the basic concepts and production of industrial oils and fats. The book is edited by an experienced author and contributed to by authoritative experts in their field. Indeed, this book was first published in 1945, and revised editions appeared in 1951 and 1964. The fourth edition was published in two parts, with Volume 1 appearing in 1979 and volume 2, the volume under review, appearing in 1982. Both these volumes include basically the revised chapters of the third edition (1964) except that volume 2 incorporates two new chapters along with the updated chapters.

The book contains eight chapters. Chapter 1 is on hydrogenation dealing with the chemistry, effects of substrate and process conditions, theory of catalysis, and hydrogen production and purification. This chapter is written in a simple and understandable manner avoiding a lot of mathematical derivatives, chemistry, and industrial details of hydrogenation processes.

Chapter 2 discusses fat splitting, esterification and interesterification which have usefulness in the production of fatty acids, oils and fat derived products. This is one of the chapters listing the maximum number of references. Chapter 3 describes different techniques of extraction processes for industrial production of oils and fats. Chapter 4 deals with the techniques of refining and bleaching of oils and fats so that they can be used in different industries for edible and inedible purposes. Chapter 5 covers manufacture, importance, additives, stability, evaluation and quality control of cooking and salad oils and different kinds of salad dressings. The utilization of oils and fats in the form of cooking oils and salad dressings is of growing concern to the public health because of the need for polyunsaturated fatty acids in the American diet. Miscellaneous oils and fat products in chapter 6 include drying and nondrying oil products, lubricants and plasticizers, commercial fatty acids and their derivatives and synthetic fats and fatty acids.

Chapters 7 and 8 on Analytical Methods and Environmental Aspects of Animal and Vegetable Processing, respectively, are entirely new chapters in this book. Chapter 7 provides the maximum number of up-to-date references indicating growing and rapidly changing analytical techniques. The official and nonofficial methods for the oils and fats, vegetable-source materials, byproducts, fatty acids, fatty nitrogen chemicals, soaps and other fat and oil products are given. In addition, analytical methods for the detection of objectionable or toxic components of oils and fats, fatty acids and other fat and oil products are included. Typical methods for the detection of contaminants and nontoxic constituents of oils and fats are also covered in this chapter. The chapter on Environmental Aspects of Animal and Vegetable Oil Processing deals with water, air and land pollution impacts, regulations and control methods. This type of information, not provided in many books on oils and fats, is extremely important to consumers, regulatory agencies and manufacturers of industrial oils and fats. On the other hand, production managers, inexperienced engineers and technicians may also benefit by the information on the environmental control needs of the industry.

Overall, the book is a valuable guide to chemical engineers, industrial technologists, scientists and other persons involved in the oil and fat industry. Its bibliography is up to date, with approximately 30% of the references from the period 1970–1980, and it provides an excellent source of information on the theory, utilization, evaluation and practice of isolating oils and fats from natural sources. The book is also useful to students, although rather too expensive for use as a textbook. Its appeal to medicinal chemists is limited by the lack of any extensive discussion of pharmaceutical applications of oils and fats, but it is recommended for purchase by science and technological libraries.

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Advances in Natural Products Chemistry. Extraction and Isolation of Biologically Active Compounds. Edited by S. NATORI, N. IKEKAWA, and M. SUZUKI. Halsted Press, John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10158. xii+599 pp. 15.5 x 23 cm. $89.95.

This is an unusual book, in that it focusses primarily on the techniques used in natural products research rather than on the results of such research. Its 39 chapters, contributed by 56 Japanese scientists, cover most of the major fields of natural products work. In each chapter, the author or authors write about their own research, with an emphasis on the experimental methods employed. The book is thus replete with flow charts of the isolation of natural products, with reproductions of various chromatograms, and with structures of the isolated compounds, but the chemistry of the isolated natural products is hardly discussed at all.

One particularly valuable feature of the book is the extensive treatment given to bioassay procedures in many of the chapters. Bioassays are a vital part of the isolation of biologically

active natural products, and this book makes available information on over 50 such assays through an index of bioassays. There is also an index of experimental procedures, with chromatography in all its forms making up the bulk of the entries, a plant and animal index and a subject index.

The chapters cover *inter alia* such subjects as antibiotics, fungal toxins, abnormal secondary metabolites in plants, plant growth inhibitors, insect artifeedants, biosynthetic studies, saponins, indole alkaloids, marijuana constituents, marine toxins, and plant tissue culture. The volume is a revised version, in English, of an original work published in Japanese in 1977, but the individual chapters appear for the most part to have been rewritten for this edition and thus describe work completed within the last ten years, with references as late as 1981 in some cases. The English is excellent, and the occasional typographical errors do not usually create problems in understanding the material. One minor awkwardness is that the authors' names (with one exception) are not listed with the chapters, and the reader has to search through a list of contributors to find the authors of each chapter.

The reviewer is not aware of any comparable book, and it should thus prove invaluable to any scientist interested in learning new techniques in natural products research, and it will prove particularly useful to anyone entering the field for the first time.

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Supplements to the Second Edition of Rodd's Chemistry of Carbon Compounds, Volume III: Aromatic Compounds, parts D, E, and F (partial), edited by M. F. ANSELL. Elsevier Scientific Publishing Company, 52 Vanderbilt Avenue, New York, NY 10017. 1982. xx+424 pp. 15.5 x 23 cm. $111.50.

This volume continues the updating of Rodd's Chemistry of Carbon Compounds series by reviewing the literature pertaining to several classes of aromatic compounds during the approximate period 1973 through 1979. This supplement focuses primarily on benzene derivatives with alkyl and alkenyl side chains and aromatic aldehydes and ketones. Chapters on arylbenzenes and polyphenylmethanes are also included.

As in the previous volumes of this important series, the topics are covered principally in terms of the organic reactions of the title compounds. Methods developed for the synthesis of the title compounds of each chapter during the period reviewed are fairly well documented although there are some omissions. Of particular interest to most chemists are the large number of reactions for preparation, removal, and interconversion of functional groups using the title compounds as starting materials. The reactions presented range from the common to the unusual and include some examples of enzymatic reactions. References to physical and spectroscopic properties are briefly noted in several instances, but are not a general feature of every chapter.

A natural products chemist interested primarily in the isolation and structure elucidation of naturally occurring aromatic compounds will find only a small amount of information in this volume. This information is concentrated primarily in Chapter 16 which is devoted to depsides, tannins, and lignans, and in Chapter 19 which briefly addresses chalcones, cinnamic acids, and related natural products.

This volume would not be suitable for acquisition by most individuals due to its limited scope and relatively high cost. However, it would be a valuable addition to libraries concerned with keeping this comprehensive and informative series up to date.

ALBERT T. SNEDEN, *Department of Chemistry, Virginia Commonwealth University*

Medicinal Plants and Home Remedies of Appalachia, J. L. BOLYARD. Charles C. Thomas, 2600 South First Street, Springfield, IL 62717. 1982. xvii+187 pp. 16x23.5 cm $18.50.

The author, who is an interpretive naturalist at Callaway Gardens, Georgia, and was formerly a naturalist with the National Audubon Society, has earned a Master of Science degree from the department of botany, Miami University, Oxford, Ohio. This book represents the culmination of her research efforts for that degree. In gathering information for this volume, she worked under the auspices of the Appalachian Oral History Project of Alice Lloyd College, Pippa Passes, Kentucky. This established Oral History Project furnished her with the opportunity to meet the native people of Kentucky Appalachia and to gain their cooperation in gathering the drug plant lore presented in this book. She also acknowledges the Department of Pharmacognosy and Pharmacology, University of Illinois Medical Center, Chicago, as a helpful source of bibliographic and computerized reference files on natural drugs.

The text consists of four chapters. These are: Introduction, A Method for Collecting Home Remedies, Plants Used in Home Remedies (the bulk of the text), and Additional Considerations. In addition, there is a Glossary, a list of references which includes bibliographic data and a list of interviews, an index of plant names and an index of diseases and remedies.

Chapter III, Plants Used in Home Remedies, is organized by a standard taxonomic scheme with each subject presented in monograph form. In addition to the usual nomenclature items, each monograph addresses most, if not all, of the following topics: Kentucky Uses, Georgia Uses, Indian Uses, Historical Uses, Related Genera, Biological Activity, and Organic Con-

stituents. Kentucky Uses refers to the uses of the plants by the natives of Kentucky Appalachia. The author makes a case for comparing those uses with both the uses of the same plants by people of the area of Georgia which she terms the Low Country and the uses made by American Indians.

This book is interesting, more in an anthropological or ethnobotanical sense than in a scientific sense. In many ways it parallels the work done by Edward Croom with plant drug uses of the Lumbee Indians of North Carolina. It remains to be seen whether such studies may lead to useful modern drug discoveries.

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Terpenoids and Steroids, Volume 11, J. R. Hanson, Senior Reporter. Royal Society of Chemistry, Blackhorse Road, Letchworth, Herts. SG6 1HN, England. 1982. xi+243 pp. 14x22 cm. $94.00.

This volume covers the literature published between September, 1979 and August, 1980. The first four chapters constituting Part I on terpenoids deal with sesquiterpenoids (90 pp., 307 references), diterpenoids (19 pp., 163 references), triterpenoids (23 pp., 115 references) and carotenoids and polyterpenoids (30 pp., 285 references). Chapters 1 to 3 are divided into sections based on major skeletal types. Emphasis is placed on new natural products and recent syntheses and reactions; brief mention is made of physical methods and biosynthesis. Chapter 1, in particular, contains many detailed synthetic schemes and a valuable update on the biologically important α-methylene lactones. The main topic of chapter 4 is carotenoids which are discussed from the point of view of new structures, synthesis and reactions, physical methods and biosynthesis.

Part II on steroids is divided into two chapters. The first (22 pp., 170 references) provides an excellent review of physical methods with particularly useful discussions of X-ray analysis, N.M.R. spectroscopy and chiroptical phenomena. Brief reviews of mass spectrometry, gas chromatography-mass spectrometry, high pressure liquid chromatography and immunoassay are also included. The second chapter (42 pp., 248 references) contains Section A on reactions categorized according to functional groups, rearrangements, functionalisation of non-activated positions and photochemical reactions. Section B on partial syntheses is divided into subsections based on structural types and brief discussion of microbiological transformations. The reactions discussed clearly illustrate that steroid chemistry and synthesis continue to be challenging areas of research. In general, the reviews in this volume are well organized and clearly illustrated by a generous use of formulae and reaction schemes. As noted by Dr. Hanson in his introduction, this volume, like volume 10, suffers from the absence of a chapter on monoterpenoids. One hopes that this shortcoming will be rectified in future volumes. Nevertheless, the reporters are to be congratulated on fine presentations, and the Royal Society of Chemistry is to be commended on providing a continuing valuable service to organic chemists. This volume is strongly recommended to all natural products chemists though, unfortunately, the price will place it beyond the pocket of the average researcher. All libraries serving chemists should, however, place its purchase on top priority.

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The Alkaloids, Volume 11, M. F. GRUNDON, Senior Reporter. Royal Society of Chemistry, Blackhorse Road, Letchworth, Herts. SG6 1HN, England. 1981. xi+259 pp. 14x22 cm. $111.00.

This is volume 11 in the excellent series published by the Royal Society of Chemistry titled "The Alkaloids" Specialist Periodical Reports, and describes work which was reported during the period July 1979–June 1980. The book is divided into sixteen chapters which contain over seven hundred references, approximately one-third of which are devoted to synthesis and biosynthesis. An excellent section on bisindole alkaloids is presented in Chapter 12 wherein a number of new types of these bases are described. In addition, several pages in this section are devoted to bisindoles of the Vinca type and bring the reader up to date on this important facet of alkaloid chemistry. While most of the volume deals with research published over a one year period, the informative section on Erythrina alkaloids covers a two year period (1978–80). The topics and outlay of the book follow the same format as in previous volumes, beginning with Biosynthesis (Chapter 1) only to end with a Chapter (16) on Miscellaneous Alkaloids.

The chapters in this volume are well written and well presented as was the case with previous members of this series. This volume is a must for those workers engaged in alkaloid research. Although a common practice in this series, this reviewer finds the lack of a subject index as somewhat disconcerting. One would hope the wide acceptance of "The Alkaloids" would encourage the editors to, at least, set up a subject index based on the names of the alkaloids in question for easier reference. Furthermore, as inflation tears away at scientific budgets, there appears to be no relief from the publishing industry for this volume [$111.00 (US)] is sorely overpriced. This, in fact, may preclude purchase of this volume by many workers in the field which certainly defeats the purpose of its authors. Nonetheless, the volume provides a real service to those involved in research in the alkaloid area and is a welcome addition to previous volumes in the series.

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Plant Nonprotein Amino and Imino Acids, G. A. ROSENTHAL. Academic Press, 111 Fifth Avenue, New York, NY 10003. 1982. x+273 pp. 16x23.5 cm. $37.50.

Nonprotein amino and imino acids are widespread plant secondary metabolites which range from minor constituents in many plants to major components of others. Dr. Rosenthal has done an excellent job of bringing together the scattered and fragmented literature dealing with this subject. But the book must be recognized as more than that. An introductory chapter dealing with nomenclature and general physical and chemical properties of these compounds proves to be of much more value and will serve most readers as an introduction or review of amino acids generally. A second chapter reviews analytical methodology applicable to amino acids and brings the reader up to date in that area. In both chapters, Rosenthal effectively compares and contrasts protein and nonprotein amino acids and their properties.

After the two introductory chapters, the preparation and/or isolation, biological properties, toxicity and metabolism of nonprotein amino and imino acids are surveyed in a chapter entitled "Toxic Constituents and Their Related Metabolites". Compounds are arranged under the general headings: Lathyrogens and Neurotoxins, Heterocyclic and Substituted Aromatic Compounds, Basic Compounds, Selenium Containing Compounds, and Miscellaneous Compounds. These are followed by a section called Toxicity Studies and the chapter terminated by a Conclusions section.

The first portion of the fourth chapter deals with general aspects of nitrogen assimilation in plants, and subsequent portions take up various groups of amino acids (The Aspartic Acid Family, The Glutamic Acid Family, Aromatic Amino Acids, Heterocyclic Compounds, Cyclopropyl or Unsaturated Compounds, and Miscellaneous Compounds) and their roles and importance in intermediary metabolism. An appendix listing each known nonprotein amino and imino acid, its source and pertinent references follows. Finally, there is an extensive Bibliography including references from as late as 1981. In addition to the Bibliography a series of references follows each chapter.

The book is well done, eminently readable and authoritative. It will make a worthwhile addition to the libraries of most phytochemists and plant biochemists, and will prove valuable to agronomists (legumes are major cultivated plants and they often have nonprotein amino acids), ecologists, pharmacognosists, and a variety of other fields.

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The Biosynthesis of Mycotoxins, edited by P. S. Steyn. Academic Press, Inc., 111 Fifth Avenue, New York, NY 10003. 1980. xv+432 pp. 16x23.5 cm. $44.00.

Collected in this volume are comprehensive reviews of selected groups of mycotoxins written by researchers active in the respective areas. Each provides general background on discovery, isolation, structure proof and often a brief discussion of biological properties. As the title states, however, the principal emphasis in all cases is biosynthesis and it is here that the chapters provide good historical background and thoroughly documented discussion of the subject at hand. The gamut of classical radiochemical techniques, use of mutants, effects of varied growth media, use of modern spectroscopic techniques, and, where available, results of studies at the cell-free and enzyme level are reviewed. In short the quality of these chapters is generally very high and in some instances exceptionally so (those by Floss, Tamm and Steyn).

The book opens with a general introduction to secondary metabolism (J. D. Bu'Lock) followed by chapters on: ergot alkaloids (H. G. Floss and J. A. Anderson), trichothecene mycotoxins (Ch. Tamm and W. Breitenstein), aflatoxins (P. S. Steyn, R. Vleggaar and P. L. Wessels), ergochromes (Branck), neurotropic mycotoxins (M. Yamazaki), patulin and penicillic acid (L. O. Zamir), cytochalasans (Ch. Tamm), gliotoxin and related dioxopiperazines (G. W. Kirby and D. J. Robins), cyclopiazonic acid and related tetramic acids (C. W. Holzapfel), anthraquinonoid mycotoxins (U. Sankawa), and a concluding chapter by Vleggaar and Steyn on about ten miscellaneous mycotoxins.

Some redundancies are evident in several discussions of the fundamentals of polyketide biosynthesis and, to a lesser extent, in the use of stable-isotope techniques for NMR-based investigations. Important progress has been made since publication of this book on the controversial issue of *trans* to *cis* isomerization of farnesol essential to the formation of the trichothecenes. Some very useful studies of Hsieh, Bennett and Lee at the anthraquinone level in the aflatoxin pathway are given rather brief treatment. On the technical side, several structures lack functional groups and double bonds. However, on balance these complaints are minor given the vastly offsetting thoroughness and high quality of these reviews. This is an important reference volume for workers in mycotoxin research and natural product biosynthesis.

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