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BOOK REVIEWS

Chemistry and Biology of Naturally Occurring Acetylenes and Related Compounds (NOARC). Edited by J. LAM, H. BRETELER, T. ARNASON, and L. HANSEN. Elsevier Science Publishing, P.O. Box 882, Madison Square Station, New York, NY 10159. 1988. xvii + 366 pp. 16.5 × 24.5 cm. $102.75. ISBN 0-444-87115-2.

This volume contains the proceedings of the First International Conference on the Chemistry and Biology of Naturally Occurring Acetylenes and Related Compounds (NOARC) held in Aarhus, Denmark, July 1987. It includes a total of 24 chapters subdivided into chemical, botanical, and applied aspects. At the end of each of the three subdivisions there is a transcript of the discussion following the lectures, and at the end of the book there is a section on "Conclusions and Recommendations."

Polyacetylenes, tridecapentaynene-derived mono-, di-, and ter-thiophenes, and related compounds constitute a fascinating group of biologically active secondary plant metabolites formed from oleic acid, found in Asteraceae as well as in certain groups of fungi (Basidiomycetes). Light-independent and phototoxic effects against bacteria, fungi, viruses, nematodes, insects, and other organisms are well documented for NOARCs, particularly for the most notable representative, α-terthienyl, found in the common garden marigold (*Tagetes*). There is considerable interest in the mechanism of phototoxic action of these compounds, which appears to involve generation of singlet oxygen. NOARCs are of potential commercial utility as environmentally nonthreatening biocidal agents.

In this book the section on "chemical aspects" includes brief historical overviews by F. Bohlmann (naturally occurring acetylenes) and H. Wijnberg (α-terthienyl), current reviews of polythiophene and polyacetylene syntheses (R. Rossi), photostabilizing complexing agents (J. Lam and T. Thomasen), α-terthienyl and phenylheptatriyne biological activity and isolation (F.J. Gommers and J. Bakker; J. Kagan and R.W. Tuveson; R. Sütfeld and H. Breteler; F. Hadacek, A. Werner, and H. Greger), studies of falcarinols from carrots (G.C. Barley, E.R.H. Jones, and V. Thaller), and isolation and synthesis of toxins from the fungus *Eutypa lata* (G. Tsoupras *et al.*). The section on "botanical aspects" covers an historical overview including a discussion of the use of NOARCs in folk medicine for skin infections, stomach problems, etc. (G.H.N. Towers and D. Champagne); biosynthesis and evolution (K.R. Downum, D. Provost, and L. Swain; R. Jente *et al.*); phytochemistry of the insecticidal, molluscicdal, and pesticidal olefinic and acetylenic alkamides (H. Greger); chapters on metabolism and biosynthesis (P. Singh; R. Jente *et al.*; R. Sütfeld; B. Tosi *et al.*; Y.Y. Marchant); and biotechnological aspects including formation of polythiophenes in root and other tissue cultures (H.E. Flores, A.F. Croes, D.H. Ketel, J.P.F.G. Helsper *et al.*). "Applied aspects" include chapters on insecticidal and antiviral properties of α-terthienyl and other NOARCs (J.T. Arnason *et al.*; J.B. Hudson and G.H.N. Towers).

The 50-page transcript of the discussions represents a unique feature of the book. Reading this section I felt as if I were seated in the front row of the conference listening to a lively exchange of ideas among the distinguished participants. In some ways the discussion was more informative than chapters reviewing earlier work already published elsewhere in more detail.

The individual chapters range from 5 to 23 pages in length. Some chapters contain only a few references no more recent than 1973, whereas others are more thorough and up-to-date in their coverage. There is also an unfortunate uneveness in production of this volume due to use of camera-ready copy, with variation among the chapters with regard to type face and spacing (single or double-spaced, right justified or unjustified), outline style, and format for references. I found numerous spelling and other errors. The book has a list of participants but unfortunately lacks a subject index. However, despite its shortcomings, this book can be recommended for research libraries and for specialists in research areas covered in this volume.

ERIC BLOCK, *State University of New York at Albany*

Sulphur-Containing Drugs and Related Organic Compounds. Chemistry, Biochemistry and Toxicology. Volume 1 Part B. Metabolism of Sulphur-Functional Groups. Edited by L.A. DAMANI. Halsted Press, 605 Third Avenue, New York, NY 10158. 1989. 324 pp. 16.7 × 24.5 cm. $89.95. ISBN 0-470-21258-6.

This is the second part of the first of three volumes of a comprehensive source of information on sulfur-containing drugs and related organic compounds ("sulfur xenobiochemistry"). It consists of chapters on phosphorothionates (F. de Matteis), thioamides (J.R. Cashman), thiocarbamides (G.G. Skellern), carbamothioates and carbamodithioates (Y. Segall), sulfoxides and sulfones (A.G. Renwick), sulfonium salts

(P.A. Crooks), sulfonamides (P.A. Crooks), sulfamates, sulfonates, and sulfate esters (A.G. Renwick), sulfur heterocycles (D.J. Rance), and glucosinolates, alliins, and cyclic disulfides: sulfur-containing secondary metabolites (G.R. Fenwick and A.B. Hanley).

This book and the companion volumes should appeal to a broad range of readers. Because the fates of sulfur-containing herbicides, insecticides, fungicides, bactericides, and nematocides are discussed, this volume will be of interest to agricultural as well as environmental chemists and pharmacologists. The chemistry of some of the compounds broadly classified as drugs will also be of interest to those concerned with antioxidants and vulcanization accelerators. Finally, there is much in this text that will appeal to researchers in the fields of natural products and medicinal chemistry as well as readers with general interests in the field of organosulfur chemistry.

The referencing seems current through 1987-1988. The attractive, typeset book contains a subject index. The book is recommended for purchase by research libraries as well as specialists in the areas mentioned.

ERIC BLOCK, *State University of New York at Albany*

X-Ray Structure Determination. A Practical Guide. 2nd edition. G.H. STOUT and L.H. JENSEN. Wiley-Interscience, 605 Third Avenue, New York, NY 10158. 1989. xv + 453 pp. 16 × 24 cm. $45.00. ISBN 0-471-60711-8.

A generation of crystallographers has for some years lamented the fact that, because of rapid advances in instrumentation, structure solving methods, and computing, Stout and Jensen's excellent book, published in 1968, had become somewhat dated. The second edition retains this excellence while providing an up-to-date working guide.

At first glance, the new edition does not look very different from the original, because there are few new figures. The book does, however, contain much updated information, discussion of concerns that have arisen as a result of the increased automation of some of the structure determination process, and coverage of topics not included in the first edition. The book is organized to parallel the progress of an actual structure determination, beginning with theoretical aspects of X-rays, diffraction, and symmetry, and then proceeding to more practical matters: crystal growing and mounting, photography of the diffraction pattern, and space group determination. Intensity data collection and reduction are then discussed, followed by a summary of Fourier theory as applied to crystallography, then discussions of methods of structure solution and refinement. The final chapters involve errors and uncertainties and calculation of bond distances and other derived quantities, followed by five appendices. Approximately forty pages are devoted to photographic methods, reflecting the authors' conviction that photographs should always be taken, in order to avoid errors in lattice characterization.

The strongest additions to the book are the new sections on practical considerations in least-squares refinement in Chapter 16, and Chapter 19, which concerns pitfalls that can lead to an incorrect structure and the question of to what extent the results can be believed even when these pitfalls are avoided. Other new material includes discussions of synchrotron radiation, area detectors, thermal diffuse scattering, and expanded discussions of space group symmetry and of the practical aspects of direct methods.

The authors make little attempt to describe commonly used crystallographic software, except for MULTAN, and various other topics of importance in the field (twinning, etc.) are likewise considered beyond the scope of the book. However, the book is heavily annotated, and each chapter includes a bibliography that leads the reader easily to the literature.

The book is not without flaws. Although in a modern crystallography laboratory, an investigator is as likely to encounter a kappa-axis diffractometer as one based on Eulerian geometry, the kappa geometry is afforded two sentences and no figure. The few new figures in the second edition are inferior in quality to the generally excellent figures retained from the first edition. There is a paucity of practical guidance for space groups of symmetry higher than orthorhombic. There seem to be more typographical errors than in the first edition. This is particularly noticeable in Table 5.3, a listing of space groups with identical extinctions, and perhaps the most useful table in the book: four errors have appeared in the new version.

Anyone who is actively engaged in single crystal X-ray structure determination will certainly want a copy of this book and will refer to it often. The number of well worn first editions to be found in laboratories attests to this. The moderate price also makes it highly suited as a textbook for a graduate course.

FRANK R. FRONCZEK, *Louisiana State University*

The United States Pharmacopeia XXII; The National Formulary XVII. United States Pharmacopeial Convention, 12601 Twinbrook Parkway, Rockville, MD 20852. 1989. iv + 2067 pp. 21.5 × 28 cm. $250.00. ISBN 0-913595-37-3.

The *United States Pharmacopeia* (*USP XXII*) and *The National Formulary* (*NF XVII*) continue in the tradition of previous revisions in providing legally enforceable standards of drug quality for medicinal agents, drug dosage forms, and drug products. At one time these books were published as two volumes under the auspices of two different organizations. However, beginning with the publication of the *USP XX* and *NF XV*, both books were published as two distinct official compendia in one volume under the authority of one organization, the United States Pharmacopeial Convention. Established in 1820, this organization remains unique as a drug-standard-setting institution; it receives no direct financial assistance from governmental sources and is an independent, nonprofit organization composed of delegates from academia, industry, government, and state and national associations concerned with medicines. It is responsible for establishing standards of strength, quality, purity, packaging, and labeling for drugs used in the United States and publishing these standards in the USP-NF. Drug standards are developed and continuously revised by the USP Committee on Revision, which consists of elected representatives from the fields of medicine and pharmacy, and by over thirty advisory panels of experts in related areas. Between revisions, supplements, which include the most appropriate information regarding standards of new drug substances and dosage forms not included in the current revision, are published.

USP XXII includes more than 3000 monographs on drug substances and dosage forms; *NF XVII* includes about 250 monographs on inactive agents or excipients classified as pharmaceutic ingredients.

Some of the new features found in *USP XXII* are: (1) a new general chapter that redefines the USP pattern of use of in vivo and in vitro methods for testing drug quality; where possible it favors reduction in the use of animals, (2) the addition of approximately 80 new antibiotic monographs, (3) the special requirements for testing drug-release in drug dosage form, (4) an increase to 360 excipients, including many polymeric materials, (5) two new general chapters dealing with impurities, (6) new chapters on Scanning Electron Microscopy (SEM) and on Water-Solid Interactions in Pharmaceutical Systems, and (7) inclusion of new radiopharmaceuticals.

USP XXII-NF XVII continues, as have volumes in the past, to be an excellent book dealing with legally recognized standards of drug quality. It is highly recommended as a valuable literature reference for all libraries in medical and pharmacy schools, chemistry departments, and related institutions, and for all scientists, especially those in the pharmaceutical industry, concerned with any of the many aspects of drug quality.

ADELBERT M. KNEVEL, *Purdue University*

Kirk-Othmer Concise Encyclopedia of Chemical Technology. Edited by M. GRAYSON. Wiley-Interscience, John Wiley and Sons, 605 Third Avenue, New York, NY 10158. 1985 (cloth), 1989 (paper). xxxii + 1318 pp. 21.5 × 28 cm. $59.95 (paper). ISBN 0471-51700-3.

This volume is an affordable, soft-cover edition of the original hardbound book published in 1985 but not previously reviewed in the journal. It is a condensed version of the material contained in the 24 main volumes and supplement volume of the third edition of the *Kirk-Othmer Encyclopedia of Chemical Technology*. The emphasis is on chemicals and mixtures that are important in the chemical industry, but there are many articles that will be of interest to readers of this journal. The article on antibiotics is 20 pages long, and there are also useful articles on subjects such as chemotherapeutics, steroids, alkaloids, prostaglandins, vitamins, and various other natural products. Probably the main value of the book, however, would be in answering chemistry-related questions that come up outside one's area of expertise; in such cases this encyclopedia might save a trip to the library to research some simple subject. Readers who are frequently called on to answer such questions should find this book a useful investment, especially because it represents very good value for money.

DAVID G.I. KINGSTON, *Virginia Polytechnic Institute and State University*

Biosynthetic Products for Cancer Chemotherapy. Volume 6. GEORGE R. PETTIT, CHERRY L. HERALD, and CECIL R. SMITH. Elsevier Science Publishing, P.O. Box 882, Madison Square Station, New York, NY 10159. 1989. xiv + 400 pp. 16 × 23.5 cm. $141.50. ISBN 0-444-88049.

Volume 6 in this continuing series presents a tabular survey of plant and animal antineoplastic and

cytotoxic constitutents, as well as a summary of marine organism products isolated and reported in the literature from January 1983 to January 1986.

Following two introductory chapters, the book is divided into three main sections: "New Biosynthetic Antineoplastic and/or Cell Growth Inhibitory Agents," "Marine Animal Biosynthetic Products," and "Marine Plant Biosynthetic Products." A subject index is followed by a table of molecular weights, a bibliography, and an Appendix comprising the toxic constituents of cigarette smoke. Within the three main sections, compounds are organized by biogenesis and increasing molecular weight, assuring, for the most part, that compounds of similar structure are summarized proximately.

In the first section, for each compound, the following data are included: name, molecular formula, molecular weight, bioactivity, melting point, optical rotation, spectral data, the source organism and its location, and the pertinent reference(s). Known, established antineoplastic compounds are cited when a new source has been identified. The second and third sections are similarly organized, and their inclusion is based on source, not on antineoplastic activity. Because these listings comprise 175 pages, whereas the antineoplastic compounds comprise only 83 pages, the title of the book is a little misleading.

Chapter 1 of this volume is a discussion of the World Health Organization Cancer Unit recommendations made in 1983 regarding the use of 11 first generation antineoplastic agents. Pettit *et al.* rightly feel that the second generation of natural products currently in advanced pharmacology or clinical trial offers in almost every case the possibility that presently refractory tumors may succumb to chemotherapy. Chapter 2 describes the relationship between viruses and human cancer and also gives a brief, but very useful, history of the etiology of the AIDS complex. These two chapters cover the literature to January 1989 and are a personal appeal for enhanced research endeavors by the federal government in the areas of both antiviral and antineoplastic drug discovery.

The authors are to be congratulated for their persistence in continuing to summarize for others the diverse literature on antineoplastic agents. The useful summary of marine secondary metabolites verifies that this source will undoubtedly continue to provide novel, biologically active metabolites, and the indices add a very important dimension to the way that this book can be used by the bench chemist. The drawbacks are of course that coverage of the compound literature is already four years old, and from this reviewer's point of view it is disappointing not to find references to synthesis, biosynthesis, and mechanism of action of active compounds included in the coverage. But overall this is a very valuable compilation of antineoplastic and marine natural products which should definitely be on the shelves of every chemical reference library. Sadly, the price of the volume will preclude its being added to the personal libraries of many natural product chemists.

GEOFFREY A. CORDELL, *University of Illinois at Chicago*

Sulphur-Containing Drugs and Related Organic Compounds: Chemistry, Biochemistry and Toxicology, Volume 1 Part A. Metabolism of Sulphur Functional Groups. Edited by L.A. DAMANI. Ellis Horwood, Ltd., distributed in the USA by John Wiley & Sons, Inc., 605 Third Avenue, New York, NY 10158. 1989. 167 pp. 17 × 24.5 cm. $89.95. ISBN 0-470-21257-8.

The aim of this three-volume series is a comprehensive presentation of our current knowledge on the chemistry, analytical chemistry, biochemistry, and toxicology of sulfur-containing compounds. This formidable task is attempted in each volume by authors who are active investigators in the subjects of their respective chapters. Volume 1, divided into Parts A and B, is concerned with the chemical and biochemical reactivity of both inorganic and organic compounds. Chapter 1 by Dr. Damani gives an overview of the different aspects of sulfur chemistry, biochemistry, and xenobiochemistry. Chapter 2 discusses the biochemistry of naturally occurring sulfur compounds. Chapters 3 and 4 discuss agricultural, industrial, and medicinal sulfur-containing compounds. After a discussion of inorganic sulfur compounds by J. Westley in Chapter 5, the volume ends with two chapters discussing, respectively, the Phase I and Phase II reactions of thioethers, thiols, dithionic acids, and disulfides. Volumes 2 and 3 will concentrate on the analytical, biochemical, and toxicological aspects of sulfur xenobiochemistry and metabolism and on the pharmacokinetics of sulfur-containing drugs, respectively.

Presented as a "useful reference source," this first volume suffers several deficiencies. For example, in Chapter 1 (Aspects of sulphur chemistry, biochemistry and xenobiochemistry) and Chapter 2 (Naturally occurring sulphur compounds), no reference is made to the important sulfur coenzymes presently known to occur in the archaebacteria, which leaves the reader with the view that these coenzymes do not exist. In several places the data in the tables is contradictory to what is discussed in the text. In addition, a important table in Chapter 1 outlining the options for the metabolism of a wide range of different sulfur functionalities provides no references to support the reactions listed. The redundancy of information between the chapters has, however, been kept to a minimum.

Overall this first volume in the series offers the reader a relatively comprehensive view of sulfur xenobiochemistry and, with the other volumes in the series, should be of value to anyone interested in the biochemical pharmacology and toxicology of sulfur-containing compounds.

ROBERT H. WHITE, *Virginia Polytechnic Institute and State University*

Diterpenes of Flowering Plants. F. SEAMAN, F. BOHLMANN, C. ZDERO, and T.J. MABRY. Springer-Verlag, 175 Fifth Avenue, New York, NY 10010. 1990. vi + 638 pp. 16 × 24 cm. $99.00. ISBN 0-387-97058-4.

Secondary metabolites of lower and higher plants are now being isolated as such a rate that publication of compendia dealing with various classes of plant constituents is sure to be welcomed by those who need to inform themselves quickly on structures and sources of known compounds of plant origin. My enthusiasm at receipt of the present volume by four experts who have previously authored or coauthored impressive compilations of this type was therefore tempered only slightly by the discovery of a subtitle which declares that this survey is limited to diterpenes of Compositae. No matter—one should be thankful that the labor of compiling this work was undertaken at all.

Closer examination of the volume, however, reveals shortcomings which will hamper the use for which it is intended. More than half of the volume is taken up by tables listing the diterpenes so far found in Compositae by (1) common names which correspond to an arbitrarily assigned number, (2) substitution pattern for each basic skeleton chosen by the authors, (3) number (from 1 to 1260) under each of which the plant sources is listed, and (4) structure, which essentially repeats Table 2 in more detail. Tables 1, 2, and 4 correspond so that it is easy to locate a structure if the common name or the name chosen by the authors for the basic skeleton is known or vice versa; however, due to the fact that skeletal structures have multiplied since a systematic nomenclature of cyclic diterpenes was agreed upon by workers in the field more than 20 years ago, the names under which compounds are listed in Tables 1, 2, and 4 or in the index are frequently those chosen by the discoverers or the authors and are therefore not necessarily familiar or indicative of the structure. An unfortunate example of this is the inappropriate use of "tetrachyrane" (hydrocarbon ending!) for a series of lactones based on the *ent*-20 (10↦9*S*) abeokaurane skeleton. Further tending to confusion is the circumstance that for compounds of the ent series the prefixes α and β are given correctly in Table 4 but inverted in Table 2 to conform with the chosen headings and that they are quite generally wrong in the compound index, possibly on the unjustifiable ground that in the index entries the ent prefix is placed last.

Another problem confronts the user who seeks to inform himself on the diterpene content of a particular species. This requires leafing through all of Table 3 (68 pages) and then locating in Table 2 or 4 the structures to which the numbers refer, frequently again by leafing through much of the table. As a gauge of the time involved, I decided to check on the entries in Table 3 for the results described in references 323 and 336 which led to isolation of compounds 671, 674, 747, and 1260 from *Eupatorium petaloideum* and compounds 805 and 806 from *Eupatorium album*. Locating structures 747 and 1260 was time-consuming; more important, however, was the discovery that Table 3 was full of serious errors concerning the contents of these two species and the references thereto. Random checks of a few other items led to the discovery of further errors of commission and omission and also indicated that in a number of instances critical evaluation of the literature was lacking. Hence users of the volume need to be warned that its availability does not obviate consultation of Chemical Abstracts and the original literature.

The remaining sections comprise an instructive chapter on plausible biogenetic routes to the various diterpene skeletons, a chapter which discusses diterpene distribution and possible phylogenetic relationships within Compositae, a short survey of what is known about biological activities of diterpenes from Compositae, and a chapter on diterpene analysis devoted almost exclusively to the confusing history of clerodane stereochemistry. Unfortunately the authors' attempt to clarify the literature is almost incomprehensible even for one who has lived with the topic; it leaves much to be desired. A bibliography containing 505 references through 1986, none later, an appendix enumerating frequently found ether and ester side chains, a compound index, a species index, and a general index round out the volume which would have benefited from closer editorial scrutiny as spelling errors abound in the bibliography and are occasionally found elsewhere.

It is clear that much effort has gone into composition of this work. In spite of the criticisms I have voiced the volume will be very useful to all phytochemists if they are aware of its shortcomings. The price is reasonable in comparison with the cost of similar books.

WERNER HERZ, *Florida State University*

Chemotaxonomie der Pflanzen, Volume VIII. R. HEGNAUER, Birkhäuser Verlag AG, Ringstrasse 39, CH-4016 Therwil, Switzerland. 1989. vi + 718 pp. 17 × 24.5 cm. SFR 520. ISBN 3-7643-1895-3.

This is Volume VIII of the continuing series of Hegnauer's "Chemotaxonomie der Pflanzen," which is dedicated to the late Tony Swain. All volumes are written in German and present comprehensive overviews of the distribution and systematic significance of plant natural products. Volume VIII is a supplement to Volumes III and IV and covers the dicot families Acanthaceae to Lythraceae. Because of the dramatic increase in data, treatment of the dicot families has been separated into this volume and Volume IX, which is in preparation. Volume IX will cover the rest of the dicot families and will also provide the chemotaxonomic index, which is not included in this volume.

The introduction gives key references to comprehensive treatments of natural products as well as the modern systematic alignments of the dicot families. Subsequently, each of the plant families (152) is discussed in detail with listings of the different types of natural products which have been isolated from various taxa of a given plant family. In many cases, figures with structures of new natural products within a family are shown. This is followed by a brief treatment of chemotaxonomic and general phylogenetic considerations and a wealth of literature references. Each section on a plant family provides an addendum with more recent treatments of the subject plus pertinent references. Specific reference is made to the economic value as well as biological activities and the ecological significance of natural products within certain members of a plant family. The volume concludes with an addendum listing most recent publications of the covered plant families, with entries ending in August 1988.

Who am I to commend Professor Hegnauer for such a monumental piece of work? Instead, I wish to thank him for providing us with this superb reference book which will benefit many scientists working in the fields of plant systematics, natural product chemistry, the pharmacal sciences, and chemical ecology.

NIKOLAUS FISCHER, *Louisiana State University*

Resource Management in Amazonia: Indigenous and Folk Strategies (Advances in Economic Botany, Volume 7). Edited by D.A. POSEY and W. BALEE. The New York Botanical Garden, Bronx, New York 10458. 1989. x + 287 pp. 17.5 × 25 cm. $62.65 (paper). ISBN 0-89327-340-6.

Amazonia, an area of 5,402,760 km^2 (about 3.6% of the earth's land surface), to many people still represents a vast unexplored tropical jungle that still evokes awe, romance, and wonderment. This is reflected by the terms "counterfeit paradise" or "green hell" by which tourists still refer to it. However, in response to the large-scale and hasty economic development efforts directed to this region (in particular within the Brazilian portion), enormous research activities have been undertaken in the Amazon region during the past quarter century, and a large body of knowledge has now been accumulated on this forest ecosystem. Among the large number of books and research papers that have been generated as a result of these activities, the present book stands as one of the most informative on the current Amazonian situation.

This book deals with the ethnoecology of Amazonia, written by professionals who are currently involved with research of the Amazon region. It is a collection of essays based on the most recent studies of conservation and management, which emphasize how indigenous and folk peoples actually mold the natural landscape to suit their needs and desires and how they have adapted to it. Originally conceived as the proceedings of a symposium with eight contributors, it has grown into this book with contributors from various disciplines: cultural anthropology, archeology, botany, developmental education, ecology, and geography. There are 16 chapters, which are grouped into two sections: the first section deals with theoretical approaches to resource management (4 chapters), the second with case studies (12 chapters). Each chapter starts with an Abstract and normally ends with a "Conclusion," followed by acknowledgments and a list of references. The chapters are richly illustrated with black and white photographs, maps, tables, and diagrams. A 5-page index (subject and scientific names) is provided at the end of the book.

From the point of view of natural product research, the book has a somewhat limited interest. There are only three chapters that deal with the uses of plants in medicine. These three chapters are: "Use of plant resources by the Chacobo" (by B.M. Boom, pp. 78–96), "Management of a tropical scrub savanna by the Gorotire Kayapo of Brazil" (by A.B. Anderson and D.A. Posey, pp. 159–172), and "The perception of ecological zones and natural resources in the Brazilian Amazon: an ethnoecology of Lake Coari" (by J. Frechione, D.A. Posey, and L.F. da Silva, pp. 260–282). Unfortunately, under the "medicinal plants" entry in the index, only the chapter by Boom is referenced; one may miss the other two chapters if one does not peruse the book at length. The rest of the book is dedicated to traditional concepts of ecology, agriculture, and ethnobotany and, in the words of a distinguished Amazon researcher, Dr. Ghillean T. Prance, who wrote the Foreword, the book contains "a wealth of information about plant uses and plant biology evenly distributed throughout . . . ."

The book is definitely recommended for everyone who has an interest in the problems of tropical rain forest depletion, conservation, and utilization. Even research workers and students in the area of natural products whose interest goes beyond laboratory investigation will greatly benefit from reading this book, in view of the current interest in drug discovery from the tropical rain forests. Scientists in other disciplines, including agriculture, anthropology, archeology, biology, botany, conservation, ecology, and education will find a gold mine of reference sources in this book on current and past research on Amazonia.

DJAJA DJENDOEL SOEJARTO, *University of Illinois at Chicago*

Vogel's Textbook of Practical Organic Chemistry. Fifth Edition. Revised by BRIAN S. FURNISS, ANTONY J. HANNAFORD, PETER W.G. SMITH, and AUSTIN R. TATCHELL. Longman Scientific and Technical and John Wiley and Sons, 605 Third Avenue, New York, NY 10158. 1989. xxviii + 1514 pp. 16 × 24 cm. $84.95. ISBN 0470-21414-7.

That this volume is the fifth edition of a text first published in 1946 attests to the value of the original work and its subsequent editions. Its aim remains to provide a one-volume reference text which will be of value not only to undergraduate and graduate students of organic chemistry but also to practicing organic chemists, and it meets this aim very well. As in previous volumes, the emphasis is on synthetic organic chemistry, with about half the book being devoted to the synthesis and reactions of the various classes of organic compounds, but there is enough information on experimental techniques (including chromatography) and on spectroscopy to make the book useful to natural product researchers.

The book opens with a short chapter on the tactics and strategy of organic synthesis. The second chapter (224 pages) provides a thorough introduction to various experimental techniques, including an important section on hazards in organic chemistry laboratories and sections on apparatus and reaction procedures, isolation and purification processes, and the determination of physical constants. Chapter 3 (139 pages) provides an overview of the four major spectroscopic methods, with an emphasis on the interpretation of spectral data. Chapter 4 (75 pages) then provides a concise but useful description of the purification of solvents and various reagents.

The heart of the book, as previously noted, consists of detailed descriptions of the preparation of various compounds, with aliphatic compounds in Chapter 5 (354 pages), aromatic compounds in Chapter 6 (263 pages), selected alicyclic compounds in Chapter 7 (40 pages), and selected heterocyclic compounds in Chapter 8 (69 pages). Although most of the compounds described can be purchased from commercial suppliers, the synthetic descriptions are useful in the synthesis of analogues that may not be commercially available and as examples of general reactions.

The book concludes with chapters on the investigation and characterization of organic compounds (102 pages) and on the physical constants of organic compounds (103 pages). The Appendices contain some very useful spectroscopic correlation tables, a brief survey of the literature of organic chemistry, and information on hazard symbols, common synthons, and manufacturers and suppliers. This latter section is not particularly useful for a US reader, because it lists mainly UK suppliers.

Overall this book contains a wealth of information and represents excellent value for the money. The reviewer's previous edition is now well worn and seems to reside permanently in his students' laboratories rather than his office. This latest edition will undoubtedly see similar heavy use.

DAVID G.I. KINGSTON, *Virginia Polytechnic Institute and State University*

Bioorganic Marine Chemistry, Volume 3. Edited by PAUL J. SCHEUER, Springer-Verlag, 175 Fifth Avenue, New York, NY 10010. 1989. vii + 175 pp. 16.5 × 24.5 cm. $88.10. ISBN 3-540-50870-8; ISBN 0-387-50870-8.

Marine natural product chemistry, the study of the secondary metabolites produced by marine plants and animals, has changed drastically over the past few years from largely a science of organic structure determination to one based significantly in interdisciplinary research. While traditional studies focused upon the structural uniqueness of marine-derived compounds, more contemporary research now focuses on the ecological and biomedical significance of these compounds. This book is the third volume in a series, "Bioorganic Marine Chemistry," which illustrates this change in emphasis. Six chapters, contributed by leading researchers, make up the volume. While there is no single theme, the first three chapters deal with various structural and functional aspects of marine peptides. Two chapters discuss aspects of behavioral biology mediated by chemical effects, while the last chapter discusses the discovery of bioactive marine compounds in the context of cancer drug development.

In Chapter 1, Ireland and co-workers provide a summary of the small peptides isolated from marine sources as of 1987. This is a highly useful summary, organized along phylogenetic lines, which serves to illustrate both the uniqueness of marine peptides and the paucity of study invested in marine organisms. It is clear that peptides are highly functional in the marine environment and that this is a field which will expand in the near future.

In Chapter 2, Suzuki describes recent work on the structures and functions of the sperm-activating peptides from sea urchin egg surface jelly. This is an excellent review of the development of this field; which embodies important research pertinent to human fertilization phenomena. A discussion of the peptides isolated, their roles in attracting and activating urchin spermatozoa, their syntheses, and their roles in acceleration of the sperm acrosome reaction are described.

In Chapter 3, Kobayashi and co-workers provide a brief but informative overview of the peptide neurotoxins from tropical cone shells (*Conus* spp.). This chapter focuses on the pharmacological properties of peptides isolated from six *Conus* species, with special emphasis placed on the specifics of their mechanisms of inhibition of neuromuscular transmission.

In Chapter 4, Davis *et al.* provide a detailed discussion of the complexities of marine fouling and larval settling phenomena. This is a good overview of a highly complex phenomenon, which leaves the impression that little if any definitive research has been performed in this area. For example, although there are numerous reports of marine secondary metabolites with bioactivities toward "potential" fouling organisms, there have been no experiments performed in situ to assess their effects against natural fouling communities. This area of research is clearly fertile ground for collaborative efforts between chemists and biologists, a view strongly supported by these authors.

In Chapter 5, Sakata presents a short review mainly of his own research performed over the past five years. Sakata has pioneered studies of the organic molecules that stimulate the feeding responses of marine gastropods. This work has surprisingly shown that polar glycerolipids of differing structure types cause feeding stimulation in diverse gastropods such as marine prosobranchs, abalone, sea hares, and others. These findings came somewhat as a surprise, because feeding stimulants and attractants for other marine invertebrates and fishes are known to involve amino acids and small peptides.

In Chapter 6, Suffness and co-workers from the NIH National Cancer Institute provide a fascinating and practical view of cancer drug development in general and some views focused on specific marine-derived anticancer agents. The review consists of the history and current developments at the NCI and describes in detail the methods under development to attack the problem of "cancer cell specific" drugs. Of particular importance has been the continuing debate surrounding linking preliminary in vitro cell line discovery with human-relevant in vivo models. Of particular importance to marine investigators is the discussion of compound supply for scale-up, re-collection problems, and the time course for the development of a clinically utilized anticancer agent.

Overall, Volume 3 of this series is a small but significant contribution to the survey literature in marine bioorganic chemistry. Unfortunately, the small size of this contribution in relation to its cost may diminish its overall distribution.

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