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Book Reviews

The Chemistry of Human Behavior. By Herbert L. Meltzer. Nelson-Hall, Chicago. 1979. viii + 261 pp. 22.5 × 15 cm. $17.95.

The success of any volume devoted to the chemistry of the brain must be judged by its ability to describe the essential chemical events associated with well-defined modalities of brain function, including behavior. In this volume, the author provides a good introduction to the chemical machinery and organization of the brain, particularly in relation to chemical communication between neurons, chemical imbalances in mental and certain neurological disorders, and the mechanism of action of the more important psychotropic drugs. The first part, which is devoted to the organization and development of the brain, presents a brief, lucid account of the chemical architecture of the brain during development and under certain neuropathological states. After describing the chemical events and brain pathways associated with information processing, the author ends with a useful discussion of the chemical modifications associated with mental illness and various drugs of abuse. The book ends with a timely discussion of the ethics of animal and human experimentation, followed by a helpful summary of the book's contents. This is a well-written integrated account of the chemical, morphological, and functional organization of the brain of interest to both the layman and chemist. For the medicinal chemist unfamiliar with the brain mechanisms underlying the action of psychotropic drugs, the book is particularly useful.

University of Rochester, Center for Brain Research **Leo G. Abood**

Nucleic Acid Chemistry. Improved and New Synthetic Procedures, Methods and Techniques. Parts 1 and 2. Edited by Leroy B. Townsend and R. Stuart Tipson. Wiley-Interscience, New York. 1978. xv + 1067 pp. 15 × 23 cm. $70.00.

These two parts may be regarded as a successor to Volume 1 of "Synthetic Procedures in Nucleic Acid Chemistry", edited by W. W. Zorbach and R. S. Tipson, taking into account that the rapid expansion of the field of nucleic acid chemistry asked for a new collection of improved synthetic procedures, methods, and techniques. The need for a compilation of reliable methods has derived from the fact that the extensive literature on nucleic acid chemistry makes it now very difficult, even for the expert in the field, to select a suitable procedure from the enormous variety of synthetic possibilities. The present two parts contain detailed information of the most modern approaches to the various problems encountered and exemplify the synthetic methods and techniques developed and proven by many authors who are either the original investigators or possess detailed knowledge through extensive experience in their own laboratory.

The contents are subdivided into discussions and descriptions of eight main topics. In Part 1: (I) "Heterocyclic Compounds", such as purines, pyrimidines and related ring systems; (II) "Carbohydrates", which will serve as valuable components for glycosidation reactions; (III) "Nucleosides Containing a Monocyclic Aglycone", such as imidazole, pyrimidine, triazine, pyrazole, and pyridine. In Part 2: (III) "Nucleosides of Bicyclic Aglycones" include purines, aza- and deazapurines, pteridines, and structural analogues; (IV) "Nucleotides and Polynucleotides" consist of a series of pyrimidine and purine derivatives; (V) "Isotopically Labeled Compounds"; (VI) "Chemical and Enzymic Syntheses"; (VII) "Reagents, Intermediates and Miscellaneous Compounds"; (VIII) "Instrumental or Analytical Techniques and Applications" including analysis of equilibrium chemical mixtures by absorption, application of high-pressure liquid chromatography, determination of anomeric configurations by proton magnetic resonance spectroscopy, and thin-layer chromatography of purine bases, nucleosides, and nucleotides. Finally, an author and subject index account for completion of these two books, which are directed to organic chemists, medicinal chemists, and biochemists who should profit from the excellent descriptions and information in regard to nucleic acid chemistry. The two volumes certainly belong on the book shelf of anyone directly associated with this field.

University of Konstanz **Wolfgang Pfleiderer**

Advances in Cyclic Nucleotide Research. Volume 10. Current Methodology. Edited by G. Brooker, P. Greengard, and G. A. Robison. Raven Press, New York. 1979. xi + 259 pp. 16 × 24 cm. $24.00.

The purpose of this volume of "Advances in Cyclic Nucleotide Research" is to provide a detailed description of some of the more important methods currently being used in the field. In each chapter the principle of the method is given, followed by the materials needed, detailed "cookbook" instructions for using the method and, in some cases, a sample of the primary, as well as the transformed, data. Potential problem areas, techniques for checking assay validity, and other information often omitted from the primary literature are also included. It should thus be possible for readers to take these descriptions and establish the methods in their own laboratories. It has been 7 years since this series has offered a volume on methodology, and so this issue is especially welcome. The step by step "state of the art" descriptions allow readers to become better prepared to evaluate the results of others, even if they choose not to use the methods in their own laboratories.

The 11 chapters essentially cover the field of modern cyclic nucleotide research. The radioimmunoassay of cyclic AMP and cyclic GMP (G. Brooker and others), the assay and resolution of cyclic nucleotide phosphodiesterases (W. J. Thompson and others), and the preparation and assay of the calcium-dependent modulator protein (R. K. Sharma and J. H. Wang) are detailed. Methods for the assays of adenylate cyclase (Y. Salomon) and guanylate cyclase (D. L. Garbers and F. Murad) and the enzymatic preparation of ^{32}P precursor material for those assays (R. A. Johnson and T. F. Walseth) are discussed. Assays of cyclic nucleotide dependent protein kinase (G. N. Gill and G. M. Walton) and endogenous protein phosphorylation/dephosphorylation (S. A. Rudolph and B. K. Krueger) reactions are presented, as well as an immunocytochemical approach to cyclic nucleotide and protein kinase localization (W. A. Spruill and A. L. Steiner). The purification of cyclic nucleotide receptor proteins by affinity chromatography (W. L. Dills and others) and the use of metal nucleotide complexes in steady-state kinetic experiments (T. Bartfai), exciting new aspects of cyclic nucleotide methodology, are also discussed.

Northeastern University **Jeffrey Blumberg**

Drug Design. Volume VIII. Edited by E. J. Ariëns. Academic Press, New York. 1979. xvii + 420 pp. 15 × 23 cm. $42.00.

This latest addition to the "Drug Design" series maintains the high quality of contributions which have characterized earlier volumes. A variety of differing subject areas are presented.

Chapter 1 is a review of "Advances in the Methodology of Quantitative Drug Design" (by Y. C. Martin). A brief description is provided of methods enabling substituent choices for lead development (cluster analysis and multidimensional scaling), and the use of substituent constants in nonmathematical optimization schemes (Topliss, Fibonacci, and Darvas decision trees) is surveyed. Recent advances in the determination and use of substituent parameters, particularly steric and lipophilic parameters, are described. Nonlinear compartmental modeling is dealt with in some detail.

Chapter 2 provides perspective on the "Application of Pattern Recognition to Drug Design" (by G. L. Kirschner and B. R. Kowalski). Such systems as have been studied using these methods are critically appraised, and future avenues of development are pointed out.

Chapter 3 describes the "Design of Controlled Drug Delivery Systems" (by S. K. Chandrasekaran, F. Theeuwes, and S. I. Yum), specifically ones which make use of osmotic pumps. The design and the in vitro and in vivo performance of two such pumps are described.

Chapter 4 surveys "Receptor Binding as a Tool in the Development of New Bioactive Steroids" (by J. P. Raynaud, T. Ojasoo, M. M. Bouton, and D. Philibert). The methodology and screening procedure is discussed, and the relationship between binding affinity and biological potency is assessed.

Chapter 5 provides a lucid exposition on the "Design of Synthetic Sweeteners" (by G. A. Crosby, G. E. DuBois, and R. E. Wingard, Jr.). A cross-section of the approaches and problems in developing new sweetening agents is extremely well developed.

Chapter 6 discusses the problems associated with and possible approaches to the "Prospective Assessment of Environmental Effects of Chemicals" (by E. H. Hueck-van der Plas and H. J. Hueck).

Chapter 7 discusses the "Design of Selective Ion Binding Macrocyclic Compounds and Their Biological Applications" (by R. M. Izatt, J. D. Lamb, D. J. Eatough, J. J. Christensen and J. H. Rytting). The chemical synthesis and properties of macrocyclic polyethers are reviewed and the potential for the use of such substances as ion carrier agents or as heavy metal antidotes is discussed.

Temple University **Arthur Cammarata**

Organic-Chemical Drugs and Their Synonyms. 5th Edition. Volumes 1-3. Edited by Martin Negwer. Verlag Chemie International, New York. 1978. 1863 pp. 18 × 24.5 cm. $125.00.

The fifth edition of this series, published in a 3-volume set, provides a comprehensive list of organic compounds used as drugs and pesticides arranged by the concept of incremental molecular formulas. This edition lists 6664 drugs with more than 60000 synonyms. All "Chemical Abstracts Series Registry Numbers" (CAS numbers) are listed and are summarized in a CAS number register (Vol. III). A supplement list of drugs and a group index are also included. The arrangement of the organochemical drugs and their synonyms are in two columns on each page. The CAS number, index number, and structural formula are included, besides the molecular formula, which constitutes the basic arrangement of this book. The CA index names, which, however, do not always differ from those used by IUPAC nomenclature, are identified. Each compound includes the biological characterization of the drug concerned or the latter's therapeutic use (in German). This series will be a valuable addition to any library of institutions concerned with drug use and development and will provide a rapid first source of information. It will be particularly useful for those institutions (hospitals, poison control centers, and small medical libraries), where chemical abstracts may not be readily available.

Staff

Discovery, Development, and Delivery of New Drugs. By Karl H. Beyer, Jr. SP Medical & Scientific Books, Spectrum Publications, New York. 1978. 238 pp. 15 × 23 cm. $20.00.

This is an excellent book, well worth reading by anyone interested or involved in the three D's of new drugs. It will be especially valuable to the student contemplating entering this area or the medical profession. It provides a view rarely seen, if it has been published at all, of how interesting compounds are discovered and what it takes to successfully introduce one as a new drug. It is an inside look at thought processes, timing, and pitfalls, told with the authority of one who has been there and probably learned much of what he advises the hard way. (Dr. Beyer was senior vice-president of research at Merck Sharp and Dohme on his retirement in 1973 to enter teaching.)

Fully a third of the book is devoted to the discovery process, including an insightful analysis of creativity. Dr. Beyer compares creativity, luck, and serendipity in new drug discovery. He analyzes seven features characteristic of successful designed discovery, other routes to discovery (the biologists' approach, the biochemists' approach, and the chemists' approach), and discovery beyond the limits of knowledge. Three chapters describe the tailoring of specific new drugs. One section is of special interest: "How Not to Go About Tailoring a New Drug".

The realities of the current regulatory climate are handled delicately, but forthrightly. They influence preclinical development. ("Don't subject an interesting new compound needlessly to new procedures in the laboratory while the interpretation of results...can be more controversial than conclusive".) They make careful clinical planning and design a must. ("The clinical investigation of a new drug can be self defeating today.") Under "Development" are included "Safety Assessment", "Chemical Development", "Pharmaceutical Development", "Clinical Pharmacology", and the "Clinical Trial—Its Structure, Its Function".

Two areas missing from most scientists' formal education are patents and marketing. The succinct section on patents is an excellent introduction to the subject. It describes the kinds of patents available, patent considerations in the tailoring phase, protection of novelty, and other aspects. "Delivery" in the title refers to marketing and promotion. Proper attention to marketing considerations, such as pinpointing therapeutic objectives, coordinating these with clinical studies, and other planning, can be vital for the success of a new drug. The situation when a marketing group can be a hazard to research is also discussed.

Special comments are directed to the university researcher and government scientist specific for the individual's resources and patent situation. Additional advice directed to the drug discoverer includes "The one thing he or she can do that is most likely to help smooth the road to delivery..."; "...two ways to cut down on time and trouble"; and in the penultimate paragraph, "There is one more thing, though, you have to learn...".

Throughout this book attention is given to the contribution of individuals in a variety of professions. It is easy, entertaining, and enjoyable reading, but at the same time has passages one will want to underline, think about, and remember.

Riker Research Laboratories, Inc. **Robert A. Scherrer**

Recent Results in Cancer Research. Antitumor Antibiotics. Edited by S. K. Carter, H. Umezawa, J. Douros, and Y. Sakurai. Springer-Verlag, Berlin, Heidelberg, and New York. 1978. viii + 303 pp. 16 × 25 cm. $42.50.

This volume is a collection of papers of a symposium on antitumor antibiotics held in San Francisco on May 25-26, 1977, sponsored by the Northern California Cancer Program. In the words of one of the editors, "This symposium broadly concerned antitumor antibiotics and was designed to cover both the preclinical aspects of development and the clinical status of current and new drugs".

This symposium is another manifestation of the collaboration between Japanese and American investigators in the field of cancer chemotherapy. Accordingly, it is no surprise to see that many of the 29 chapters were written by Japanese workers.

Of particular interest to medicinal chemists engaged in antibiotic research are the chapters of Schepartz and Douros which

deal with aspects of the fermentation program of the National Cancer Institute, the chapter of Rosazza entitled "Antitumor Antibiotic Bioactivation, Biotransformation and Derivatization by Microbial Systems", those dealing with the assay and detection of antibiotic antitumor agents, as well as Chapter 10 by Goldin, which is concerned with criteria for the selection of new analogues.

There are 18 chapters which cover the clinical aspects of antibiotic cancer chemotherapy. Clinical experience with drugs, such as the anthracyclines, bliomycin, mitomycin C, and neocarzinostatin, is the subject of reports by Japanese and American investigators. This section of the book may be of interest to those who are not familiar with the clinical literature on antitumor antibiotics. However, it is a pity that there is no chapter which critically evaluates these results. In this respect, the final chapter by Carter entitled "Antitumor Antibiotics—Thoughts for the Future" is disappointing.

Rensselaer Polytechnic Institute **Sydney Archer**

Glycoproteins and Glycolipids in Disease Processes. ACS Symposium Series. Edited by E. F. Walborg, Jr. American Chemical Society, Washington, D.C. 1978. xv + 480 pp. 16 × 23.5 cm. $33.50.

This book is the result of a symposium sponsored by the Division of Carbohydrate Chemistry of the American Chemical Society. The editor has succeeded admirably in putting together a volume with contributions from experts in the field of glycoprotein and glycolipid research. Although excellent reviews on various aspects of the chemistry and biochemistry of glycoproteins and glycolipids are available, it is for the first time that a single volume on the role of glycoconjugates in disease processes has been made available. The book is an excellent one and should be treasured by readers and researchers alike. As pointed out by the editor, the book focuses on current concepts covering structure and metabolism of glycoproteins and glycolipids and relates recent advances in this area to disease processes, including infection, carrier, degenerative diseases, and genetic disorders. The book is divided into five major sections, each having an introductory article: (1) "Structure and Metabolism of Glycoproteins and Glycolipids", (2) "Genetic Disorders of Complex Carbohydrate Metabolism", (3) "Infection and Degenerative Diseases", (4) "Secreted Glycoproteins and Cell-Surface Antigens of Carrier Cells", and (5) "Alterations of Membrane-Associated Glycolipids and Glycoproteins during Malignant Transformation".

The articles are written in a highly scholarly manner with proper documentation of references and clear illustrations. I highly recommend the book.

Schering Corporation **T. L. Nagabhushan**

Calcium-Binding Proteins and Calcium Function. Edited by R. H. Wasserman, R. A. Corradino, E. Carafoli, R. H. Kretsinger, D. H. MacLennon, and F. L. Siegel. Elsevier/North-Holland, New York. 1977. xiv + 514 pp. 18.5 × 26 cm. $45.00.

This book represents the proceedings of the "International Symposium on Calcium-Binding Proteins and Calcium Function in Health and Disease" held in June, 1977, at Cornell University. This symposium was the second of its type; the first one was held in Poland in 1973. This book contains 81 papers which cover many different aspects of a wide variety of calcium-binding proteins and which are organized into the following seven chapters: "Underlying Physical and Chemical Concepts", "Calcium-Binding Proteins in Nervous Tissue", "Sarcoplasmic Reticulum", "Calcium-Binding Proteins in Muscle", "Vitamin D- and Vitamin K-Dependent Calcium-Binding Proteins", "Extracellular Calcium-Binding Proteins", and "Intracellular Calcium-Binding Proteins".

The introductory chapter on physical–chemical concepts is of general interest and contains 11 papers, including a useful summary of thermodynamic considerations of calcium binding to model compounds and proteins and an interesting analysis of 60 Ca^{2+}-model compound crystal structures. Several other papers are concerned with physical techniques for studying Ca^{2+} binding to proteins, and a few present models for the physical role of Ca^{2+} in particular systems. There are also two interesting papers dealing with the evolutionary aspects of calcium-binding proteins and the role of calcium in eukaryotes.

The next three chapters deal with calcium-binding proteins from particular tissues and are thus more specialized. However, the papers in any one chapter actually employ a diversity of methodology and consequently should be of general interest even to individuals studying another calcium system. The chapter on vitamins D and K dependent calcium-binding proteins provides reports of some very exciting and current work on proteins containing the new calcium-binding amino acid, γ-carboxyglutamic acid, Gla. The last two chapters on extracellular and intracellular calcium-binding proteins contain reports on proteins from a variety of sources (serum, saliva, and mitochondria), including nonvertebrates.

This book deals with a topic of tremendous breadth and yet manages to highlight a major portion of the area it encompasses. Consequently, although this book is very expensive, I believe it would be a worthwhile purchase for an individual scientist studying calcium-binding proteins as well as for a science library. Furthermore, this book could easily provide the basis for a seminar course on calcium-binding proteins; it would only be necessary to bring the presentation up to date with more recent articles.

Wellesley College **Judith T. Levy**

Catalytic Hydrogenation in Organic Synthesis. By Morris Freifelder. Wiley, New York. 1978. xiv + 191 pp. 15.5 × 23 cm. $18.50.

Hydrogenation with heterogeneous catalysis is an important, well-established method for the reduction of organic compounds. It is clean, relatively inexpensive, and can often achieve results unobtainable by other methods. It is, therefore, essential for laboratories engaged in organic synthesis to have the means for carrying out this reaction. Because of the nature of the reaction, however, the results are often highly dependent on the activity of the catalyst and the choice of solvent and reaction conditions. This is especially true for compounds with more than one reducible group where selective reduction is desired. In this his second volume on the subject, Morris Freifelder has addressed the experimental aspects of the hydrogenation reaction. In so doing, he has drawn heavily on his own experience in the area. Experimental procedures, which are used throughout the book to illustrate different types of reactions, are by in large taken from work carried out in his own laboratory. Each procedure is accompanied by one or more notes, which are used to amplify the experimental description of the reaction detailing the effects of varying the catalyst, solvent, or other conditions and discussing the scope and limitations of the procedure. In each case, the author has illustrated a preferred method for carrying out a given reaction. The reported yields are generally high, and the reaction conditions can usually be achieved in the commercially available low-pressure hydrogenation apparatus.

After a very brief general discussion of experimental conditions, catalysts, and equipment, the book is divided into chapters describing the reduction of the various functional groups. Since few molecules of interest to the medicinal chemist have only one such group, particular attention is given to the selective reduction of a particular group in the presence of other reducible moieties. Where applicable, the partial reduction of a particular functional group is also discussed. Particularly useful chapters are devoted to the hydrogenolysis reaction, to reductive alkylations and aminations, and to the reductions of nitrogen-containing groups, such as nitriles, nitro and nitroso groups, oximes, imines, etc.

Any new book on experimental catalytic hydrogenation must be compared to the now well-known "Catalytic Hydrogenation" by R. L. Augustine, which was published in 1965. Such a comparison is particularly appropriate in this case, for, although published in 1978, this volume has few references more recent than 1970 and relies primarily on published literature and experimental work completed prior to 1968. A comparison of the two books reveals that Augustine has a better discussion of the various hydrogenation catalysts and the different types of equipment used for carrying out the reaction. Freifelder, for

example, makes little mention of the atmospheric hydrogenation equipment which is so useful for carrying out small-scale reactions and for following the course of a reaction in situations where selectivity is required. Augustine's discussion of stereochemistry is also superior to that of Freifelder, who takes little note of the stereochemical consequences of the hydrogenation reactions studied. With regard to presentation, Freifelder has not made effective use of structural formulas for illustrative purposes, thus making his text more difficult to follow.

This book's major contribution is derived from its wealth of experimental detail and commentary, which should be useful to the student of synthetic organic chemistry and to the professional experimentalist who has an occasional need to carry out a catalytic reduction.

The Upjohn Co. **Jackson B. Hester**

Photochemistry. Volume 9. Specialist Periodical Reports. By D. Bryce-Smith, Senior Reporter. The Chemical Society, Burlington House, London. 1978. xxii + 653 pp. 14 × 22 cm. $83.00.

Although these volumes continue to be indispensable to photochemists because of their thorough and critical reviews of large sections of the literature in this field, their value to medicinal chemists in general also continues to be marginal. This latest volume covers the literature appearing between July 1976 and June 1977, with the exception of a chapter on "Spectroscopic and Theoretical Aspects", which covers the 2-year span from July 1975 to June 1977. This chapter, part of the section on "Physical Aspects of Photochemistry", appears in place of the chapter on "Developments in Instrumentation and Techniques", which appeared last year. Otherwise, the format is as described last year [see *J. Med. Chem.*, **21**, 595 (1978)], except for the omission this time of the chapter on "Chemical Aspects of Photobiology", which is promised for the next volume in this series.

The reviews by established and knowledgable photochemists are uniformly thorough and informative. I always find reference to some papers that I somehow missed during my reading of the current journals, even aided by some computerized guides to the literature. The small amount of time that many of us devote to casual perusal of the current literature results in our depending more and more on these thorough reviews for bringing papers to our attention that we otherwise might overlook. This service is all the more valuable since papers are discussed, however briefly, within the context of other recent reports, including some from previous volumes in this series. It seems to me that there are fewer citations which include tables of data or graphs compared with previous volumes and that reports on the average are summarized more briefly than before. Considering that the length of the survey is about the same size as last year (although the price has increased by 12.2%!) one may safely conclude that there is no diminution in the photochemistry literature and that many interesting and exciting discoveries continue to appear.

Once again, I can recommend the volume to all institutional libraries which strive for complete coverage of the current literature. Individual photochemists would be well advised to have their own copy if they can afford it, but medicinal chemists should be content to consult the volume in their institutional library. The production job continues to be first rate.

New York University **David I. Schuster**

Annual Reports on Fermentation Processes. Volume 2. Edited by David Perlman. Academic Press, New York. 1978. viii + 338 pp. 16 × 23.5 cm. $19.00.

This volume, the second in a series edited by David Perlman and presented as being supported actively by the Division of Microbial and Biochemical Technology of the American Chemical Society, is aimed at giving the reader an account of "significant developments published during the past few years concerning fermentation processes". The intended beneficiaries are readers who may have only a limited or secondary interest in the topics covered but who, nonetheless, wish to keep abreast of the larger field of fermentation technology. As with the first volume [cf. *J. Med. Chem.*, **22**, 214 (1979)], it is difficult if not impossible for a volume of this sort to achieve such a vague goal.

Volume 2 of "Annual Reports on Fermentation Processes" contains 12 chapters ranging in length from 11 to 43 pages. One group of contributions considers fermentation processes themselves and deals with specific topics such as the optimization of cheap or available substrates (e.g., glucose from cellulosic precursors, Tsao et al.; Flickinger and Tsao), computer control of the process (Wiegand), or a theoretical analysis of irreversible factors in the behavior of enzymes and fermentation systems (Tanner). A second and slightly more practical group of contributions covers new developments in the use of immobilized cells (Abbott), enzymes of current commercial interest (Aunstrup), production of amino acids (Hirose et al.), and, briefly, yeasts currently in commercial scale production (Peppler). A third group of chapters deals with more specific fermentation products and includes an updated review of β-lactam antibiotics (Gorman and Huber), an encyclopedic coverage of aminoglycosides (Nara), a long review on the microbial transformations of antibiotics (Shibata and Uyeda), and a discussion of cytotoxic and antitumor compounds produced by fermentation processes (Aszalos and Berdy).

The chapters in Volume 2 of "Annual Reports on Fermentation Processes" are, by and large, well written and carefully edited. The variability with respect to novelty and coverage (some chapters are carefully planned continuations of topics surveyed in Volume 1, whereas others are either too brief of overly encyclopedic and somewhat repetitious) makes it hard to predict how much one will benefit from having this volume in a personal library. Clearly, some sections will be useful to students and others who wish a primary source to use before going more deeply into a topic area. It is indeed regretable that even with a rapid photographic mode of reproduction and soft covers that this volume sells for $19.00.

Northwestern University Medical and Dental Schools **John W. Corcoran**

Computer Assisted Studies of Chemical Structure and Biological Function. Edited by Andrew J. Stuper, William E. Brugger, and Peter C. Jurs. Wiley, New York. 1979. xi + 220 pp. 16 × 23.5 cm. $23.50.

This book expands the literature on quantitative structure–activity relationship (QSAR) studies with heavy emphasis on pattern recognition, chemical structure information handing, and the role of the computer. The introduction contains the usual review of QSAR methods, including Hansch, Free–Wilson, quantum chemistry, and pattern recognition. It continues to be a surprise to see a distinction made between quantum chemistry and QSAR techniques when, actually, quantum mechanical indices are generally used as input to QSAR just like any other measured or calculated parameter.

The rest of the book is devoted to areas of particular interest to the authors. Pattern recognition is treated in Chapter 2. Information handling, including coding, Wiswesser line notation, connection tables, and geometric descriptors, is discussed in Chapter 3. Chapters 4 and 5 (more pattern recognition and the authors' software package) are computer oriented as the title of the book promises.

Chapter 6 gives examples of pattern recognition-like models and information handling techniques to psychotropic agents and barbiturates. The whole of Chapter 7 is devoted to structure–activity relationships of olfactory stimulants—an area, apparently, of particular interest to the authors.

The book is well written and relatively "clean" in presentation. It is another book that should be added to the QSAR library and is recommended to novices and professionals alike who work in the tricky field of molecular design. The only mild criticisms are the separation of quantum mechanics as a method in QSAR rather than as a technique to provide input to QSAR, the possible impression to the reader that computers can do anything, and, perhaps, the heavy emphasis on pattern recognition and computers which only play selective roles in the broad QSAR picture.

University of Tennessee Center for the Health Sciences **William P. Purcell**