amido]pyrrole-2-carboxamido]propionitrile Hydrochloride (11). This compound was prepared from the nitropyrrole 4b as described above for the synthesis of its homologue 7. Compound 11 was obtained in 10% yield: mp 196–199 °C; NMR δ 2.84 (2 H), 3.95 (N-CH_3 groups), 4.13 (2 H), 7.0, 7.18, 7.34 (aromatic H's), 9.85, 10.30 (amide H's); UV λ_{max} (EtOH) 244 nm (ϵ 19 900), 305 (21 400); IR ν 3040–3500, 2950, 2260, 1640, 1580, 1440, 1400, 1260, 1200, 1150, 1110, 1000, 1010 cm^{-1}; MS, m/e 435 (M − 100, 30), 411 (10), 314 (42), 261 (100); TLC, a single spot using solvent systems I and II.

β-[*N*-Methyl-4-[*N*-methyl-4-[*N*-methyl-4-(guanidineacetamido)pyrrole-2-carboxamido]pyrrole-2-carboxamido]pyrrole-2-carboxamido]butyronitrile Hydrochloride (12). This compound was prepared from the nitropyrrole 4c as described above for the synthesis of its homologue 7. Compound 12 was obtained in 28% yield: mp 195–198 °C; NMR δ 1.3 (C-CH_3), 2.1, 2.82 (2 H), 3.92 (N-CH_3 groups), 408 (2 H), 6.88, 7.04, 7.22 (aromatic H's), 9.84, 10.3 (amide H's); UV λ_{max} (EtOH) 242 nm (ϵ 24 000), 305 (25 600); IR ν 3000, 3500, 2470, 2260, 1650, 1580, 1520, 1430, 1400, 1260, 1200, 1150, 1100, 1060, 1010 cm^{-1}; MS, m/e 449 (M − 100, 26), 328 (100), 261 (84). Anal. ($C_{25}H_{31}N_{11}O_4 \cdot HCl \cdot 2H_2O$) C, H, N, Cl; TLC, a single spot using solvent systems I and II.

β-[*N*-Methyl-4-(guanidineacetamido)pyrrole-2-carboxamido]propionamidine Dihydrochloride (16). This compound was prepared from the nitropyrrole 14 as described above for the synthesis of its homologue 7. Compound 16 was obtained in 9.7% yield: mp 234–240 °C; NMR δ 2.7 (2 H), 3.7 (N-CH_3), 4.0 (2 H), 6.8, 7.09 (aromatic H's), 7.5, 8.4, 8.92, 10.3 (amide, amidine, and guanidine H's); UV λ_{max} (EtOH) 238 nm (ϵ 15 000), 274 (11 500); IR ν 3090–3320, 1670, 1640, 1580, 1520, 1440, 1410, 1240 cm^{-1}; MS, m/e 274 (M − $2NH_3$, 40), 246 (30), 220 (20), 208 (67), 192 (100); MS, m/e (field desorption) 291, 274, 208, 192; TLC, a single spot in TLC using solvent systems I and II. Anal. ($C_{12}H_{20}N_8O_2 \cdot 2HCl$) C, H, N, Cl.

Virology. The details for the virological experimental were given in our previous paper in this series.[27]

Acknowledgment. We thank Rhône-Poulene Laboratories, France, for a sample of authentic congocidine. The chemical research was partially supported by the Israeli National Council on Research and Development. The virological studies were supported in part by a grant from Dr. K. Hermann, Hermal Chemie, Hamburg, West Germany. We are indebted to Yehudit Hamburger, Yael Asher, Eynat Tavor, and Yaffa Cohen for technical assistance, Dr. B. Fridlender for his help in performing the DNA polymerase assay, and to David Linder for the mass spectra.

Book Reviews

How to Find Chemical Information. By Robert E. Maizell. Wiley, New York. 1979. xxiii + 261 pp. 15 × 23 cm. $17.95.

The author of this "guide for practicing chemists, teachers, and students" is currently Manager of Information Services for the Olin Corp. For 20 years he has had daily experience in handling chemical information sources in a number of academic and industrial positions.

In a book of this size it is impossible to describe adequately all available sources of chemical information. The author has elected to describe the more important classical sources, the more significant newer sources, and the underlying methods, principles, and keys that the chemist and engineer need to cope with the constantly changing array of sources and tools. In an effort to update his information, he includes an appendix of about 30 items, keyed to appropriate pages in the text, describing developments through 1978.

Specific major topics included in the book are: search strategy; current awareness; acquisition of chemical documents; Chemical Abstracts Service; other abstracting and indexing services; computer-based information retrieval systems; reviews; major reference books; patents; physical property data; chemical marketing and business information; process information; and, in response to the current emphasis in programs and expenditures, a chapter on toxicology, safety, and pollution. Medicinal chemical literature as such is not discussed.

Two items in the book were particularly interesting to me. In discussing the surrogate concept in literature use, the author points out that the secondary sources of information are now so numerous, complex, and ephemeral that they are used best by information science specialists. These surrogates for the laboratory chemist or project leader are valuable colleagues. The author then retreats and, in the course of half a page, makes an excellent case for exercising the greatest caution when using surrogates, and he lists several excellent reasons for a chemist doing his own literature work. Case histories of projects gone astray as the result of faulty literature work make fascinating reading. I know of one case where, because of reliance on unqualified surrogates, a major compilation was published with so many errors that the errata list was almost as long as the original document. As in so many instances in life, the use of surrogates involves trade-offs.

In a chapter describing how to locate and use physical property and related data, the author includes a section on how to evaluate data from conflicting or unevaluative sources. Appropriate officials in the FDA, EPA, and other regulatory agencies should read the 18 questions asked, answers to each of which must be given before any sane decision can be reached concerning the reliability of the data. I lived with the problem of data collection and evaluation for a period of 2 years, during which, with the help of the best available surrogates, I prepared a compilation of about 30 items for each of 900 chemicals. When collection was complete, the data and references cited were evaluated by a public health M.D., an organic chemist with 40 years experience, a fire and safety expert, and a chemical engineer who was an expert in the evaluation of physical properties. Then and only then were the data released for publication. The proper use of the chemical literature is hard, exacting, time-consuming work. There are shortcuts, but Dr. Maizell and I agree that they who use them will sooner or later wish that they had not.

Amherst, Mass. **Edward R. Atkinson**

The Porphyrins. Volume VI. Biochemistry. Part A. Edited by David Dolphin. Academic Press, New York. 1979. xxi + 932 pp. 16 × 23 cm. $90.00.

This fine volume should appeal to a very wide spectrum of readers having an interest in porphyrin chemistry. Its value is greatly enhanced by the inclusion of a substantial number of experimental procedures, a feature which should lead to its use as a laboratory source-book as well as a library text.

The first two chapters deal comprehensively with protoporphyrin biosynthesis, Chapter 1 being particularly rich in chemical information regarding the organic synthesis of biogenetic precursors in labeled form. Chlorophyll biosynthesis is covered in Chapter 3, while Chapter 4 presents a critical evaluation of enzymatic and other preparations of everything from δ-aminolevulinic acid to protoporphyrin IX. The chemistry and biochemistry of the bile pigments are extensively reviewed in Chapters 5 and 6, again with much pertinent spectroscopic and experimental detail. Chapter 7 discusses plant pigments as exemplified by phytochrome and the phycobiliproteins. Derivatives

of bile pigments having differing degrees and positions of unsaturation form the subject matter of Chapter 8, and this theme continues in Chapter 9 which deals in a substantial way with the organic synthesis and characterization of these and related compounds. Chapter 10 furnishes a brief discussion of the interesting Stokvis color reaction. A full account of the clinical chemistry of the porphyrins is given in Chapter 11. Patterns of porphyrin metabolism in health and disease are outlined, clinical symptoms are described, and laboratory methodology is again accorded a prominent place. The volume concludes with a review of clinical and analytical aspects of mammalian bile pigments.

This book is, inevitably, expensive. It is also comprehensive, well referenced and indexed, and a most valuable tool for the research worker.

University of Dublin, Trinity College **David Grayson**

Pharmacological Modulation of Steroid Action. Edited by Enrico Genazzani, Francesco DiCarlo, and W. Ian P. Mainwaring. Raven Press, New York. 1980. xiv + 297 pp. 16 × 24 cm. $29.50.

This reviewer had to do some "investigating" to conclude that this book contains papers presented at a conference somewhere in Italy. Why the editors of the book tried to keep this a secret (the date and place of the meeting), I did not discover.

As usual, proceedings of conferences represent a variable quality of papers. However, most of these papers are of good quality and summarize information available several years ago. There is no doubt that having conferences like this is of great importance because it brings together workers in the same area of research. They provide a forum for the exchange of ideas and information on work in progress and establish rapport for possible cooperative ventures. It is rather unfortunate that, lately, organizers of such meetings consider it a must to publish the proceedings of the meetings in book form and have their names listed as editors. Most frequently the proceedings contain papers which are being published a multiple of times. This referee heard, and/or read, certain papers published in this book on several different occasions. Except for the rather limited value of having papers on related topics published in one volume, one wonders what purpose is served by having multiple publications of essentially the same papers by the same authors.

The Worcester Foundation for Experimental Biology **Eliahu Caspi**

Polymers as Aids in Organic Chemistry. By N. K. Mathur, C. K. Narang, and R. E. Williams. Academic Press, New York. 1980. xii + 258 pp. 15 × 23 cm. $32.50.

The attachment of inorganic or organic reagents to a polymeric support, including supports such as organic polymers, silica gel, alumina, and others, is a field which has developed quite rapidly over the last decade or two. The practical usefulness of polymeric reagents has been readily recognized and accepted by many groups of researchers, including biochemists, synthetic organic chemists, catalysis chemists, analytical chemists, and others. Despite the proliferation of various review articles discussing this field, very few books have ever appeared, and most of these were just compilations of the more important literature articles from previous years. It has been obvious that a critical and comprehensive book was needed, which would bring together the many diverse fields and aspects involved. The current book by Mathur, Narang, and Williams accomplishes virtually all which has been needed, and provides an excellent introduction and comprehensive, critical survey of polymers as aids in organic chemistry.

The book devotes the first three chapters to a review of basic polymer chemistry, the types of polymeric materials that have been used as supports for organic reactions and/or reagents, and finally methods for the determination of functionalization in polymer supports. These chapters serve as the foundation for all that follows and are necessary for a full understanding of subsequent material. However, the book is so well arranged, that one can entirely avoid these first few chapters and go directly to the chapters of most interest and/or need. Because the book is devoted to the use of polymers in organic chemistry, and not just to polymeric reagents per se, the next five chapters are devoted to a variety of polymeric syntheses of macromolecules. These include a broad and comprehensive discussion of polypeptide synthesis, oligonucleotide synthesis, oligosaccharide synthesis, and peptide synthesis now using polymeric active esters. The final chapter in this sequence discusses the use of polymeric supports in solid-phase sequencing of peptides and proteins. These middle chapters are essential reading for anyone interested in biological macromolecules and their possible solid-supported synthesis.

The next six chapters are devoted to the uses of polymers in general synthetic organic chemistry and catalysis. This includes a review of some general reactions that have been performed on polymers, the synthesis of large ring, macrocyclic systems, monofunctionalization of difunctional compounds, and some photochemical applications of polymer-supported compounds. A small discussion is included regarding the use of polymer-supported reagents for asymmetric synthesis, as well as the use of asymmetric polymeric materials for the resolution of racemic compounds. Perhaps the heart of the book consists, at least to this reviewer, of three major chapters near the end. These discuss the many, diverse polymer-bound reagents that have been developed, the development and applications of polymer-bound catalysts, and finally the area of polymer-bound transition-metal complexes acting as catalysts. These are really excellent discussions of their respective areas and provide the reader with an up-to-date summary of almost all that has been reported in the patent and scientific–technological areas over the past few decades. Finally, the very last chapter discusses ancillary areas of chemistry where polymer supports have been utilized, such as in analytical chemistry with affinity chromatography, or in the use of polymers for the controlled, long-term release of agricultural agents or drugs.

Thus, it can be seen that the present book covers a very wide and diverse field of subjects, but all are in some way related to the use of polymers in organic, bioorganic, or analytical chemistry. The literature covered is quite up-to-date and is very well surveyed with regard to the various contributors in each topic or subtopic. Virtually all previous review articles and books are at least briefly mentioned, and the reader is thereby provided with a very excellent literature survey of the entire field. The book is useful to anyone wishing to undertake research or applications work related in any way to the use of polymeric supports, but it is not a laboratory handbook of methods or procedures. It very nicely reviews what has been done in a wide variety of related areas and provides the reader with an overall appreciation for this rapidly developing field of chemistry. If anything, one comes away with a desire for a more extensive coverage of certain areas, along with an in-depth evaluation of the advantages and disadvantages of certain synthetic approaches. Perhaps a second edition will provide this material in another few years.

Northeastern University **Ira Krull**

General and Synthetic Methods. Volume 3. Specialist Periodical Reports. By G. Pattenden, Senior Reporter. The Chemical Society, Burlington House, London. 1980. xiv + 382 pp. 13.5 × 21.5 cm. $83.00.

This report, similar in scope and format to the previous two volumes in this series, covers the literature published during 1978. Of particular interest to medicinal chemists may be the fact that developments in the synthesis of saturated heterocycles, unfortunately omitted from Volume 2, are again included.

The subject matter is classified according to chapters entitled: "Saturated and Unsaturated Acyclic Hydrocarbons"; "Aldehydes and Ketones"; "Carboxylic Acids and Derivatives"; "Alcohols, Halogeno-compounds and Ethers"; "Amines, Nitriles and Other Nitrogen-containing Functional Groups"; "Organometallics in Synthesis"; "Saturated Carbocyclic Ring Synthesis"; "Saturated Heterocyclic Ring Synthesis"; "Strategy and Design in Synthesis"; "Photochemistry in Synthesis". There is an additional section on "Reviews on General Synthetic Methods", which also includes a few entries from 1977.

Obviously there are many instances in which the above classification of subjects results in overlaps and/or duplication, and some such cases are covered by cross-references. Although there

is an author index and a detailed table of contents, the book does suffer from the absence of a subject index. Some chapter titles are misleading; for example, "Hydrocarbons" does not deal with hydrocarbons per se but rather with the formation and reactions of the hydrocarbon components of functionalized derivatives. A survey of any particular type of functionality really requires a page by page perusal of the entire volume.

This volume is an invaluable aid to chemists involved in synthetic work, who are hard pressed to keep up with the ever expanding literature in their field. It is a sad commentary that the even more rapid escalation of the price of these volumes will preclude most individuals from acquiring their personal copies of these highly desirable reports.

Northeastern University **Alfred Viola**

Drug Design. Volume 9. Edited by E. J. Ariëns. Academic Press, New York. 1980. xix + 355 pp. 16 × 24 cm. $39.50.

In contrast to previous volumes, this addition to the "Drug Design" series contains a much heavier emphasis on computer-assisted methods. Five of the seven chapters contained in this volume have such an inclination. The content of these chapters ranges from the informative to highly sophisticated current applications. Two of the seven chapters follow more traditional precepts; one in relation to rectal and vaginal drug delivery forms and the other in relation to structure–toxicity considerations.

Chapter 6, by E. F. Meyer, Jr., presents a highly informative discussion on interactive computer graphics in medicinal chemistry. In particular, the use of computer graphics for the visualization of drug–receptor interactions and as a basis for proposing candidate agents is described.

S. H. Unger, in Chapter 2, presents a perspective whereby the knowledge accumulated in seeking to develop quantitative structure–activity relationships, QSARs, may be used as a basis for a more general system of thought. Attention is drawn to the manner by which one may be guided in selecting appropriate bioassays by the use of QSAR techniques. Lead generation as a consequence of the application of QSAR methods is very well presented. Lead optimization is also discussed and, interestingly, QSARs are used more as a basis for inference than as a basis for extrapolation. The examples chosen are largely those which have been encountered in the laboratories of the author of this chapter and for which a QSAR orientation has proven beneficial.

A refined version of substructural analysis is presented by V. E. Golender and A. B. Rozenblit in Chapter 7 and is termed a logico-structural approach to drug design. The procedure amounts to generating an appropriate superposition of substructural centers by the use of special algorithms, followed by a relative frequency count of features which appear essential for a given type of biological activity. The validity of the method appears to have been substantially verified, and a brief description of how the approach was used in predicting activities for a compound is also provided.

The level of mathematical sophistication required to appreciate Chapter 4, prepared by P. P. Mager, may preclude many from reading this chapter. This in unfortunate because a highly unified multivariate approach to drug design is presented. In essence, what is described is a means of extracting the maximum possible information from raw bioassay results and, subsequently, to make use of this information in arriving at QSARs. The approach is unique in the respects that differing biological effects for a given series of compounds can be dealt with simultaneously and that distinctions in physical properties associated with each biological effect can be taken into account. A number of examples which illustrate the power of the method are given.

S. H. Yalkowsky and W. Morozowich, in Chapter 3, discuss the importance of solubility and of partition coefficients to bioavailability, specifically to the bioavailability of orally active prodrugs. Correlative approaches for the prediction of solubility and of partition coefficients are presented so as to facilitate prodrug design.

Rationales for the design of rectal and vaginal drug delivery forms are discussed in Chapter 5, by C. J. de Blaey and J. Polderman. Major emphasis is placed in relation to factors influencing the bioavailability of rectally administered dosage forms, particularly those imposed by physiology, by the nature of the drug substance, and by the choice of vehicle.

Most stimulating in terms of its content and certainly most significant in terms of its timing is Chapter 1, prepared by E. J. Ariëns, which has as a concern the design of safer chemicals. Possible approaches that may be taken so as to minimize the toxic risk to persons coming into contact with industrial chemicals but yet without affecting the use to which such chemicals may be put are surveyed.

Given the high inclination of this volume to computer-assisted methodologies, it is difficult to recommend this volume more generally than to libraries or to persons who specialize in such an area.

Temple University **Arthur Cammarata**

The Porphyrins. Volume IV. Physical Chemistry. Part B. Edited by David Dolphin. Academic Press, New York. 1979. xix + 527 pp. 16 × 23 cm. $47.00.

This fourth volume of the seven-volume treatise consists of a collection of review articles by recognized experts, on the NMR, ESR, and Mössbauer spectroscopy of the porphyrins and derivatives. There are two chapters on NMR (of diamagnetic porphyrins, by T. R. Janson and J. J. Katz; of paramagnetic metalloporphyrins, by G. N. La Mar and F. A. Walker), one on ENDOR of chlorophylls and the photosynthetic light conversion apparatus (by J. R. Norris, H. Scheer, and J. J. Katz), four on ESR (of porphyrin cations and anions, by J. Fajer and M. S. Davis; of porphyrin excited states, by J. H. Van Der Waals, W. G. Van Dorp, and T. J. Schaafsma; of hemoproteins, by G. Palmer; of metalloporphyrins, by W. C. Lin), and two on Mössbauer (of hemoproteins, by E. Munck; of iron porphyrins, by J. R. Sams and T. B. Tsin). As well as a critical review of the literature in each area, the authors have also provided an adequate, but not excessive, introduction to the theoretical principles involved, and to the significance of the data obtained, so that the book may be recommended to those whose daily routine does not involve these particular spectroscopic techniques.

For workers in porphyrin chemistry, the various chapters will provide a valuable extension, elaboration, and updating of the material presented in the relevant chapters of Smith's "Porphyrins and Metalloporphyrins". However, it is disappointing, but possibly an inevitable consequence of multiauthor books, that the latest references in some chapters are 1975/1976. Fortunately, some authors have tried to rectify the situation with short sections on later (1977/1978) highlights of the relevant literature. The quality of presentation, printing, and indexing maintains the high standard of other volumes in the series. By present standards the volume is a fair value for its price, and researchers will want to be sure that a volume is within easy reach.

University of Dublin, Trinity College **John M. Kelly**

Metallothionein. Edited by Jeremias H. R. Kägi and Monica Nordberg. Birkhäuser Verlag, Boston. 1979. 378 pp. 17 × 34 cm. $49.00.

This monograph contains papers presented at the "First International Meeting on Metallothionein and other Low Molecular Weight Metal-binding Proteins" held in Zurich, July, 1978. Metallothioneins are zinc-, cadmium-, and copper-containing proteins characterized by their high metal content, low molecular weight (6000–10000), and unusual amino acid composition (ca. 33% cysteine). These proteins have been purified from human tissues and from numerous animal phylla. The high affinity of metallothionein for metals of physiological or environmental interest (Zn, Cd, Hg, Cu) has attracted the attention of nutritionists and toxicologists, as well as biochemists. Although current evidence suggests that metallothionein plays a role in the regulation of zinc or copper metabolism, the physiological function of the metalloprotein is not known.

The first half of the book offers a general overview of metallothionein research. An introductory historical essay by Bert Vallee describes the discovery and extensive investigation of metallothionein in the author's laboratory. Other articles in this section include a collective draft report, which summarizes the

meeting and reviews current knowledge about metallothionein, and a general discussion, entitled "Queries and Conjectures", which explores some of the unanswered questions about metallothionein.

The remainder of the book contains technical papers presented at the meeting. Topics covered include biochemical and physicochemical properties of metallothioneins, the role of metallothionein in metal metabolism and toxicity, and the induction and biosynthesis of metallothionein. Several papers report amino acid sequences of metallothioneins; the striking similarity in primary structures among vertebrate and invertebrate proteins is emphasized. Other articles report the application of circular dichroism, X-ray photoelectron spectrometry, and multinuclear NMR to studies of the metal–mercaptide chromophore of metallothionein. Medicinal chemists will be particularly interested in articles describing the stimulation and inhibition of metallothionein biosynthesis by various chemical agents and environmental stresses.

Since this monograph is the first volume devoted exclusively to metallothionein, it is likely to become an important reference work. It will be most valuable as an introductory source for interested researchers in the fields of chemistry, pharmacology, toxicology, and medicine. The book highlights the unresolved problems of metallothionein function and will stimulate many readers.

University of Minnesota **Bruce Banks**

Organic Chemistry. By Daniel S. Kemp and Frank Vellaccio. Worth Publishers, Inc., New York. 1980. xiii + 1422 pp. 18 × 26.5 cm. $25.95.

Feeling the need for another basic text in organic chemistry, the authors have produced a book that is both innovative and practical. Departing from the organizational sequence used in other organic texts, Kemp and Vellaccio move early on from the chemistry of alcohols and alkyl halides to carbonyl compounds, thereby permitting the later topics of synthesis and biochemistry to be taught more naturally. As it so often was in Kemp's 10–250 (MIT) lectures to introductory organic students, the beauty and utility of carbonyl chemistry is also the book's centerpiece. Although producing a large book containing 38 chapters, the authors succeed in connecting with useful generalizations the potentially intimidating mass of facts that traditionally attend the teaching of organic chemistry. Perhaps more than any other organic text, this book uses the first person plural in an engaging style that successfully conveys the authors contagious enthusiasm for organic chemistry, making the student feel that he is a fellow explorer of its fascinating topics. The citation of names and dates of past and current organic chemists whose contributions are pivotal reinforces the fact that organic chemistry was and is developed through the work of clever investigators. Also, the occasional use of an anecdote, aside, and vignette in the text reminds us that, like any other human enterprise, organic chemistry can indeed be charming. The book contains a useful appendix, numerous problems, and is accompanied by a workbook. Besides its emphasis on the chemistry of oxygen and nitrogen-containing functional groups, a consideration of natural products chemistry, biosynthesis, and macromolecules would be especially appealing to the medicinal chemist.

New England Nuclear **Crist N. Filer**

Progress in Medicinal Chemistry. Volume 16. Edited by G. P. Ellis and G. B. West. North Holland Publishing Co., Amsterdam, New York, and Oxford. x + 292 pp. 15 × 21.5 cm. $63.50.

Volume 16 of this excellent series contains five chapters. The first chapter, by Murphy on recent changes in patent law, constitutes a particularly timely update in view of the European Patent Convention which came into force in 1977. This convention has spawned the European Patent Office through which it is possible to obtain patent protection in 16 European countries through a single application. Medicinal chemists with an interest in European patents will find this chapter particularly useful. Singh, Kapoor, and Paul have comprehensively reviewed heterosteroids, defining the term such that apart from comprising analogues with heteroatoms in the nucleus, derivatives with heteroatoms in a side chain are also included. The authors cite 979 references covering heterosteroids with a wide range of pharmacological activities.

Neidle presents a thorough and critical analysis of the mechanisms by which various drugs bind to and affect DNA function. This chapter will be required reading for anyone with an interest in this field.

Two final chapters, by Hammond on agents affecting Mg^{2+}-activated adenosine triphosphatase and by Stenlake reviewing the most recent data on the molecular structure of the acetylcholine receptor protein and of stereochemical requirements for agonist–antagonist interactions, complement the latest volume of this series.

Ayerst Laboratories **Leslie G. Humber**

Potential Industrial Carcinogens and Mutagens. By L. Fishbein. Elsevier, Amsterdam and New York. 1979. x + 534 pp. 17 × 25 cm. $73.25.

This is a reference work dedicated to summarizing and tabulating all available data with regard to production, distribution, metabolic and environmental fates, human exposures, uses, metabolism, mutagenicity, and finally carcinogenicity of a large number of classes of organic and inorganic compounds. It is apparently a very thorough compilation of the above data and information and should be very useful to researchers working in a wide variety of disciplines. The first few chapters of the book discuss fundamental principles and theories of chemical carcinogenesis, mutagenesis, epidemiology, risk assessment, and threshold dose. These serve as an introduction and background material for an improved understanding and interpretation of the remaining chapters devoted to individual classes of chemicals. A total of about 175 industrial organic chemicals are discussed, some in great detail, and these are collated in a series of 21 major groupings and 38 structural subgroupings. This is not the type of book that one would read cover to cover, but it is a very useful and practical reference work regarding just what is currently known about a wide variety of industrial chemicals. The overall information provided suggests possible or potential risks to man from these chemicals and helps to predict the hazards of new agents being considered for introduction into the environment.

In general, the book should be of considerable interest to those of us involved in toxicology, carcinogenesis and mutagenesis studies, genetics, and environmental health. It should also provide considerable practical assistance to various officials involved in the public health and environmental protection areas. The book is extremely useful, well thought out, and concisely put together. Its review of the literature and reference compilations are excellent, as are the discussions of the background and principles of mutagenesis and carcinogenesis, risk assessment, epidemiology, etc. One minor drawback is that there is an apparent lack of serious proofreading, and the number of typographic/printing errors per page is quite high.

Northeastern University **Ira S. Krull**

Progress in Pharmacology. Volume 2. Number 4. Newer Antiarrhythmic Agents. By P. A. van Zwieten and E. Schönbaum. Verlag Chemie International, Inc., Deerfield Beach, FL. 1980. vi + 117 pp. 17 × 24 cm. $42.50.

The number of drugs available to the physician for antiarrhythmic therapy is continuing to increase. While our knowledge of the electrophysiological events involved in arrhythmias is fairly well defined, there is still a gap in our understanding of the detailed mechanism of action in the disease state of many of the antiarrhythmics available and particularly the newer and more useful agents. This volume details the proceedings of a 1978 symposium organized by the Dutch Pharmacological Society on the topic of recent advances in antiarrhythmic drugs. A group of internationally prominent European pharmacologists, recognized for their studies on antiarrhythmic agents, addressed the

many aspects of the newer drugs being used in this clinically complex disease.

The volume is divided into 15 chapters. The earlier chapter authors provide an overview of the general pharmacological considerations of antiarrhythmics (Chapter I, by Ariens), the electrophysiology of fibrillation (Chapter II, by Antoni), and the classification and properties of antiarrhythmic models (Chapter IV, by Szekeres). Additional general interest chapters comparing the efficacy and cardiovascular effects of antiarrhythmics (Chapter XIII, by Verdouw et al.), the enzymatic control of heart action potential (Chapter XIV, by Godfraind), and the influence of antiarrhythmics on AV conduction (Chapter VI, by Duchene-Marullaz et al.) are included. The use of drugs in this disease from a cardiologist's perspective (Chapter V, by Meijler) is an interesting insight on the state of our knowledge noted at the commencement of this review.

The second thrust of the book (Chapters VII–XII) relates the pharmacologic effects of some of the newer antiarrhythmics, Mexilitene, Disopyramide, Verapamil, D-600 (a methoxy derivative of Verapamil), and ORG 6001 (an aminoandrostranone), and includes clinical electrophysiological considerations, pharmacokinetic studies, and possible mechanisms of action for these agents. The final chapter (Chapter XV, by Jansen) is particularly valuable to the antiarrhythmic enthusiast by the presentation of a comprehensive outline of the essential pharmacological profile for a therapeutically superior agent.

The volume is well referenced, each author providing an extensive bibliography of the current literature relevant to the chapter topic. An extensive subject index is included. The book is a valuable update of the newer antiarrhythmic agents and is recommended for inclusion in all pharmacological library collections. It should be considered for the library of investigators in the field of antiarrhythmics and particularly those not fortunate enough to attend the symposium. The cost ($42.50) is a little on the expensive side, especially for those with only peripheral antiarrythmic interests. The volume maintains the tradition and high standards of the excellent series entitled "Progress is Pharmacology".

Ferris State College **Ian W. Mathison**

Books of Interest

GABA—Biochemistry and CNS Functions. Volume 123. Edited by Paul Mandel and Francis V. DeFeudis. Plenum Press, New York. 1979. xi + 505 pp. 17 × 25.5 cm. $42.50.

Medical Polymers: Chemical Problems (Journal of Polymer Science). Polymer Symposium 66, an Interscience Publication. By B. Sedlacek, C. G. Overberger, and H. F. Mark. Wiley, New York. 1979. vii + 540 pp. 15 × 23 cm. $35.00.

Encyclopedia of Electrochemistry of the Elements. Volume 14 (Organic Section). By Allen J. Bard and Henning Lund. Marcel Dekker, New York. 1980. xii + 308 pp. 18 × 26 cm. $88.00.

Pharmacology and Clinical Use of Angiotensin I Converting Enzyme Inhibitors (Drug Development and Evaluation). By Franz Gross and Rainer Liedtke. Gustav Fischer Verlag, Stuttgart, New York. 1980. vii + 130 pp. 15.5 × 23 cm. $21.30.

Handbook of Water-Soluble Gums and Resins. Edited by Robert L. Davidson. McGraw-Hill, New York. 1980. xiv + 659 pp. 16 × 23.5 cm. $39.50.

NMR Spectroscopy. By H. Günther. Translation: Robert W. Gleason. Wiley, New York. 1980. xiv + 436 pp. 16 × 24 cm. $45.00 (cloth); $16.50 (paper).

AMA Drug Evaluations. Fourth Edition. By AMA Department of Drugs. Wiley, New York. 1980. xix + 1470 pp. 19 × 26 cm. $48.00.

Organo Metallics in Organic Synthesis. Volume 1. General Discussions and Organometallics of Main Group Metals in Organic Synthesis. By Ei-eichi Negishi. Wiley, New York. 1980. xiv + 532 pp. 16 × 23.5 cm. $25.00.

Electroanalysis in Hygiene, Environmental, Clinical and Pharmaceutical Chemistry. Proceedings of a Conference, Organized by the Electroanalytical Group of the Chemical Society, London, Held at Chelsea College, University of London, April 17–20, 1979. By W. Franklin Smyth. Elsevier Scientific, New York. 1980. xi + 473 pp. 17 × 24.5 cm. $70.75.

Advances in Prostaglandin and Thromboxane Research. Volume 5. By J. C. Frolich. Raven Press, New York. 1978. 16 × 24 cm. ix + 246 pp. $24.00.

Cancer Markers (Diagnostic and Developmental Significance). By Stewart Sell. The Humana Press, Inc. 1980. xxvii + 451 pp. $49.50.

Nucleosides, Nucleotides and Their Biological Applications. By Jean-Louis Barascut and Jean-Louis Imbach. Institute National de la Santé. 1978. 15.5 × 24 cm. 294 pp. French francs 30.00.

Molecular Neurobiology. By Gordon Guroff. Marcel Dekker, New York. 1980. xiv + 571 pp. 16 × 23.5 cm. $53.30.