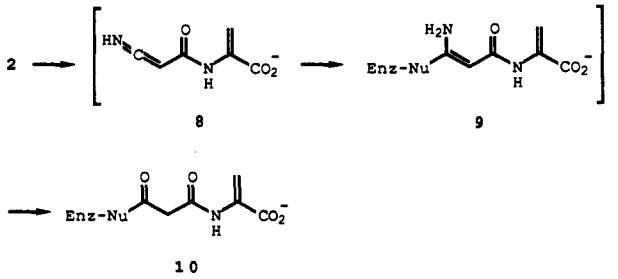
protein monomer.[17] (iii) Upon denaturation of the inactivated enzyme in 7 M urea all of the radioactivity remained associated with the protein. Furthermore, the enzyme inactivated by the radioactive form of 2 was allowed to incubate with 1 M H_2NOH under denaturing conditions (7 M urea, pH 8.0) for 5 h. Under these conditions, none of the radioactivity was liberated from the protein, suggesting that the modified amino acid may not be an acidic residue. These experiments document the covalent nature of protein modification and argue for the high specificity of such interaction.

We propose the following plausible mechanism for the action of the inactivators. Compounds 1 and 2 undergo an enzyme-mediated deprotonation α to the carbonyl function,[18] conceivably by the zinc-bound water/hydroxide.[19] The deprotonation step is expected to lead to the formation of a ketenimine, followed by the trapping of an active site nucleophile, resulting in covalent modification of the enzyme. Our attempts at detecting the transient appearance of a new chromophore at 270–300 nm[20] from 2 during the course of inactivation were not successful. It appears that after nucleophile capture (8 → 9), the resultant enamine (9) undergoes facile hydrolysis to a species such as 10, for which the enol form is not expected to predominate.[21]



Registry No. 1, 133648-14-3; 2, 133626-26-3; 5, 683-57-8; 6, 133626-27-4; H_3CCOCO_2H, 127-17-3; dipeptidase, 9031-99-6.

(17) The chromophore for the α,β-unsaturated system of 2 (ϵ_{235} ~4400 M^{-1} cm^{-1}) was incorporated into the inactivated protein. On the basis of the extinction coefficient of 2 in solution, approximately 2.7 molecules of the inactivator were appended to the protein. In light of the caveat that large changes in the extinction coefficient of the chromophore in the active site may be expected, this type of analysis may carry a large inherent error. The extent of protein modification by the radioactivity measurements should be more reliable.

(18) Such a rearrangement for nitrile has been exploited in enzyme inactivation previously: Miles, E. W. Effects of Modification of the β-2 Subunit of the $\alpha 2\beta 2$ Complex of Tryptophan Synthase by α-Cyanoglycin, a Substrate Analog. *Biochem. Biophys. Res. Commun.* **1975**, *64*, 248–255. Maycock, A. L.; Suva, R. H.; Abeles, R. H. Novel Inactivators of Plasma Amine Oxidase *J. Am. Chem. Soc.* **1975**, *97*, 5613–5614. Tang, S. S.; Trackman, P. C.; Kagan, H. M. Reactions of Aortic Lysyl Oxidase with β-Aminopropionitrile. *J. Biol. Chem.* **1983**, *258*, 4331–4338.

(19) For a discussion of the mechanistic role proposed for the metal-bound water in zinc proteases, see: Mathews, B. W. Structural Basis of the Action of Thermolysin and Related Zinc Peptidases. *Acc. Chem. Res.* **1988**, *21*, 333–340. Christianson, D. W.; Lipscomb, W. N. Carboxypeptidase A. *Acc. Chem. Res.* **1989**, *22*, 62–69.

(20) For a survey of chromophores typical for β-amino-α,β-unsaturated carbonyl compounds, consult: Ostercamp, D. L. Vinylogous Imides. 2. Ultraviolet Spectra and the Application of Woodward's Rules. *J. Org. Chem.* **1970**, *35*, 1632–1641.

(21) The pK_a for the α-methylene in structures such as 10 is approximately in the range 14–16.

Yong-Qian Wu, Shahriar Mobashery*

Department of Chemistry
Wayne State University
Detroit, Michigan 48202

Received March 4, 1991

Book Reviews

Nicotine Psychopharmacology. Molecular, Cellular, and Behavioural Aspects. Edited by S. Wonnacott, M. A. H. Russell, and I. P. Stolerman. Oxford University Press, Oxford and New York. 1990. XIX + 427 pp. 16 × 24 cm. ISBN 0-19-261614-5. $80.00.

This book aims "to bring together a very wide range of material from different areas of research relevant to understanding the psychopharmacology of nicotine". In 11 relatively free-standing chapters, experts review the pharmacokinetics, metabolism, and pharmacodynamics of nicotine and its effects on animal and human behavior and on synaptic transmission in the nervous system (studied with electrophysiological, biochemical, or molecular biology techniques). The role of nicotine in tobacco dependence is reviewed from different angles in three chapters, and two more deal with the possible relevance of nicotinic cholinergic mechanisms to Parkinson's and Alzheimer's disease.

Tight editorial control has made the book laudably cohesive notwithstanding the diversity of subjects and the large number of authors. Nonetheless, some contributors appear innocent of recent developments in related fields and for instance stick to older pharmacologic classifications in spite of the demonstration by molecular cloning of a much greater diversity in neural nicotinic receptors. Most chapters follow a uniform pattern, beginning with an introduction that outlines the scope and the topics to be discussed. This is followed by the body of the chapter, clearly subdivided with the progressive decimal numbering system in headings and subheadings (all titles of which can be found again in an extensive analytical table of contents). The last section of each chapter summarizes the evidence and presents the conclusions. The chapters are largely self-contained, but well-integrated, with extensive and detailed cross-referencing, e.g. to specific tables or figures in chapters by other contributors. Occasional overlap was probably unavoidable, and it is rarely excessive except for the last chapter Nicotine Intake and Its Control Over Smoking which reiterates much that has been dealt with in the first two chapters, as can be surmised already from their titles: "Tobacco smoking and nicotine dependence" and "Nicotine dependence: animal studies".

Most chapters review the (often vast) literature expertly and critically, interpreting for the nonspecialist reader the shortcomings as well as the merits of certain studies, alerting him/her to some methodological pitfalls, and discussing apparent and real discrepancies. At times the historical development in a field is sketched, affording better appreciation for the context of earlier work and for changes of opinion over time. Gaps in our current knowledge are honestly indicated, even when they undermine entire areas of research: the relevance for tobacco smoking of studies using intravenous, percutaneous, or oral administration of nicotine is called into question as none of these routes probably mimics the repeat bolus dosage of cigarette puffs. Although most authors manage reasonably well to avoid jargon, they largely fail to keep the editors' promise of providing "descriptions and ex-

planations for specialized techniques". The complete novice will therefore not appreciate technical details insofar as they are provided, but can nonetheless come away with a good appreciation of the issues. The limited discussion of relevant neuroanatomy in various chapters might have better been consolidated into a single in-depth overview. Medicinal chemists may be disappointed to find so little chemistry: they must be content with a single diagram of the structure of nicotine and its major metabolites, for which they have to wait till p 124 and which was not deemed worthy of inclusion in the subject index.

The literature references at the end of each chapter are extensive and do not neglect the older literature when relevant. References are mostly current through 1988, which is adequate except for fast-moving areas such as recombinant DNA work on nicotinic acetylcholine receptors. The chapter discussing this topic is already dated notwithstanding apparent attempts at last-minute updating (inclusion of 1989 meeting abstracts and add-on sentences at the end of sections containing information that clearly was not available when the rest of the text was written).

The book is well-produced, with mercifully few typographical or grammatical errors (an exception being the occasional use of data as a singular). An author index is lacking; the subject index is extensive but somewhat uneven and at times idiosyncratic. For instance: α-bungarotoxin and 5-HT are alphabetised as if spelled alpha-bungarotoxin and five-HT, but P300 is the first alphabetical entry under "P". One finds detailed entries such as "foreign languages, terms for 'addiction'" and "pubic hair, effect of smoking" (which deals not with the smoking of pubic hair), but searches in vain for "clone", "cloning" or "(chemical) structure". Information on smoking reduction is found under the more colloquial "cutting down", but for stopping of smoking one is referred to the more learned "cessation". General entries such as "synapses, cholinergic", "cholinoceptors", or "toxins" each refer to but a single page, though these topics are discussed on many occasions.

With the recently rekindled interest in nicotinic cholinergic mechanisms from the molecular level to the clinic, this book constitutes a timely summary of a wide range of topics. It will be a rich mine of information for neuroscientists with a general interest in the subject, for graduate students entering the field or for clinicians looking for a recent update on basic research relevant to smoking addiction or nicotinic cholinergic mechanisms in disease. Specialists in a particular area of nicotine research will find it useful for acquainting themselves with the results of other areas. Academic and hospital libraries should have a copy available.

Department of Biochemical Pharmacology
Janssen Research Foundation
Turnhoutseweg, 30
B2340 Beerse, Belgium
Walter H. M. L. Luyten

Textbook of Secretory Diarrhea. Edited by E. Lebenthal and M. E. Duffey. Raven Press, New York. 1990. xii + 442 pp. 22 × 28.5 cm. ISBN 0-88167-666-7. $110.00.

This textbook compiles a wealth of information on the causes and treatment of secretory diarrhea. The basic mechanisms controlling intestinal electrolyte transport under normal and pathologic conditions are emphasized. The book is organized into five parts, consisting of 31 chapters by 53 individuals involved in the research of the described topic.

Part I (chapters 1–3) deals with the humoral, neural, and immunological regulation of electrolyte transport. Chapter 2 is a particularly valuable review of the role of eicosanoids (leukotrienes and prostaglandins) in pathophysiological secretion such as inflammatory bowel disease. Part II (chapters 4–11) covers the cellular mechanisms by which enterocytes transport electrolytes and nutrients. Chapter 5 is an excellent reference for biologists interested in the chloride-secreting properties of isolated intestinal epithelial cell lines. Part III (chapters 12–16) discusses, in depth, several topics related to receptor activation and signal transduction in enterocyte membranes. Part IV (chapters 17–25) surveys a variety of causative factors (bacterial toxins, parasites, bile acids, neuroendocrine tumors) associated with diarrheal disease. Two chapters on the treatment of diarrhea in infancy and childhood are also included. Part V (chapters 26–31) presents several therapeutic approaches to treating diarrhea. Various aspects of pharmacological (opioids, somatostatin-like peptides, inhibitors of eicosanoid-induced secretion, α_2-adrenergic agonists) and oral rehydration therapies are discussed.

This is the most comprehensive text on the subject of secretory diarrhea to date. Citations as late as 1990 were noted; however, some chapters appeared more up-to-date than others. A minor detraction is a tendency for overlap among some of the topics.

Overall, this text should make a worthwhile addition to the personal libraries of scientists and clinicians involved in the understanding and treatment of secretory diarrhea. Medicinal chemists are likely to find a couple of the chapters of interest.

Department of Gastrointestinal Diseases Research
Searle Research and Development
Skokie, Illinois 60077
James F. Kachur

Bradykinin Antagonists. Basic and Clinical Research. Edited by Ronald M. Burch. Marcel Decker, New York. 1991. vii + 281 pp. 15.5 × 23.5 cm. ISBN 0-8247-8310-7. $99.75.

The field of bradykinin antagonists is an exciting area of research which has grown considerably over the past several years. This volume is an in-depth review not only of the medicinal chemistry and preclinical pharmacology of these agents and their potential effects on various disease states but also of their early clinical trials. It is organized in three distinct stages which allows the reader to follow the role of bradykinin antagonists from pharmacological principles to the medicinal chemistry underlying analogue preparation and to their potential human utility.

The first several chapters review the basic biology and comparative pharmacology of both the B1 and the B2 bradykinin receptor antagonists. These chapters elaborate the structure–activity relationships of several classes of peptide antagonists and present the biological activity of over 500 peptides. Next is a chapter discussing research non-peptide antagonists centered mainly on natural product extracts. A summary of NMR studies of the conformational properties of bradykinin and selected analogues with a proposed solution conformation follows. The chemistry section is completed with a consideration of the metabolism of these compounds and their in vivo lability.

The final segment of this treatise focuses on the physiological effects of bradykinin and its peptide antagonists on the cardiovascular system and in particular on their actions against rhinitis and in airways. The final chapter is an excellent discussion of the potential treatment of asthma with these agents.

In summary, this book, which covers the literature through 1989, provides valuable insight into the recent advances in the area of bradykinin research and will be a valued addition to the collections of chemists, pharmacologists, and pulmonologists.

Nova Pharmaceutical Corporation
6200 Freeport Centre
Baltimore, Maryland 21224
J. Paul Carter

Studies in Natural Products Chemistry. Volume 7. Structure and Chemistry (Part A). Edited by Atta-ur-Rahman. Elsevier, Amsterdam. 1990. x + 528 pp. 17 × 24.5 cm. ISBN 0-444-88829-2. $179.50.

Professor Atta-ur-Rahman has again succeeded in gathering a group of internationally proficient scientists to coauthor this new volume in his series devoted to natural products. The topics discussed are timely, and the coverage is thorough and up-to-date.

Authors and titles are as follows: W. Gaffield, Chirality as Manifested in the Biological Activity of Natural Products; K. Bock and B. W. Sigurskjold, The Use of Synthetic Substrate Analogues in the Study of Enzyme Carbohydrate Interactions; D. V. Banthorpe, Synthesis of Lower Terpenoids and Related Compounds by Plant Tissue Cultures; G. R. Mallavarapu, Recent Advances in Oleanane Triterpenes; U. Kakpol, D. H. Miles, A. M. Payne, and V. Chittawond, Chemical Constituents and Bioactive Compounds from Mangrove Plants; J. A. Marco and O. Barbera,

Natural Products from the Genus Artemisia L.; G. G. Habermehl and H. C. Krebs, Toxins of Echinoderms; G. Britton, The Stereochemistry of Carotenoid Biosynthesis; M. Okano, N. Fukamiya, and K.-H. Lee, Biologically Active Compounds from Simaroubaceous Plants; K. Hostettmann and A. Marston, Bioactive Constituents of Plants used in African Traditional Medicine; and A. Bianco, The Chemistry of Iridoids.

The book has been provided with a detailed Subject Index.

Department of Chemistry **Maurice Shamma**
The Pennsylvania State University
University Park, Pennsylvania 16802

Atherosclerosis Reviews: Volume 21. Prevention and Noninvasive Therapy of Atherosclerosis. Edited by Alexander Leaf and Peter C. Weber. Raven Press, New York. 1990. xiii + 206 pp. 16 × 24 cm. ISBN 0-88167-684-5. $69.00.

This volume presents the proceedings from the international workshop that was held in Key West, FL, from November 30–December 2, 1989. The book contains 21 chapters ranging in length from 6 to 23 pages. This comprehensive review of atherosclerosis and its complications covers topics ranging from the epidemiology of the risk factors involved in coronary heart disease to the molecular biology of platelet wall interactions and the interaction of growth factors in the initiation and progression of the atherogenic process.

The first five chapters describe the risk factors involved in coronary artery disease in a number of diverse populations. The importance of diet, exercise, alcohol consumption, hypertension, etc. are discussed as they relate to the incidence of the disease. The next four chapters describe recent data regarding the importance of growth factors, oxidized LDL, platelet-wall interactions, and inflammatory and immune mechanisms in atherosclerosis. The remainder of the volume discusses a number of unrelated areas including both clinical and basic research findings. The clinical chapters describe the use of lipid-lowering drugs in atherosclerosis, a meta-analyses of aspirin trials in cardiovascular disease, and atherosclerotic regression in humans. The basic research chapters deal with areas as diverse as the mechanism of platelet-wall inhibition by prostacyclin, platelet adhesion and aggregation, and the relationship of triglyceride and high-density-lipoprotein metabolism.

The relative shortness and diversity of the chapters makes this an easy book to read. Due to its diversity, the book should appeal to a large cross-section of scientists/clinicians involved in both the treatment and research of atherosclerosis. The chapters are well-written and contain a liberal number of recent references. The last chapter on new trends in atherosclerosis research should be of special interest to those involved in drug discovery since a number of potential therapeutic targets are described.

Wyeth-Ayerst Research **Dennis M. Ackerman**
CN 8000
Princeton, New Jersey 08543-8000

Modelling of Molecular Structures and Properties. Edited by J.-L. Rivail. Elsevier Science Publishing, New York. 1990. xxiv + 788 pp. 17.5 × 24.5 cm. ISBN 0-444-88714-8. $269.25.

While most molecular modeling meetings include a few scientists who would describe themselves primarily as "physical chemists", there may be many medicinal chemists jaded by the more creative extrapolations of modeling enthusiasts who wonder, "What would happen if a gathering of eminent physical chemists were required to spend a week discussing the modeling of molecular structures and properties?" This book, the Proceedings of the 44th International Meeting of Physical Chemistry in Nancy, France, on September 11–15, 1989, comprises the annals of just such a gathering. Indeed, while the spirit of the lectures and discussions was very positive, much more attention than usual was placed on calculations and techniques which could be compared with experiment or other calculations, rather than unverifiable large-scale computations.

The 80 lectures included, which of course emphasize French participants, are of higher than average quality. Editing is very light; no indices appear except for a table of contents and list of participants, references usually end in 1988, and the discussions occasionally address points that evidently disappeared from the edited manuscripts. The strongest lectures, by internationally recognized authorities such as Buckingham, Stone, Karplus, Wipff, and Wodak, present general methodology and issues specific to the modeling of biopolymers. One general theme is the improvement of force field calculations, with slow progress evident in approaches to solvation and other electrostatic interactions. Another major theme is the theoretical calculation of DNA structure, and another the study of the notoriously intractable structures of oligopeptides by the pairing of computations and NMR measurements. There is also a sprinkling of interesting simulations of nonbiological systems such as graphite and silicates.

Unfortunately the drug design and graphics applications lectures are relatively weak, for example lacking in specifics of either techniques or applications, and are not at all representative of current methodology. Thus, assuming that drug design is the modeling topic of greatest importance to readers of this journal, and considering its very high cost, purchase of this volume can be recommended only to libraries which serve a broader scientific community.

Tripos Associates **Richard D. Cramer III**
1699 South Hanley Road
St. Louis, Missouri 63144

The Peripheral Actions of 5-Hydroxytryptamine. Edited by John R. Fozard. Oxford University Press, Oxford. 1989. 16 × 24 cm. xxiii + 410 pp. ISBN 0-19-261683-8. $90.00.

With the bulk of serotonin (5-hydroxytryptamine) being found outside the central nervous system, it is appropriate that a monograph be devoted, at long last, to the peripheral actions of this agent. The editor has assembled an impressive list of contributors who are recognized authorities in the field. The book consists of 16 chapters. The first chapter describes the synthesis, storage, and metabolism of serotonin. It would have been helpful had this chapter been followed by a discussion of the various populations of serotonin receptors that have been described in the literature; this is a topic that can be bewildering to those not actively involved in serotonin research. Fortunately, such a chapter does appear later in the book. The remainder of the book is devoted primarily to the involvement of these receptors in the cardiovascular, pulmonary, and gastrointestinal effects of serotonergic agents. There are also chapters on the role of serotonin in endocrine function and secretory mechanisms, amplification mechanisms in peripheral tissue, and nonvascular smooth muscle relaxation and contraction. Several chapters provide informative discussions of serotonin receptors on enteric neurons (not previously reviewed to this extent) and an historical treatment of the development of 5-HT3 antagonists. An interesting problem, that certain (mostly 5-HT2-related) agents act in a competitive manner in some tissue preparations but not in others (or in the periphery but not in their central actions, or visa versa), is addressed in two separate chapters. The final chapter deals with the clinical potential of serotonergic agents; this excellent chapter is limited, however, to potential cardiovascular applications.

Overall, the book is very well written, well documented, and easy to read. In fact, this reviewer did not encounter a single typographical error. There is no question that *The Peripheral Actions of 5-Hydroxytryptamine* will be found in the laboratories of most investigators actively engaged in peripheral serotonin research. Although probably not written with medicinal chemists in mind, and consequently lacking in those topics of prime concern to medicinal chemists (e.g. chemical structures, detailed discussions of structure–activity relationships, concepts of drug design), this book should be, nevertheless, a useful reference source. At the very least, it makes for interesting reading and clearly presents a rapidly growing, and what to many is a very confusing, area of research.

Department of Medicinal Chemistry **Richard A. Glennon**
School of Pharmacy
Medical College of Virginia
Virginia Commonwealth University
Richmond, Virginia 23298-0540

New Antidiabetic Drugs. Edited by Clifford J. Bailey and Peter R. Flatt. Smith-Gordon/Nishimura, London. 1990. xiv + 295 pp. 17.5 × 24.5 cm. ISBN 1-85463-017-2. $55.00.

New Antidiabetic Drugs is a comprehensive yet succinct overview of the traditional treatments for diabetes mellitus and recent developments in the search for improved therapies. The book consists of 27 chapters representing a collection of contributions from leaders in the area of diabetes research. The opening chapter is a brief review of the etiology and symptoms of diabetes mellitus and related complications as well as a reappraisal of the purpose and significance of glycemic control in diabetic patients. This is followed by three chapters that analyze the efficacy and inadequacies of current insulin and sulfonylurea therapies and dietary adjuncts. The majority of the chapters (chapters 6–27) focus upon the hypoglycemic activity and therapeutic potential of new compounds, many with novel mechanisms of action. Subject areas covered include insulin analogues and routes of delivery, insulin mimetics (peroxovanadium compounds), novel insulin secretagogues, agents which reduce insulin resistance, antiobesity and lipid-lowering agents, α-glucosidase inhibitors, carnitine palmitoyltransferase 1 inhibitors, growth hormone fragments, and somatostatin analogues. Most of these chapters contain a brief discussion of the chemistry, structure–activity relationships, mechanisms of action, pharmacology, toxicology, and clinical status of these potential drugs. In addition to those sections devoted to novel antidiabetic drugs, there are several chapters of particular interest to those involved in drug design. For example, chapter 5 discusses the heterogeneity of diabetes and the selection of appropriate cellular and animal models to evaluate new drugs and determine their mechanism of action. Also, chapter 7 reviews current understanding of the sites and modulators of insulin release and provides an overview of the potential mechanisms of action of insulin secretagogues.

New Antidiabetic Drugs succinctly reviews many of the significant advances made in diabetes drug research over the past several decades and is worthwhile addition for those involved in diabetes research and novel drug design.

Department of Pharmacal Sciences **Jack DeRuiter**
School of Pharmacy
Auburn University
Auburn, Alabama 36849

New Methods in Drug Research. Volume 3. Edited by Alexandros Makriyannis. J.R. Prous Science Publishers, Barcelona, Spain. 1989. xiv + 274 pp. 15 × 22.5 cm. ISBN 84-86973-14-7. $50.00.

The third volume in this series follows the patterns of the previous two and covers a broad range of chemically and biologically based topics. This is a reflection of the number of disciplines and diverse expertise of scientists involved in modern drug research and development. The overall purpose of this series is to provide a wide range of scientists with advances in methodologies in subject areas beyond their own particular discipline. This volume is generally well written and the fourteen chapters written by experts in their fields, are reasonably up to date in their referenced literature compared with many printed works.

The first chapter by Steven Ley illustrates the often overlooked fact that sophisticated chemistry is required for the synthesis of many biologically active molecules. Molecular modeling techniques, utilized in the development of a PAF receptor binding model, are described by Stuart Schreiber. Irving Goldberg's chapter discusses mechanistic details of antitumor antibiotics that are probed by DNA chemistry and biochemistry. Chapters by Victor Hruby and V. Renugopalakrishnan discuss advances in the design and conformational properties of analgesic peptides using spectroscopic techniques. The considerable interest in amino acids, as excitatory transmitters in the central nervous system, is evident from the chapter by Povl Krogsgaard-Larsen and colleagues which describes the design and synthesis of isoxazole derivatives as specific ligands for glutamate receptors. Potential drug therapies for AIDS is obviously of contemporary interest and concern, and the development of nucleoside analogues, as potent and selective inhibitors of HIV replication, is discussed by Piet Herdewijn and co-workers. The increased understanding of the molecular basis of the immune response is evident from the chapters by John Devlin and G. Baschang. Lipoxins are among the latest products from arachidonic metabolism to be considered as targets for drug design, and recent advances are summarized in the chapter by Charles Serhan. An excellent application of prodrug design in drug targeting is discussed by Leif-Å. Svensson in the development of bambuterol as a prodrug for terbutaline. The current interest in enantioselectivity in drug action is discussed by Andrew Hutt and co-workers with reference to drug metabolism and disposition. K. G. Rajendran and I. Parikh review the evidence from immunocytochemical and histochemical methods, that steroid receptors are membrane associated. Finally, Gordon Siek and Judith Marquis describe the use of in vitro cell culture methods in neurotoxicology and neurobiology.

The diverse range of topics commends this book to scientists of all disciplines who are engaged in drug research. The particular value is for those who wish to be acquainted in developments in methodologies and subject areas outside their own field. The hard-bound volume appears reasonably priced at $50.

Center for Drug Design and Development **Graham J. Durant**
Department of Medicinal and Biological Chemistry
The University of Toledo, College of Pharmacy
Toledo, Ohio 43606

Practical Applications of Quantitative Structure–Activity Relationships (QSAR) in Environmental Chemistry and Toxicology. Edited by W. Karcher and J. Devillers. Kluwer Academic Publishers, London. 1990. xi + 475 pp. ISBN 0-7923-0827-1. $139.00.

The experimental assessment of the environmental fate of all existing chemical compounds and their adverse effects is, of course, impossible. As a consequence, attempts have been made to estimate fate and effects of chemicals. Among the estimation methods the study of quantitative structure–activity relationships (QSAR) has obtained increasing interest over the last decade. In these studies, environmental and toxicological properties are calculated from electronic, atomic, fragmental or molecular properties of molecules (molecular descriptors) or from macroscopic physicochemical properties like aqueous–organic partition coefficients, chromatographic retention data, and reaction rate constants.

Historically, QSAR studies of environmental pollutants have been preceded by similar studies of drugs and pesticides. These studies have many molecular descriptors and physicochemical predictors in common. Unfortunately, compared to drug design and pesticide research, much less is known about environmental contaminants and the field to be considered is much more diverse. The role of QSAR in environmental contamination studies is (1) to provide methods to reliably estimate the potential hazards of contaminants in a relatively simple way, preferably on a short-time basis, thereby reducing the number of expensive and time-consuming experiments needed to assess those environmental hazards; (2) to provide guidelines for the classification of chemicals and to identify outliers; and (3) to help understand the mechanisms of action by which adverse effects come about.

The intention of the current volume is to acquaint prospective users with the scope, potential, and the state of the art of present day QSAR methods in environmental science. It treats the structural and statistical background of QSAR methods and presents examples of validated QSAR models for the derivation of physicochemical and biological data, including the distribution of chemicals in the environment and bioaccumulation and biodegradation data. The book is based on the lectures given during the Eurocourse on "Practical applications of QSAR in environmental chemistry and toxicology", held at the Joint Research Centre (JRC) of the European Community in Ispra, Italy, in June, 1990. The lecturers/authors are a select company of researchers in the QSAR field from Europe and North America.

The volume can be roughly divided into three parts. The first six contributions are devoted to the basic requirements for the development of QSAR models and present an overview of the type of descriptors that can be used in QSAR. The second part (five papers) consists of a treatment of statistical techniques used in QSAR analysis. Finally, the third part (just over half of the book) is addressed to applications of QSAR. Twelve separate papers deal with a variety of subjects, such as, e.g., risk assessment by QSAR in general, reactivity, algae population growth, fish toxicity, biodegradability, and teratogenicity.

One of the disadvantages of using lectures presented during a course to compile a book is the inherent assumption that the prospective readers consist of a similar group as the students who attended the original course. In other words, one may ask whether the potential readers of this volume will be interested in as much an introduction into the field as the students. This volume is the first in a series on chemical and environmental science to come devoted to the publication of courses and educational seminars organized by the JRC as part of its education and training program. Hence, it is the apparent aim of the JRC to publish books for a population as described above. In this sense, the first two parts of the book do meet their purpose. In particular the statistical methods section should be greatly appreciated since so little attention has been paid to a systematic treatment of this important part of QSAR research.

However, this book is far from being a standard textbook as far as logical and structural build up are concerned. In addition, I do not think the purpose outlined above will serve potentially interested readers equally. I myself expected a little more after coming across the title. Because of the apparent need to publish the material rapidly, i.e., before the commencement of the course, the editors have done little about the many unnecessary repetitions that occur as a result of the cursory character. More important, the title of the volume will probably attract readers already acquainted with the field but is not quite appropriate to describe both the first half and some of the contributions in the second half of the book. Thus, a contradiction exists between the aims formulated in the preface of the book and its title, which is reflected in the contents itself.

All the same, the applications part of the book will satisfy the readers I spoke of, at least partly, in particular because of some valuable reviews presented here. In particular the contributions of Hermens and Bradbury et al. on fish toxicity, Kuenemann et al. and Freitag et al. on prediction of biodegradation, Schultz and Dawson on teratogenicity, and Govers on polycyclic aromatic hydrocarbons present a highly up-to-date state of the art of QSAR research and exemplify its future potency. Moreover, although the various contributions in this part differ sometimes greatly in quality, originality, and exemplary character, for the students, their diversity ensures a proper introduction into the intriguing field of QSAR research.

In conclusion, be it that this volume, because of its cursory character, will perhaps disappoint some of the more experienced readers attracted by the title, it is particularly interesting and useful for those who wish to become familiar with QSAR research and methodology, including its merits and pitfalls. The major aims of environmental QSAR research all are discussed in the book. Its robust design will enable its principal aim as a reference work over some years.

Swedish Environmental Protection Agency **Pim de Voogt**
Statens Naturvårdsverk, 171 85 Solna,
Sweden

The Alkaloids. Chemistry and Pharmacology. Volume 38. Edited by Arnold Brossi. Academic Press, Inc., New York. 1990. ix + 337 pp. 15 × 23.5 cm. ISBN 0-12-469538-8. $95.00.

This volume contains three chapters: Ergot Alkaloids authored by Ichiya Ninomiya and Toshiko Kiguchi, Spirobenzylisoquinoline and Related Alkaloids authored by Gabor Blasko, and Purine Alkaloids authored by Atta-ur-Rahman and Muhammad Iqbal Choudhary.

Ergot alkaloids were previously reviewed in 1965, volume 8, and again in 1975, volume 15 of this treatise. This timely review covers both isolation of new alkaloids and most of the synthetic work in this area. More than 30 new ergot alkaloids were introduced in the period 1974–1988. The main focus of this chapter is on the coverage of the major synthetic advancements made in this area. The authors emphasize that most of the synthetic methodology for the construction of ergot alkaloids was devised in the past two decades.

Conformational studies of the 9-ergolenes and ergolines are reviewed as well as the biosynthesis of ergolenes, peptide alkaloids, and Clavicipilic acid. A section discusses the pharmacological properties of ergot alkaloids and semisynthetic analogues for therapeutic use. The chapter contains 300 references through 1988.

Spirobenzylisoquinoline alkaloids were previously reviewed in 1971, volume 13 of this treatise. The number of spirobenzylisoquinoline alkaloids isolated have grown from a scant seven in 1971 to greater than forty in this review. Also discussed here are the indenobenzazepine alkaloids, once incorrectly assigned as spirobenzylisoquinoline alkaloids. The synthesis of both the spirobenzylisoquinoline and indenobenzazepine alkaloids are covered in this review. The chapter contains 146 references through 1988, including one from 1989.

Purine alkaloids, surprisingly not reviewed previously in this treatise, are a relatively small but important group of alkaloids isolated from both plants and animals. Most of the interest in these alkaloids is due to their important pharmacological and physiological properties. The synthetic approaches to the purine nucleus are reviewed, as are the syntheses of a few purine bases. In addition, a section covering the common spectral (UV, IR, NMR, and MS) properties of purine alkaloids is included. The chapter contains 327 references through 1988, including two from 1989.

An Index to volume 38 and a Cumulative Index of Titles for volumes 1–38 are included, as is characteristic of this treatise.

This volume should be of interest to all synthetic and medicinal chemists.

Bristol-Myers Squibb **Ciro J. Spagnuolo**
Process Research and Development
P.O. Box 191
New Brunswick, New Jersey 08903-0191

Annual Review of Biochemistry. Edited by C. H. Richardson, J. N. Abelson, A. Meister, and C. T. Walsh. Annual Reviews Inc., Palo Alto, CA. 1990. viii + 1122 pp. 16 × 23 cm. ISBN 0-8243-0859-X. $39.00.

This is the latest edition of the well-known series featuring topical reviews of contemporary interest in biochemistry. The prefatory chapter is a semiautobiographical account by O. H. Lowry, which highlights his contributions to analytical protein biochemsitry. This is followed by 32 chapters which average about 30 pages each in length. In the field of enzymes/coenzymes, chapters are included on pyruvoyl-dependent enzymes, pyridoxal enzymes (recent developments), coenzymes of methanogenesis, selenium biochemistry (also including non-enzyme-related aspects), and the use of transition-state analogues in protein crystallography. There are also chapters on cytochrome *c* oxidase and on cAMP-dependent protein kinase which deal mostly with structure–function. A chapter on the bacterial phosphoenolpyruvate:glycose phosphotransferase system deals with an important aspect of intermediary metabolism.

In the area of non-enzyme protein structure–function are chapters on the "motor" proteins of cytoplasmic microtubular transport, antibody–antigen complexes, clathrin and associated assembly and diassembly proteins (present on the surface of coated pits and coated vesicles), and the glycoproteins responsible for calcium-depdendent cell–cell adhesion, called cadherins. Two chapters deal with protein folding, one covering the dynamics of local folding and the nature of intermediates, and the other covering global folding patterns from a topological standpoint. There are three chapters which fall under the broad heading of biophysics, dealing with the occlusion phenomenon in the active transport of cations, translocation of proteins by the mitochondrial protein import apparatus, and the dynamics of sequence-directed curvature of DNA.

In the general area of molecular biology, there are chapters on the DNA helicases (enzymes which unwind DNA), self-splicing of group I introns, regulation of vaccinia virus transcription, RNA polymerase B (II) (and general transcription factors), DNA recognition by proteins with the helix–turn–helix motif, and the development of synthetic chemical agents as probes of nucleic acid conformation, specifically those which cause strand cleavage. There is also a chapter which deals with the genetics of the collagen family of proteins. Three chapters fall under the general category of immunology, covering the class I major histocompatibility complex molecules, the T cell receptor (with an emphasis on genetic aspects), and the cytokines (regulators of immune and inflammatory responses).

Two chapters are included which deal with plant biochemistry, one related to the metal-binding polypeptides called phytochelatins, and the other dealing with defense-related proteins in higher plants. Finally, in the miscellaneous category, there is a chapter on the biosynthesis and molecular pharmacology of endotoxins, the liposaccharides found on the outer surface of Gram-negative bacteria, a chapter on peptides from frog skin, and a chapter on biochemical aspects (hormonal and transmitter regulation) of obesity.

As is the case with its predecessors, this volume contains a detailed subject index as well as an index to all authors in the cited literature (referenced to the textual page on which the citation appears). It is probable that a number of practicing biochemists have personal collections of Annual Reviews, but most of us depend on our research libraries (no matter how small) to subscribe to this traditional and highly respected compendium of reviews. I would bet that most readers of the *Journal Medicinal Chemistry*, like myself, make a practice of browsing through this volume (at least the table of contents) each year it is published.

Department of Chemistry **Lawrence M. Sayre**
Case Western Reserve University
Cleveland, Ohio 44106

Neurotoxicity of Excitatory Amino Acids. Edited by Alessandro Guidott. Raven Press, New York. 1990. xvii + 340 pp. 16 × 24 cm. ISBN 0-88167-715-9. $80.00.

The volume edited by Guidotti records the substance of a Fidia Research Foundation Symposium held in Scottsdale, Arizona in October 1989. As defined by the title, the purpose of the gathering was to discuss the state of the art understanding of the role played by excitatory amino acids (EAA) in neuronal degeneration.

The book follows closely the format of the proceedings and is subdivided into four major categories; each chapter is further subdivided with key-point headings. The first section (Ca^{++} and Ca^{++} Channels, six chapters) explores the properties of the various subtypes of Ca^{++} channels in a number of systems (cerebellar, hippocampal, and motor neurons as well as myocardium and PC 12 cells), discussing the role of Ca^{++} influx and intracellular Ca^{++} mobilization in cell function and toxicity. This is followed logically by the three chapters in section II (Ca^{++}-Dependent Enzymes) which focus more closely on secondary and tertiary consequences of Ca^{++} mobilization at the molecular, biochemical, and immunohistochemical level. Particular subjects include Ca^{++}-dependent proteases, the phosphatase, clacineurin, and protein kinase C. Section III (Cellular Mechanisms Underlying Long-Term Potentiation and Excitoxicity, 10 chapters) discusses a variety of topics which span molecular to clinical science. Major highlights include articles on LTP, calpain I, dendritic spine changes, transcription factors, glutamate-induced gene express, the relationship of HIV-1, and EAA transmission, as well as model systems for studying EAA-induced neurotoxicity. The book closes nicely with section IV (Excitatory Amino Acids and Ischemic Damage, six chapters) which addresses the role of EAAs in brain injury and the potential advantages and disadvantages of EAA antagonists for treating trauma to the CNS. From my own perspective, I found the chapters by Huang and Huang, and Manev et al. (PKC), Favaron et al. (sphingoglycolipids), and Manni et al. and Mazzari et al. (gangliosides) to be most useful since these suggest secondary avenues to develop novel therapeutics which may be of use in conditions where EAAs are etiological to brain trauma.

From a statistical perspective, over 100 scientists contributed to the 26 chapters contained in the book. Senior authors represent many of the recognized experts in EAA neurotoxicity and encompass a balance of academic, government, and industry research laboratories. Chapters vary in length from 5 to 20 pages, and are well-illustrated with clear and useful diagrams, charts, tables, and photographic results. A full author and title format has been incorporated for references which facilitates identification of citations that may be of further interest to the reader. The average number of references per chapter is 42 but range from 15 to 110. For a volume of 340 plus pages, the eight page index is somewhat sparse particularly since it is arranged according to major categories with underlying subheadings.

While this volume covers a range of important topics in a historical and descriptive manner, I had reservations on two fronts. Thus, although I received the book for review in late January and completed this shortly thereafter, the articles contained therein describe work completed in 1989 or earlier (the most current references end in that year). Much of this work has now been published in other formats. Second, as proceedings of a symposium, the chapters do not describe methodological details and so are of limited value as a practical guide to students or novices to the field. For these reasons the volume, while perhaps appropriate to institutional or department libraries, or to those wishing a rapid introduction to EAA-induced neurotoxicity, would be of less importance to researchers already familiar to the area.

Nova Pharmaceutical Corporation **John Wm. Ferkany**
CNS Research
6200 Freeport Centre
Baltimore, Maryland 21224-2788

Receptor Biochemistry and Methodology. Volume 15. **Serotonin Receptor Subtypes. Basic and Clinical Aspects.** Edited by Stephen J. Peroutka. Wiley-Liss, Inc., New York. 1991. ix + 236 pp. 18 × 26 cm. ISBN 0-471-56840-6. $69.95.

The varied and often conflicting effects elicited by serotonin in different systems has confounded researchers for some time. This diversity of responses is now explained by the interaction of the transmitter with a multiplicity of receptor subpopulations. Indeed, since 1980 there has been a veritable explosion of new subtypes identified mainly on the basis of radioligand binding studies. Acceptance of the diversity of serotonin receptors was enhanced by their confirmation by various biochemical and other functional assays. A further expansion in the number of distinct serotonin receptor subtypes occurred in the late 1980s as a consequence of the application of molecular biological techniques. Today, in the neighborhood of 20 serotonin receptor subtypes have been claimed.

In this book up-to-date information is provided for these subpopulations of serotonin receptors in eight chapters. The initial presentation describes the molecular characterization of three serotonin receptor subtypes. Chapter 2 by Richard A. Glennon and his colleagues will be of particular interest to medicinal chemists; it relates structure with complementary receptor subtype interaction for a variety of ligands. Subsequent sections deal with the molecular pharmacology, biochemistry, and electrophysiology of serotonin receptor subtypes. Following informative chapters dealing with serotonin neurotoxins, particularly MDMA [3,4-(methylenedioxy)methamphetamine, "ectasy"], and serotonin and animal behavior, the book concludes with a chapter on the clinical utility of agents selective for various serotonin receptor subpopulations. This is a true research success story. At present, $5\text{-}HT_{1A}$ (e.g. buspirone), $5\text{-}HT_{1D}$ (e.g. sumatriptan), $5\text{-}HT_2$ (e.g. ketanserin), and $5\text{-}HT_3$ (e.g. ondansetron) selective agents are in clinical development for the treatment of anxiety, depression, migraine, appetite disorders, emesis, and many other maladies.

Each chapter is thoroughly referenced. Excellent author and subject indexes are also included. This book will be exemplary reading for all medicinal chemists and pharmacologists. Those actively engaged in serotonin research will undoubtedly want this excellent book in their personal libraries.

Staff

Bioactive Molecules. Volume 12. Ergot Alkaloids. Chemistry, Biological Effects, Biotechnology. By Zdeněk Řehâček and Přemysl Sajdl. Elsevier Science Publishing Co., New York. 1990. 383 pp. 17.5 × 24.5 cm. ISBN 0-444-98767-3. $159.00.

The authors of this volume weave the specific topic of ergot alkaloids within the larger context of the current status and future development of the fields of microbiology and biotechnology. They argue that for the full potential of the revolution in biotechnology to be realized, not only must there be cooperation among researchers in basic science, biotechnologists, and research management, but also full integration of scientific specialties, and the development of a truly effective educational system, all on a global scale. This theme, which pervades the entire text, is particularly emphasized in the introduction and the first and last two chapters.

The second of the nine chapters is devoted to the chemistry of the ergot alkaloids and their biological activities, two of the three topics in the subtitle. The chemistry is predominantly limited to a description of the clavines, simple lysergic acid derivatives, and ergopeptines as biodynamically derived products, along with analytical methods involved in their assay and identification. The synthetic organic chemist will find only brief references to total syntheses and even less concerning the elaboration of these natural products to semisynthetic compounds of possible therapeutic interest. The biological activity of the ergot alkaloids is covered briefly as well, but appears reasonably comprehensive.

The description of the biology and biochemistry of the various species of Claviceps fungus as related to ergot alkaloid production is where the strength of this book lies. In chapters 3–5, there is a detailed discussion of how cell physiology, genetics, and environment influence the biosynthesis of ergot alkaloids by both parasitic and saprophytic cultures. Chapters 6 and 7 take these discussions from the laboratory to industrial scale production considerations.

While there are a few typographical errors, this volume is remarkably well-written, especially considering that English is not the authors' native language. It has a detailed table of contents, ample references through 1987, and complete subject and author indexes. This fairly expensive book will not likely become a best seller, but would be a valuable addition to the research libraries of biotechnologists everywhere.

Lilly Research Laboratories **Jerry W. Misner**
Lilly Corporate Center
Indianapolis, Indiana 46285

Molecular Mechanisms in Bioorganic Processes. Edited by Christine Bleasdale and Bernard T. Golding. The Royal Society of Chemistry, Cambridge, U.K. 1990. xi + 371 pp. 16 × 24 cm. ISBN 0-85186-946-7. £49.50.

All of the lectures and selected posters from an international symposium Molecular Mechanisms in Bioorganic Chemistry held at the University of Newcastle upon Tyne, July, 1989, are presented in this book. In 24 chapters experts in the field describe a wide variety of molecular mechanisms involved in biorganic processes. Topics treated in detail include mechanisms of carbon–sulfur bond formation in enzymic processes, stereochemistry of one-carbon metabolism, mechanism-based β-lactam elastase inhibitors, aziridino-dap: a potent irreversible inhibitor of diaminopimelate epimerase, molecular mechanisms of sensitivity to anticancer drugs, mode of bleomycin activation, nucleic acid recognition by small molecules, designed enzymes, transfer of the general acyl group in solution, synthesis and biosynthesis of C-nucleosides, coenzyme B_{12}-dependent rearrangement reactions, molecular recognition of β-lactamases, and molecular studies on the biosynthesis of enterobactin. Each presentation is very clearly described with detailed chemical mechanisms and is concluded with a brief list of references. An adequate subject, but no author, index is included. The uniformity of style, format, and printing is extraordinary for a symposium summary.

Most medicinal chemists, pharmacologists, enzymologists, and geneticists will find this book of interest. Those engaged in mechanism-based design of therapeutic agents will probably derive benefit from a personal copy.

Staff

Economic and Medicinal Plant Research. Volume 4. Plants and Traditional Medicine. Edited by H. Wagner and Norman H. Farnsworth. Academic Press, San Diego, CA. 1990. XIV + 174 pp. 15.5 × 23.5 cm. ISBN 0-12-730065-1. $59.00.

Everybody acknowledges the important role pharmacognosy has played in the development of medicine and pharmacy. Nine chapters in this small and costly book attest to this aspect of medicinal plants research. Most of the descriptions of medicinal plants indigenous to foreign countries (China, Ghana, India, Japan, Mexico, Panama, Samoa, and Thailand) stop at qualitative botanical surveys and do not proceed to the isolation and identification of the active principles. The first half of most chapters occupies itself with accounts of traditional versus modern medicinal practices in those countries. It is incredible that in so many places patients turn for treatment to traditional healers who, in many cases, are only one stone's throw removed from therapeutic ignorance and from old-fashioned medicine men. If that is the way over half of the world deals with the problems of gross diagnosis and therapy, we should thank our good fortune that we live in a region where we have access to scientific medicine. Of all the many books I have reviewed for this journal, none has angered me as much as this one. It advocates tendencies to step back to medicine as it was practiced in Europe and North America 200 years ago. Medicinal chemists should read this book only if they want to find out what poor science can concoct.

Department of Chemistry **Alfred Burger**
University of Virginia
Charlottesville, Virginia 22901

Advances in Prostaglandin, Thromboxane, and Leukotriene Research. Volumes 21A and B. Edited by B. Samuelsson, P. Ramwell, R. Paoletti, G. Folco, and E. Granstrom. Raven Press, New York. 1991. xxxvi + 492 pp (A), 540 pp (B). 16.5 × 24 cm. ISBN 0-88167-742-6. $135.00 for two-volume set.

This two-volume set contains more than 200 papers presented at the Seventh International Conference on Prostaglandins and Related Compounds held in Florence, Italy in May 1990. It is an extremely timely publication appearing only about 6 months after the conference, and is filled with up-to-date, important findings in a wide range of areas. Volume A includes studies on the molecular biology, biosynthesis, and metabolism of eicosanoids and on cytochrome P-450 dependent arachidonic acid metabolites. Dietary and tissue precursors, control of precursor release, analytical methods, receptors and antagonists, and the respiratory system are also covered. In volume B research results are presented on the effects of eicosanoids on the carbiovascular, renal, nervous, endocrine, reproductive, and immune systems and the role of these substances in asthma, allergy, inflammation, mucosal protection, cell differentiation and proliferation, cancer, and metathesis. A round-table discussion on new frontiers in prostaglandin therapeutics explored the effects of prostaglandin E on inflammation and immune responses and the interactions of cytokines, NSAIDS, and PG's in cartilage degradation and repair. Also included are reports on PAF and PAF antagonists and the involvement of cytokines and lipid mediators in the regulation of CD23/Fcϵ receptor II expression and IgE-dependent responses. For the medicinal chemist, several new compounds were disclosed and their pharmacological properties discussed. BAY U 3405, a thromboxane antagonist, GR63779X, an antiulcer prostaglandin, and ONO-LB-457, an orally active LTB_4 receptor antagonist, are representative. As an attendee of the conference, I found a lot of excellent and important works reported in the extensive poster sessions. Unfortunately this information is not present in the proceedings. Nevertheless these volumes represent an excellent summary of the state-of-the-art of eicosanoid research and should be part of the personal library of those involved in any aspect

of the area. The volumes are adequately referenced and reasonably priced.

Gastrointestinal Diseases Research **Paul W. Collins**
Searle Research and Development
Skokie, Illinois 60077

Fluorine in Bioorganic Chemistry. By John T. Welch and Seetha Eswarakrishnan. John Wiley & Sons, New York. 1991. xviii + 261 pp. 16 × 24 cm. ISBN 0-471-50649-4. $59.95.

The continuing interest in the development of new medicinal and pharmacological agents based on selective fluorination of biomolecules assures that *Fluorine in Bioorganic Chemistry* will attract considerable attention. A strength of this book is in the large number of examples of fluorination schemes that are presented, framed in the context of biologically relevant molecules. Unfortunately, the book is seriously flawed, both in content and in style.

Topics are arranged by compound class. The advantage of such an arrangement should be to permit a unified discussion of the strategies used to take advantage of the unique properties of fluorinated molecules in each compound class, along with biological sequelae resulting from fluorination, and biochemical mechanisms involved. Unfortunately, the biological discussions are quite weak, uneven, and in places misleading. On the other hand, this arrangement results in some redundancy because many fluorination reagents must be discussed in several different places. As it is, many topics are covered in a "note-card" fashion, with reaction schemes following each other in rapid succession, with little or no text given for clarification of points. The reaction schemes themselves are often quite confusing, with several reagents often presented over a reaction arrow, with no indication of whether these are present at one time, or whether several steps are represented. (It requires careful analysis by the reader to follow many of these.) The book also has many typographical errors and a number of incorrectly drawn structures. It is regrettable that it appears that this book was researched and put together in a very hurried fashion. The absence of perspective in the biological discussions, together with weak discussions of chemical principles, will make it difficult for chemists to adapt the material presented to their own research problems.

Staff

Organic Syntheses. Reaction Guide. Incorporating Collective Volumes 1–7 and Annual Volumes 65–68. By Dennis C. Liotta and Mark Volmer. John Wiley & Sons, Inc., New York. 1991. xvi + 854 pp. 16 × 23.5 cm. ISBN 0-471-54261-X. $49.95.

Volumes of *Organic Syntheses* continue to present a selection of exemplary chemical transformations that are extensively detailed, practically designed, and well-suited to laboratory adaption. Unfortunately, the wealth of information contained in these volumes can be retrieved only with difficulty. The *Reaction Guide* effectively summarizes, in structural format, all procedures published through volume 68. An indexing system based on 11 broad classes of reactions that will be readily recognized by the vast majority of organic chemists, i.e. addition, annulation, C–C bond formation, cleavage, elimination, miscellaneous, oxidation, protection/deprotection, rearrangement, reduction, and substitution, facilitates the location of syntheses described in all the volumes. Individual steps in a sequence of reactions are indexed separately. Classification of reactions, however, oftentimes is difficult. For example, the conversion of a secondary alcohol to an acetate involves an addition/elimination at a carbonyl carbon and on the basis of the structural change the reaction might be classified as either a substitution at a trigonal center or replacement of a hydroxyl group with an acetoxy group at a methylene carbon. In this case the latter approach is chosen because the alcohol is deemed the "more important" of the two reactants. In situations where the choice is less clear-cut, the reaction is listed in both possible categories.

With a little practice and browsing, organic chemists will be able to readily locate reactions of interest in this classic series. *Organic Syntheses Reaction Guide* should nicely complement various other searching indexes. It is an essential addition to all libraries that include this collection of volumes.

Staff

Biochemistry of Peptide Antibiotics. Edited by Horst Kleinkauf and Hans von Dohren. Walter de Gruyter, New York. 1990. xiv + 522 pp. 17 × 24 cm. ISBN 0-89925-551-5. DM310.

The title of this book is somewhat misleading in that it implies a much more limited scope of subject matter than is actually covered by its 3 contributed chapters and introductory Recent Advances and Trends chapter by the editors. Topics included encompass the molecular biology, biosynthesis, chemical synthesis, structure–activity relationships, and industrial production of a wide range of bioactive peptides, many of which are not "antibiotics" in the usual sense of the term. The resulting work is a loose collection of related articles, and subsequent discussion will be limited to those most likely to be of interest to readers of this journal.

The main research interest of the editors is nonribosomal peptide biosynthesis, and this topic is the subject of several chapters, including a summary of recent work on one of the best-characterized examples, gramicidin S synthetase, and an excellent general treatment of enzyme-mediated peptide bond formation. The synthesis and structure–activity relationships of gramicidin S analogues are the subject of another contribution, including an interesting discussion of the design of related membrane-perturbing agents. Conspicuously absent is a chapter on β-lactam biosynthesis, which is briefly covered in the introductory chapter. Excellent reviews of the glycopeptide and cyclosporin fields are included from the Merrell Dow and Sandoz groups responsible for most of the recent developments in these areas. The Umezawa school is represented by two contributions, including a review of that group's extensive work on protease inhibitors of microbial origin. A chapter from the Takeda group describes their screening program for cell-wall biosynthesis inhibitors, including considerable detail on the isolation, structure elucidation and biological properties of the cephabacin, fornacidin and lactivicin groups of antibacterial agents. The book concludes with a useful compilation of peptide antibiotics, classified by structural type with leading references for each group.

The physical presentation of this book is excellent: typeset text printed on quality paper with clear structural formulas and commendably free of errors. Most of the chapters survey the literature through 1988, with a few 1989 references. The broad span of topics and relatively high cost may limit its attractiveness as a personal acquisition, but it certainly deserves a place in a biomedical research library.

Merck Sharp & Dohme **James V. Heck**
Research Laboratories
P.O. Box 2000
Rahway, New Jersey 07065-0900

The Alkaloids. Volume 39. A. Brossi, Ed. Academic Press, Inc., San Diego, CA. 1990. xi + 364 pp. 15.5 × 23.5 cm. ISBN 0-12-469539-6. $95.00.

This volume of the famous *Alkaloids* series contains some fascinating and diverse material. Chapter 1 (W. Steglich and D. Strack) reviews the betalains, a series of yellow, orange, red, or purple pigments from plants and fungi that have considerable chemotaxonomic significance. Chapter 2 (W. Roos) reviews benzodiazepine alkaloids, a small group of anthranilate-derived fungal metabolites which have a variety of physiological activities, including potential as antitumor agents. Chapter 3 (L. Castedo and G. Tojo) summarizes the aporphine-related phenanthrene alkaloids, while Chapter 4 (L. Crombie, W. M. L. Crombie, and D. A. Whiting) provides a richly detailed review of the khat (*Catha edulis*) alkaloids and related compounds. In Chapter 5, Y. Hashimoto, K. Kawanishi, and M. Ichimaru bring to the 1990's, in a very interesting fashion, the subject of alkaloid histochemistry. Chapter 6 is an up-to-date review of recent developments in taxane

chemistry, very timely in view of the current interest in taxol as an antitumor agent and the scarcity of the plant-derived material. In Chapter 7, G. W. Gribble summarizes in an authoritative manner recent developments in the chemistry of ellipticine, its analogues, and the derivatives of current clinical interest.

These chapters carry on the outstanding traditions of the series and will be required reading for those working in the fields of alkaloid chemistry, medicinal chemistry, and physiologically active natural products.

Department of Chemistry **Philip W. Le Quesne**
Northeastern University
Boston, Massachusetts 02115-5096

Synthesis and Chemistry of Agrochemicals II. ACS Symposium Series 443. Edited by Don R. Baker, Joseph G. Fenyes, and William K. Moberg. American Chemical Society, Washington, DC. 1991. xiii + 609 pp. 16 × 23.5 cm. ISBN 0-8412-1885-4. $109.95.

Chemistry—including the synthesis of new molecules, isolation and analysis of naturally occurring compounds and enzymes, and studies of physicochemical processes to understand the predict structure–activity relationships—lies at the center of agricultural chemistry. The discipline reaches its greatest heights when this chemistry is integrated with biochemistry, biology, and agronomy. Thus, agricultural chemistry bears a striking similarity to medicinal chemistry. Such a relationship is clearly reflected in this book which collects presentations from the American Chemical Society's Division of Agrochemicals' symposia from 1987 to 1989.

The book is comprised of 46 chapters which are broadly divided into sections that consider trends in the synthesis and chemistry of agrochemicals, sulfonyl herbicides, other weed and plant control methods, control of insects, acarids and nematodes, and control of fungi. In these chapters stimulating chemistry is integrated with discovery strategies, biochemical studies, and biological testing in the greenhouse and field. Each presentation is fascinating in itself. In combination they illustrate the imaginative application of chemistry to solve important agricultural problems and provide an accurate view of the field. Each chapter is thoroughly referenced and comprehensive author, affiliation, and subject indexes are included.

The medicinal chemistry reader cannot avoid being impressed by the remarkable similarity of medicinal and agricultural chemistry. Indeed, medicinal chemists will surely derive a great deal from the design, mechanisms, and syntheses described in the fascinating presentations that are included in this book.

Staff

Books of Interest

Selective Hydrocarbon Activation. Principles and Progress. Edited by Julian A. Davies, Patricia L. Watson, Arthur Greenberg, and Joel F. Liebman. VCH Publishers, Inc., New York. 1990. xiv + 568 pp. 16 × 24 cm. ISBN 0-89573-713-2. $145.00.

Nuclear Analytical Methods in the Life Sciences. Edited by Rolf Zeisler and Vincent P. Guinn. The Humana Press, Inc., Clifton, NJ. 1991. xiii + 776 pp. 18 × 26 cm. ISBN 0-89603-202-7. $150.00.

Cystic Fibrosis. Immunopathology and Host Response. Edited by Richard B. Moss. The Humana Press, Inc., Clifton, NJ. 1990. xi + 251 pp. 18.5 × 26 cm. ISBN 0-89603-192-6. $79.50.

Regulation of Gene Expression in the Nervous System. Neurology and Neurobiology. Volume 59. Edited by Anna Maria Giuffrida Stella, Jean de Vellis, and J. Regino Perez-Polo. Wiley-Liss, New York. 1990. xxiii + 465 pp. 16 × 23.5 cm. ISBN 0-471-56825-2. $124.95.

WHO Expert Committee on Biological Standardization. Fortieth Report. Technical Series 800. By World Health Organization, Geneva, Switzerland. 1990. 221 pp. 14 × 20 cm. ISBN 92-4-120800-7. Sw. fr. 26.

Encyclopedic Dictionary of Genetics. With German Equivalents and Extensive German/English Index. By R. C. King and W. D. Stansfield. VCH Publishers, Inc. New York. 1990. 809 pp. 17.5 × 24.5 cm. ISBN 0-89573-661-6 (USA). $230.00.

Approved Drug Products and Legal Requirements. Volume III. USPDI, 11th Edition. By U.S. Pharmacopeial Convention, Inc., Rockville, Maryland. 1991. xxv + 1016 pp. 22.5 × 28 cm. ISBN 0-913595-57-8 (Vol. III). $75.00.

Reshaping Life. Second Edition. Key Issues in Genetic Engineering. By G. J. V. Nossal and Ross L. Coppel. Cambridge University Press, New York. 1990. xii + 179 pp. 14 × 21.5 cm. ISBN 0-521-38969-0. $14.95.

USP DI. 11th Edition. Volume IA, A–H, Volume IB, I–Z, Drug Information for the Health Care Professional; Volume II. Advise for the Patient. Drug Information in Lay Language. United States Pharmacopeial Convention, Inc. Rockville, MD. 1991. Vol. IA xxxii + 1629 pp; Vol. IB 1622 pp; Vol. II xxxvii + 1578 pp. 22.5 × 28 cm. ISBN 0-913595-52-7 (3-book set). $130.00.

Sweeteners: Discovery, Molecular Design and Chemoreception. ACS Symposium Series 450. Edited by D. Eric Walters, Frank T. Orthoefer, and Grant E. DuBois. American Chemical Society, Washington, D.C. 1991. x + 333 pp. 16 × 23.5 cm. ISBN 0-8412-1903-6. $79.95.

Naturally Occurring Pest Bioregulators. ACS Symposium Series 449. Edited by Paul A. Hedin. American Chemical Society, Washington, D.C. 1991. xii + 456 pp. 16 × 23.5 cm. ISBN 0-8412-1897-8. $89.95.

Insect Neuropeptides. Chemistry, Biology and Action. ACS Symposium Series 453. Edited by Julius J. Menn, Thomas J. Kelly, and Edward P. Masler. American Chemical Society, Washington, D.C. 1991. xi + 260 pp. 15.5 × 23.5 cm. ISBN 0-8412-1919-2. $59.95.

Spectrometric Identification of Organic Compounds. Fifth Edition. By R. M. Silverstein, G. Clayton Bassler, and Terence C. Morrill. John Wiley & Sons, Inc., New York. 1991. x + 419 pp. 22 × 28.5 cm. ISBN 0-471-63404-2. $54.95.

Trace Elements in Health and Disease. Edited by Antero Aitio, Antti Aro, Jorma Jarvisalo, and Harri Vainio. Royal Society of Chemistry, Cambridge, U.K. 1991. x + 236 pp. 16 × 24 cm. ISBN 0-85186-976-9. £45.00.