Book Reviews

Methods in Pharmacology. Vol. 2. Physical Methods. By C. F. Chignell. Appleton, Century, Crofts, New York, N. Y. 1972. $29.95.

A few years ago certain parts of this excellent text on methods would not have been understandable and thus useless for pharmacy and pharmacology professionals. Some chapters are still difficult and must be supplemented by supporting references given in the bibliographies. The topics are covered at the level of methodology and useful interpretation. The book is not meant to provide a fundamental basis in any of the topics but it comes close to doing so in a few. Although the book is directed toward pharmacology and current research levels in pharmacy, it should prove popular with many biochemists. Most of the methods discussed depend for complete interpretation on theoretical foundations which most biological scientists are unlikely to have acquired. It is always dangerous to use such techniques as the Mossbauer effect and circular dichroism without consultation with experts in these difficult topics. Nevertheless, the coverage in even these topics is sufficient to provide a useful introduction for the uninitiated.

Fluorescence is dealt with in some detail but could have been hit somewhat harder. Little critical discussion of the commercial instruments, only a few of which possess minimum quality, is given. Introductions to phosphorescence spectroscopy, circular dichroism, and the Mössbauer effect are better than average. Pharmacologists and scientists in related fields are likely to be already familiar with nuclear magnetic resonance and electron paramagnetic resonance techniques and will have graduated to more detailed monographs. These chapters might have emphasized ^{13}C nmr in more detial and time-dependent behavior in more detail in anticipation of the broad use these aspects will acquire in the near future. The nmr chapter is particularly weak in this respect. Chapters on scattered light by Teller and a rather special chapter on the spectrophotometry of turbid suspensions of cytochromes by Estabrook, *et al.*, are very well done and will become popular as these methods become popular as light scattering once was. The chapter on fast reactions by Taylor requires considerable supplementary reading if the reader wishes to use the methods. It is a good introduction but far from complete as might be expected in view of the magnitude of the subject. This chapter is inadequate as a working text for application of the methods. Discussions of X-ray diffraction, mass spectrometry, newer methods in polarography, and heartburst calorimetry are adequate for the beginner but unsatisfying by comparison to more comprehensive and often more authoritative discussions available in specific monographs and other collections of methods descriptions. Other aspects of calorimetry are slighted, an omission which we hope will be corrected in subsequent volumes. On the whole the book will prove valuable as an introduction to a number of methods already established as important in chemical and biological research. It is unreasonable to expect more extensive discussions in an introductory volume of this sort and the chief value of the book is to get the reader started with the new methods. Not all the chapters deal adequately with the limitations of the methods but several do. By and large the book should prove a valuable addition to the library of pharmacologists and biochemists since, despite the fact that most chapters provide only an introduction, investigators will find understandable discussions of methods outside their immediate research interests. The book is terribly overpriced but on the current relative scale of costs, probably worth the money. In view of the limited coverage necessary in most chapters, it may be wise to read the copy in the library to select from it more advanced references in areas the reader wishes to initiate in his own laboratory.

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Perfusion Techniques in Biochemistry. A Laboratory Manual in the Use of Isolated Perfused Organs in Biochemical Experimentation. By B. D. Ross. Oxford University Press, London. 1972. 479 pp. $37.00.

This manual fills a crucial need for a summary of the many procedures which have been published in recent years describing the perfusion of organs of laboratory animals, chiefly, the rat. It deals with 71 methods in 22 organs and tissues with sufficient coverage of the anatomy, histology, and physiology of the organ to permit a person not trained in these areas to use the techniques with confidence.

The first two chapters (128 pp) present an excellent summary of the general principles, perfusate media, oxygenators, pumps, and temperature control applicable to perfusions generally. The emphasis is placed on the perfusion technique as a biochemical tool, but the physiological considerations are not overlooked.

The remainder of the manual describes in great detail the perfusion of liver, kidney, heart and skeletal muscle, endocrine organs, and intestines with some attention to other organs and tissues including adipose tissue, brain, spleen, thymus, salivary gland bone, placenta, mammary gland, blood vessels, and lung.

The treatment of liver perfusion is comprehensive with illustrations of the anatomy, equipment, surgical procedure, typical research results, and performance data relating to viability, length of survival, and stability of the perfused organs. The author makes extensive comparisons of the isolated and *in situ* techniques and the principal perfusion media by tabulating the concentrations of various substrates such as lactate, pyruvate, glucose, ATP, ADP, AMP, etc., especially as they might reflect the functional state of the liver during perfusion. More than 140 references to papers using perfused rat liver are presented.

This manual is carefully organized, well illustrated, and documented and will be indispensible to those who are concerned with the contributions or the potential of this technique in biological or medical investigations.

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Amino Acids, Peptides, and Proteins. Vol. 4 (Specialist Periodical Reports). Edited by G. T. Young with 16 other contributors. The Chemical Society, London. 1971. xvi + 498 pp. 14 × 22 cm. £9.00.

This volume, the fourth in a series of Specialist Periodical Reports on Amino Acids, Peptides, and Proteins, provides a concise summary of the literature in these fields for 1971. The authors have succeeded admirably in the prodigious task of gleaning the most important information from more than 3000 papers. These papers come from books, symposia, and a large number of journals, some fairly obscure; however, there has apparently been no attempt to review those developments reported only in patents. The emphasis is largely chemical and physicochemical although biological properties are alluded to in situations where there are explicable relationships between chemical structures and biological activities.

The primary value of such a publication is to provide workers, in the various areas covered, with a convenient means of reviewing developments in their own and related areas. It serves to refresh one's memory about facts long since forgotten and to supplement one's knowledge with facts overlooked in the deluge of new literature.

Because the indexing of a volume containing so much diverse information would have unduly delayed publication, the editor has wisely substituted a rather comprehensive, 10-page table of contents. Though not ideal, this is adequate for the specialists for whom this work is designed.

This volume contains a short, but fact-filled chapter on amino acids. There are 276 pages devoted to a very comprehensive review of recent developments in all aspects of the elucidation of primary, secondary, tertiary, and quaternary structures of peptides and proteins. The 90 pages devoted to the chemical synthesis of peptides contain, in addition to a compilation of the latest technical developments, a brief survey of some of the recent developments in structure–action relationships for biologically active peptides. The coverage of this topic is admittedly highly selective and the section on hypothalamic peptides, one of the most interesting areas to medicinal chemists, is, of necessity, outdated because of the very rapid developments in this area. The comments on the solid-phase syntheses of high molecular weight polypeptides should be required reading for any medicinal chemist contemplating a venture into this area of chemistry. The chapter on peptide synthesis again contains the very useful tables of newly synthesized amino acid derivatives and peptides. Of particular interest to medicinal chemists is the chapter,

"Peptides with Structural Features not Typical of Proteins." This chapter is devoted largely to low molecular weight natural products, particularly the peptide antibiotics.

This volume is well written, contains remarkably few errors, and is definitely recommended reading for anyone working in these areas of chemistry.

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Chemical and Biological Aspects of Drug Dependence. Edited by S. J. Mule and Henry Brill with 33 contributors. Chemical Rubber Publishing Co., Cleveland, Ohio. 1972. xii + 561 pp. 19 × 26 cm.

Before any meaningful dialogue can take place, the participants must agree on basic terminology. The editors and contributors to this compendium have been careful to avoid the semantic difficulties which often confuse readers of drug reports. The initial chapter by Dr. M. H. Seevers discussing the characteristics of dependence on and abuse of psychoactive drugs serves as a keynote for the remainder of the book. A strict definition of drug dependence as a "laboratory based term which refers to an objective pattern of drug seeking behavior that can be experimentally demonstrated..." is adhered to throughout the text.

Essentially, the book is divided into five subsections, each addressed to a major aspect of drug dependence, namely, significance and characteristics, chemical aspects, criteria for evaluation, physiological and pharmacological aspects, and biochemical aspects. In the first section, the characteristics of dependence on various psychoactive drugs in both man and laboratory animals are described in detail. Individual chapters are devoted to the classes of commonly abused psychoactive drugs including the narcotic analgesics, barbiturates, alcohol, tranquilizers, CNS stimulants, hallucinogens, and cannabis.

The criteria and methods for evaluating physical and psychic dependence and overall abuse potential of these drugs are dealt with in Fraser's chapter which constitutes section two.

In addition to an excellent presentation of structure–activity relationships, the third section on chemical aspects of drug dependence is particularly timely in light of the recent report on the location of narcotic receptor sites in the CNS. Separate monographs are presented on receptor theory and the disposition and metabolism of drugs. Despite an intense research effort and hundreds of published papers, a completely satisfactory understanding of the biological disposition of most drugs of abuse has not been reached. Misra's review of this subject with 501 citations is thorough and quite impressive. One hopes that it will stimulate renewed interest in this important area of research.

The need for more sensitive and specific methodology for drug analysis has resulted in a proliferation of papers and techniques characterized by a degree of redundancy that only serves to cloud the issue. Thus, the value of this text as a useful source for laboratory workers is particularly enhanced by Mule's chapter containing a detailed description and critical evaluation of various methods for the detection and identification of various psychotropic drugs in biological specimens.

While the last sections of the text probably will appeal mainly to preclinical scientists, they are well written and highly readable. Hug has exercised a tremendous personal effort in describing the characteristics of acute and chronic tolerance development. He critically reviews the existing theories related to the mechanism of tolerance and covers all major classes of psychoactive drugs such as narcotic analgesics, general CNS depressants, barbiturates, CNS stimulants, psychomimetics, and cannabis. Hug's review of this subject with nearly 400 citations is very thoughtful and up to date. Following the fine chapter by Wikler who discusses the general theories of physical dependence and special factors related to physical dependence of opioids, barbiturates, and ethanol, there are several chapters dealing thoroughly with other physiological and pharmacological aspects of drug dependence including the electrophysiology, neuropathology, teratogenicity, embryolethality, and mutagenicity of drugs of dependence.

The biochemical approach appears to represent more recent contributions to the understanding of the mechanism of drug dependence. The final section of this book is devoted to a review of the effect of acute and chronic drug treatment on various biochemical constituents as well as some biochemically active endogenous compounds, such as enzymes, proteins, nucleic acids, carbohydrates, lipids, hormones, and neurotransmitters. The possible involvement of any of these compounds in acute drug action as well as tolerance and physical dependence development also is reviewed thoroughly.

Although the CNS is the primary site of drug intervention by "mind-altering" drugs, the action of a drug is limited by its level in the CNS. Therefore, in the last chapter, Clouet first describes briefly the factors affecting brain levels of drugs such as the absorption, distribution, transport, plasma binding, metabolism, and excretion of the drugs which may be an additional possible site of alteration during chronic drug use. Included also is a discussion of the possible biochemical mechanisms underlying the centrally mediated phenomenon of drug dependence. The theoretical approach she describes, derived from studies of others as well as her own, should stimulate more logical biochemical studies. This is a very innovative as well as entertaining chapter.

Generally, all of the reviews are well documented and up to date. The contributors have effected a comprehensive and succinct presentation of the material which is a critical criterion in judging the value of a publication of this nature. The editors have done an admirable job in determining the scope and content of the book. It is, in our opinion, one of the best monographs in the area of chemical and biological aspects of drug dependence. It is a valuable contribution to our understanding of a subject about which we must remain experimentally and intellectually sensitive.

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Carbon-13 Nuclear Magnetic Resonance for Organic Chemists. By George C. Levy and Gordon L. Nelson. Wiley-Interscience, New York, N. Y. 1972. xiii + 222 pp. 23.5 × 16 cm. $9.95.

Carbon-13 magnetic resonance (cmr) technology has developed in recent years to the point where it has become potentially of great use to the practicing organic or medicinal chemist. However, to the uninitiated who wishes to utilize this powerful spectroscopic method, consultation of the original literature is somewhat confusing at best and totally frustrating at worst. Several review articles concerning cmr have appeared in the last several years which contribute to an easier understanding of the field, but only one comprehensive textbook (by J. B. Strothers) exists which covers the literature into 1970. In an area which is progressing as rapidly as cmr, further updated material needs to be published at least biannually, and it is this updating process to which the current work contributes.

The book is written in a very low-key and concise manner, with no lengthy derivations, yet still presents a clear conceptual picture of the cmr process. It proceeds with a rational development of the history of cmr, in which one can easily appreciate the progress which has been made. The major differences between pmr and cmr methods are delineated, followed by three chapters which discuss detailed chemical shifts and spectral assignments of both aliphatic and aromatic hydrocarbons and carbon-containing organic functional groups. It is not a compendium of chemical shift values by any means nor does it claim to be. Several compendia of this type are cited, however, for those who need these specific data. A chapter concerning cmr spectra of reactive intermediates (ions and radicals) is included, along with two chapters on polymers. The second of these holds special interest for the biologically oriented chemist, for this chapter contains descriptions of cmr studies of carbohydrates, amino acids, peptides, proteins, nucleosides, nucleotides, and other biomolecules. Following these is a chapter concerning relaxation studies utilizing pulsed Fourier transform cmr which is currently being used to facilitate spectral assignments and to obtain information on conformational flexibility. Finally, a short chapter on special techniques and applications is included which intimates some of the applications just now being developed.

The authors' stated purpose is to introduce the researcher to the field of cmr and "to provide him with sufficient information to effectively use available cmr techniques in his own research," and in my opinion they have succeeded admirably. This book is adequately endowed with key literature references which allow for more detailed information on lightly covered topics. It has been published in a format which should encourage wide distribution, for the use of the photoreproductive process has accomplished

both rapid publication (literature coverage through Jan 1972) and modest cost to the reader. Probably the most accurate evaluation of the work may be obtained from the statement that we have found the book invaluable in our own research. On this basis, I recommend it to anyone who is interested in or concerned with cmr spectroscopy and especially to those who might not yet be aware of the many potential uses of this powerful analytical method.

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Treatment of Parkinsonism. The Role of Dopa Decarboxylase Inhibitors. Edited by Melvin D. Yahr. Advances in Neurology. Vol. 2. Raven Press, New York, N. Y. 1973. xiv + 303 pp. 24 × 16 cm. $15.95.

This volume contains papers presented in Nov 1972 during a meeting held at the Parkinson's Disease Foundation Research Center, Columbia University. The purpose of the latte. eeting and this compilation is to review the current status of the y in Parkinsonism with particular emphasis on the development and t. rapeutic application of extracerebral dopa decarboxylase inhibitors. . eneral, the book meets these objectives.

For the medicinal chemist, there are a few chapters of p. ticular interest. Sourkes' chapter on the enzymology and sites of a. n of monamines in the CNS describes work performed with a varie of dopaminergic agents (*e.g.*, aporphines) and reveals some intrigu. neurochemical correlations. Chapters by Kopin and Calne, *et al.*, c. scribe the effects of L-dopa (and dopamine) on the cardiovascular system and have broad implications with respect to the therapeutic utility of dopaminergic agents. The chapter by Sandler on transamination and tetrahydroisoquinoline formation briefly reviews some recent findings in the increasingly important area of human alkaloidal production. In the remaining 12 chapters, the remarkable benefits to Parkinsonian patients, resulting from combination treatment with L-dopa and extracerebral dopa decarboxylase inhibitors, are detailed.

Except for a considerable degree of redundancy in introductory sections of several chapters, the volume is well edited. The book is relatively free of typographical errors and the chapters have been assembled in a reasonably logical fashion. In general, this book is recommended to all those concerned with the chemotherapeutic treatment of Parkinson's disease and related neurological disorders.

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Drugs and Fetal Development. Edited by Marcus A. Klingberg, Armand Abramovici, and Juan Chemke. Plenum Press, New York and London. 1972. 559 pp. 16 × 25 cm. $27.50.

One of the most vexing problems confronting modern medicine today is that relating to the influence of drugs or environmental pollutants upon the developing mammal. This concern is multifaceted since it involves chemicals whose primary therapeutic purpose is for the prevention of . rtilization as well as agents which may adversely affect the ovum once it has been fertilized. Consequently, the discipline of developmental pharmacology assumes a rather global perspective.

The proceedings of the symposium on "The Effect of Prolonged Drug Usage on Fetal Development" held in Israel in 1971 have been accurately collated in Vol. 27 of the series entitled "Advances in Experimental Medicine and Biology." As with most compilations of this sort there is frequently difficulty in maintaining any continuity of style or subject content. However, this problem does not detract from the many worthwhile contributions presented at the meeting. The individual research papers serve to highlight again the need for defining which species has the highest degree of utility in predicting teratologic effects in man. In this context, several papers are presented on the effects of drugs in pregnant women and these data, while mostly descriptive in nature, should provide insights for future experimental studies.

This volume is not recommended for the casual individual interested in becoming acquainted with the discipline of developmental pharmacology but is meant for the sophisticated investigator desirous of obtaining specialized information.

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Evaluations of Drug Interactions. 1st ed. Published by the American Pharmaceutical Association with 187 participants. APHA, Washington, D. C. 1973. xxxii + 357 pp. 15.5 × 23 cm. $10.00.

The occurrence of a specific drug–drug interaction in many cases is a rare event. In those particular cases where its occurrence is quite common, its significance may be viewed differently by the laboratory scientist, the prescribing physician, and the practicing pharmacist. This volume on drug interactions attempts to meet the needs of all of the previously mentioned groups by the use of a unique multiple authorship format.

The Monographs section which includes 104 specific drug–drug interactions was written, reviewed, and evaluated by panels of scientists, physicians, clinical pharmacologists, and practicing pharmacists. Because of this multiple authorship format, the reader receives a well-rounded treatment of the specific interactions being covered. The clinical significance of the interaction, if any, is covered both in the Evaluation of Clinical Data and Clinical Significance sections of the monograph. For the concerned practitioner, there is a Recommendations section which is essentially a "what to do if . . ." treatment. These recommendations range from specific contraindication of concomitant use of the interacting drugs to that of "monitoring the patient" for possible symptoms. The use of the phrase "monitoring the patient" often appears in the Recommenda-ions section and is probably the result of the clinical pharmacists' . ut into the monographs. What this phrase will mean to the pr. icing community pharmacist is unknown.

Fo. hose interested in the "hows and whys" of the various interaction. he individual monographs also contain a section of the Pharmac. gical Effect and Mechanism of the interaction. This subject is a. covered in somewhat more detail in the Chapters section. Thes. hapters consist of brief but thorough reviews of specific therape ic classes of pharmacological agents with emphasis on their modes o. tion and possible areas for interactions.

Last to be conside. d is the Index. Besides indexing the specific drugs included in the . in heading of the monographs, the Index also contains "related d. s" which may be implicated as possible interactants by virtue of si. lar chemical structure or pharmacologic mechanism of action.

In summary, I think the volu. is a welcome addition to the area of drug–drug interaction literatu. Besides its obvious value to the practicing pharmacist and physicia. t should prove useful to those involved in the teaching of pharmaco. v, medicinal chemistry, and biopharmaceutics by providing relevan. amples of the principles that are being presented to students.

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Carbohydrate Chemistry. Vol. 5. J. S. Brimacombe, Senio. e-porter, with five contributors. The Chemical Society, Burlin. on House, London. 1972. xi + 434 pp. 14.5 × 22 cm. £8.00.

This is one in the series of "Specialist Periodical Reports" published by The Chemical Society which endeavors to survey the 1971 literature relating to the chemistry of carbohydrates. The report is divided into two parts, the first dealing with mono-, di-, and trisaccharides and their derivatives and the second with macromolecular carbohydrates.

The first part of the report, authored by J. S. Brimacombe, R. J. Ferrier, R. D. Guthrie, and T. D. Inch, surveys recent work in the synthesis and structural characterization of various classes of carbohydrates and their derivatives and provides chapters dealing with physical and analytical methods of analysis as well. Structural formulas and figures presenting synthetic routes are generously used and greatly increase the usefulness of the report.

The second part of the report, coauthored by J. F. Kennedy and R. J. Sturgeon, deals with macromolecular carbohydrates and surveys the literature of both 1970 and 1971. Several chapters are devoted to polysaccharides, glycoproteins, and glycolipids, and other

chapters are devoted to methods which are used to structurally characterize, synthesize, and modify these polymers. A chapter surveying glycosidases is especially useful.

The subject material of both areas is clearly presented and covered extremely well (2267 references are cited!), making the report a valuable reference for workers in the carbohydrate field as well as in allied fields.

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Pesticide Formulations. Edited by Wade Van Valkenburg with 12 other contributors. Marcel Dekker, New York, N. Y. 1973. x + 481 pp. 15 × 25 cm. Hard cover, $29.50.

The fact that in the year 1973 a book can be entitled simply "Pesticide Formulations" without reference to former volumes or revisions is indicative of the number of books published on this subject. The formulation of pesticides is a scientific endeavor practiced by researchers all over the world. Because pesticide formulation discoveries are difficult to patent, industry in particular has considered their own developments to be proprietary information and have guarded them closely. Papers on the subject originating from government and academic researchers are scattered sparsely through chemical and biological journals. Text books and review articles are essentially nonexistent. "Pesticide Formulations," edited by Dr. Wade Van Valkenburg, an industry pesticide formulation scientist, is, therefore, a welcomed publication. Contributing editors have covered pertinent subjects ranging from correlation of biological activity with chemical structures and physical properties to the description of a plant for formulation of insecticides. The varied types of formulations, *i.e.*, dusts, wettable powders, granulars, emulsions, and miscibles, are described. Designing each type of formulation to assure desirable physical properties includes proper choice of inerts, surfactants, solvents, and manufacturing techniques. Formulations can have profound effects on penetration, spreading, retention, translocation, soil distribution, and drift of active ingredients which in turn affect biological efficacy. Information is presented in clear concise language which should be easily understood by nonexperts in the field. Each chapter is supplemented with excellent bibliographies which alone are worth the price of the book.

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The Prostaglandins. Progress in Research. Edited by S. M. M. Karim with nine other contributors. Wiley-Interscience, New York, N. Y. 1972. 327 pp.

The aspects of prostaglandin research covered in this book are wide-ranging, including chapters devoted to the effects of prostaglandins on major organ systems, prostaglandin antagonists, and prostanoic acid chemistry. An introductory chapter by the editor provides sufficient biochemical and pharmacological information to those previously unacquainted with the field to allow full appreciation of the more detailed presentations that follow. Except for the more recently developed radioimmunoassay techniques, methods developed for the determination of prostaglandins are concisely discussed.

Special emphasis is given (approximately one-third of the book) to the effects of prostaglandins on reproductive processes such as luteal function and parturition in primates. These topics are presented in detail by Kirton and the editor, a leader in the clinical use of prostaglandins for abortion and induction of labor at term. A voluminous discussion of the latter topics is centered primarily on the relative efficacy and side effects associated with different dosage regimens of prostaglandins E_2 and $F_{2\alpha}$ in humans. The author's generally favorable results with these agents relative to other investigators were partially attributed to the lower doses he employed. Additional discussions of possible physiological roles of prostaglandins in reproduction included the possible relationships of seminal prostaglandins to fertility and *in vivo* prostaglandin synthesis to female reproductive physiology. Possibilities for future work in this area are numerous; as yet, the role(s) of prostaglandins in these processes are obscure. A section concerning the cardiovascular and renal actions of prostaglandins by Karim and Somers is primarily distinguished by a compilation of cardiovascular parameters observed in human studies. Bennett summarizes data implicating the involvement of prostaglandins in normal and disordered gastrointestinal tract function and suggests several directions for future research in this area. Relationships sought in these areas have been confounded by the opposing effects of prostaglandins E and F on circular smooth muscle. The potentially important effects of prostaglandins on bronchial smooth muscle tone are discussed by Smith, as well as speculations concerning their possible role in asthma. The need for development of a nonirritant analog of the potent bronchodilator, PGE_2, is apparent. A useful review of current thinking on the mechanism of platelet function precedes an interesting section by Mody concerning the effects of prostaglandins on platelet aggregation. This section includes recent work by the author suggesting that mechanisms other than modulation of adenylyl cyclase are important in this effect. Eakins and Sanner discuss recent work concerning currently available pharmacological antagonists to prostaglandins, including 7-oxaprostaglandin analogs, dibenzoxazepine derivatives, and polyphloretin phosphate. The need for development of specific selective antagonists to prostaglandins E and F actions is apparent from these studies. Pathways elucidated for the total synthesis of prostaglandins and analogs are presented by Schneider, with primary emphasis placed on the approaches employed by the Upjohn group and Corey and coworkers.

In summary, the presentations included serve as a useful reference source and overview of directions of current research in the prostaglandin field. Considering the phenomenal growth of prostaglandin literature in the past few years, the book is relatively up-to-date and makes worthwhile reading, particularly for those interested in the relationships of prostaglandins to reproductive physiology.

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Foreign Compound Metabolism in Mammals. Vol. 2. Edited by D. E. Hathaway with six contributors. The Chemical Society, London. 1972. xv + 512 pp. 21.5 × 14 cm. $26.20.

This volume, another of the excellent Specialist Periodical Reports of The Chemical Society, updates Volume 1 for the literature of 1970 and 1971. The book is unique, in that it contains detailed reviews of metabolic transformations of specific compounds, including drugs, pesticides, and miscellaneous organic compounds, as well as highly useful reviews devoted to questions of mechanisms of all types of metabolic reactions. In addition, several specialized chapters are included, as follows: Tracers for Metabolism, Drug Kinetics, Species, Sex, and Strain Differences in Metabolism, and Interactions of Drugs and Foreign Compounds.

The chapter relating 1970 and 1971 papers in biotransformations runs to approximately 150 pages of fine type and includes over 700 references. Every conceivable drug class is covered, as are such materials as food additives, carcinogens, toxins, and silicon and boron compounds. The chapter on mechanisms of biotransformation is equally readable and complete and provides an unsurpassed introduction into mechanistic considerations regarding any metabolic reaction in which a reader may be interested. A complete index, by author and by compound, provides ready entry into the book.

It is a cliche to state that a book is an invaluable reference source to those engaged in a particular field, but with respect to drug research the statement truly applies to this book. Purchase in the near future is recommended, lest the position of the dollar deteriorate further.

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The Chemotherapy of Protozoan Diseases. Vol. I–IV. By Edgar A. Steck. U. S. Army Medical Research and Development Command, Washington, D.C. 20314. 1972. 20.5 × 26.5 cm.

The infectious protozoan diseases affecting man and animals have and still do cause untold misery, death, and economic loss. Although the protozoan diseases are particularly prevalent in warm climates, the rapid interchange of people to and from the tropics has been the basis for much concern in the United States, particularly with the return of servicemen carrying undiagnosed cases of malaria and other protozoan infections from Southeast Asia. The author of this treatise, a chemist who has first hand access to much of the current research data being generated in this field, especially through the U. S. Army's Research Program on Malaria, approached this subject

from a multidisciplinary standpoint. The medical and biological aspects and the modes for treatment which have been used, especially in man, are integrated with the chemical features of agents employed in treatment. The four volumes are organized into five sections. Volume I (Sections 1 and 2) contains a chapter on Approaches to Strategy (Section 1) which includes such pertinent topics as the etiology, pathology, and immunological aspects of protozoan diseases, as well as current concepts on the mode of action of antiprotozoal agents. Section 2 includes the amebic infections, including amebiasis and such lesser amebic infections producing pathological changes in the gut of man by protozoa of the family *Endamoebidae* in the class *rhizopodea.* Section 3, which occupies all of Volume II, focuses on the Flagellate infections such as leischmaniases, Chagas' disease, African trypanosomiases, *Chilomastix mesnili* infections, Giardiases, and urogenital and intestinal trichomoniasis infections. Sections 4 and 5 which are included in Volume III include the telosporean infections such as toxoplasmosis, pneumocystosis, sarcosporidiosis, and the cilliate infection, balantidiasis. Volume IV contains the pictorial information which has been developed to support the blending of topics requisite in the text. The Appendix also contains a list of synonyms and designations of important chemotherapeutic agents discussed. A compilation of the drugs of choice concludes the Appendix. A subject index is also included. The biological literature has been covered to July 1, 1968, and the chemically related topics to July 1, 1969. An Addendum provides progress reported in the literature to Jan 1971. These volumes are printed from typed manuscript by offset lithography in a readable and flowing style.

My only disappointment with these volumes, other than their arrival on the scene too late (or perhaps even too early for much of the current research results on the U. S. Army's research program on the chemotherapy of Plasmodium falciparum infections could have been included) arises from a lack of critical analysis and integration of data presented. These four volumes consist principally of a collection of summaries of the findings reported in individual research articles or in the patent literature. This lack of critique, however, is balanced by the comprehensiveness of the coverage. The bibliography for Chapter XXIII on the Chemotherapy of Malaria, for instance, includes 2108 references, many of them pertaining to the patent literature. Perhaps the author could have saved some valuable space by eliminating the discussion of and reaction scheme of Woodward's chemical synthesis of quinine in 1944 and presenting more detailed discussions of the chemical–biological relationship between the diastereomeric alkaloids quinine and quinidine. (The naive reader may get the impression from page 23.84 that quinine (levorotatory) and quinidine (dextrotatory) are enantiomers, which they are not.)

However, the author has admirably achieved his goal of "familiarizing the medicinal chemist with the biological and medical aspects of infections caused by protozoa . . . and to provide ready reference in chemical matters for those who wish to make use of chemotherapeutic agents." It is apparent that the specialist will find ample reasons for devoting critical attention to this compilation. The general reader is given a very broad view of the scope of the field, whereas the specialist is provided with the most complete available entry into its literature. This reviewer urges medicinal chemists to make ample room on their bookshelves for this valuable source of information. At a time of skyrocketing prices for such compendia, it is noteworthy that the U. S. Army Medical Research and Development Command does make this work available *gratis* under a liberal policy of controlled distribution.

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