Book Reviews

Pharmaceutical Manufacturing Encyclopedia. Second Edition. By Marshall Sittig. Noyes Publications, Park Ridge, NJ. 1988. Vol. 1, A–K: xxix + 866 pp. Vol. 2, L–Z: pp 867–1756. 16.5 × 24 cm. ISBN 0-8155-1144-2. $225.00.

The second edition of this two-volume set first published in 1979 gives details for the manufacture of 1295 pharmaceuticals, now being marketed as tradenamed products somewhere in the world. The pertinent process information has been obtained from examples given in the patent literature. In addition to the patented process information, references are also cited under each drug's entry to major pharmaceutical reference work where additional information can be obtained on synthesis methods and the pharmacology of the individual products.

This work is presented in two volumes. The arrangement within the books is alphabetical by generic name. The table of contents appears at the beginning of Volume 1. There is also an index by tradenames used in many of the countries in the world. Another index lists the raw materials used in the manufacture of the various drugs, an index which should be commercially valuable to suppliers of chemical raw materials to the pharmaceutical industry. These indexes appear at the end of Volume 2.

These volumes provide a handy first reference both to the manufacturing process and also to other reference sources where additional details on the product may be found.

This handbook should be useful as an initial point of access to the commercial pharmaceutical literature. It can be consulted as a master source before using computerized retrieval even if computer data on the pertinent literature are readily available.

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Alkaloids: Chemical and Biological Perspectives. Volume 6. Edited by S. William Pelletier. Wiley-Interscience, New York. 1988. xv + 542 pp. 17 × 24 cm. ISBN 0-471-60298-1. $110.00.

Five excellent chapters make up this book. The first chapter on the chemistry, biology, and therapeutics of the mitomycins (W. A. Remers and R. T. Dorr) deals authoritatively with a pharmacologically important group of metabolites since mitomycin C has proven anticancer activity. The second chapter is a fascinating review of the alkaloids of *Tabernaemontana* species (T. A. van Beek and M. A. J. T. van Gessel). The big surprise is that the taxonomy of this genus of the family Apocynaceae had been in a state of utter confusion up until the very recent past. It is now established that the genus *Tabernaemontana* has no less than 26 synonyms! To bring some order into this house of chaos, the authors have wisely supplied us with a list of recognized *Tabernaemontana* species and their synonyms. They have also classified the more than 350 *Tabernaemontana* alkaloids according to types and possible biogenetic origins. Included among these alkaloids is camptothecin (or is it camptothecine?) whose use in the treatment of liver carcinoma and psoriasis has been contemplated in China. Another important *Tabernaemontana* alkaloid is vincamine, which is a registered drug in France and Hungary. The chances are good that with time more *Tabernaemontana* alkaloids will become of clinical relevance.

The third chapter (D. J. Hart) deals with azomethine additions as a tool in the synthesis of alkaloids and their analogues. The aim is to study the construction of carbon–carbon bonds adjacent to nitrogen.

The biosynthesis of the protoberberine alkaloids is the subject of the fourth chapter (C. W. W. Beecher and W. J. Kelleher). This topic is a matter of intense interest to alkaloid chemists in general since important enzymatic studies have been carried out, in addition to feeding experiments using labeled precursors. The authors have made a special effort to present the data available in a lucid, objective, and factual manner. The final chapter on the quinoline, acridone, and quinazoline alkaloids (M. F. Grundon) is a masterly presentation of the chemistry, biosynthesis, and biological properties of these alkaloids, which occur mainly among the Rutaceae.

This book is highly recommended to the practitioners and students of natural products chemistry. It has been very well edited. It is relatively free of errors and has been supplied with subject and organisms indexes.

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Multivariate Chemometrics in QSAR: A Dialogue. By Peter P. Mager. Research Studies Press Ltd. Wiley, New York. 1988. xiv + 345 pp. 15 × 23 cm. ISBN 0471-91570-X. $123.00.

This book is Volume 13 of the Chemometrics Series edited by Dr. D. Bawden. It is a highly specialized monograph that covers predominantly the specific aspects of multivariate QSAR techniques pioneered by Dr. Mager. While the introduction to this book contains some definitions useful for the beginner and comments are made throughout the text about an orientation toward the novice QSAR user, the bulk of the book is a highly theoretical and mathematical presentation of the subject, more truly oriented toward the QSAR specialist rather than the practicing synthetic organic or medicinal chemist. The first three chapters contain a superficial and, in some instances, out of date overview of computer-based approaches to the problem of molecule design.

Chapter V discusses some special techniques unique to the combination of multivariable structure–activity analysis with multivariate bioassay (MASCA) model as it can be applied to QSAR problems. The next three chapters describe specific applications to molecular design and how the MASCA technique could be used to provide guidance for the design of new molecules. While there are detailed examples of the analysis of real data cases, the ones chosen do not show the potential benefits of a QSAR analysis. The most successful results discussed are those correlating the physicochemical parameters of molecules rather than biological or medicinal applications.

The final chapters of the book contain an interesting and unique feature: Dr. Mager has published a section of peer commentary on the preceding text. This commentary was written by four well-known scientists actively involved in QSAR or statistical analysis of data. The peer commentary is followed by a chapter of rebuttal discussion by Dr. Mager.

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Methods in Enzymology. Drug and Enzyme Targeting, Part B, Volume 149. By Sidney P. Colowick and Nathan O. Kaplan. Academic Press, Inc., San Diego, CA. 1987. 359 pp. 15 × 23 cm. ISBN 0-12-182489-1. $55.00.

This volume contains 31 chapters and is divided into three parts. The smallest section (4 chapters) describes cell-targeting techniques (including receptor-mediated endocytosis, retroviral-mediated gene transfer, and processing of lysosomal enzymes) while the remainder of the book is equally split between liposome and cellular (mainly erythrocytes) carriers. Most of the material is flatly familiar. We have read it all before, and the bibliography confirms this suspicion. Of the approximately 780 references cited, almost 90% were published before 1984. Only 3 of the 31 chapters

manage to quote more than 5 references after this date. Since the goal of the editors was to "make available to interested scientists a readily accessible source describing state-of-the-art methods in targeting technology" the casual reader could reasonably conclude that this technology has not advanced much over the last 5 years. This is a little unfair. Several of the concepts developed in the 1970s and described in this volume (particularly liposome technology) are currently or will soon be clinically evaluated, but this topic is not covered. Overall this is a disappointing volume with little new to say. It is not recommended for the expert or the interested browser; however, it may have some utility for graduate students or postdoctorals wishing a compilation of liposome and cell carrier research technologies compressed into a single volume.

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Isotopes in the Physical and Biomedical Sciences. Volume 1. Labelled Compounds (Part A). Edited by E. Buncel and J. R. Jones. Elsevier, Amsterdam, The Netherlands. 1987. xii + 505 pp. 17 × 25 cm. ISBN 0-444-42809-7. $335.00.

Although the literature on isotopically labeled compounds is now too large to be surveyed adequately, the editors of this volume have done a fine job of choosing important areas for consideration and selecting competent scientists to review them. The volume consists of 13 chapters by scientists from nine different countries. It focuses on (1) nomenclature (1 chapter), (2) specific methods of labeling (4 chapters), and (3) the preparation of particular classes of compounds (8 chapters). The classes of compounds chosen for review (e.g., neurochemicals, lipids, purines and pyrimidines, β-blockers) are all of significant biomedical interest. The bulk of the consideration in the book is given to radioisotopes (particularly ^{3}H, ^{14}C, and radio-iodine), although stable isotopes are also included.

All of the chapters appear to be thoroughly researched, and most have a fairly long list of literature citations. Each chapter begins with a table of contents, and nearly all are clearly laid out. The style of writing is quite lucid throughout the book—a noteworthy achievement since there are so many authors, some of whom do not use English as their first language. There is frequent, though judicious, use of charts, drawings, and tables. A brief subject index has been added at the end.

This volume should be a most useful resource for anyone who is involved in the synthesis or application of labeled compounds.

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Neurotransmitters and Epilepsy. Edited by Philip C. Jobe and Hugh E. Laird II. Humana, Clifton, NJ. 1987. xviii + 376 pp. 16 × 23.5 cm. ISBN 0-89603-101-2. $69.50.

The objective of this book is to present a conceptual approach to the study of neurotransmitters in epilepsy. To accomplish this it is necessary to understand the function of neurotransmitter systems in various experimental models of epilepsy. For this reason the editors have included chapters on these systems in nine different models and have capped this subject with a chapter on the role of selected neurotransmitters in various types of human epilepsy. The chapters, all written by experts in the field, thus explore the following aspects of epilepsy: genetics, animal models, in vitro models, opioids, GABAergic systems, ACTH and other hormones, hippocampal pyramidal cells, cholinergic, serotonergic and other neurotransmitter systems, pharmacologic studies, electroshock seizure models, biochemical studies, sound-induced seizures, noradrenergic systems, seizure induction by convulsant drugs, inhibitory and excitatory amino acid systems, glucose metabolism, ATPase, thyroid hormone, pyridoxine, and metals. In the final chapter data from various epilepsy models are integrated by the editors to facilitate a better understanding of the function of the neurotransmitters in modulating epilepsy.

Although published in 1987, the book contains only very few references to literature as late as 1985 and several in 1986. The index (10 pages) is adequate, and the quality, uniformity, and print of the book are excellent. *Neurotransmitters and Epilepsy* is a practical guide to an important area of therapeutic research. It should be a useful addition to the library of all neuroscientists. It will also be of value to researchers and clinicians concerned with epilepsy. Medicinal chemists will probably find the book of benefit primarily as a source of new approaches to the treatment of this neurologic disorder.

Staff

Dealing with Drugs: Consequences of Government Control. Edited by Ronald Hamowy. Lexington Books, Lexington, MA. 1987. xi + 385 pp. 16 × 23 cm. ISBN 0-936488-07-7. $40.00.

This volume is one of a series of studies in public policy from the Pacific Research Institute for Public Policy. It provides a series of cogent and persuasive discussions of the various facets of worldwide drug use and drug problems—individual, societal, ethical, moral, legal, political, and scientific. The 10 authors are recognized experts in their respective areas. Their analyses and expositions are trenchant and, in several instances, brilliant.

Although "acceptable drugs" such as alcohol and tobacco, as well as "controlled medicinal drugs" such as amphetamine are occasionally mentioned, the major focus of this volume is illicit drugs for pleasure, such as heroin, cocaine, and marijuana. A telling case is made that the U.S. policy for the past 60 years or so for dealing with these drugs, as well as the more recent "wars on drugs" (1970–1987), has been an abysmal failure. In spite of enormous expenditures to curb the use, production, and distribution of these substances their availability and use are more widespread than at any time in history. Whereas a convincing case is made for decriminalization of heroin, cocaine, marijuana, and other "pleasure drugs", the prescription offered for the kinds of regulations and control that will work effectively for the benefit of the user and society after legalization is less convincing and less comforting. We have had much experience with the "acceptable drugs", alcohol and tobacco. In the case of alcohol in particular, it is quite clear that alcoholism is widespread and the user is not the only sufferer. Personal associates of the alcoholic pay a large emotional price and society at large also pays a great price in terms of lives and loss of productivity.

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Medicinal Chemistry. A Biochemical Approach. Second Edition. By Thomas Nogrady. Oxford University Press, Oxford and New York. 1988. xvii + 514 pp. 17 × 24 cm. ISBN 0-19-505639-9. $49.95.

This is the second edition of a previously well-received textbook of medicinal chemistry by Thomas Nogrady. Being a single-authored work, the book is generally uniform in style and content and does not suffer from the unevenness of most multi-authored works. The second edition retains the general format of the first. Drugs are organized according to their biological targets within eight chapters. An introductory chapter on physicochemical principles is followed by four chapters on different facets of receptor-active drugs. There are also chapters on nonmessenger drug targets, drug distribution and metabolism, and a final chapter on drug design principles. An appendix lists drugs arranged by pharmacological activity. The overall layout and print quality is improved, and attempts have been made to update this edition compared with the first edition published only 3 years ago. In addition to general updating, new subject areas are introduced into the new edition, for example, on phosphatidylinositol-derived second messengers and the role of oncogene products in transmembrane signaling. Additional new topics include atrial natriuretic factors, antiarrhythmic drugs, and DNA topoisomerase mechanisms, and there is also an outline of molecular modeling and computer graphics in drug design. The book appears generally free of mistakes but one or two have crept into the second edition, for example, the incorrect structure of muscimol on page 229.

It is obviously impossible to produce a comprehensive textbook of medicinal chemistry within the space of 500 pages. However,

the book serves well as a very readable introduction to medicinal chemistry, and the extensive bibliography provides the reader with a ready access into chosen subject areas for in-depth study. Despite the updated literature of this new edition, the rate of development of medicinal chemistry means that some of the topics discussed already appear out of date. This is inevitable and emphasizes the difficult task of producing textbooks. However, this new edition of Thomas Nogrady's *Medicinal Chemistry* will prove a useful addition to the bookshelves of a spectrum of readers ranging from students to teachers and researchers in medicinal chemistry and pharmacology.

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Enzyme Mechanisms. Edited by Michael I. Page and Andrew Williams. The Royal Society of Chemistry, London. 1987. xviii + 550 pp. 14.5 × 22 cm. ISBN 0-85186-947-5. $183.00.

This book comprises 26 chapters written by a total of 33 authors, covering the following topics: Theories of Enzyme Catalysis (M. I. Page, 13 pp); four chapters on enzyme models, Synthetic Polymers (I. M. Klotz, 21 pp), Crown Ethers (J. F. Stoddart, 21 pp), Cyclodextrins (M. L. Bender, 11 pp), and Small Molecule and Intramolecular Catalysis (A. J. Kirby, 11 pp); Use of Protein Engineering to Study Enzyme Mechanisms (R. J. Leatherbow and A. R. Fersht, 19 pp); Transition State Affinity and the Design of Enzyme Inhibitors (R. Wolfenden and L. Frick, 26 pp); seven chapters on acyl group transfer, Fundamental Mechanisms (A. Williams, 17 pp), Cysteine Proteinases (K. Brocklehurst, 19 pp), Serine Proteinases (A. L. Fink, 19 pp), Phosphoryl Transfer (P. M. Cullis, 43 pp), Sulphotransferases and Sulphatases (M. W. Duffel and W. B. Jakoby, 8 pp), Aspartic Proteinases (G. Fischer, 11 pp), and Metalloproteinases (D. S. Auld, 19 pp); Glycosyl Group Transfer (M. L. Sinnott, 39 pp); Isomerization Mechanisms through Hydrogen and Carbon Transfer (J. P. Richard, 19 pp); Imine Formation in Enzymatic Reactions (D. J. Hupe, 28 pp); Pyridoxal Phosphate Dependent Enzymes (V. C. Emery and M. Akhtar, 45 pp); Thiamine-dependent Enzymes (P. Haake, 14 pp); Adenosylcobalamin-dependent Enzyme Reactions (B. T. Golding and D. N. R. Rao, 25 pp); Folate-dependent Enzymes (S. J. Benkovic and M. Young, 13 pp); two chapters on glutathione-dependent enzymes, Chemistry (K. T. Douglas, 26 pp) and Glutathione-S-Transferases (W. B. Jakoby, 9 pp); two chapters on oxidoreductases, Pyridine Nucleotide-dependent Enzymes (M. J. Adams, 29 pp) and Flavoenzymes (C. S. J. Walpole and R. Wrigglesworth, 28 pp); and Multi-enzyme Complexes–Eukaryotic Fatty Acid Synthases (N. Singh and J. K. Stoops, 17 pp).

As is obvious from the preceding list, this is an important collection of review essays by many of the leaders in their respective research areas. Each chapter is a concise description of the mechanisms of appropriate enzymes. The chapters are well written, and numerous references to earlier reviews as well as to current research are given. Although the book has a 1987 copyright, with few exceptions, only the work published prior to 1986 is discussed.

This is an excellent book which the publishers have singlehandedly rendered virtually useless to the readership most likely to use it by omitting an index and by charging such an exorbitant price. For both of these reasons, but primarily the latter, the book cannot be used as a course text, and primarily for the former reason, it has little utility as a reference book. Unless you have a specific topic that you want to read about and have the patience to go through the entire table of contents, which lists all headings and subheadings in each chapter, you will soon find other sources to get the information. For the sake of the many notable authors and potential readers, my advice to the publishers is to compile an index fast and drastically lower the price!

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From CA to CAS ONLINE. By Hedda Schulz. VCH Publishers, New York. 1988. xii + 227 pp. 17 × 24 cm. ISBN 0-89573-815-5. $39.95.

This is an English translation of the book *Von CA bis CAS ONLINE*. The British translator has used British spelling so that in some instances there are differences in the descriptive text and the related figures and citations that were taken from the literature (or databases) of the Chemical Abstracts Service. It is important, especially for CAS ONLINE searchers, to note this as it could cause problems; the system may fail to recognize a search term because of the spelling difference.

The book is very practically written and recognizes the differences among scientists searching in the field of chemistry, their strategies, and computer capabilities. A major objective of this book is to aid the reader in developing adequate search strategies for retrieving electronically stored information. The first part of the book explains the organization of *Chemical Abstracts* and shows how to obtain "hidden" information. Development of search strategies is presented with examples. The second part is directed toward all the important facts about computer-readable files, online access to Chemical Abstracts Services, and suppliers of this information. In addition, this book contains an updated, revised, and comprehensive chapter extracted from H. R. Pichler's book *Online-Recherchen für Chemiker*. This chapter provides numerous practical examples outlining the use and command language of CAS ONLINE.

This book is intended for students of chemistry with the need of searching the literature in chemistry and related fields. It is very practically written and should be a valuable addition to the libraries of almost all practicing chemists.

Staff

Glial Cell Receptors. Edited by Harold K. Kimelberg. Raven, New York. 1988. xiii + 274 pp. 16 × 24 cm. ISBN 0-88167-401-X. $79.00.

Although glial cells have had a long history of identification and classification, their functions have received relatively little attention. A fascinating aspect of current glial research is the identification of receptors similar to those found in various neuronal pathways on these modestly studied cells. This identifies glial cells as complex responders to changing conditions and supports the view that these cells have diverse functions in the nervous system. This book collects this current, exciting, and rapidly expanding research by scientists presently studying the identification and functions of such receptors. Their studies imply that the complex functions of the CNS may be more than neuronal, but are also likely to be mediated via transmitter actions on neuronal–glial systems. Receptors on glial cells include ones acted on by the biogenic amines, adrenergics, GABA, serotonin, insulin, benzodiazepines, and peptides. Second messenger responses and other aspects of transmitter–glial cell interactions are also considered.

Most of the studies have utilized in vitro preparations and consequently lead to the question of whether these results can be extrapolated to glial cells in situ. The documented existence of receptors on a wide variety of glial cultures supports the notion that receptors exist on normal glia in situ.

The implications of existence of receptors for transmitters on glial cells is particularly intriguing. As a result, this book should be of interest to many neuroscientists. Medicinal chemists involved in CNS research will find this stimulating and provocative reading.

Staff

Topics in Nucleic Acid Structure. Part 3. Edited by Stephen Neidle. VCH Publishers, New York. 1987. x + 230 pp. 15 × 24 cm. ISBN 0-89573-606-3. $84.50.

Five years have elasped since the publication of Part 2 of *Topics in Nucleic Acid Structure*. The original design of this series has been to emphasize the results of three-dimensional structural studies of macromolecules and discuss the implications of the

results for biological systems. This volume departs from previous volumes in two ways. A review on the conformation of nucleic acid precursors is included (nucleobases, nucleosides, and nucleotides) and several chapters are oriented toward discussion of technique and structural considerations rather than the biological implications of results.

The conformation of certain biologically active nucleosides is reviewed in Chapter 1 (G. I. Birnbaum and D. Shugar), which is twice the length (60 pages) of each of the subsequent reviews and includes two distinct sections: a description of the conformational aspects of solid-state nucleosides and an eclectic discussion of the structure of biologically active nucleosides and nucleotides in solution. The latter discussion is supported by NMR, X-ray crystal structure, and other physical and theoretical techniques and is somewhat complicated by the addition of kinetic and mechanistic information from enzymes from various sources. The complexity of presentation is reflected in the organization of the review in which the subject material is grouped either by enzyme (inhibitors of orotidylate decarboxylase, 5'-nucleotidase, etc.) or by structure (formycin and analogues, NAD^+, etc.). Conformations of a variety of compounds are considered including the antiviral agents ribavirin and acyclovir; however, a more directed approach would have enhanced the biochemical discussion. Nevertheless, this chapter is appropriate as the lead review and hopefully future volumes in the series will include aspects of nucleoside–enzyme interaction.

Studies of DNA helical structure or parts thereof comprise the following three contributions. The conformation and structural function of 2-deoxyribofuranose of DNA is considered in Chapter 2 (B. Lesyng), in contrast to other five-membered rings including ribofuranose and 2-fluoro-2-deoxyfuranose using molecular quantum mechanics, statistical physics, and spectroscopic data. Thus, the pseudorotation barrier between the major conformers of 2-deoxyribose is described as a helix conformational switch. Biological implications of this switch mechanism are discussed.

Recent X-ray diffraction studies of DNA structure have emphasized the use of oligomeric DNA molecules, and the results from DNA fiber diffraction have received less attention. In Chapter 3 (W. Fuller and A. Mahendrasingam) the continued contribution of X-ray fiber diffraction to DNA structural studies is reviewed. The type of data currently available using this technique and the results expected using improved technology are discussed. An abundance of diffraction patterns are included.

Alternative DNA structures have been proposed in the past as a result of perceived difficulties in the replication of an intertwined helix. One such model, side-by-side DNA, has been suggested to be consistent with observed diffraction data for the B form of DNA. In Chapter 4, R. J. Greenall reviews the claims made by proponents of the side-by-side model and then proceeds to establish certain diffraction constraints which any DNA model must satisfy in order to account for all the observed data. Biological arguments, which one might easily be tempted to introduce, have been withheld to discuss the required structure strictly in crystallographic terms.

Of special interest to structural molecular biologists will be the last two reviews. In Chapter 5 (C. K. Singleton), the structure of Z-DNA in solution, the conditions under which it is formed, and the methods for detection are reviewed. The conformational effects of a left-handed DNA block within a DNA helix are discussed. In addition, a variety of possible functions of Z-DNA are presented along with the molecular biological approaches that have been employed to define the physiological role of Z-DNA.

The volume concludes with a readable review in an area of current intense interest, DNA–protein interactions. Chapter 6 (A. D. B. Malcolm and G. Snounou) focuses on the use of restriction endonucleases as models for DNA–protein interactions. Thus, endonucleases and certain corresponding methylases are considered in a classical biochemical manner, rather than simply as "DNA scissors". Temperature, pH, and ionic strength optima are discussed as well as certain aspects of the reaction mechanism and enzyme specificity at the site of cleavage.

As with other volumes in this series, Part 3 is oriented toward those interested in the three-dimensional structure and conformation of nucleic acids. The range of interest is necessarily broadened by the discussion of nucleoside conformation, and the volume will be of interest to nucleoside chemists and others interested in nucleoside metabolism, structure, and protein–nucleic acid interaction. The volume is relatively free of typographical errors; however, there is some confusion as to whether the furanose oxygen should be designated as O1' or O4'. Also, the relationship between the S and Z forms of DNA is not clearly defined. The graphics for this volume are generally adequate but in certain cases minimal for a text dedicated to three-dimensional structure.

Specialist reviews typically demand a higher price than other texts. However, with a broader range of topics it may be difficult to justify the relatively high cost of this volume for certain contributions of interest. Indeed, certain of these areas have recently been reviewed elsewhere. Nevertheless, the contributions are generally well written and there is a nice progression in content from nucleoside conformation to DNA–protein interaction.

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Organic Synthesis. Collective Volume 6. Edited by W. E. Noland. Wiley, New York. 1988. xviii + 1208 pp. 23.5 × 16 cm. ISBN 0-471-85243-0. $59.95.

As anticipated, the long awaited Collective Volume 6 of *Organic Synthesis* is a valuable addition to the synthetic/medicinal chemist's arsenal. It will be the last collective volume to include 10 annual volumes, 50–59 (1970–1979), as the advances in organic synthesis warrant a more rapid turnover.

Unopened, this volume loudly announces that changes have been made, the familiar and useful thumb indices are missing. While initially taken back, inspection of the consolidated general index quickly answers the question as to why. It is very thorough, spanning 125 pages; it efficiently cross-indexes the familiar indices (type of reaction, type of compound, preparation or purification of solvent and reagents, etc.). It continues to include isolated intermediates and now includes compounds appearing in the discussion section or related tables. The *Chemical Abstracts* names and registry numbers for title compounds, isolated intermediates, and reagents employed are included. Keeping with the times, hazard warnings are indexed both in the general index and in a separate hazard index. Other indices are the author index, a concordance index correlating the collective volume with the yearly volumes, and an expanded formula index which contains all compounds covered in the general index. The utility of this volume has been significantly advanced by these modifications.

This volume contains 289 specific procedures, most of which have general applicability. The procedures are arranged by the compound's common name in alphabetical order, such as "Sulfide Synthesis: Benzyl Sulfide" is indexed under benzyl, and procedures in a synthetic sequence are now separated. Several improvements in experimental procedure have been made and rechecked since the annual volumes, and one procedure omitted due to an unavailable reagent. Some procedures include spectral data, a trend that developed during this 10-year period; it is now a suggested inclusion.

The continuation of this series is a must for any scientific library and is strongly suggested for the personal libraries of practicing synthetic organic/medicinal chemists.

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Reagents for Organic Synthesis. Volume 13. By Mary Fieser and Janice G. Smith. Wiley-Interscience, New York. 1988. 472 pp. 16 × 23.5 cm. ISBN 0-471-63007-1. $39.95.

The latest volume in this well-known and widely used reference work discusses reagents published from 1985 thru mid-1986. As with previous volumes in this series, the book provides a wealth of information on new reagents introduced during this period and updates those reagents included in previous volumes, focusing on those reagents that open new vistas in organic synthesis. The format in this volume follows those of previous volumes and includes indexes to types of reaction: Synthesis Index and Reagent Index. The inclusion of Janice G. Smith as co-author of this

volume is a welcome addition to the capable leadership of Mary Fieser, who carried the burden of being the single author for three of the last four volumes.

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Drug Stereochemistry. Analytical Methods and Pharmacology. Edited by Irving W. Wainer and Dennis E. Drayer. Marcel Dekker, Inc., New York. 1988. xvi + 376 pp. 16 × 23.5 cm. ISBN 0-8247-7837-5. $145.00.

The editors of this book have utilized a combination of 23 authors to write 15 chapters. The introductory chapters provide a solid background as to the history of stereochemistry and terminology that is used. Although most of the chapters do discuss analytical methods and biological activity, as the title would suggest, there is a chapter on synthesis of enantiomerically pure drugs. Also, several chapters provide perspectives from the industrial as well as the government's regulatory point of view. This book does provide some very valuable chapters for those interested in pursuing stereochemically pure drugs. Because of the variance in authors there are some points repeated in several parts of the book. Some examples are difinitions in Chapter 2 are repeated in Chapters 12 and 13. The discussion of Tocainide on page 252 is repeated on page 303. This kind of repetition is found in a number of instances and should have been filtered out of the various chapters. Some errors exist in the book such as the fact that the last line on page 195 is partially repeated on page 197 and there is an attempt to indicate some stereochemistry relative to structure 66 on page 193 that is not appropriate. Chapters 10 and 13 seem to cover some common material. The subject index is very limited and does not list a number of the important drugs. The book does provide some good information on separation technique and analytical procedures for checking purity. This book is timely in the sense that it deals with a very important topic with drugs and is easy to read. It is too bad that the book is so expensive and this will prevent the purchase by many students and faculty, but this book should be included in scientific libraries as a resource. A concern unrelated to the content of the book is that the title print on the book cover came off partially, and this should not be the case considering the cost of the book.

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Annual Review of Pharmacology and Toxicology. Volume 28. Edited by Robert George, Ronald Okun, and Arthur K. Cho. Annual Reviews Inc., Palo Alto, CA. 1988. vii + 504 pp. 16 × 23 cm. ISBN 0-8243-0428-4. $34.00.

The 28th volume in this annual series begins with an enjoyable autobiography by Julius Axelrod and concludes with another in the series of "review of reviews" (by E. Leong Way), which looks at several recently published books in the pharmacological sciences. The 22 review articles in this volume appear well-written as usual, but in my opinion, too many of the chapters deal with topics relating to CNS pharmacology at the exclusion of subjects in other disciplines. The book contains a functional subject index and cumulative indexes of the contributing authors and chapter titles of Volumes 24–28.

Subjects relating to CNS pharmacology are detailed in eight chapters. The chapter on the blood–brain barrier (by Pardridge) defines this dynamic interface between the blood and brain and describes strategies for drug delivery to the brain. Dynorphin (by Smith and Lee), a series of related peptides that may modulate the activity of opioids rather than having direct effects themselves, is the subject of a second review; whereas, the neuromodulatory actions of peptides (by Kow and Pfaff) describing the characteristics, mechanisms, and significance of peptide neuromodulation on neural and endocrine function is the topic of a third chapter. A fourth review on the biochemistry of neurotransmitters in man (by Barrio, Huang, and Phelps) looks at the use of positron emission tomography to focus on in vivo pre- and postsynaptic neurotransmission (primarily dopamine). The regulation of the release of coexisting neurotransmitters (by Bartfai, Iverfeldt, Fisone, and Serfözö) and neuroleptics and neuroendocrine function (by Gunnet and Moore), which looks at how neuroleptics as central dopamine antagonists alter prolactin, growth hormone, and thyroid stimulating hormone release from the anterior pituitary, are two additional CNS-related reviews. The subjects of the remaining two chapters are temperature regulation by the opioid system (by Adler, Geller, Rosow, and Cochin), which evaluates evidence primarily from rodents that opioids have a role in thermoregulation, and endogenous ligands for the binding sites of psychotropic drugs (by Barbaccia, Costa, and Guidotti), which looks at the benzodiazepine, phencyclidine, imipramine, and ketanserin recognition sites with the hope of gaining a greater understanding of interneuronal communication as it relates to learning and memory.

Topics in cardiovascular pharmacology are discussed in four chapters. The review on cardiac cellular electrophysiology (by Gintant and Cohen) focuses on how membrane currents at the cellular level relate to the generation of arrhythmias and their inhibition by antiarrhythic drugs; that on serotonin and vascular responses (by Hollenberg) describes the pathogenesis of cardiovascular disease involving large arteries; the third (by Bevan and Bevan) describes arterial wall changes in chronic cerebrospasm as resulting from damage to the vascular smooth muscle and possibly other elements of the artery; and the fourth (by Bohr and Webb) discusses the plasma membrane as the major difference between vascular smooth muscle from normotensive and hypertensive animals.

The subjects of other chapters include the gastric H,K-ATPase as a target for the antisecretory agents omeprazole and SCH 28080 (by Sachs, Carlsson, Lindberg, and Wallmark); the satietins, a family of α_1-glycoproteins found in serum that have potent and selective anorectic activity (by Knoll); the antibiotic chloramphenicol, which inhibits peptide bond synthesis at the 50S ribosomal subunit of sensitive bacteria (by Yunis); mechanisms leading to drug-induced nephrotoxicity as highlighted by the aminoglycosides, cephalosporins, cyclosporin A, and acetaminophen (by Walker and Duggin); and the role of the immune system in drug hypersensitivites (by Pohl, Satoh, Christ, and Kenna).

The remaining chapters deal with pharmacological modulation of erythropoietin production (by Fisher); novel marine neurotoxins, including brevetoxins, ciguatoxin, maitotoxin, and conus toxins (by Wu and Narahashi); host defense mechanisms against the reactive oxygen metabolites (by Cotgreave, Moldéus, and Orrenius); chemotherapy of leprosy (by Hastings and Franzblau); and the molecular pharmacological approaches to treating AIDS (by Sarin) including blocking HIV-1 virus binding to the T4 receptor of T helper cells, inhibition of the viral reverse transcriptase, and use of antisense RNA inhibitors.

Despite the preponderance of CNS-related subject material, this 28th volume should present at least several chapters of interest for both pharmacologists and medicinal chemists. The present volume, as with others in the Annual Review Series, provides the reader with an opportunity to quickly obtain up-to-date information in areas peripheral to one's major disciplines. It is thus recommended reading.

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Phenothiazines and 1,4-Benzothiazines. Chemical and Biomedical Aspects. Edited by R. R. Gupta. Elsevier, Amsterdam. 1988. xxii + 992 pp. 17 × 25 cm. ISBN 0-444-42967-0. $284.25.

The peak interest in phenothiazines was reached in the late 1950s. This was the consequence of the discovery of the remarkable antipsychotic, then termed "tranquilizing", properties of chlorpromazine. Prior to this time and subsequently, phenothiazines and the chemically related 1,4-benzothiazines have been and continue to be of considerable chemical and medicinal interest.

This very comprehensive treatise presents an up-to-date coverage of these heterocyclic compounds in nine detailed chapters ranging from ones addressing synthetic aspects, free radicals, cations, and charge transfer complexes to those devoted to spectroscopic and conformational studies. These chapters are followed by seven others that address behavioral, toxicological, antitumor, receptor binding, enzyme inhibition, and analytical applications of these classes of chemicals.

Although many reviews dealing with phenothiazines and related structures have appeared, the objective of this book, that is, to provide an exhaustive coverage of the basic and applied aspects of phenothiazines and 1,4-benzothiazines is achieved. As such this book provides a collection of information of interest to many synthetic, medicinal, and analytical chemists as well as to various bioscientists. It clearly deserves a place in medical and chemical libraries.

Staff

Trace Amines. Comparative and Clinical Neurobiology. Edited by A. A. Boulton, A. V. Juorio, and R. G. H. Downer. Humana Press, Clifton, NJ. 1988. xix + 476 pp. 16 × 23.5 cm. ISBN 0-89603-144-6. $75.00.

This is the third volume on trace amines since the first conference on this subject in 1983. It is based on the "Proceedings of the Trace Amines: Their Comparative and Clinical Neurobiology" conference held in May 1987 at Isla Margarita, Venezuela. Clearly the term "trace amines", or amines that occur in only minute amounts in vertebrates and invertebrates, carries with it the incorrect connotation that these are of minor importance. Amines, such as tryptamine and octopamine as well as various other monoamines, have very important functions in insects and mammals. These amines or their metabolites and their associated enzymes are good candidates as biological markers of stress, migraine, depression, schizophrenia, and tardive dyskinesia. They may also represent targets for the discovery of new insecticides.

The book, which has been compiled from camera-ready manuscripts from invited and submitted contributions, covers a wide range of topics. Included are presentations on trace amine distribution in insects and the possibility of their modulation in the development of insecticides. Pharmacological, receptor, and synaptic characteristics of octopamine and tryptamine, novel agonists and antagonists of tryptamine, a binding site for tyramine, mapping of aminergic pathways, neuromodulatory functions, second messenger systems, and various other functions of trace amines and enzymes that modulate them particularly in the central nervous system are treated in a comprehensive, up-to-date manner.

Trace Amines, a volume of *Experimental and Clinical Neuroscience*, represents a valuable resource for neuroscientists at both the clinical and research level.

Staff

Phosphorus-31 NMR Spectroscopy in Stereochemical Analysis. Organic Compounds and Metal Complexes. Edited by John G. Verkade and Louis D. Quin. VCH Publishers Inc., Deerfield Beach, FL. 1987. xvi + 717 pp. 16 × 24 cm. ISBN 0-89573-149-5. $125.00.

The practitioners of ^{31}P NMR spectroscopy will always have a real need for compendia of chemical shift and coupling constant data for phosphorus-containing compounds. The comprehensive tabulation of this data by G. Mavel in *Annual Reports on NMR Spectroscopy*, Vol. 5b, reviewed the literature through 1969, and given the immense amount of data gathered and explosive growth in instrumental capabilities and methodologies for obtaining NMR data over the past several years, an updating of the data base is timely and welcome. The work reviewed here, *Phosphorus-31 NMR Spectroscopy in Stereochemical Analysis*, edited by John G. Verkade and Louis D. Quin (Vol. 8 in the Methods in Stereochemical Analysis Series) clearly helps fill this need. This book is, however, far more than a collection of data and provides a collection of 20 reviews of diverse areas in which ^{31}P NMR has been applied to problems of structure, bonding, and stereochemistry.

The articles are sharply focussed on individual subjects. They are intended to be critical rather than comprehensive and strive to provide explanations based on structure and bonding for trends observed in ^{31}P parameters. The unifying theme is stereochemistry, although a few of the chapters have little bearing on that area. The writing style varies somewhat among the various authors but is generally of high-quality. Figures, spectra, equations, etc. are clear and carefully placed.

This reviewer was extremely pleased with the first chapter, which deals with practical experimental techniques. While the details of spectrometer operation as given are mostly relevant to a particular and somewhat dated NMR spectrometer, there is a very appropriate and lucid discussion on the problems of referencing ^{31}P NMR spectra. (This is a recurring problem since the advent of superconducting magnets.) The susceptibility corrections needed for using capillary references with solenoid magnets are discussed. Shift values for reference compounds other than 85% H_3PO_4 and practical guides for their use are provided. A method for temperature calibration is discussed.

The chapter on the use of modern NMR methods for ^{31}P NMR work was less satisfying. The discussion of spin-tickling experiments for extracting the relative signs of coupling constants was confusing and incomplete, and the discussion of an INDOR-type (CW) experiment is probably irrelevant, given the 2-D methods currently used. The discussion of chemical exchange experiments would have been enhanced by inclusion of examples (with spectra) of 2-D exchange spectroscopy. The treatments of 2-D COSY, multiple quantum, and *J*-resolved spectroscopy methods are too cursory and should have included more and better examples dealing with ^{31}P NMR, which are readily available. The pulse sequence for the NOESY experiment as provided is incorrect. The reader should look elsewhere for an introduction to modern multiple-pulse techniques in ^{31}P NMR.

Particularly gratifying was the section by Quin dealing with long-range $^{31}P-^{1}H$ coupling in stereochemical problems. This chapter discusses the uses and limitations of Karplus analysis of vicinal couplings for rigid molecules and the influence of stereoelectronic effects on the parameters from which geometrical conclusions might be drawn. Shorter but worthwhile sections on geminal and four-bond coupling are included. The same author provides a chapter on the use of $^{31}P-^{13}C$ couplings. The discussion focuses on the effects of dihedral angle, lone-pair orientation, and other stereochemical features on these couplings. These couplings could be profitably used more often, in conjunction with corresponding phosphorus–proton couplings, to resolve cases in which a single $^{3}J_{PH}$ value leads to a stereochemically ambiguous result.

A chapter by M. J. Gallagher offers a systematic review of the effects of ring size, stereochemistry, and oxidation state on the conformations of phosphorus-containing heterocycles, as probed by ^{31}P chemical shift measurements. The treatment is thorough and is an excellent source of information for workers interested in the conformational analysis of heterocycles.

A chapter by Michalski, Skowronska, and Bodalski provides an excellent survey of mechanistic phosphorus chemistry, with emphasis on the use of ^{31}P NMR to detect and identify unstable or short-lived reaction intermediates. Wittig, Arbuzov, Perkow, Mitsunobu, and many other reactions are discussed, and this chapter would be desirable reading for anyone who needs to follow one of these reactions.

The remaining subjects chosen are somewhat disparate, and while most readers with an interest in phosphorus chemistry will find at least some of the sections to be useful, some of the topics are fairly arcane, e.g., polyphosphorus compounds and three sections dealing with unusual ligation modes of phosphorus, and will have a limited audience (although the general reader would benefit from the cogent discussion of the analysis of complex spin patterns in the spectra of polyphosphorus compounds). Workers in these areas will certainly benefit from their inclusion. The theoretical reviews of the chemical shift and spin–spin coupling are probably too complex to benefit the average chemist, but it's always good to know where to find discussions of the mathematical underpinnings of NMR parameters.

The editors have wisely chosen not to duplicate the coverage provided in the recently published *Phosphorus-31 NMR, Prin-*

ciples and Applications by David Gorenstein and have not included any articles dealing with applications of ^{31}P NMR to biochemical problems (with the exception of occasional discussions of the geometry of nucleotides). They graciously refer readers interested in biochemical applications to that work.

The plentiful and extensive tables of ^{31}P shift data found in many of the sections of this book are not intended to be comprehensive but generally provide a sufficient cross section of compounds in a given class, so that the reader can probably find a reasonable model compound for any compound likely to be encountered. The tables are somewhat scattered, so it may require some effort to locate the appropriate table to use. Individually they are well-organized and thoroughly referenced. The tables of coupling constants for ^{31}P are more limited (except in some of the organometallic areas which have extensive tables of coupling data), but a wealth of coupling constant information can be gleaned from some of the chapters, which would otherwise be found only through exhaustive literature searching. The tables constitute some of the best features of this work and can easily save the user the price of the book in days not spent in the library. During the course of this reviewer's reading, several instances arose in which this book provided quick answers to problems brought to our lab. I recommend it enthusiastically to every NMR lab and research group interested in phosphorus chemistry.

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Organic Reactions. Volume 35. Edited By Andrew S. Kende. John Wiley and Sons, New York. 1988. xxi + 650 pp. 15.5 × 23.5 cm. ISBN 0-471-83253-7. $69.95.

This volume contains three chapters: The Beckmann Reactions: Rearrangements, Elimination–Additions, Fragmentations, and Rearrangement–Cyclizations by Robert E. Gawley; The Persulfate Oxidations of Phenols and Arylamines (the Elbs and the Boyland–Sims Oxidations) by E. J. Behrman; and Fluorination with Diethylaminosulfur Trifluoride and Related Aminofluorosulfuranes by Milos Hudlicky. Each provides the thorough review with encyclopedic tables of published examples that is characteristic of the series.

Dr. Gawley's chapter is an update on the Beckmann rearrangement, which was last reviewed in this series in 1960, Volume 11. In addition to the usual rearrangements and fragmentations of keto- and aldoximes, haloximes, and nitrones, this review discusses elimination–addition reactions, which provide imines from oximes. Also, intramolecular rearrangement–cyclizations, which have emerged as a most synthetically useful reaction, are discussed. The photochemical Beckmann rearrangement, known since the early sixties, is not covered.

The tabulation of examples is broken down into five major subtables covering 34 pages. References are numerous, (675) although only a few as recent as 1983. This chapter is rich in experimental examples, numbering 35, covering every facet of Beckmann chemistry.

The chapter by Dr. Behrman covers separately the Elbs reaction (persulfate oxidations of phenols) and the Boyland–Sims reaction (persulfate oxidation of arylamines) in a most scholarly manner. Every facet of experimental conditions are discussed, including isomer distribution and potential byproducts. References number 278 and are complete through mid-1984 and even contain a few from 1985. However, there are only two examples of experimental procedures. The "Tabular Survey" section contains 15 tables covering 65 pages. A useful addition is table 15 entitled Unsuccessful Oxidations.

The chapter by Dr. Hudlicky, after an adequate introduction, begins with the preparation of aminofluorosulfuranes including tables containing physical constants and details for preparations in the "Experimental Procedures" section. He then describes reactions of aminofluorosulfuranes with a host of functional groups, including alcohols, carbonyl-containing compounds, halides, phosphorus compounds, etc. A section on the comparison of other fluorinating agents is most useful, as is the section on side reactions. Detailed experimental procedures are numerous. The "Tabular Survey" section is broken down into 12 tables covering 78 pages, which includes some unsuccessful fluorinations. References number 173 complete through 1984 with a number of them taken from 1985 and even 1986.

In addition to a subject index, the book has cumulative author and chapter/topic indices for Volumes 1–35.

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Organic Reactions. Volume 36. Edited by Andrew S. Kende. John Wiley and Sons, New York. 1988. xvii + 602 pp. 15.5 × 23.5 cm. ISBN 0-471-85748-3. $69.95.

Volume 36 contains three chapters: The [3 + 2]Nitrone–Olefin Cycloaddition Reaction by Pat N. Confalone and Edward M. Huie; Phosphorus Addition at sp^2 Carbon by Robert Engel; and Reductions by Metal Alkoxyaluminum Hydrides. Part II. Carboxylic Acids and Derivatives, Nitrogen Compounds, and Sulfur Compounds by Jaroslav Malek.

The chapter by Drs. Confalone and Huie provides an intellectually satisfying review of the cycloaddition reaction between nitrones and olefins. After a discussion of the preparation of the nitrones and the mechanism of the cycloaddition process, the authors thoroughly cover the regio- and stereoselectivity of both the inter- and intramolecular variants of this reaction. An excellent addition to this chapter is the section on "Applications to Natural Product Total Synthesis".

There is a wide variety of experimental procedures, ten in all. The section "Tabular Survey" is broken down into 22 subtables covering 98 pages. There are 299 references that cover the literature through May 1985.

The chapter by Dr. Engel reviews the formation of carbon–phosphorus bonds by the addition of phosphorus reagents to unsaturated carbon-containing functional groups. Specific examples cover the addition of trivalent phosphorus esters and amides (including silylated analogues) to aldehydes, ketones, their α,β-unsaturated counterparts; α,β-unsaturated nitriles, and imines to produce carbon–phosphorus bonds. These organophosphorus products are useful as "modified" Wittig reagents or as synthetic equivalents of acyl anions as discussed in the section entitled "Synthetic Utility".

The "Experimental Procedure" section includes 12 procedures, which further points out the importance and varied uses of this reaction. References number 230 and are complete through 1984 with a few from 1985. There are three subtables in the "Tabular Survey" section spanning 37 pages.

The chapter by Dr. Malek is a continuation of his earlier chapter in this series (Volume 34, 1985) entitled Reductions by Metal Alkoxyaluminum Hydrides. This chapter thoroughly reviews the reduction of carboxylic acids, esters, lactones, acyl chlorides, amides, lactams, imines, oximes, nitro compounds, and sulfur compounds such as disulfides, sulfoxides, and sulfones among other functionality.

The "Experimental Procedures" section is huge, covering every important use for metal alkoxyaluminum hydrides. The "Tabular Survey" section consists of 31 subtables, covering 225 pages, detailing reductions of nearly the same number of functional groups. References number 1069 and are complete through 1985.

Each chapter remains a recent and thorough review, which includes tables of published examples that are characteristic of the series.

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Dynamics of Proteins and Nucleic Acids. By J. Andrew McCammon and Stephen C. Harvey. Cambridge University Press, Cambridge, U.K. 1987. xii + 234 pp. 15 × 23 cm. ISBN 0-521-30750-3. $39.50.

Over the past decade, various molecular dynamics methods have emerged as useful adjuncts to energy minimization in the theoretical exploration of biomolecular folding and function. They provide one means of efficiently exploring regions of conformational space not readily accessible by classical minimization

techniques. Under certain circumstances they also allow the theoretical study of the dynamics of isolated molecules and of molecular association processes. The most interesting and promising outgrowth of these studies is the free-energy perturbation method for calculating biologically relevant thermodynamic parameters.

This volume is an introduction to molecular dynamics methods by two well-established practitioners. It provides a clear exposition of the necessary background and reviews a wide array of techniques which have been developed for various special purposes. The book is well organized, and many concrete biomolecular applications are discussed. It should be a useful reference for both students and active workers in the field. My chief criticism concerns the citations of earlier work. Although the discussion of work in areas of molecular dynamics is quite complete, almost no mention is made, in the relevant introductory sections or elsewhere, of much of the concurrent work using recent developments in energy minimization techniques. The discussion of empirical potential energy functions also neglects some packages in current use. This rather parochial viewpoint detracts from an otherwise excellent introduction to the subject.

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Concise Encyclopedia Biochemistry. Second Edition. Revised and expanded by Thomas Scott and Mary Eagleson. Walter de Gruyter, Berlin. 1988. vi + 649 pp. 17 × 25 cm. ISBN 3-11-011625-1. $89.90.

This encyclopedia provides a comprehensive, compact source of biochemical data. The first edition was published in 1983 and was based on a translation of the *Brockhaus ABC Biochemie* that was published in 1976 with a second edition in 1981. In the first English edition most of the effort was devoted to the translation process. In this second English edition considerable expansion and revision of old material has been incorporated. This has become critical because the rapid pace of development in biochemistry, especially that brought about by genetic engineering and the cloning of DNA. This book is an encyclopedic presentation of all areas of biochemistry. Approximately 4500 entries, over 100 tables, IUB enzyme nomenclature, and standard biochemical abbreviations are included with extensive cross-referencing. Some literature references have been incorporated into the individual entries.

The authors of this expanded and revised edition have done a very admirable service in their compilation. Nevertheless, in an undertaking of this magnitude it is inevitable that the individual presentations sometimes are not completely up-to-date or perhaps as detailed as a researcher in a particular area might wish. For example, subtypes of α, β, muscarinic, adenosinergic, etc., receptors appear not to be discussed. Also, many compounds, mechanisms, and pathways have unavoidably been overlooked. Despite these minor criticisms this encyclopedia is a valuable reference tool which should be of interest to not only biochemists but to all medical researchers, including medicinal chemists.

Staff

Vitamins. By Wilhelm Friedrich. Walter de Gruyter, Berlin. 1988. vi + 1058 pp. 17 × 24 cm. ISBN 3-11-010244-7. $211.60.

This book presents a detailed description of all known vitamins, i.e., organic low molecular weight components of the diet which are required by the organism in only small amounts for normal development. The address of such a massive topic by a single author is a monumental undertaking. Wilhelm Friedrich has done this in a very comprehensive manner however. In the introduction he conveys to the reader basic information about vitamins. Much of this chapter is in tabular form with the express purpose of simplifying reading and comprehension of an extraordinarily large amount of material as it covers virtually every aspect of the biochemistry and physiology of the vitamins and compounds of uncertain vitamin character. A beautiful series of colored pictures of the crystals, chemical structures, and CPK (space-filling) models of the vitamins is included. This introduction is followed by detailed chapters on each of the 13 vitamins. These very comprehensive chapters address almost every aspect of the vitamin from structure to metabolism, biosynthesis, deficiency consequences, chemical and pharmacological mechanisms of actions, and many other topics. Thus, this is probably the most complete treatment of the subject of vitamins to appear under a single cover.

Obviously, such a massive undertaking by a single author must have taken many years to compile. As a consequence for most of the vitamins very few references are found to publications later than 1984. To compensate for this the author has included an 18-page Literature Supplement chapter with pertinent references, complete with their titles, through 1986 for each of the 14 chapters. Lastly, the book concludes with a thorough 38-page Subject Index that should enable the reader to locate any of the great multitude of topics discussed in the book.

Overall, *Vitamins* must be *the* or at least one of the most comprehensive treatments of this subject. It is recommended for all scientific libraries. Should a scientist want a question pertaining to vitamins answered, this is the place to look.

Staff

Practical Pharmaceutical Chemistry. Fourth Edition. Parts 1 and 2. By A. H. Beckett and J. B. Stenlake. The Althone Press, London. 1988. Part 1: x + 326 pp. 15.5 × 24 cm. ISBN 0-485-11322-8. $55.00. Part 2: xii + 602 pp. 15.5 × 24 cm. ISBN 0-485-11323-8. $75.00.

Both parts of this fourth edition have been thoroughly revised and updated with the specific objective of reducing the heavy dependence of the earlier editions on the methods of the *British Pharmacopoeia*. The discussion of drug registration has also been broadened since publication of the third edition in 1976. Part 1 deals with pharmaceutical analysis and quality control. It is the standard undergraduate textbook in pharmaceutical chemistry. Topics covered include chemical purity and its control, registration and assessment of medicines, theory and methodology of quantitative analysis, acidimetry and alkalimetry, titration in nonaqueous solvents, oxidation/reduction titrations, methods of precipitation and complexation, techniques of solvent extraction, and medicaments in formulations.

Part 2 presents physical techniques of analysis for more advanced courses. Treatment of spectroscopy and radiopharmaceuticals has been greatly expanded. Chapters on the contribution and role of physical methods of analysis and on application of spectroscopic techniques in structural elucidation and verification of identity have been added in this part. Other topics covered in Part 2 are instrumental methods in the development and use of medicines, general physical methods, analysis of drugs and excipients in the solid state, chromatography, electrochemical methods, various kinds of spectroscopy and their application to structure elucidation.

Both parts are clearly written with many practical examples. These books are intended as teaching texts in pharmaceutical chemistry. They accomplish the objective very admirably.

Staff

Regulatory Roles of Opioid Peptides. Edited by P. Illes and C. Farsang. VCH Publishers, Inc., New York. 1988. xii + 540 pp. 17.5 × 24.5 cm. ISBN 0-89573-818-X. $98.00.

This volume consists principally of papers presented at a Symposium to the 2nd World Congress of Neuroscience held in Budapest, Hungary, August 14–15, 1987. Several chapters were contributed by authors not participating in the symposium. The selection of topics was biased by the editors' fields of interest, namely the modulation of neuronal excitability (including transmitter release) and the regulation of cardiovascular mechanisms. A concise, scholarly summary of the contents is given in a preface by the editors, P. Illes and C. Farsang, who are also co-authors on several chapters.

The book consists of five major themes: I. Opioid Peptides and their Receptors (9 chapters); II. Regulation of Neuronal

Excitability (4 chapters); III. Regulation of Transmitters and Hormone Release (8 chapters); IV. Regulation of Integrative Mechanisms in the Central Nervous System (6 chapters); V. Regulation of Cardiovascular Mechanisms (10 chapters). Authorship is predominantly European (Hungarian, German, United Kingdom), several chapters are by United States authors (one by Canadian), and there are presentations by Russia, Poland, Sweden, France, and the Netherlands.

Although the print (offset) is not uniform, it is generally of good quality. Editing and proofreading have been thorough. All chapters appear to be well referenced. The readership for this volume will be restricted (especially among medicinal chemists), but the contents will be useful to those scientists interested in the mechanisms involved in the regulatory roles of the opioid–peptide systems. Any disturbance of these mechanisms may lead to illnesses or to a deterioration of various pathophysiological conditions. The beneficial effects of receptor-type, selective opioids may have therapeutic implications other than the classic ones.

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Economic and Medicinal Plant Research. Vol. 2. Edited by H. Wagner, Hiroshi Hikino, and Norman R. Farnsworth. Academic Press, New York. 1988. xi + 201 pp. 16 × 23.5 cm. ISBN 0-12-730063-5. $27.00.

The five chapters in this volume of a projected series are essentially reviews of earlier reviews with material added to include pertinent literature citations of the last 2 or 3 years. The reader is thus brought up-to-date on five topics considered by the editors to have imminent practicality for the development of new drugs from natural sources.

The authors of the chapter on forskolin, an activator of adenyl cyclase, are decidedly optimistic about the potential of the compound or some of its semisynthetic analogues for use in the treatment of congestive heart failure, asthma, and glaucoma. Preliminary clinical studies would seem to substantiate this optimism.

One might be pardoned, however, for being less sanguine about the immediate practical importance of any of the many classes of compounds considered as fertility-regulating agents. In view of the complexity of the mechanisms involved in the reproductive process, much research in the direction of the (probably) unattainable "ideal drug" or at least an "acceptable" one remains to be done.

An extensive review of the chemistry of plant-derived anticancer agents, an evaluation of five natural drugs used in separate regions of the world to treat liver disorders, and a chapter on the known nonsteroidal cardioactive drugs complete the volume.

If, indeed, there are still to be found useful plant drugs to compete with or eventually replace the oft-cited classics, this small volume supplies a large number of leads to this end. The editors/authors "hope decision makers in industry, government agencies, philanthropic foundations and elsewhere...will consider these and related projects as worthwhile endeavours for further research" (Preface). "Tis a consummation devoutly to be wished".

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Calcium in Drug Actions. Edited by P. F. Baker. Springer Verlag, Berlin/New York. 1988. xxvi + 567 pp. 17 × 25 cm. ISBN 0-387-17411-7. $340.00.

Together with Howard Rasmussen, the late Peter Baker was a major proponent of the importance of calcium as a second messenger at a time, the early 1970s, when the major research emphasis was on the cyclic nucleotides. Dr. Baker's review in *Progress in Biophysics and Molecular Biology* in 1972 (Volume 24, pages 177–223) was seminal in leading to the current volume, the 83rd in Springer Verlag's *Handbook of Experimental Pharmacology* series. Divided into three major sections: calcium receptors and calcium metabolism; calcium and physiological function; and (take a deep breath here!) drugs that either mimic calcium or elements of intracellular calcium metabolism, the present monograph comprises 25 chapters by many of the leading experts in the field of calcium research.

While the title of this volume is *Calcium in Drug Actions*, a more appropriate title would be "Drug Effects on Calcium". The drugs mentioned, and by a drug one should define a therapeutically useful chemical entity as opposed to a research chemical, include the calcium-entry blockers, amiloride, and the tricyclic antipsychotics, typified by trifluoperazine., the latter in its actions as a calmodulin inhibitor. To illustrate the perceived inaccuracy of the title, the binding of the neurokinin, substance P to calmodulin occurs with a $K_{0.5}$ in the micromolar range (page 45). While this is an interesting observation, how does this relate to the binding of this peptide to its own receptor at a concentration some 3 orders of magnitude less than that observed for calmodulin?

There is a good deal of unnecessary historical repetition between several of the chapters and, with few exceptions, the references are only current up until the end of 1986, a major limitation given the intense activity in the field. One searches in vain for any mention of the protein kinase C antagonist, staurosporine, and for the novel calmodulin inhibitor, CGS 9343B.

This volume, like most from this publisher is beautifully produced (although there are more typos than this reviewer has seen in others, the most obvious being the running title for Chapter 9). It's price is however prohibitive to the point of being outrageous. No doubt libraries, in their need to complete their *Handbook of Experimental Pharmacology* collection will acquire this volume. For the reader interested in the active area of calcium research, a subscription to *Trends in Pharmacological Sciences* will provide more topical and considerably cheaper information.

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Dictionary of Antibiotics and Related Substances. Edited by B. W. Bycroft. Contributors: A. A. Higton and A. D. Roberts. Chapman and Hall, New York. 1988. xviii + 944 pp. 21 × 29 cm. $675.00.

This dictionary is a single volume comprehensive survey of antibiotic substances incorporating information gathered to the end of 1986. Details for approximately 8000 antibiotics and related compounds have been compiled in approximately 4000 entries to provide a relatively large book. The dictionary is indexed by antibiotic name, molecular formula, CAS Registry Number, and the type of compound. The name index is an alphabetical listing of all names given throughout the dictionary and contains thousands of synonyms. The type of compound index classifies all antibiotics described under one or more of 46 headings (e.g., macrolide, nucleoside).

The compilation was initially based on an expansion of the antibiotic component of the *Dictionary of Organic Compounds, Fifth Edition* published in 1982, but well over half of the *Dictionary of Antibiotics and Related Substances* consists of new entries, and the remainder has been extensively revised and expanded. The general format for each entry is clearly presented and contains the antibiotic name, structure, molecular formula, structure class, producing organism or other source, a very brief description of biological and physical properties, derivatives, and a few key references.

The classical definition of an antibiotic was extended to include some semisynthetics, biologically active substances from sources other than microorganisms but structurally related to major classes of antibiotics, and other microbial and fungal metabolites of structural and general interest. The intent was to include every substance for which a well-defined structure or molecular formula is available.

To appreciate the effort required to compile this data one needs only to consider that there are probably close to 9000 antibiotics produced by terrestrial microorganisms alone that have been reported in the literature. The dictionary provides excellent quick

access to structures and other lead information on those antibiotics that have been well described not only in journals but also patents. A few omissions have occurred but this is not unexpected in a project of this magnitude. The comprehensive and up-to-date nature of this compilation with its simple format and indexing of crucial data makes it unique and extremely useful. The dictionary would be a valuable addition to the desk of anyone working in antibiotic research but unfortunately the price will probably restrict it mainly to research libraries.

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General and Synthetic Methods. Volume 9. Specialist Periodical Reports. Edited by G. Pattenden. Royal Society of Chemistry, Burlington House, London. 1987. xi + 722 pp. 14 × 22.5 cm. ISBN 0-85186-904-1. $230.00.

This book follows the format established in previous volumes in which the published synthetic literature of the year (1984) is reviewed. The first five chapters cover hydrocarbons, carboxylic acids, aldehydes and ketones, alcohols, and amines and are subdivided into chemically related functional groups. The remaining chapters review organometallics in synthesis and the synthesis of saturated carbocyclic and heterocyclic rings. Also included are chapters on highlights in the total synthesis of natural products and a compilation of synthetic reviews. The chemistry is amply illustrated, and each chapter is followed by references. Typographical errors, although numerous, do not detract from the content. Considering the magnitude and timeliness of this effort the authors have done a commendable job.

The chapters are not simply a listing of the year's events, but instead contain the insight of the individual author. Each author attempts to place new synthetic methods or procedures in context and suggest the general utility of the cited observations. This format makes the book extremely useful for chemists who are interested in following the development of synthetic methodology. The volume can also be used as a condensed guide for planning synthetic strategy. However, because the book is limited to a single year, many important synthetic methods may receive only scant mention. The volume contains an author index but no subject index, and chapters are not cross-referenced.

This series is not intended as a guide for choosing a specific synthetic method and is not in general useful in the routine planning of synthesis. However, for those who want to keep abreast of recent developments in synthetic methodology and its application, this volume presents the material in an enjoyable and informative manner.

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Chemotherapy and Drug Resistance in Malaria. Volumes 1 and 2. By Wallace Peters. Academic Press, New York. 1987. xi + 1100 + ccxxxix pp. 15 × 23.5 cm. Volume 1: ISBN 0-12-552721-7. Volume 2: 0-12-552722-5. $125.00.

These two volumes constitute an expanded and completely updated second edition of a most useful work on malaria chemotherapy. Figures, tables, and chemical structure diagrams are excellent throughout. A complete index, the 3000+ references, and very few typographical errors attest to the care in which this book was written. A valuable historical perspective is integrated nicely with suggestions for future research.

The first introductory chapter discusses drug failure vs drug resistance, defines terminology unique to antimalarial drugs and their uses, and contains a convenient outline of the entire two-volume set. The plasmodial life-cycle, physiology, ultrastructure, and biochemistry are briefly described in Chapter 2, and host-parasite interactions, including immunity, are the subjects of Chapter 3.

The techniques and limitations of antimalarial drug testing from primary screens to clinical evaluations are described in Chapters 4–6. The influence of parasite, host, and test parameters on defining a "normal" level of drug response is illustrated in Chapter 7. Techniques for producing drug-resistance in the laboratory are outlined in Chapter 8. Experimental (Chapters 9–13) and clinical (Chapters 14–17) drug resistance data for various classes of antimalarial drugs are then considered.

The pharmacology (drug uptake, tissue distribution, drug metabolism, enzyme inhibition) and molecular basis of antimalarial action in relation to drug resistance are the topics of Chapters 18 and 19. An informative discussion about the mechanism(s) of chloroquine resistance is also found in Chapter 19. Entomological, epidemiological, and immunological facets of drug resistance are considered in Chapters 20 and 21. A timely discussion on the relationship between immunity and chemotherapy including immunostimulant vs immunosuppressive actions of antimalarials is found in Chapter 21. The molecular biology and genetics of drug resistance are discussed in Chapter 22.

New Approaches to New Drugs, the title of Chapter 23, is consistent with a number of suggestions for new drug development outlined there. This chapter is, however, largely a useful discussion of past failures and successes at obtaining prodrugs, repository compounds, and enzyme inhibitors. Drug targeting is also discussed. Examples of drug combinations to improve efficiency and overcome drug resistance are the subject of Chapter 24. Finally, a guide to the clinical use and limitations of available antimalarial drugs form the concluding chapters (25 and 26) of this work. A quote from Chapter 1 concludes this review: "It must not (but undoubtedly will) be forgotten that to depend entirely on one weapon in the fight against malaria is doomed to failure, be that weapon a drug, vaccine, or an insecticide."

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Third International Conference on Chemistry and Biotechnology of Biologically Active Natural Products. Volumes 1–5. Edited by the Bulgarian Academy of Sciences. VCH Publishers, New York. 1988. 16 × 22 cm. Vol. 1: 280 pp. ISBN 0-89573-619-5. Vol. 2: 344 pp. ISBN 0-89573-620-9. Vol. 3: 447 pp. ISBN 0-89573-619-5. Vol. 4: ix + 540 pp. ISBN 089573-619-5. Vol. 5: ix + 565 pp. ISBN 0-89573-619-5. $295.00.

This collection embodies the Proceedings of the Third International Conference on the above topic, held in Sofia, Bulgaria, September 16–21, 1985. Volume 1 comprises the main plenary lectures; Volume 2, plenary lectures and papers on the synthesis of natural products and biotechnology; Volume 3, plenary lectures and papers on bioorganic chemistry and structural elucidation and chemical transformation of natural products; Volume 4, communications on the synthesis of natural products and biotechnology; and Volume 5, communications on bioorganic chemistry and the structural elucidation and transformation of natural products.

The outstanding feature of the papers in these volumes is their variety—they are various in origin, in subject matter, in the quality of their physical presentation, and in their significance for any given potential reader. The Organizing Committee chose not to edit them at all, which has left the quality of the presentations completely up to the authors. In scanning them, one feels that one passes quickly from alkaloid synthesis to studies of peptides to polysaccharides to tissue culture to methods for accelerating the ripening of Gouda cheese. There are no indexes, and the lists of authors and tables of contents are not much help in locating some of the topics of interest. This is a pity because perusing the volumes is interesting and, especially for the Western reader, illuminating in that it brings some excellent East European work forward. If the Organizing Committee had insisted on uniform standards of presentation of papers and also on vigorous editing, the intrinsic value of this collection would have been enhanced and its usefulness augmented.

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Cyclopenta[*a*]phenanthrenes. By Maurice M. Coombs and Tarlochan S. Bhatt. Cambridge University Press, Cambridge. 1987. xvii + 206 pp. ISBN 0-521-30123-8. $69.50.

This book covers both the chemical and biological aspects of cyclopenta[*a*]phenanthrenes. There is 50 years of work to tell about, and it is reviewed here thoroughly from all perspectives. An introductory chapter covers nomenclature and relates these compounds to other PAH's and to steroids. The relationship to steroids is that they share a common ring system, aside from the difference in the degree of unsaturation. As the authors point out, it is possible that aberrant steroid metabolism in animals might lead to the endogenous production of cyclopenta[*a*]-phenanthrenes, potentially accounting for some of the human cancer burden. Although this is speculative, the recent discovery of these compounds in several natural environments, apparently as a consequence of microbiological dehydrogenation of sterols, has breathed new life into this old idea.

Chapters 2 and 3 cover the chemical synthesis of cyclopenta-[*a*]phenanthrenes, and Chapter 4 presents their "general chemistry", e.g., oxidation, reduction, and halogenation reactions. Next is a chapter on the physical (including spectral) properties, especially mass spectra. A compilation of cyclopenta[*a*]-phenanthrenes by formula is provided in this chapter as well. Then the chapters on the biological aspects get started, covering carcinogenicity, mutagenicity, and metabolic activation of cyclopenta[*a*]phenanthrenes and their interaction with DNA. Prior to the concluding chapter, already mentioned above, is a chapter on the X-ray crystallography of these compounds in which an apparent correlation between molecular strain and carcinogenicity is presented.

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The Chemistry and Biology of Benz[*a*]anthracenes. By M. S. Newman, B. Tierney, and S. Veeraghavan. Cambridge University Press, Cambridge. 1988. xiv + 228 pp. 16 × 23.5 cm. ISBN 0-521-30544-6. $69.50.

Benz[*a*]anthracene (B[*a*]A) is a four-ring polyaromatic hydrocarbon (PAH) with a rich synthetic and biological history. For example, 7,12-dimethylbenz[*a*]anthracene is one of the most potent carcinogens known. The biological history for these compounds began in the thirties when PAH's including B[*a*]A were found to cause tumors in animals. This triggered the synthetic history, involving the preparation of many derivatives of B[*a*]A having different substituents and patterns of substituents. These derivatives were then tested for their biological activity, stimulating further synthetic work. Thus these two histories are interwoven.

This book chooses a practical and effective strategy for presenting this history. In the front part, 372 references are covered with text, structures, and tables devoted solely to the chemistry of B[*a*]A's. The period of time covered is middle 1930s to the end of 1984. This text, 81 pages in length, basically divides the chemical studies into five synthetic routes to B[*a*]A's, each of which is a chapter: B[*a*]A's from benzenes and naphthalenes, from anthracenes, from phenanthrenes, via Diels–Alder routes to rings B and C, and via miscellaneous routes.

As a survey this part of the text is satisfactory, but it is rather crisp. There is little provided by way of background, discussion, insights, generalizations, and perspectives. Right at the start, for example, it is pointed out that B[*a*]A's complex with compounds such as picric acid, but there is no discussion of the properties of these complexes. While the complexes are stated to be extremely useful for characterization and purification, only two references both prior to 1950 are cited.

The second part, by B. Tierney, covers the biology of B[*a*]A's as four chapters: metabolism, macromolecular binding (to DNA, RNA, and protein), mutagenicity, and carcinogenicity. The references are not numbered, but I estimated about 450, and they cover up to the end of 1985. This part is rich in background, discussion, insights, generalizations, and perspectives. It is a thorough and well-written treatment of the subject.

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Relaxing and Contracting Factors. Biological and Clinical Research. Edited by Paul M. Vanhoutte. Humana Press, Clifton, NJ. 1988. xxv + 543 pp. 15 × 23 cm. ISBN 0-89603-128-4. $74.50.

Since the first report by Robert Furchgott and his associates in 1980 of evidence of endothelium-dependent relaxation of isolated arteries, the role of the endothelium in vascular control has been the subject of intense investigation by vascular pharmacologists and physiologists. This volume of *The Endothelium* is the first to cover this exciting new area of the biomedical sciences. Topics addressed by the most prominent scientists in the field cover a wide range of basic and clinical subjects. These include endothelium-dependent relaxation and contraction, endothelium-derived relaxing factor, arachidonic acid and release of relaxing factors, calcium transport mechanisms, physicochemical stimuli, the role of cyclic AMP and GMP, atherosclerosis and hypertension, endothelium-dependent responses in cerebral, pulmonary, and peripheral circulation, plus many other pertinent topics.

The quality of the book is generally excellent, all chapters are well referenced with very timely citations, and the index although somewhat abbreviated, coupled with the detailed table of contents, should be sufficient to enable the reader to locate items of interest.

Researchers and clinicians concerned with vascular research in a variety of areas will find this an invaluable collection of important scientific information. Medicinal chemists involved in vascular research will certainly want to examine this book with great care. The excellent coverage of this new area should serve as a stimulus for many ideas for research directed toward novel therapeutic agents.

Staff

The World Drug Situation. World Health Organization. WHO, Geneva, Switzerland. 1988. vi + 123 pp. 16 × 24 cm. ISBN 92-4-156114-9. Paperback, $16.00.

This slim booklet may appeal to market researchers and statisticians but will do nothing for medicinal chemists. It describes the supply of and demand for medicinal agents worldwide and breaks this down in selected countries. You will sympathize with the Japanese whose consumption of drugs has surpassed ours, but that could be expected as they grew more powerful. You will also survey the situation in Trinidad, Zimbabwe, and other interesting developing countries. You will be stunned by production and annual sales figures which approach 100 billion dollars globally. This insider information should encourage you to start up a generic drug company, since generics make up 25% of all drugs sold in the U.S. All this and other statistical material are presented in many tables and graphs, a monumental collaborative effort. Anonymous organizations cannot be expected to write as interestingly as a single author, but never mind that; figures speak louder than words. Be sure to read this in the morning when you are wide awake; after lunch it may lull you to sleep.

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Recent Advances in Steroid Hormone Action. Edited by V. K. Moudgil. W. de Gruyter, Berlin and New York. 1987. ix + 552 pp. 17 × 24 cm. ISBN 3-11-010762-7. $150.00.

It can be plausibly argued that among the natural hormones no chemical class has greater breadth or depth of importance than steroids. They have been the subject of chemical and pharmacological investigation for the entire twentieth century, and yet it seems that every few years an additional physiologic function is found for steroidal molecules. This book undertakes, in 18

excellent and tightly written chapters, to summarize what is known of the mode of action of steroid hormones at the molecular level—specifically, with regard to the nature and mode of operation of steroid receptors and their interaction with DNA, RNA, and the nuclear matrix. The main emphasis is given to estrogen, androgen, progestogen, and glucocorticoid receptors. Anyone interested in these hormonal activities or in the medicinal chemistry of the appropriate steroids will wish to read this book.

This field of research is currently undergoing tremendous expansion, and the authors have used their space to convey as many data and ideas as possible. The editor has wisely provided two aids for the reader. First, the 18 chapters are organized into five groups: interaction of steroid receptors with DNA and chromatin, cloning of steroid receptors and gene expression, steroid hormone receptors (structure and modifications), analysis of steroid receptors in cancer cells, and advances in methodological approaches. Secondly, the editor has written a long introductory chapter in which the contributed chapters are summarized in a comparative fashion and the editor's personal evaluation of the state of the field is presented.

These editorial endeavors taken together with the high quality of the contributed chapters make the book highly stimulating and profitable for study. It is a pleasure to recommend it to all investigators in the field of steroid hormones.

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Annual Review of Neuroscience. Edited by W. Maxwell Cowan, E. M. Shooter, C. F. Stevens, and R. F. Thompson. Annual Reviews, Palo Alto, CA. 1988. viii + 580 pp. 16 × 23 cm. ISBN 0-82Y3-2411-0. $34.00.

This volume continues the tradition of excellence established by this series. The volume consists of a series of review articles on topics of current interest to neurobiologists. All the reviews are by recognized experts in the field. Anyone interested in the general topic of neurobiology will find articles of interest within this volume.

The readers of the *Journal of Medicinal Chemistry* are, by and large, interested in developing therapeutic agents on a rational basis. Even from this perspective, there will be some chapters of immediate interest. Topics such as Tachykinins by Maggio and 5-Hydroxytryptamine Receptor Subtypes by Peroutka may be of more immediate utility than chapters on animal behavior and anatomically based studies of the nervous system. Given the relatively low cost of this volume, it is easy to recommend that anyone working in the neurosciences acquire their own copy for perusal at leisure.

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Molecular Basis of Lymphokine Action. Edited by David R. Webb, Carl W. Pierce, and Stanley Cohen. The Humana Press, Clifton, NJ. 1987. xxviii + 481 pp. 16 × 23 cm. ISBN 0-89603-139-X. $74.50.

This book represents the proceedings of the Fifth International Lymphokine Workshop. The conference was held in Clearwater Beach, FL, in January 1987. The book is basically divided into six sections each covering a broad area of cytokine research presented at the conference, namely, Suppressor Factors, Interleukin 1, Interleukin 2, Effector Factors, Hematopoietic Growth Factors, and Clinical Uses of Lymphokines. Overall, the content of the book is balanced in that it contains chapters that are primarily reviews of a specific area or are summaries of recent research results. In some cases, the information in the chapters is outdated. This is particularly true for rapidly advancing areas such as studies on the interleukin 1 receptor, which has recently been cloned. Other sections, such as those concerning Suppressor Factors, B-Cell Growth and Differentiation Factors, Hematopoietic Growth Factors, and Interleukin 2, are scientifically up-to-date, even though the conference was held 2 years ago. These latter sections provide useful information for immunologists, molecular biologists, cell biologists, and medicinal chemists interested in a concise overview of these contemporary topics in cellular immunology. This book would provide a firm foundation for reading current immunological journal articles in these areas. The weakest portion of the book is the section entitled Clinical Uses of Lymphokines, which is somewhat of a misnomer considering the topics covered. The plethora of clinical studies evaluating interleukin 2, interferon, tumor necrosis factor, and a variety of colony-stimulating factors would lead one to believe that these studies would be covered in this section. However, no clinical studies are included. Overall, this book provides a good summary of several areas of cytokine research and should be a good reference book for scientists interested in obtaining an overview of recent research in this rapidly evolving area of immunology.

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Macromolecular Biorecognition. Principles and Methods. Edited by Irwin Chaiken, Emilia Chiancone, Angelo Fontana, and Paolo Neri. The Humana Press Inc., Clifton, NJ. 1987. xix + 356 pp. 16 × 24 cm. ISBN 0-89603-141-1. $59.50.

This book is the proceedings of a conference entitled "Mechanisms of Recognition in Biological Macromolecules" which was held in Siena, Italy, September 4–6, 1986, and was sponsored in part by the National Research Council of Italy. The book consists of four sections entitled (I) Specific Interactions in Proteins: Molecular Aspects and Functional Regulation (12 contributed papers), (II) Interaction of Nucleic Acids with Proteins and Drugs (5 contributed articles), (III) Immunological Recognition and Development of Synthetic Vaccines (7 contributed articles), and (IV) Analytical and Preparative Bioaffinity Methods (6 contributed articles).

The papers in this book represent a multidisciplinary approach to understanding the specific interactions which take place between various enzymes and substrates or inhibitors, antibodies and antigens, hormones and receptors, and DNA with drugs. X-ray crystallographic results are presented on several macromolecular complexes, including an antigen/antibody complex. Ab initio and molecular mechanical calculations have been combined with computer graphics to provide a picture of the way an enzyme exerts its catalytic effect. Another interesting paper deals with the recognition surfaces of peptides and proteins with a thought-provoking discussion of the recognition of sense/antisense peptides. Three papers treat the interactions of serine proteinases and their inhibitors. A very good discussion is presented on the principles of synthetic peptide vaccines, and several good papers discuss analytical methods involving antibodies and modified avidins. Several papers present very interesting material but are too brief.

While a good balance is maintained between the techniques which are presented, a welcome addition would have been the inclusion of more papers on three-dimensional structures of macromolecular complexes and expanded explanations for the specificity of their interactions. Several of the authors could have improved their papers significantly by spending more time in the preparation of their figures illustrating three-dimensional structures. Finally, as this book is the proceedings of a symposium, one must consider the timeliness of the material. However, the majority of the papers in this book will remain of considerable interest for years to come.

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Advances in Heterocyclic Chemistry. Volume 43. Edited by A. R. Katritzky. Academic Press, San Diego, CA. 1988. vii + 353 pp. 16 × 23.5 cm. ISBN 0-12-020643-9. $95.00.

This is a continuation volume in the series *Advances in Heterocyclic Chemistry* that began in 1963. As with past volumes, this volume contains an excellent mix of material from authors who are authorities in the fields that they present. This volume is divided into six chapters.

The Chemisty of Azaphosphorines by David Hewitt is the first comprehensive review of heterocyclic rings containing only phosphorus and nitrogen as heteroatoms. The chapter is of value not only to workers in the field but to those seeking new areas of research as it points out that many areas remain totally unexplored. One potential drawback to the review is the listing of only two references later than 1984.

Wilhelm Flitsch has authored two chapters in this volume. The first on The Chemistry of 4-Azaazulenes updates a field that was last reviewed in 1958. Flitsch's second review covers Hydrogenated Porphyrin Derivatives: Hydroporphyrins. This chapter is not only of value because of the chemistry but also because of the biochemical implications of hydroporphyrins. Of particular note is the fact that about one-third of the references in both of Flitsch's chapters are from 1983 or later.

Gimmett and Keene have reviewed Reactions of Annular Nitrogens of Azines with Electrophiles. With the exception of metal coordination this chapter amplifies and updates attack of annular nitrogen of diazines, triazines, and tetrazines by a variety of electrophilic species.

Gallo, Roussel, and Berg present a comprehensive treatment of The Quantitative Analysis of Steric Effects in Heteroaromatics. This important and monumental effort is the longest chapter and constitutes over one-third of the volume. Of significance is the fact that almost 20% of the over 500 references are from 1983 and later. The coverage has been limited to those articles in which steric effects are studied quantitatively.

The final chapter is by Charushin, Chupakhin, and van der Plas on the topic of Reactions of Azines with Bifunctional Nucleophiles: Cyclizations and Ring Transformations. More specifically the article deals with reactions of azines in which bifunctional nucleophilic reagents attack two atoms of the same aza-aromatic ring to yield cyclization products which may then undergo rearrangements.

This volume continues the high standards set by previous volumes in the series. It is well edited and relatively free of errors. Unfortunately the Cumulative Index of Titles found in some past volumes is missing.

It is a tribute to the editor, the authors, and the field of heterocyclic chemistry that this series continues to present interesting and exciting topics.

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Radiochemistry of Carbon, Nitrogen and Oxygen. By Munawwar Sajjad and Richard M. Lambrecht. National Technical Information Service, U.S. Department of Commerce, Springfield, VA. 1988. vi + 88 pp. 17.5 × 24.5 cm. NAS-N5-3019. $14.95 (Limited number available free of charge).

This monograph consists of two reviews. The first section deals with radiopharmaceuticals and biomedical applications. It covers the production and preparation of the important precursors of ^{11}C, ^{13}N, ^{14}O, and ^{15}O. The second section deals with the analysis of carbon, nitrogen, and oxygen in different materials but use of nuclear techniques. A survey of radiochemical methods of analysis of these elements in various matrices is also included.

Staff

Annual Reports in Medicinal Chemistry. Volume 23. Edited by Richard C. Allen. Academic, Orlando, FL. 1988. xvi + 390 pp. 17 × 25 cm. ISBN 0-12-040523-7. $44.00.

This book, the most eagerly awaited publication of its kind, needs no introduction to medicinal chemists. All members of the Medicinal Chemistry Section of the American Chemical Society receive this annual review as part of their membership. This volume lives up to the high standards of its predecessors. The new Editor-in-Chief, Richard C. Allen, has followed closely the format of the previous editor, Denis M. Bailey. Thus, this volume as last year's is divided into seven main sections, namely, CNS Agents; Cardiopulmonary and Vascular Agents (which closely approximates last year's Pharmacodynamic Agents); Chemotherapeutic Agents; Endocrinology, Immunology and Metabolic Disorders; Topics in Biology; Topics in Chemistry and Drug Design; and Special Topics. It is culminated by a "Compound Name, Code Number and Subject Index", "Cumulative Chapter Titles Keyword Index, Volumes 1–23", "Cumulative NCE Introduction Index, 1983–1987", and "Cumulative NCE Introduction Index, 1983–1987 (Sorted by Indication)". The last two indexes are new and allow an easier search for recent new compound entries. As usual topics are covered from their last entry in *Annual Reports in Medicinal Chemistry* to present in a comprehensive fashion in 10 pages or less. Some newer topics addressed this year are drugs for cognitive disorders, adenosine receptor modulators, peripheral actions of muscarinic agents, vasopressin antagonists, atrial natriuretic factor, plasminogen activators, chemical modification of antibodies for cancer chemotherapy, immunomodulatory approaches to inflammation therapy, arachidonic acid metabolism in rheumatiod arthritis treatment, obesity therapy, gastrointestinal motility enhancing agents, G-proteins, protein kinase C, strategies in treatment of AIDS, NMR in protein structure determination, strategies for determining bioactive conformers of peptides, oligonucleotide inhibitors of gene expression, enzyme-assisted transformations in organic media, and mechanistic aspects of xenobiotic metabolism as related to drug design. The last chapter To Market, To Market–1987 reveals that 25% more new chemical entites (NCEs) were introduced in 1987 than in 1986—a new record.

Annual Reports in Medicinal Chemistry is the medicinal chemist's bible for keeping abreast of the field of medicinal chemistry. All medicinal chemists should have their own copy. It is equally of interest to many other allied medicinal and biological disciplines.

Staff

Advances in Membrane Fluidity. Volume 1. Methods for Studying Membrane Fluidity. Volume 2. Lipid Domains and the Relationship to Membrane Function. Volume 3. Physiological Regulation of Membrane Fluidity. Edited by Roland C. Aloia, Cyril C. Curtain, and Larry M. Gordon. Alan R. Liss, New York. 1988. ISBN 0-8451-4600-9; 0-8451-4601-7; 0-8451-4602-5. $120.00 (each volume).

During the past 25 years understanding of the dynamics and organization of biological membranes has advanced considerably. The concept of "fluidity" is an amorphous term that represents many aspects of the molecular motion of membrane components. Biological membranes are heterogeneous and recent advances in sophisticated biophysical and analytical techniques have aided in assessment of their structural and functional parameters. The intimate relationship between functions such as enzyme activity, ion translocation, and receptor-mediated events and the architectural arrangement of lipids, proteins, and carbohydrates have recently been placed on a firm biophysical–molecular basis. Thus, the general topic of membrane fluidity has taken on increased importance in trying to understand these activities and events.

In Volume 1 experimental techniques are reviewed in 12 chapters by experts who present practical applications, caveats, and interpretation of results. Mastery of all of these complex methodologies is clearly not possible for every investigator, but an appreciation of the intracacies of each technique is important for the informed membrane researcher.

Volume 2 is directed toward lipid domains and their relationsip to membrane functions. The 12 chapters in this volume deal with annular, or boundary, lipids surrounding integral proteins, lateral-phase separations of lipids, proteins, and carbohydrates across the bilayer, and nonbilayer regions. Relationships among domain structures, fluidity, and functions in a diverse group of membranes are described.

Volume 3 (12 chapters) is devoted to the physiological regulation of membrane fluidity. This is especially important because cell membranes have developed unique strategies to maintain homeostasis.

As the general subject of membrane fluidity covers surfaces that surround potential drug targets ranging from intestinal structures to human immunodeficiency virus (HIV), this up-to-date, thorougly reviewed, and indexed series is recommended not

only to those concerned with membrane research but also to other drug researchers. Medicinal chemists will want to have library access to these thought-provoking volumes.

Staff

Progress in Medicinal Chemistry. Volume 24. Edited by G. P. Ellis and G. B. West. Elsevier Science Publishers B. V., Amsterdam. 1987. v + 359 pp. 15 × 21 cm. ISBN 0-444-80876-0. $275.00.

This volume continues the long-standing tradition of providing readers with excellent reviews of topics relevant to medicinal chemistry. Eight reviews are presented and five of these are on topics which may be considered in the mainstream of drug research, namely, histamine receptors in the central nervous system, platinum antitumor agents, cannabis and cannabimimetic agents, hypoglycemic agents, and calcium channel blockers. The other chapters include discussions on ricin and ricin immunoconjugates, molybdenum hydroxylases, and aldose reductase inhibitors.

The chapter on ricin describes not only its occurrence, structure, and biosynthesis but also its conjugation with monoclonal antibodies in order to achieve tumor-specific cytotoxicity. Ever since the technology for production of monoclonal antibodies was first described in 1975 by Köhler and Milstein, numerous groups have attempted to use antibodies directed against specific tumor antigens for selective delivery of cytotoxic drugs to tumors. Despite the attractiveness of this approach, many problems and limitations exist which are brought out in this chapter. Although such problems are well-known to researchers active in the field, others will benefit from reading this interesting and well-written chapter.

The molybdenum hydroxylases are widely distributed in nature, but they have generally not been grouped under this heading. The aldehyde oxidases and xanthine oxidase are the major enzymes belonging to this group, which the writer believes may be as important as the cytochrome P450 system in drug detoxification. This chapter reviews the substrates for the molybdenum hydroxylases, which include a number of xenobiotics such as methotrexate, quinine, 6-mercaptopurine, and acylovir. Morever, the distribution and species variability associated with these enzymes has important consequences in drug bioavailability—a matter of considerable importance in drug development.

The search for aldose reductase inhibitors is aimed at finding drugs that will reduce the incidence of degenerative complications of diabetes which affect the eyes, kidneys, and other tissues. While the exact cause of these complications is unkown, and may even be multifactorial, it is known that sorbitol selectively accumulates in affected tissues of animals with experimentally induced diabetes. In hyperglycemic states, the hexokinase pathway for glucose metabolism becomes saturated and the excess glucose becomes available for conversion to sorbitol by aldose reductase. Accordingly, it is proposed that aldose reductase inhibitors should retard this accumulation and impede the development of diabetic complications which are only partially controlled by insulin. Structure–activity relationships for a large number of inhibitors are reviewed.

In all cases, chapters are well-written and contain references up to and including publications appearing in 1986. Libraries and regular purchasers of this series will want to continue their subscription. Researchers in the specific areas covered will find the reviews valuable and teachers in medicinal chemistry and pharmacology will find them useful for updating their lectures.

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Enzymatic Peptide Synthesis. By Willi Kullmann. CRC Press, Boca Raton, FL. 1987. 140 pp. 18 × 26 cm. ISBN 0-8493-6841-3. $89.00.

This book on enzymatic peptide synthesis represents a rather comprehensive review of the area through 1985. The text is clear, concise, and nicely illustrated. Each chapter is well-referenced with the references appearing at the end of each chapter.

Chapter 1 provides an interesting historical overview of peptide synthesis, both classical and enzymatic. Chapters 2–5 discuss the thermodynamic and mechanistic aspects of the enzymatic approach. Much attention is paid to the thermodynamic approach toward enzymatic synthesis rather than the kinetic approach. Lucid discussions of the effects of organic cosolvents, pH, and temperature on product yield are provided. The author has, however, neglected to disscuss the utilization of reverse micelles. Also, it was somewhat disappointing to see the now defunct "classical" charge–relay system of the serine proteases treated as dogma. Chapters 8–10 describe the achievements of the enzymatic approach from the synthesis of the dipeptide sweetner aspartame to the total synthesis of biologically active peptides, and finally the enzymatic manipulations of whole proteins. Chapters 11–12 discuss the kinetics of protease-controlled peptide synthesis and the utility of proteases in protective group chemistry, respectively. Chapters 13–14 close with a discussion of the shortcomings and alternatives of this approach as well as providing a glimpse at the future direction of this area.

Though this book provides an in-depth review of the area through 1985, the reader is directed to the current literature for recent advances in the area such as the use of non-proteases, amidase-damaged proteases, and catalytic antibodies, and the new approach to enantioselectivity control by reaction media. In summary, the book comes well-recommended to those interested in enzymatic peptide synthesis.

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The Alkaloids. Volume 32. Edited by Arnold Brossi. Academic Press, Inc., New York. 1988. ix + 454 pp. 16 × 24 cm. ISBN 0-12-469532-9. $99.00.

The 32nd volume of the notable Alkaloid Series contains five chapters on a broad range of topics. Chapter 1 by Y. Hashimoto, K. Kawanishi, and M. Morivasu is entitled Forensic Chemistry of Alkaloids by Chromatographic Analysis. This area was last reviewed in 1970. Since that time great advances in methodology, notably in the development of instrumentation and chromatographic columns for high-performance liquid chromatography has taken place. The authors have presented this information in a manner which will be useful, particularly to individuals interested in a general survey. Analytical techniques for each alkaloid covered are discussed. Thus, GC or GCMS, HPLC, and TLC procedures are given for each compound. Little space or attention is given to super critical fluid chromatography or to the discussion of LCMS, which is now at an excellent working stage. The literature cited, unfortunately, with only a few exceptions, is reviewed only through the early 1980s. Nevertheless, a useful review on analytical methods for opium alkaloids and heroin, amphetamines, the constituents of khat, the coca alkaloids, cactus alkaloids, harmala alkaloids, tryptamines, ergot alkaloids, LSD, and tobacco alkaloids is presented.

Chapter 2 Steroidal Alkaloids of Apocynaceae and Buxaceae is reviewed by Atta-ur-Rahman and Anjum Muzaffar. Reviews in this series were last published in 1973 and hence an update is certainly in order. In the style of this excellent review, isolation and structure elucidation are presented in the most detailed manner. Experimental details concerning UV, IR, NMR, and mass spectra of the compounds are presented along with detailed structure proof of the various steroidal alkaloids. The various alkaloids discussed under Apocynacea include the conanine group, the pregnane group, the paravallarine group, and the aminoglyco steroids. A detailed description of the synthesis and chemical transformation in each of the above groups is presented. An equally detailed section dealing with the alkaloids of the Buxaceae is then presented in a manner similar to that already presented in the previous section.

Following these well-described sections, two extremely brief statements on biosynthesis and pharmacology are presented. This information is so sketchy it could have well been omitted. Although most of the 245 literature citations are prior to 1980, they do provide a useful review of the literature and include a number of recent references (1986–1988) from Atta-ur-Rahman's group.

A chapter on the Distribution of Alkaloids in Traditional Chinese Medicinal Plants is presented by G.-O. Han, Y.-Y. Chen, and X.-T. Liang. The authors had the worthy idea of limiting the literature-cited references in 1980s and hence, their total number of references are small (79) and are restricted almost exclusively to papers that have appeared only in Chinese journals. Alkaloids covered include those from various Aconitum species, from Delphinium and Spiraea species, and in particular an extensive discussion of the Stephania alkaloids. In all cases, the authors give brief statements of the uses of some of these alkaloids or the plants from which they were obtained in folk medicine. In many cases, it was difficult for this reviewer to obtain a clear picture of which compounds were new and which may have been found previously. Nevertheless, this is a useful chapter for those workers who may be interested in correlating the constituents found in Chinese folk medicine with the reports of their physiological activities.

Chapter 4 by Henk Hiemstra and W. Nico Speckamp, from the Laboratory of Organic Chemistry, University of Amsterdam, deals with *N*-Acyliminium Ions as Intermediates in Alkaloids Synthesis. This chapter is rather different from most of the others discussed in Vol. 32 as it deals almost entirely with alkaloid synthesis. The 184 references contain many relatively recent references wtih possibly over half of them in the 1980s. Hiemstra and Speckamp describe in great detail the *N*-acyliminium ion approach to the synthesis of isoquinoline, indole, pyrrolidine, piperidine, tropane, and pyrrolizidine alkaloids. The exhaustive nature of this review is indicated by the fact that no less than 530 structures are shown in this comprehensive paper.

The final chapter Quinoline Alkaloids Related to Anthranilic Acid by M. F. Grundon deals with a subject that was last reviewed 10 years ago in Vol. 17 of the series. Subsequently, more than 80 new quinoline alkaloids have been isolated and considerable advances have been made in synthesis of the alkaloids. Grundon's review covers not only description of the alkaloids but also of spectroscoptic methods. Considerable data on ^{1}H NMR and ^{13}C NMR is presented as well as that of mass spectrometry. The article is comprehensive. Useful tables showing the occurrence of the various types of alkaloids in each of the major classification are presented along with melting points and references. In addition, synthetic procedures are described in detail. A complete description of all the major classes of alkaloids related to anthranilic acid is presented by Grundon along with many useful tables. Of the some 244 references, many are quite up to date, i.e., in the 1980s up through 1986.

The Alkaloids, Vol. 32, edited by Arnold Brossi is a useful reference book that should be in all technical libraries.

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Inhibition of Polyamine Metabolism. Edited by P. P. McCann, A. E. Pegg, and A. Sjoerdsma. Academic Press, Inc., Orlando, FL. 1987. xvi + 371 pp. 17 × 23 cm. ISBN 0-12-481835-8. $75.00.

In response to the increasing interest in the use of inhibitors of polyamine metabolism as chemotherapeutic agents and in the study of plant and animal physiology, the editors of this comprehensive and timely review have assembled a series of well-written chapters summarizing the field of polyamine biosynthesis inhibitors, from their synthesis and design to their biological effects and potential clinical applications.

A brief introduction provides a schematic overview of the enzymatic reactions involved in polyamine metabolism, followed by 16 individually written chapters: Inhibition of Basic Amino Acid Decarboxylases Involved in Polyamine Biosynthesis (Bey, Danzin, and Jung), Pharmacologic Interference with Enzymes of Polyamine Biosynthesis and of 5'-Methylthioadenosine Metabolism (Pegg and Williams-Ashman), Inhibition of Enzymes Oxidizing Polyamines (Seiler), Molecular and Cellular Functions of the Polyamines (Marton and Morris), The Use of Inhibitors to Study the Biochemistry and Molecular Biology of Polyamine Biosynthesis and Uptake (Pegg), Inhibitors of Polyamine Biosynthesis: Cellular and *in Vivo* Effects on Tumor Proliferation (Sunkara, Baylin, and Luk), Polyamine Inhibition *in Vivo* and in Organ Growth (Danzin and Mamont), Polyamine Synthesis Inhibitors Act as Both Inducers and Suppressors of Cell Differentiation (Heby, Luk, and Schindler), The Contragestational Effects of Ornithine Decarboxylase Inhibition (Fozard), Modulation of Antineoplastic Drug Action by Inhibitors of Polyamine Biosynthesis (Porter and Jänne), Inhibition of Carcinogenesis by Inhibitors of Putrescine Biosynthesis (Verma and Boutwell), Inhibition of Polyamine Biosynthesis in Microorganisms (Bitoni and McCann), Inhibition of Viral Polyamine Biosynthesis (Tyms and Williamson), Inhibition of Polyamine Biosynthesis in Plants and Plant Pathogenic Fungi (Slocum and Galston), Parasitic Protazoa and Polyamines (Bacchi and McCann), and Clinical Aspects of Inhibition of Ornithine Decarboxylase with Emphasis on Therapeutic Trials of Eflornithine (DFMO) in Cancer and Protozoan Diseases (Schechter, Barlow, and Sjoerdsma).

In general, the chapters are well-written, contain numerous current as well as historical references (although only a few chapters contain references from 1986–1987), and provide concise summaries of their respective topics. While they are not designed to be exhaustive essays, nor do they describe methodological details, they do cover their respective subjects well enough so as to acquaint the reader with the general flavor of the area. Several authors provide useful suggestions for future studies of interest to both the seasoned investigator as well as to those just entering the field. Tables and figures are well-defined, well-referenced, and provide an added level of information; the index is brief but adequate.

Written to "stimulate futher research on both the basic and applied aspects of polyamines", this reference is a thorough collection of reviews, written by internationally recognized investigators, which until now could only have been found in numerous books and a much larger number of review articles.

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Organometallic Chemistry: An Overview. By John S. Thayer. VCH Publishers, Inc., New York. 1988. xi + 170 pp. 16 × 24 cm. ISBN 0-89573-121-5. $35.00.

This volume represents a brief review of the fundamental principles of organometallic chemistry, a field whose manifold importance in organic synthesis, industrial catalysis, and biological processes has become increasingly apparent over the past 20 years. The book adopts a simple approach, much akin to that used in an undergraduate organic text, to trace some of the major organometallic functional groups and their reactivity patterns. As this is an introductory treatment, significant effort is expended to translate the technical jargon of organometallic chemistry into language that can be understood by individuals with some background in organic chemistry. This book is unusual in that it devotes a significant space to the main group metals and metalloids and may therefore prove of particular value for individuals interested in these fields.

The book is arbitrarily divided into 14 chapters: (1) history and literature of organometallic chemistry, (2) synthesis of metal–carbon bonds, (3) "ionic" metal–carbon bonds, (4) "electron-deficient" metal–carbon bonds, (5) metal–carbon σ bonds of the "reactive" or less electronegative metals, (6) metal–carbon σ bonds of the metals with relatively high electronegativities, (7) metal–carbon σ bonds of the metalloids, (8) ligands that bind as monohapto π-donors or π-acceptors, (9) ligands that bind as di- or polyhapto π-donors or π-acceptors, (10) polynuclear clusters containing hydrocarbon ligands, (11) medicinal and biochemical applications of organometallic compounds, (12) the toxicological and biocidal activity of organometallics and organometalloids, (13) the environmental occurrence and metabolism of organometallic and organometalloid compounds, and (14) a brief afterword covering a few recent developments in organometallic and organometalloid chemistry.

All of the chapters provide concise treatments of the subtopic emphasizing a narrative description of the area rather than a highly rigorous development of the attendant concepts. Good lists of leading references authored by the recognized authorities in each field are footnoted in the text. The dilligent reader may, however, experience an extreme form of culture shock in moving directly from this treatment to some of the more technical treatments indicated in the references. It may be advisable to soften this transition through the intermediacy of a more advanced organometallic text.

Chapters 11–13 represent a useful introduction to the biological relevance of organometallic species, with special emphasis on organometalloid compounds. The historical applications of organometalloids as medicinal agents, as well as applications of organometalloids in biochemical research, are briefly reviewed. A similar overview of the use of organometalloids as pesticides and antifouling agents is also valuable.

This volume should be useful for nonchemists or for chemists with very limited backgrounds in transition metal and metalloid chemistry who need a first introduction to the field.

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ChemBase (Version 1.2). Molecular Design Ltd., San Leandro, CA. 1988. $3500.00.

ChemBase, a chemical database management system, is, like ChemText (for review, see *J. Med. Chem.* **1988**, *31*, 495), a component of Molecular Design's Chemists Personal Software Series (CPSS). Minimum hardware requirements necessary to operate ChemBase are a PC (or XT, AT, PS/2) (and although PS/2 Models 50–80 are specified, this reviewer encountered no problems with a Model 30), PC DOS (Release 2.0 or higher for PC and XT, Release 3.0–3.3 for AT, and Release 3.3 for PS/2), 640 KB RAM, graphics card (Hercules monochrome card, or CGA, EGA, VGA adapter), mouse, and one floppy and one hard (10 MB minimum capacity) disk drive. The program, a multi-disk package, comes with extensive documentation: a 50-page Quick Guide, a 150-page tutorial, and a 200-page User Guide. In addition, over 400 pulldown help screens are available while running the program.

ChemBase might be most easily described as an electronic card file system where data can be stored (on a "Form") by name, structure, or some other descriptor. For example, employing the Molecule Editor, a structure can be readily constructed on-screen using the mouse and, with a single mouse-click, inserted directly into the Form. Numerous conveniences are available for constructing these structures including structural templates (e.g., rings, chains, amino acids, sugars) and functional groups. Bonds are readily added, deleted, broken, or transformed (i.e., converted between single, double, triple, up, down) with minimal effort. Heteroatoms are easily incorporated. In drawing a structure, the program will even flash a warning when the proper valence of an atom has been exceeded. Chirality, charge, and isotope can be noted. A "clean" function will quickly convert crudely drawn structures to structures with standard bond lengths and bond angles.

Once the structure has been transferred to the Form, textual data can be added with the Text Editor. Certain fields, if employed, are automatically calculated (e.g., molecular weight, empirical formula, elemental composition); data in other fields are entered manually. The Form Editor allows for customization of the Form and essentially any type of chemical, biological, or spectral data can be saved. A Reaction Editor permits the construction and saving of chemical reactions, including solvents, catalysts, and reaction conditions.

Perhaps the greatest utility of the program is to rapidly search a database. Several types of searches are possible: a molecule (or reaction) substructure search, a transform substructure search (which finds the reaction transformation requested), a molecular formula search (which allows partial matches), and a general text/numeric field search. When a match has been found, all of the data associated with the molecule is shown on the Form (or, if desired, in a tabular format). Searches of reactions can include synthetic intermediates, searches of molecular formulas can include ranges (e.g., C_{6-8}) and exclude atoms (e.g., C_6Br_0), and searches of alpha/numeric text permits use of logical operators (e.g., mp. > 150 °C). Substructure searches can also be defined by use of the Query Atom or Query Bond options.

Other useful features include Group Abbreviation (e.g., Ph for phenyl), Atom-centered Values that allows association of ranges with a particular atom (e.g., for NMR data), and Atom Aliasing that allows attachment of nonstandard descriptors to an atom site. Data can be imported from ChemText, and encapsulated postscript features allow use of some desktop publishing programs. As with ChemText, hardcopy can be obtained using dot matrix printers, but laser printers are recommended for publication-quality print.

ChemBase is a very flexible database management system specifically designed for use with structural data. Although a concerted effort may be necessary to fully utilize all of ChemBase's features and capabilities (and professional training courses are available), most applications can be learned within a matter of hours. The cost of the program is quite hefty for an individual investigator but site licenses and academic pricing are available. Futhermore, there does not appear to be a comparable PC product on the market. ChemBase is a convenience and a must for anyone who currently saves structural data (and associated information) in written form: it will eventually make fumbling through notebooks, data sheets, and index cards a lost art.

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Oxidases and Related Redox Systems. Edited by Tsoo E. King, Howard S. Mason, and Martin Morrison. Alan R. Liss, New York. 1988. xxvii + 789 pp. 16 × 23.5 cm. ISBN 0-8451-5124-X. $140.00.

This volume contains the collected papers and discussion of the 4th International Symposium on Oxidases and Related Redox Systems (ISOX IV), held in Portland, OR, October 4–8, 1987. The book is divided into two major parts. Part I (the first 90 pages of the book) represents a special session celebrating the centennial of the birth of Professor David Keilin (1887–1963), who the organizers credit with "making major discoveries that contributed to the founding of the modern fields of respiratory biology and bioenergetics". Six former associates share their reminiscences about Professor Keilin's life and scientific contributions, about his institute, and about the scientific milieu of the times. The papers in this section are affectionate and nostalgic and make for some interesting reading.

Part II presents the scientific sessions of the symposium, and the editors follow the same style as they used for the preceding three ISOX symposia. Preprints supplied by the speakers were collected and distributed 1 month prior to the meeting in order to help stimulate informed discussion among the participants. Most papers are followed by a page or two of discussion. The papers are organized by session, the first of which deals with general considerations regarding the properties of oxygen (three papers). Subsequent sessions focus on the flavoproteins (3 papers), iron and copper proteins (10 papers), transfer of reducing equivalents (4 papers), peroxidases (4 papers), P-450 and related proteins (6 papers), and cytochrome c oxidase (10 papers). Generally, the papers present recent results from active laboratories, but most of the authors have tried to provide some perspective in which to view these latest results.

As with previous editions of ISOX Proceedings, the organizers have been selective in regard to the areas covered and the individuals invited to participate. However, the papers are generally well-written and of definite value to researchers active in the field of redox enzymes and electron transfer. While this reviewer does recommend this book, its price does seem relatively high even for a specialized publication such as this. It should be mentioned that Dr. Morrison passed away a few weeks prior to the symposium, and the book includes a warm tribute to him as a scientist

and colleague.

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Advances in Second Messenger and Protein Phosphorylation Research. Volume 21: Sixth International Conference on Cyclic Nucleotides, Calcium and Protein Phosphorylation. Edited by R. Adelstein, C. Klee, and M. Rodbell. Raven, New York. 1988. Volume 21: xvii + 240 pp. 16 × 24 cm. ISBN 0-88167-407-9. $88.00. Volume 21A: 112 pp. 15.5 × 23.5 cm. ISBN 0-88167-430-3. $39.00.

These volumes are part of a distinguished series of volumes dealing with topics related to cyclic nucleotides, calcium, and protein phosphorylation. The changes in the name of the series over the years reflects the changes which have occurred in this aspect of science. The present volumes are related to a conference held in Bethesda, MD, in 1986. The papers are of high quality. In addition, brief summaries are provided of round-table discussions. Because of the 2-year delay between the meeting and the publication, there is a certain "dated" feel to some of the contributions. The organizers picked topics of interest to many investigators; at the time, the presentations were state-of-the-art; however, the progress which has occurred in the last 2 years is not always evident in the written summary of the presentation. Nonetheless, the volume will be useful summaries of the meeting. The accompanying volume of abstracts provides an interesting historical memento of the meeting for those who may have disposed of their volume at the end of the meeting. All told, I cannot endorse the publisher's entreaty to "order your copy today" in the announcement at the end of the Abstract Volume. The Abstracts Volume may be one to consult in the library.

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Neuromethods. 10. Analysis of Psychiatric Drugs. Edited by Alan A. Boulton, Glen B. Baker, and Ronald T. Coutts. Humana Press, Clifton, NJ. 1988. xx + 547 pp. 15 × 23 cm. ISBN 0-89603-121-7. $79.50.

This is the latest volume in Boulton and Baker's *Neuromethods* series. It explores the major techniques currently being utilized to analyze the action of therapeutic agents employed in psychiatry. It places major emphasis on three drug classes: antidepressants, antipsychotics, and antianxiety agents. Experts in their fields comprehensively address the methods and techniques for analyzing these substances. Principal topics relating to these drugs include protein binding of psychotropic agents, therapeutic actions versus toxicity, lipophilicity, isotope derivative assays, GLPC, GC–MS, HPLC, instrumentation, sample preparation and quantitation, radioreceptor assays, immunoassay techniques, drug screening procedures, in vitro and ex vivo screening methods, animal models, high-affinity binding of antidepressants, and structure–activity relationships at the benzodiazepine receptor. This volume gives descriptions of the analytical techniques in a manner that describes both the advantages and limitations of each particular method.

The 12 chapters in this book are uniformly well referenced, although few if any references following 1986 are cited. The index is adequate.

Most likely this book will be of at least some interest to all involved in the development, basic, and clinical applications of psychotropic agents. This is because of the broad range of topics that are covered. Conversely, it is not likely that all neuroscientists will be interested in all aspects of the book. Medicinal chemists, for example, will probably have greatest interest in the final chapter that deals with structure–activity relationships at the benzodiazepine receptor primarily via application of X-ray crystallographic investigations. The book is one which is most appropriate for library accessibility to the broad spectrum of neuroscientists.

Staff

Advances in Drug Research. Volume 17. Edited by B. Testa. Academic Press, San Diego, CA. 1988. xii + 479 pp. 16 × 23.5 cm. ISBN 0-12-013317-2. $48.00.

This volume contains five chapters on topics that seem to this reviewer to have been unusually well selected, in representing diverse areas of medicinal chemical research in which there is a high activity and great contemporary interest. The contributions include Recent Advances in the Search for Selective Antiviral Agents (De Clercq); Recent Developments in the Field of Cephem Antibiotics (Dürckheimer, Adam, Fischer, and Kirrstetter); Recent Experimental and Conceptual Advances in Drug Receptor Research in the Cardiovascular System (Ruffolo and Nichols); the Pharmacology and Therapeutic Potential of Serotonin Receptor Agonists and Antagonists (Fuller); and Recent Advances in GABA Agonists, Antagonists, and Uptake Inhibitors: Structure–Activity Relationships and Therapeutic Potential (Krogsgaard-Larsen, Hjeds, Falch, Jorgensen, and Nielsen).

All authors have concentrated on the newer literature, and the chapters contain references from 1987. Proofreading of chemical structures and text seems to have been carefully done. All chapters are well-written. This reviewer found the chapter on the physiology/pharmacology of the cardiovascular system and the rather short (59 pages) chapter on antiviral drugs to be unusually informative and useful.

Overall, this volume is a success, and it is recommended reading for medicinal chemists, pharmacologists, and others in drug research.

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The Reverse Effect. How Vitamins and Minerals Promote Health and Cause Disease. By A. Heiby. MediScience, Deerfield, IL. 1988. xvii + 1198 pp. 14.5 × 22 cm. ISBN 0-938869-01-9. $59.50.

It is axiomatic that drugs and other xenobiotics exert multiple biochemical and hence biological manifestations. As microinstrumentation has made it possible to analyze more details of endogenous biochemicals, it has become apparent that the same splintering of biological effects holds also for normal constituents of tissues. Vitamins and mineral ions are no exception. Indeed, this has been recognized for decades and described carefully in many monographs and articles. The present massive volume of almost 1200 pages expands this diversity of contradictory observations of effects and reverse effects, concentrating on these aspects rather than on coincidental side effects. Environmental and dosage alterations may induce such reversals. The author recommends that moderation be exerted, as in all things, including sweet rolls and sex. Serious actions that could limit the indiscriminate administration of vitamins include induction of tumors and other toxic dangers. The trouble with such statements is that some unique and unconfirmed articles are quoted without too much criticism and the reader is allowed to draw her/his own conclusions. Many other quotations are, however, handled critically and traced down to valid and often surprising biochemical mechanisms.

Physicians and nutritionists with much time on their hands will profit from reading this book—and will be confused by it. Biochemists will find many challenging ideas that may suggest additional researches.

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Stereoselectivity of Pesticides: Biological and Chemical Problems. Edited by E. J. Ariëns, J. J. S. Van Rensen, and W. Welling. Elsevier, Amsterdam. 1988. x + 544 pp. 17 × 25 cm. ISBN 0-444-42853-4. $171.00.

This book is the first volume of a series entitled *Chemicals in Agriculture*. It consists of 18 well-referenced chapters by 28 contributors and a useful subject and product index.

The annual worldwide production of pesticides (herbicides, insecticides, fungicides) is estimated in this volume at 3 billion

pounds. Of the 475 important and commercially available pesticides, 136 (29%) contain at least one center of asymmetry or exhibit geometric isomerism. With few exceptions, those commercial pesticides capable of existence as separate stereochemical or geometric isomers are sold as isomeric mixtures. In certain cases the individual isomers have been obtained and studied on a laboratory scale. Generally, the pesticide activity is associated in large measure with a single isomer. However, thorough studies seldom have been carried out to evaluate and compare potentially toxic environmental effects of the pesticidally active isomer and the pesticidally inactive or less active isomer(s). The editors and authors characterize the "inactive" isomer(s) in these commercial products as isomeric ballast and environmental pollutants.

It is the avowed purpose of the editors and contributors to this volume to encourage workers in the pesticide area to carry out more thorough and definitive studies with pesticides where stereochemical and geometric isomerism is possible. Such studies might ultimately lead to a reduction in the amount of toxic isomeric pollutants added to the environment. To this end, this volume reviews the status of current knowledge in the pesticide areas where isomeric composition and isomeric activity have been studied. Other chapters provide overviews of the principles of stereoisomerism and stereoselectivity; methods for the preparation, separation, and characterization of isomeric compounds; QSAR approaches to stereochemical problems; and computer-assisted selection of synthetic routes to agrochemicals. In many instances, the authors draw heavily upon analogies with the results of stereoselectivity studies of drug actions.

In the opinion of this reviewer, the volume is of minimal value to those involved in medicinal chemistry research.

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Nonadrenergic Innervation of Blood Vessels. Volume I: Putative Neurotransmitters. Volume II: Regional Innervation. Edited by G. Burnstock and S. G. Griffith. CRC Press, Inc. Boca Raton, FL. 1988. 18 × 26 cm. Vol. I: 149 pp. Vol. II: 233 pp. ISBN 0-8493-6680-1. $99.50 each volume.

These two volumes provide a concise description of the innervation of the vasculature of many diverse organs and organ systems. Many of the chapters concentrate on the comparative anatomy of vascular innervation; although, as suggested in the title, the emphasis is on nonadrenergic nerves, some valuable information on species differences in the pattern of adrenergic innervation is provided, particularly in Chapter 1 of Volume II.

The chapters in Volume I each concentrate on a particular neurotransmitter. The scope is broad, including acetylcholine, vasoactive amines such as dopamine and serotonin, purine nucleotides, as well as a variety of vasodilator and vasoconstrictor peptides. These are complemented by those of Volume II, which describe the multiple transmitters controlling vascular tone in a particular vascular bed or organ. All of the major vascular beds are discussed, as well as some interesting vessels such as the *vasa nervorum* and those supplying the sensory organs and salivary gland.

By combining these two approaches, the field is well surveyed. The anatomical data is supplemented by results from physiological and pharmacological experiments supporting the postulated role of a given transmitter. With few exceptions, each chapter would have benefited from additional information of this nature, with more figures depicting experimental data. It almost seems as if chapter length was intentionally limited, with the writing style often terse, and only a minimal discussion of the concepts presented. I often felt the need for further detail.

Although all chapters are well referenced, in most cases the literature is surveyed only through 1985. In some cases chapters have been updated to provide a few recent references, or an appendix citing recent reviews has been added. Publication delays are unavoidable, but are especially troublesome in a rapidly evolving field such as this.

Despite these limitations, these two volumes, emphasizing the complexity in the autonomic innervation of blood vessels, will prove useful as a reference for researchers in this field and a useful aid for all scientists interested in the mechanisms by which blood flow is controlled. Although individual reviews concentrating on a particular neurotransmitter or vascular bed are available, the integration of transmitter and organ system based classification schemes makes this work particularly valuable.

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Two-Dimensional NMR Spectroscopy. By Jan Schraml and Jon M. Bellama. Wiley, New York. 1988. ix + 220 pp. 16 × 23.5 cm. ISBN 0-471-60178-0. $59.95.

The advent of 2D NMR experiments has revolutionized the use of NMR for the determination of structures of organic molecules. While the most important applications of these methods are in the study of biological macromolecules, the recent literature abounds with examples involving small molecules and oligomers, such as small peptides. Medicinal chemists therefore need a proper appreciation of 2D NMR.

There are three distinct levels of understanding of 2D NMR for organic chemists. The first is an understanding, in nonmathematical terms, of the underlying physics of the experiments. For the most part the authors have achieved this through the use of vector diagrams. This approach is unsuitable for discussing multiple quantum coherence experiments which, accordingly, are presented in purely descriptive terms. The overall treatment is quite well done in Chapters 3 and 4, but Chapter 2, which serves as an overall introduction to 2D NMR, is rather disjointed and may not be easy for the nonspecialist.

The second level of understanding concerns the "hand-on" user. Here, the authors have chosen to illustrate all experiments with a common sample, 2-butanol, in order to provide the readers with a standard by which they can know whether they are performing experiments correctly. This approach will be of little interest to medicinal chemists.

Finally, there is the level at which a thorough appreciation of the uses and interplay of the various 2D methods is provided. This is of major importance for organic chemists but the treatment provided is most cursory (6 pages). What is really needed is a set of carefully chosen examples which emphasize the power of the methods and which would stimulate the readers to apply them to their problems.

One quarter of the book is an appendix dealing with the fundamentals of pulsed NMR. The reader may have been better served if this material had been interwoven into the main body of the text.

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Clinical Pharmacology and Therapeutic Uses of Diuretics. Edited by A. J. Reyes and W. P. Leary. Gustav Fischer Verlag, New York. 1988. 319 pp. 17 × 24 cm. ISBN 0-89574-267-5. $65.00.

This book contains nine chapters ranging from 14 to 64 pages each. The chapters are well referenced with current literature often cited. Four chapters deal with the use of diuretics in distinct diseases including congestive heart failure, hypertension, cirrhotic ascites, and renal failure (both acute and chronic). The other five chapers are on the present and future trends in diuretics; atrial natriuretic peptide; pharmacodynamics of furosemide, hydrochlorothiazide, and torasemide; renal excretory actions of diuretics in man; and drug interaction. Each chapter begins with a summary.

The first chapter is a thorough review which discusses the advantages and disadvantages of diuretics in general and then goes on to discuss many of the newer drugs which affect renal function including torasemide, tripamide, converting enzyme inhibitors, and calcium antagonists. Of special interest are the effects of diuretics on magnesium and calcium excretion, areas that are often overlooked in discussions on diuretics. The discussion on diuretic-induced changes in lipid and carbohydrate

metabolism is also relevant since that continues to be an area of great controversy.

A separate chapter on atrial natriuretic peptide is welcome since the importance of this peptide in the maintenance of volume homeostasis in both health and disease is becoming increasingly evident. The chapter reviews the limited clinical data with atrial natriuretic peptide and, more importantly, discusses the effect of various drug treatments on the endogenous plasma concentrations of the peptide. It's interesting that drugs that improve cardiac performance are associated with lowering elevated plasma atrial natriuretic peptide.

The chapter comparing the renal excretory pharmacodynamics in man of furosemide, hydrochlorothiazide, and torasemide is interesting but limited in that it discusses the results of a single study with these three agents. Unlike the other chapters which are essentially reviews of specific areas of diuretics, this chapter discusses the results of a single-dose oral study comparing the three diuretics. A mathematical model was used to compare the individual cumulative excretions of fluid and electrolytes in 14 healthy volunteers. Of interest are the findings that indicate that volunteers receiving both furosemide and torasemide exhibited an "undershoot" following the initial brisk increases in urine volume and electrolyte excretion whereas hydrochlorothiazide did not. The consequence of this "undershoot" was that hydrochlorothiazide exhibited a greater natriuretic effect than either furosemide or torasemide when measured over a 24-h period.

The chapter on renal excretory actions of diuretics in man corrects some basic misconceptions concerning diuretics. As a follow-up to the previous chapter, the authors state that loop diuretics should not be considered the most "potent" diuretics because of the "undershoot" that follows their administration. They go on to state that only following steady-state conditions can one diuretic be compared with another. Also, they state that drugs such as amilioride, triamterene, and spironolactone should not be considered as "potassium-sparing" but should be called "potassium-retaining" due to their propensity to produce hyperkalemia.

The chapters on congestive heart failure, hypertension, cirrhotic ascites, and renal failure (acute and chronic) are reviews of the usefulness of diuretics in the treatment of these diseases. The chapters discuss the benefits along with possible side effects that may occur with these agents. The chapter on hypertension uses a mathematical model to discuss the time course for the antihypertensive activity of diuretics.

The last chapter discusses the beneficial and detrimental drug interactions that can occur with diuretics. Beneficial interactions include the enhanced antihypertensive activity that occurs when diuretics are used in combination with vasodilators such as minoxidil. Detrimental interactions include the enhanced auditory toxicity that can occur if a loop diuretic is used in combination with certain aminoglycoside antibacterial agents such as streptomycin or gentamicin. Less obvious but important diuretic interactions that can occur with other drugs such as laxatives, sulfonylurea antidiabetic agents, etc. are also discussed.

In general, this book is well written and supplies excellent references. It is a valuable addition to those interested in the clinical use of diuretics.

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Multinational Drug Companies. Issues in Drug Discovery and Development. By Bert Spilker. Raven, New York. 1989. xxvi + 606 pp. 18 × 26 cm. ISBN 0-88167-463-X. $69.00.

This volume, the fourth from the prolific pen of Dr. Spilker related to the drug discovery and development process, is divided into five sections: drug discovery and development, corporate organization and management issues, research and development organization and management issues, technical and function issues, and external interactions and relationships.

In reviewing this volume, it is difficult to know where to start or what adjectives to use. This is, simply stated, an incredible book which should be required reading for anybody working in the industry or indeed anybody interested in modern drug discovery. All drug companies, all biotechnology companies, and all graduate programs in pharmacology should ensure that their employees/students have access to this book. In the 600 or so pages, Dr. Spilker has addressed many of the issues that confound the seemingly simple process of applying good science, biology and chemistry, to the discovery and development of new drugs. As he notes on page 6, "Although most companies may be operated and managed as if they make "widgets", a drug company must not".

While some in the pharmaceutical industry may take issue with some of Dr. Spilker's perspectives, there are few stones that he has left unturned and few issues that he has ignored. Accordingly, it is probable that many industry veterans, as they read this volume, will wish that they had had the time, energy, and initiative to have written this book.

The perspectives on management consultants (page 96) are especially refreshing and insightful. Dr Spilker notes that "anyone who calls himself a consultant, is one" and further comments that "Most management consultant companies lack adequate knowledge about the drug industry, drug development, and usually the particular company they are advising. Ironically, the consulting companies with some experience in advising the drug industry are often the most dangerous... (they) tout their drug industry experience. But, their often slick presentations belie their superficial approaches and lack of true understanding about research and development in the drug industry". Thus, this book, while providing such individuals with a major reference source to enhance their "yuppie" approach to the complex process of drug R & D also identifies the topics that research organizations need to bear in mind when "refocussing" their R & D efforts. Research scientists, research managers, and research management teams therefore will have only him/her/themselve(s) to blame if their organization suffers at the hands of such charlatans whose knowledge and expertize lie inevitably with "widgets" rather than science. With a realistic focus, a true concern about the objectives of the organization they work for and a copy of this book, they can be sufficiently knowledgeable to control the process (and the consultants they hire) or even do the job themselves!

If you care about the process of drug discovery, the future of the pharmaceutical industry, its complex management issues, and the problems of interfacing science and business organizations buy this book and read it! In addition to being very reasonably priced, it is, as Louis Lasagna notes in his cover "blurb", indeed "awesome".

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Chemistry and Biotechnology of Biologically Active Natural Products. Edited by Cs. Szantay with A. Gottsegen and G. Kovacs. Akademiai Kiado, Budapest, Hungary. 1988. xi + 402 pp. 17 × 24 cm. ISBN 963-05-4950-06. $39.00.

This book is a collection of 20 manuscripts, all in English, resulting from papers read at the Fourth International Conference on the titled subject held in Budapest, August 10–14, 1987. Its appearance within 1 year of the conference and at this very reasonable price is quite remarkable. Although the binding and paper do not promise a very long shelf life for this volume, its value is primarily temporal and probably makes this reasonable. The book is remarkably free of errors and possesses a workable but not detailed index.

The title of the book is somewhat misleading unless one notes the "1987" on the cover or realizes that it is a conference proceedings volume. Otherwise it might suggest to the unwary that a balanced, coordinated, and comprehensive treatment of the topic is intended. This is not the case. It is instead a collection of easy reading, personally focused, essays of various studies relating to the central theme of the conference. Thus, one need not read them all to realize benefit from the book nor need one read them in any particular sequence as they are not logically connected. Thus, the book will have relatively little residual value but provides a surrogate experience for those who would have liked to have been present at the conference but could not and provides en-

joyable light reading for those generally interested in bioactive natural products. Given the range of authors and the particular bias of the reader, some of the essays are very good and others are not, and it is this reviewer's belief that natural products chemists will find it more entertaining than will medicinal chemists.

Because of the nature of the book and the impossibility of guessing the contents accurately from the title, it is first necessary to describe the various essays briefly in order to give the reader an idea of the likelihood that the book would be of some interest or value for purchase either personally or for the library. Those only interested in the bottom line should skip ahead to the last paragraph.

The book opens with a brief chapter by G. Fekete of the Gedeon Richter Chemical Works, Budapest, entitled Natural Substances and Drug Therapy, Past, Present and Possible Future. He makes a case for ethnopharmacological investigation and lead development rather than random screening of higher plants. Not many of us would argue with this position. M. Zaoral of The Czech Academy of Sciences, in a chapter on Routes to Highly and Selectively Active Peptides provides a highly personalized account of the synthesis of various bioactive peptides, pseudopeptides, glycopeptides, and pseudoglycopeptides. G. Cordell and coworkers from the University of Illinois at Chicago describe the use of modern pulse techniques for the NMR-based structural determination of a variety of bioactive phenolic natural products in a chapter entitled NMR Studies of New Flavone and Homoisoflavan Derivatives. B. Fraser-Reid of Duke University describes synthetic approaches to avermectin using his well-known annulated sugar strategy. F. Baader et al. of Hoechst AG describe the synthesis of simplified analogues of mevinolin and compactin without, however, for commercial reasons, presenting much of the biotesting results for the analogues. J. Wicha of the Polish Academy of Sciences, under the title Some Aspects of Prostaglandin Synthesis, gives a highly specific account of the synthesis of classical monocyclic prostaglandins using sulfur chemistry rather than the Corey sequence. A. Kende of The University of Rochester contributes Strategic Choice in Alicyclic Synthesis, an easy-to-read account of the strategy and execution of synthetic approaches to gelsedine and lankacidin C. G. Quinkert of Universitaet Frankfurt am Main, in Enantiomerically Pure Target Compounds by Asymmetric Synthesis, provides a nice exercise in the nomenclature of chiral compounds and illustrates these principles with several interesting syntheses of non-nitrogenous natural products. K. Schuegerl and T. Scheper of Universitaet Hannover present a clear discussion of the state of the art in use of immobilized enzymes and immobilized bacterial cells for the preparation of chiral materials in a chapter on Biotransformation in Enzyme Liquid Membrane Reactors. J. Szejtli of the Chinoin Works, Budapest, under Technology and Consequences of Cyclodextrin Complexation of Biologically Active Substances, gives a general review of inclusion complexes in cyclodextrins, their properties and examples of their uses. M. Brazhnikova of the USSR Academy of Medical Sciences, in Eremomycin: a New Polycyclic Glycopeptide Antibiotic, describes the structural determination of this natural product and some of its properties. J.-P. Genet, Laboratoire de Synthese Organique et Organometallique, Paris, in New Methods for Synthesis of Biologically Active Cyclopropanes and Ergot Alkaloids, describes the synthesis of vinyl cyclopropane containing natural products, including chirality transfer, and ergot alkaloids. I. Ninomiya, Kobe Women's College of Pharmacy, under Recent Progress in Our Indole Alkaloid Synthesis describes the power of enamide photocyclization reactions for the construction of a wide variety of indole alkaloids. M. Rueffer, Universitaet Muenchen, describes exciting recent developments in the use of cell culture and purified enzymes for the study of biosynthesis in Biosynthetic Studies of Protoberberines and Related Alkaloids in Plant Cell Cultures. S. Martin, University of Texas, Austin, with A General Strategy for the Synthesis of Biologically Active Alkaloids of the Indole Family presents a very readable account of the synthesis with internal Diels–Alder strategies of several pentacyclic β-carboline alkaloids. W. Gibbons et al. of The University of London present a provocative associative hypothesis in a short chapter entitled A New Molecular Basis for Neurotransmission and Ion-channel Gating Including the Chemical Identity of Anaesthetic Receptors, Neurotransmitter Receptors; Endogenous Molecular Gates. J. Berdy of the Institute of Drug Research, Budapest, in New Trends in the Research of Bioactive Microbial Metabolites presents data and comments on the search for novel pharmacologically active agents from fermentation sources. A. Khokhlov, USSR Academy of Sciences, presents a very interesting account of the relatively newly identified, profoundly active, and structurally diverse small molecules regulating the biosynthesis of antibiotics in fermentations in Autobioregulators of Prokaryotes. Atta-Ur-Rahman, University of Karachi, presents a detailed account of the spectroscopic properties leading to the assignment of a large number of steroidal alkaloids in Structural Studies on New Steroidal Alkaloids of *Buxus papilosa*—Some Generalized Spectral Deductions. M. Shopova, Bulgarian Academy of Sciences, contributes Photodynamic Properties of Porphyrins: Photodynamic Therapy of Cancer. The book then concludes with a description of some varied small molecules, including the intensely mutagenic alkaloid, necatorone, in a chapter entitled Alkaloids from Toadstools and Mushrooms by M. Bross et al. of Universitaet Bonn.

A more detailed analyses of these essays would exceed the space available and the reader's interest, but I am pleased to report that I very much enjoyed reading many of these accounts and found them to be a diverting and relaxing exercise, and I suspect that those readers sharing an interest in contemporary natural product topics would find similar enjoyment. For the record, I personally enjoyed the chapters by Kende, Cordell, Quinkert, Khokhlov, Schuegerl and Scheper, Ninomiya, Rueffer, Martin, and Gibbons most. The present (but quick to fade) timeliness and relative low cost of the book recommends it to me for relatively light reading, and I so recommend it to you. Do not, however, buy this book if you want a long term reference book to keep in your library or if you want an organized overview of the field of natural products.

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Books of Interest

Bacterial Protein Toxins. Edited by F. J. Fehrenbach, J. E. Alouf, P. Falmagne, W. Goebel, J. Jeljaszewicz, D. Jürgens, and R. Rappuoli. VCH Publishers, Inc., New York. 1987. xii + 459 pp. 18 × 24.5 cm. ISBN 0-89574-260-8. $110.00.

Guidelines for Developing National Drug Policies. World Health Organization, Geneva, Switzerland. 1988. iv + 52 pp. 16 × 24 cm. ISBN 92-4-154230-6. $8.80.

Hypercholesterolemia: Clinical and Therapeutic Implications (Atherosclerosis Reviews, Vol. 18). Joseph Stokes and Mario Mancini. Raven Press, New York. 1988. xv + 202 pp. 16 × 24.5 cm. ISBN 0-88167-435-4. $65.00.

Immunoconjugates. Antibody Conjugates in Radioimaging and Therapy of Cancer. Carl-Wilhelm Vogel. Oxford University Press, New York. 1987. x + 308 pp. 16 × 24 cm. ISBN 0-19-504210-7. $55.00.

The Pharmacology of Nicotine. Vol. 9. Michael Rand and Klaus Thurau. IRL Press, McLean, VA. 1988. xii + 418 pp. 15 × 23 cm. ISBN 1-85221-094-X.

Platelet-Activating Factor and Cell Immunology. New Trends in Lipid Mediators Research. Vol. 1. P. Braquet. S. Karger AG, Basel, Switzerland. 1988. 179 pp. 17.5 × 24.5 cm. ISBN 3-8055-4684-X. $112.00.