Book Reviews

Surfactant Systems. Their Chemistry, Pharmacy and Biology. By D. Attwood and A. T. Florence. Chapman and Hall, New York. 1983. x + 794 pp. 16.5 × 24 cm. ISBN 0-412-14840-4. $99.00.

This book represents a completely revised and much expanded version of the original text—"Solubilization by Surface-Active Agents" by P. H. Elworthy and C. B. Macfarlane. Only a little of the original text has been incorporated into this present text, which has been much extended to include surface activity, emulsions and suspensions, the toxicology of surface-active agents, and the use of surfactant formulations in agriculture and horticulture. Also, a greater emphasis on quantitative aspects has been applied to the treatment of some subjects than was attempted in the original text.

Generally, the text covers not only the physicochemical properties of surfactants and their applications in chemical, pharmaceutical, and biological systems but also deals with the biological consequences of using surfactants in pharmaceutical formulations.

The book is divided into 11 chapters. Chapters 1–5 deal with aspects of the physical chemistry of surfactants in pharmaceutical formulations. The surface activity of compounds, their absorption at solid and liquid interfaces, and their wetting properties are reviewed (Chapter 1). Sections on phase behavior (Chapter 2), micellization and the properties of micelles (Chapter 3), and the surface activity and colloidal properties of drugs (Chapter 4) are included. A chapter on solubilization (Chapter 5) is worthy of mention and will be of special value to researchers in this area, since it represents a comprehensive review that includes descriptions of experimental methodologies currently available for studying this phenomenon. A useful section on the pharmaceutical aspects of solubilization (Chapter 6) will be of interest to industrial pharmacists, pharmaceutical scientists, and graduate students specializing in pharmaceutics.

Chapter 7 deals with the biological implications of surfactant presence in formulation and discusses the effect of surfactants on the dissolution of drugs, on membrane permeability, on drug absorption, and on formulation systems. Chapters 8 and 9 are devoted to a discussion of the application of surfactants in the solubilization of biologically active molecules.

Chapter 10 discusses the toxicity of surfactants; the metabolism and toxicology of surfactants and their interaction with cell membranes are covered.

The last chapter deals with reactivity in surfactant systems and covers the chemistry and catalysis of micellar reactions. Useful sections on the stability of surfactant systems, the stability of drugs in surfactant systems, and the polymerization of surface-active molecules are also included.

The text incorporates an excellent set of bibliographies listed at the end of each chapter. The referencing is extensive and up-to-date and will be most useful for review and research purposes. A subject index is provided. However, there is no author-cited index, which would have been helpful. The book is adequately bound.

This book is generally well written and, considering its size, is relatively error-free. Although the text does not deal with some topics in the same detail as it does with others, it succeeds in bringing to the reader's attention those aspects of surfactant systems that are most relevant in the formulation and use of surfactants in pharmacy and the pharmaceutical industry. In this respect, it fulfills an urgent need in a topic that has seen tremendous growth in the last decade. In this reviewer's opinion, this book should belong on the shelf of all pharmaceutical scientists, chemists, biochemists, and biologists who are involve in surfactant research. The text will undoubtedly be of interest also to graduate and perhaps final year pharmacy students who are specializing in pharmaceutics or pharmaceutical technology. At $99.00 this book is a good value. However, at this price, it is unlikely to become a text for general student usage.

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Hallucinogens: Neurochemical, Behavioral, and Clinical Perspectives. Editor Barry L. Jacobs. Raven Press, New York. 1984. xiii + 233 pp. 17 × 24 cm. ISBN 0-89004-990-4. $49.50.

The jacket cover of this book states..."This timely survey of current research on hallucinogenic drugs places particular emphasis on their mechanisms of action". The volume lives up to this statement, although most of the references are 1982 and before. The coordination between the authors and the editors has resulted in a cohesive treatment of a multiauthored, multidisciplined subject and should be emulated.

The various sections of the book, introduction, behavioral pharmacology, neurochemistry, neurophysiology, and synthesis, will appeal to readers depending on their individual interests. In the first chapter a definition of the term "hallucinogens" is presented with a convincing argument for its preferred use over other terms. The presentation of a chronological bibliography on hallucinogens is outstanding. The second chapter on the effect in humans is indispensible for any mechanistic explanation of effects. The chapters dealing with animal effects are interesting but bewildering to this chemist.

The neurochemistry section contains chapters on structure–activity relationships and neurochemical correlates. The SAR chapter is solid medicinal chemistry, dear to the heart of every reader of this journal. The complexity of establishing the mechanism of action is documented in the neurochemical correlates chapter.

The neurophysiology chapters discuss effects at serotonergic neurons and pre- and postsynaptic actions of hallucinogens and the accompanying hypotheses. The synthesis chapter defines the value of hallucinogenic research and lists some questions that should be explored.

The reviewer found the book very readable and particularly appreciated the summaries presented by the authors. The typographical errors were minimal. The book is recommended to anyone with research interest in the area of hallucinogens and drug effects in the brain. It is a first class volume.

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Organic Reactions. Volume 31. William G. Daubin, Editor-in-Chief. Wiley, New York. 1984. vii + 376 pp. 16 × 23.5 cm. ISBN 0-471-88671-8. $44.50.

The volumes of "Organic Reactions" consist of one or more chapters each devoted to a single reaction, or a definite phase of a reaction, of wide application. Volume 31 contains, in addition to an author index and a chapter and topic index for Volumes 1–31, only one chapter: "Addition and Substitution Reactions of Nitrile-Stabilized Carbanions" by S. Arseniyadis, K. S. Kyler, and D. S. Watt.

This chapter focuses on the reactions of nitrile-stabilized carbanions with an array of carbon nucleophiles and updates a chapter ("The Alkylation of Esters and Nitriles" by A. C. Cope, H. L. Holmes and H. O. House) that appeared in Vol. 9 of this series. Notably absent from the survey are carbanions derived from active methylene compounds bearing two electron-withdrawing groups and carbanions obtained from Reissert compounds. Following a discussion of mechanism and other general considerations, the scope and limitations of the reactions are discussed. These discussions are divided, for convenience, into

six sections on the basis of the type of nitrile carbanions involved. An ample number of experimental procedures are given to illustrate the range of bases and electrophiles that react successfully with various nitrile stabilized carbanions. Thirty-four tables are included to survey the reactions and 927 references are included with a significant number from 1980 or later.

This chapter/volume should serve as a valuable source book for anyone considering carrying out an example of these synthetically important reactions.

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Glutamine, Glutamate, and GABA in the Central Nervous System. Neurology and Neurobiology. Volume 7. Edited by Leif Hertz, Elling Kvamme, Edith G. McGeer, and Arne Schousboe. Alan R. Liss, New York. 1983. xiv + 705 pp. 16 × 23.5 cm. ISBN 0-8451-2706-3. $86.

This book contains the proceedings of a satellite symposium of the 9th Meeting of the International Society for Neurochemistry on the metabolic relationship between glutamine, glutamate, and GABA in the central nervous system held in Saskatoon, Saskatchewan, Canada, July 17–20, 1983.

It aims to present a multidisciplinary approach to the functions and interactions of these compounds. However, the generalized title of the book is a misnomer since it heavily concentrates on metabolism, regulatory processes, and transport mechanisms. It would have been helpful to potential readers if the title had reflected this.

The book is well organized and contains a good contents section, list of contributors, and a comprehensive index system. One omission is the lack of a summary by the organizers, which many readers may have found useful.

It is divided into three sections with the first describing the key enzymes of glutamine, glutamate, and GABA pathways. Chapters in this section include studies of glutaminase (Kvamme), glutamate decarboxylase (Tapia), GABA transaminase (Gale; White et al.,), and glutamine synthetase (Norenberg). McGeer and colleagues provide a useful overview for this section.

The second section describes the metabolism of glutamine, glutamate, and GABA at the cellular and subcellular level. This section includes descriptions of glutamate metabolism and release (Fonnum and Engelsen; Bradford and colleagues) and the GABA uptake system (Redburn and colleagues).

The last section, and by far the most impressive, concentrates on the physiology and pathology of glutamate and GABA. Notable contributors include Szerb (GABA release) and Roberts and Butcher (Pharmacology of glutamate receptors) and an excellent chapter by Krogsgaard-Larsen on GABA agonists.

The lack of space devoted to pharmacology and electrophysiology in the text is regrettable, since this would make the book appealing to a wider audience. However, it is clear that the book does reflect the content of the meeting.

The book is thus a good source of information for those interested in the metabolic aspects of these amino acids, though as is often the case with published proceedings, much of the content will have been reported elsewhere. The volume will become a useful reference source in medical libraries, though the price is excessive for the individual.

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The Retinoids. Volumes 1 and 2. Edited by Michael B. Sporn, Anita B. Roberts, and DeWitt S. Goodman. Academic Press, New York. 1984. Volume 1: xiii + 424 pp. 15.5 × 23.5 cm. ISBN 0-12-658101-0. $46.00. Volume 2: xiii + 446 pp. 15.5 × 23.5 cm. ISBN 0-12-658102-9. $48.00

These two volumes present a thorough overview of both the current and historically relevant research on retinoid chemistry and biology. The chapters are authored by scientists who have made significant contributions to retinoid research and, therefore, are able to write knowledgably about their fields of expertise in this readable, well-organized treatise. "The Retinoids" would be an invaluable reference work for research workers in the field and, in addition, because of its clarity of presentation, would be just as useful to others desiring general information.

The introductory chapter of the first volume explains the organization and purpose of the text. The second chapter by F. Frickel reviews the synthetic methodology used to prepare both the natural and synthetic retinoids. The third chapter by the late H. H. Kaegi outlines the synthesis of radioisotopically labeled retinoids. Also of interest to the reader may be the techniques presented for handling these compounds, many of which are very labile. In Chapter 4, C. A. Frolik and J. A. Olson describe methods used for the extraction of retinoids from biological samples, retinoid separation techniques, including high-performance liquid chromatography, and methods of chemical analysis. The fifth chapter by M. B. Sporn and A. B. Roberts covers the in vitro cell-free and cell and organ culture methods and the in vivo assays used to assess retinoid activity. The advantages and disadvantages of each method are given, along with the relevance that each method has in determining retinoid structure–activity relationships. The first volume concludes with a chapter by B. A. Underwood on the nutritional effects of vitamin A, including the differences in metabolism that occur in normal and disease states and problems that arise from deficiency and overdose of this vitamin.

The second volume begins with the seventh chapter by D. S. Goodman and W. S. Blaner, who discuss the biosynthesis of retinol from carotene, the intestinal absorption of retinol, and its metabolism in the liver. This chapter is followed by another by D. S. Goodman on the transport of retinol in the plasma by plasma retinol-binding protein, the biosynthesis and metabolism of this protein, and its association with transthyretin. A review of the cellular retinoid-binding proteins for retinol and retinoic acid is found in Chapter 9 by F. Chytil and D. E. Ong. The 10th chapter by C. D. B. Bridges describes the interaction of the retinols with the protein pigments rhodopsin and bacteriorhodopsin that are involved in the visual process of vertebrates and invertebrates and in the purple membrane of halobacteria, respectively. The metabolism of natural and synthetic retinoids is presented in Chapter 11 by C. A. Frolik. In the 12th chapter, A. B. Roberts and M. B. Sporn discuss the mechanism of action of retinoids in cell biology and biochemistry. The effects that retinoids have on the processes of cell differentiation and proliferation, enzyme activation and synthesis, and glycoprotein, glycolipid, and proteoglycan biosynthesis are included. In Chapter 13, J. J. Kamm, K. O. Ashenfelter, and C. W. Ehmann have reviewed the preclinical and clinical toxicology of some natural retinoids and some synthetic retinoids that have been used in the treatment of dermatological disorders. In Chapter 14, R. C. Moon and L. M. Itri have presented the results of their own studies and those of others on the ability of retinoids to prevent or inhibit the formation of cancer in animals and humans. In Chapter 15, G. Dennert has reviewed the effects that retinoids have on the immune system. The last chapter by G. L. Peck describes the treatment of such diseases as cystic acne, psoriasis, disorders of keratinization, and skin cancer with synthetic retinoids.

The subjects of these 16 chapters have been thoroughly researched. Each chapter is followed by an extensive list of references. At the end of each volume are an appendix listing the names and structures of the retinoids that are referred to in the text by code numbers and an index.

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ACS Symposium Series. No. 251. Conformationally Directed Drug Design. Peptides and Nucleic Acids as Templates or Targets. Edited by Julius A. Vida and Maxwell Gordon. American Chemical Society, Washington, DC, 1984. ix + 271 pp. 15.5 × 23.5 cm. ISBN 0-8412-036-0. $45.95.

This book is based on a symposium sponsored by the Division of Medicinal Chemistry at the 186th National Meeting of the

American Chemical Society in Washington, DC, August 28–September 2, 1984. It is the 251st of these books since this series was initiated in 1974 with the objective of publishing recent research as expeditiously as possible. The book is quite timely. It places emphasis on the new era of drug design where major focus is directed on effector molecules—and even more strikingly receptor sites—rather than the study of series of compounds in whole animals or isolated organ systems. In this volume 11 chapters are presented by experts in the modern methods used to design potential new drugs. As indicated by the title, major attention is aimed toward our understanding of proteinaceous and nucleic acid receptor sites and enzymes as a rational approach in the derivation of new therapeutic agents. Modern new methodologies in immunology, molecular biology, computer modeling, and recombinant techniques have already enabled the elucidation of the three-dimensional structure of some receptors and enzymes, and have enabled identification of probable binding sites. Although this reviewer is not aware of the development of major drug products via this process to date, some successes have been realized and it is logical to anticipate additional successes in the future. This process will likely be aided by continuing advances in critical technologies. Ultimately, it should be possible to design new drugs in a truly rational fashion despite the reasonable expectation that Mother Nature will, as usual, present some unexpected obstacles.

In Chapter 1 on "Virus–Receptor Interactions" protein–protein interactions of reovirus hemagglutinin with cell receptors are described. Chapter 2 is particularly informative. In it some conformational and dynamic considerations in the "Design of Peptide Superagonists and Antagonists" are presented. Special attention is given to the rational design of conformationally restricted peptide analogues and several successful endeavors are described. Chapter 3 deals with "Localization and Synthesis of Protein Antigenic Sites". In this chapter M. Zouhair Atassi describes more than a decade of his research that has resulted in the identification and synthesis of fragments of the antigenic sites of myoglobin, lysozyme, and human hemoglobin. These studies chart chemical strategies for study and synthetic duplication of protein binding sites. Chapter 4 "Studies of New Microbial Secondary Metabolites with Potential Usefulness" is written by one of the foremost scientists in the present era of medicinal and organic chemistry, Hamao Umezawa. Although his approach to drug discovery is not as precisely rational as that described in some of the other chapters, it is delightful to review the meaningful achievements of nearly four decades of successful research directed toward antibacterial and antitumor agents. In Chapter 5 "Conformation of Nucleic Acids and Their Interactions with Drugs", Andrew H.-J. Wang, the discoverer of a left-handed double helical form of DNA, describes the application of single-crystal X-ray analysis to the definition of the structure of nucleic acid fragments and the daunomycin–nucleic acid complex. "Substrate Analog Inhibitors of Highly Specific Proteases" is the subject of Chapter 6. Here, the rational development of specific inhibitors for renin, kallikrein, and IgA_1 protease is used to demonstrate application of the substrate analogue approach to the design of new drugs. Chapter 7 "Structure–Behavioral Relationship of Peptides Derived from ACTH" and Chapter 8 "Design of Novel Cyclic Hexapeptide Somatostatin Analogs from a Model of the Bioactive Conformation" describe new approaches, particularly utilizing conformational information, to ACTH and somatostatin analogues. Conformational and mechanistic considerations in the rational design of inhibitors of kinase and aspartyl protease enzymes are described in Chapter 9 "Design of Kinase Inhibitors" and Chapter 10 "Design and Discovery of Aspartyl Protease Inhibitors". Finally, Chapter 11 deals with theoretical simulation of conformation, energetics, and dynamics in "Design of Peptide Analogs". Certainly this is very important for conveying information about the structure and binding sites of receptors and enzymes to facilitate the development of new drugs. Commendable as this is, some applications deriving from the resulting knowledge about proteinaceous or nucleic acid receptors and enzymes to the derivation of non-protein, non-nucleic acid modulators would be most welcome.

This volume of the ACS Symposium Series, as usual, has been printed from "camera-ready" paper, which hinders uniformity of print and editorial style, but it achieves the objective of expeditious publication. The book contains author and subject indexes. Overall, I consider that this up-to-date book offers a peek into the future of medicinal chemical research. For this reason, I recommend it for reading not only by medicinal chemists but also by scientists of the many other disciplines concerned with the drug discovery process.

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The Target of Penicillin. The Murein Sacculus of Bacterial Cell Walls, Architecture and Growth. Edited by R. Hakenbeck, J.-V. Holtje, and H. Labischinski. Walter de Gruyter, Berlin and New York. 1983. XXVIII + 664 pp. 17.5 × 23.5 cm. ISBN 3-11-009805-2. $81.80.

This book is a collection of short papers based upon the oral and poster presentations at the International Symposium on the Murein Sacculus of Bacterial Cell Walls (March 13–18, 1983 in West Berlin). The aim of the symposium was to provide an international forum for discussion and statement of the current status of knowledge of the bacterial cell wall. The organizers of the symposium and editors of the book are to be congratulated in successfully assembling as complete an array of contributors as possible.

The introduction was written by M. R. J. Salton, who in his usual graceful and inimitable style, touches upon both the major events that have shaped cell wall research and the more pertinent new areas of inquiry. The main portion of the book is divided into six sections, each of which begins with a general or review paper followed by 7–28 papers of more limited scope. In the first section, "Primary and Three Dimensional Structure of Murein", the major focus after a complete review of primary structure is on the application of advanced physicochemical techniques, such as HPLC, NMR, FTIS, and Raman spectroscopy, to the study of murein structure. "Models For the Growth of the Murein Sacculus" is the shortest section but is well covered by the current major contributors in this area. The next section, "Function of Murein Hydrolases and Control of Murein Degradation" varies from a rethinking of old concepts in the light of some new data to updates of ongoing research to reports on some very novel approaches and findings in the action of lytic enzymes on bacterial peptidoglycan. "Biological Properties and Medical Aspects of Murein" is probably the one section that is not completely representative of the current state of knowledge in the area. Most of the contributions are of high quality, but the scope is simply limited to less than what is available on this subject. The largest section, "Structure and Function of Penicillin-Binding Proteins" contains 29 contributions which cover purification, characterization, sequencing, expression, topology, modifications, functions, and mutation analysis of penicillin-binding proteins. The last section "Biosynthesis of Murein" contains papers on regulation, site of action of some antibiotics, turnover, relationship with membrane biosynthesis, and enzymology of specific synthetic steps. The text is very well indexed with both author and subject indices. The subject index is comprehensive and well organized into major headings and subheadings as well as specific terms or phrases.

Overall, the chapters are of high quality in both thought and composition. There are a few instances of superficial treatment of some rather complex concepts. However, the editors have chosen, as stated in the preface, to allow "the reader to interpret the papers and draw his own conclusions". In some areas, an overview or an indication of the consensus view in the form of a summary of comment section would have been helpful for the general reader. As it stands, this collection requires some prior intimacy with the subject matter for complete integration of each presentation into an overall conception of cell wall synthesis, structure, and function. None the less, it does provide a comprehensive review of many recent advances in cell wall research and the continuing role that β-lactam antibiotics play in understanding cell wall biosynthesis and structure.

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Fundamentals of Nuclear Pharmacy. Second Edition. By Gopal B. Saha. Springer-Verlag, New York. 1984. xxi + 287 pp. 16 × 24 cm. ISBN 0-387-90882-X. $29.50.

This book is an outgrowth of Dr. Saha's courses in nuclear pharmacy at the University of Arkansas. The author is an internationally known authority with broad experience in the field of nuclear pharmacy. The subject is presented in an integrated manner from fundamental atomic structure to coverage of currently used radiopharmaceuticals, with emphasis on the more practical aspects.

The book is divided into 12 chapters: 1, The atom; 2, Radioactive decay; 3, Production of radionuclides; 4, Radionuclide generators; 5, Radiopharmaceuticals and instruments; 6, Radiolabeling of compounds; 7, Characteristics of specific radiopharmaceuticals; 8, Quality control of radiopharmaceuticals; 9, Nuclear pharmacy; 10, Radiation dosimetry, protection and regulations; 11, *In vitro* and *in vivo* nonimaging tests; and 12, Uses of radiopharmaceuticals in nuclear medicine.

There are six appendices which include abbreviations used in the text, a glossary of terminology, universal units and constants, decay factors of ^{99m}Tc and ^{131}I, and answers to selected questions in the text.

The most significant additions to the first edition include the following: descriptions of new labeling methods; production of short-lived radionuclides; a section on γ-ray detecting equipment; exclusive use of System Internationale (SI) units; updated information on ^{99m}Tc complexes; topics such as adverse reactions and iatrogenic alterations in the biodistribution of radiopharmaceuticals, lymphoscintigraphy, inflammatory diseases, gastric emptying, and gastrointestinal disorders; new radiation regulations; and additional review questions at the end of several chapters.

The author has presented an immense amount of information on nuclear pharmacy in a concise and easily understood textbook written in a coherent and easily readible and understandable manner. The material is clearly explained and many of the chapters are reinforced with examples and solutions to typical problems. The abundant figures and tables included are effectively used, and a timely and appropriate list of references is given at the end of each chapter. The book also contains an apparently complete subject index which readers should find helpful.

Overall, this reviewer was favorably impressed by the book and recommends it to those who are engaged in the arenas of study, research, or practice of nuclear pharmacy or nuclear medicine. It should be included in all medical and pharmacy libraries.

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Molecular Immunology. A Textbook. Edited by M. Z. Atassi, C. J. Van Oss, and D. R. Absolom. Marcel Dekker, 1984. 18 × 26 cm. x + 725 pp. $47.50.

This text contains 32 well written chapters that present current relevant topics in molecular immunology. Each chapter is written by experts in fields who stress key information without overwhelming the reader with excessive and detailed experimentation. The first six chapters deal with antigens by first introducing the concepts of immunogenicity and antigenicity followed by a specific discussion on protein, polysaccharide and blood group antigens, tissue specific and tumor antigens, bacterial and viral antigens. Great emphasis is placed on molecular structure in immune responses.

Following these chapters, the next series contains clear and concise discussions of immunoglobulins. Included is an initial discussion on the structure and function of immunoglobulins followed by a review of monoclonal antibodies, B2 microglobulin, allotypes, methods for immunoglobulin isolation and characterization and immunoglobulin diversity. The remaining chapters deal with a series of diverse topics that although relevant to molecular immunology exist as separate entities. For example, one chapter contains a thorough discussion of lectins. Other chapters include types and characteristics of antigen–antibody interactions, assay methods for the detection of antigen, a chapter on complement, cell interactions, the major histocompatibility complex, cell receptors, and a final chapter on methods of cell separation.

The text, overall, is reflective of molecular immunology and would be very useful for those interested in the topic. The book as written is suitable to both upper level undergraduates with adequate background in general biology and biochemistry and to graduate students. Since the text contains information essential for an understanding of each topic, it could also be easily supplemented with current journal articles. Another attractive aspect of this text is that the authors continually introduce important historical references which serve as important links to current information. The book is also well-balanced in that there is little excess duplication in the various chapters as is sometimes true in multiauthored texts. The cellular aspects of immunity are as one would expect in a book such as this, given only minimal coverage. As a result this book would serve as a very appropriate complement to a text in cellular immunity.

In summary, this text is well-written and well-edited and is highly recommended for course adoption, for review and for reference.

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Dynamics of Neurotransmitter Function. Edited by Israel Hanin. Raven Press, New York. 1984. xxv + 396 pp. 16 × 24 cm. ISBN 0-89004-8320. $65.00.

The subtitle of this volume explains its purpose: "a tribute to E. Costa by his present and past colleagues, collaborators, and students". The book contains a series of short articles (5–15 pages in length) that issued from a Festshrift held in 1981 in honor of Dr. Erminio Costa. This event marked the 15th anniversary of the founding of the laboratory of Preclinical Pharmacology at the National Institute of Mental Health, which Dr. Costa has directed since its inception. The principal authors of the chapters were affiliated with the laboratory at some time in their training and it is a tribute to Dr. Costa that a dozen countries are represented by his former trainees. Aside from the geographic breadth, the book covers an extensive range of topics which represent extensions of the issues explored in this very productive and creative laboratory. These topics include the catecholaminergic, cholinergic, peptidergic, and GABAergic neutrotransmitter systems as well as neurotransmitter receptors and associated cyclic nucleotide mediated responses. In all these areas, Dr. Costa and his colleagues have made seminal contributions.

An overarching theme in the research, as indicated by the title, are the dynamics of neurotransmitter action with a particular emphasis on fundamental biochemical processes. In this area of research, most investigators have approached synaptic neurochemistry at a static level, simply quantifying the levels of the various parameters of interest. Historically, Costa and his colleagues were among the first to examine the dynamic aspects of neurotransmitter action in the brain and in the periphery by analyzing the effects of physiologic and pharmacologic perturbations on the turnover of neurotransmitters. As the field moved forward, this focus on dynamics was extended to receptor–transducer interactions and receptor modulation, especially with regard to the β receptor–adenylate cyclase system. Most recently, as peptides have assumed increasing prominence as CNS neurotransmitters, he and his colleagues have addressed the dynamics of peptide processing, especially with regard to the enkephalin systems. As evidenced by this book, Dr. Costa has played a dominant role in conceptual and technical approaches to understanding synaptic neurochemistry at a functional level. In the process, he has trained numerous young investigators from many countries, who have gone on to establish their own research programs in this important and rapidly expanding area of investigation.

The nature of this book as a publication derived from a Festschrift raises the question whether it is of broad interest to

the research community. The book does not focus on a particular theme but rather the research that has evolved out of a major laboratory of synaptic neurochemistry. The brevity of the chapters and their highly focused nature limit the readership to those who have a reasonable level of expertise in synaptic neurochemistry. Nevertheless, several of the chapters provide a delightful historical perspective that tracks the evolution of ideas and technology that have grown in this fertile laboratory. For this reason, I feel that the book could be a valued addition to the personal and departmental libraries of those with particular interest in synaptic neurochemistry.

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Metal Ions in Biological Systems. Volume 17. Calcium and its Role in Biology. Edited by Helmut Sigel with the assistance of Astrid Sigel. Marcel Dekker, New York and Basel. 1984. xxiii + 532 pp. 16 × 23.5 cm. ISBN 0-8247-7172-9. $85.00.

Volume 17, dedicated to calcium ion, "the fifth most abundant element in the body", is one of a series of volumes intended to link "coordination chemistry and biochemistry in their widest sense...reflecting the growing field of bioinorganic chemistry..." and "...break down the barriers between the historically separate spheres of chemistry, biochemistry, biology, medicine, and physics..." in expectation that "outstanding discoveries will be made in the interdisciplinary areas of science". Chapters are (1) Bioinorganic Chemistry of Calcium (R. B. Martin), (2) Crystal Structure Studies of Calcium Complexes and Implications for Biological Systems (H. Einspahr and C. E. Bugg), (3) Intestinal and Renal Absorption of Calcium (P. Gmaj and H. Murer), (4) Calcium Transport Across Biological Membranes (E. Carafoli, G. Inesi, B. P. Rosen), (5) Physiological Aspects of Mitochondrial Calcium Transport (G. Fiskum), (6) Mode of Action of the Regulatory Protein Calmodulin (J. A. Cox, M. Comte, A. Malnoë, D. Burger, and E. A. Stein), (7) Calcium and Brain Proteins (S. Alemà), (8) The Roles of Ca^{2+} in the Regulation and Mechanism of Exocytosis (C. E. Creutz), (9) Calcium Function in Blood Coagulation (G. L. Nelsestuen), (10) The role of Calcium in the Regulation of the Skeletal Muscle Contraction–Relaxation Cycle (H. G. Zot and J. D. Potter), and (11) Calcification of Vertebrate Hard Tissue (R. E. Wuthier).

This work summarizes a wealth of information and is recommended reading for both chemists and biologists. Details of Ca^{2+}–macromolecule, –small molecule, and –metal ion interactions are presented and the significance, cellular mechanisms, and chains of events related to these interactions are discussed in considerable detail. Properties of Ca^{2+} proteins and enzymes receive considerable attention as do their interaction with cellular substructures. Chapters are uniformly well written and referenced into 1982 and occasionally 1983. Author and subject indices are provided. Clearly, Vol. 17 satisfies the criteria set forth by the editor for this series.

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Cyclic Nucleotide Phosphodiesterases. Advances in Cyclic Nucleotide and Protein Phosphorylation Research. Vol. 16. Edited by S. J. Strada and W. J. Thompson. Raven Press, New York. 1984. xviii + 442 pp. 16 × 24 cm. ISBN 0-89004-779-0. $49.00.

This volume of the series (formerly "Advances in Cyclic Nucleotide Research") focuses on the only enzyme system known to be responsible for degradation of cyclic nucleotides. The scope of the book is comprehensive and includes nomenclature, biochemistry, enzymology, regulation, and some mention of clinical relevance. Chapters are essentially divided by the preliminary recommendations the authors offer for nomenclature: type I, calmodulin-sensitive cyclic nucleotide phosphodiesterase; type II, cGMP-sensitive cyclic nucleotide phosphodiesterase; type III, rhodopsin-sensitive cyclic GMP phosphodiesterase; and type IV, cyclic AMP phosphodiesterase. This new classification is based on substrate preference and regulatory properties rather than any single physical criterion or separation methodology. Phosphodiesterases serve as a useful biochemical probe to explore the action of calmodulin and significant attention is directed to this topic in the book. Other topics of discussion include purification and properties of cyclic AMP and cyclic GMP phosphodiesterases, structure–activity studies, immunological characterizations, regulation of these enzymes by hormones such as insulin, the effects of drugs and nucleotides on phosphodiesterase activities, and how phosphodiesterase properties are altered in diseases such as cancer and diabetes. The volume is divided into 30 chapters by 119 contributing authors and includes 27 abstracts presented at the conference on which this volume is based; unfortunately, the site, date, and sponsor of the conference are not listed anywhere in the book. This volume on phosphodiesterase research is broad in scope and represents the first comprehensive, single source reference on the topic. While the book is of primary interest to pharmacologists, biochemists, and physiologists, it will be helpful to industrial researchers interested in exploring this enzyme system for potential pharmacological interventions.

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Annual Review of Pharmacology and Toxicology. Edited by Robert George, Ronald Olain, and Arthur K. Cho. Annual Reviews Inc., Palo Alto, CA, 1984. VII + 556 pp. 15.5 × 22.5 cm. ISBN 0-8243-0424-1. $27.00.

As usual, this volume provides wide-ranging coverage of current progress in many fields. Mechanisms of action are emphasized in chapters on antiarrhythmic drugs, positive inotropic agents, teratogenesis, and the toxicity of vanadium. The reviews dealing with muscarinic coupling and with the effects of drugs on membrane fluidity show that, in spite of intensive investigation of drug-induced physical and biochemical changes in membranes, we are still far from understanding the role of these changes in pharmacological responses.

There is a useful summary of the application of osmotic pumps for the rate-controlled delivery of drugs and hormones. Interesting modifications include pulsatile administration to mimic circadian rhythms.

Pharmacokinetic modeling continues to undertake ever more challenging problems, such as the metabolism of PCBs. These environmental poisons can exist in as many as 209 different congeners, depending on the positions and extent of chlorination of the biphenyl nucleus. Obviously, only a few of them have been studied in any detail, yet the proposed model does allow extrapolation between different species.

Cyanide poisoning and its treatment would seem to be a subject that yields few surprises, yet the chapter on this topic points out interesting discrepancies that merit further study.

An intriguing review summarizes the pharmacology and toxicology of gossypol, a potential antifertility agent for males. Much of the information presented here, especially experience with 8800 human volunteers in China, is new to Western readers. There are many interesting side effects, such as hypokalemia due to the inhibition of Na-K-ATPase, that merit further investigation.

Connoisseurs of the esoteric may be attracted by Mandell's chapter on the regulatory properties of tyrosine hydroxylase and tryptophan hydroxylase. He attempts to use statistical dynamics to explain spontaneous oscillations in the activity of these enzymes with time. What seems to be missing is a clear sense of which experimental results could be predicted by the multifaceted hypotheses presented here.

The average busy reader will find it worthwhile to peruse this volume—at least several chapters should provide interesting ideas to chew on.

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Introduction to the Principles of Drug Design. Edited by John Smith and Hywel Williams. John Wright & Sons Ltd., Bristol. 1983. ix + 295 pp. 15.5 × 23.5 cm. ISBN 0-7236-0672-2. $19.50.

This is a book put together by the faculty members of the Welsh School of Pharmacy of University of Wales Institute of Science and Technology in Cardiff (Wales). Its modest and misleading title is to predetermine the potential reader—someone with little or no knowledge of medicinal chemistry.

The design of the book is perhaps as complicated as the design of drugs themselves. The book has been divided into: nine chapters, 54 A-level subheads, 157 B-level subheads and those also divided into 84 C-level subheads. And all that on 295 pages.

To borrow a phrase from Thomas Mann, the authors planned to engage in an anticipatory form of education, where the reader is informed about the subjects he/she should learn elsewhere, instead of providing actual information. Attached at the end of each chapter lists of "further reading" could help in that form of education were they not short and haphazardly assembled. Thus, the intent of the authors to satisfy..."a need to appreciate the rationales behind the design of drugs" falls short of target.

Instead we get a book that, in its first two chapters, provides basic information on the processes of drug handling by the body and formulation–availability relationships. The forces involved in binding of a small molecule (drug) to a macromolecule (receptor or active site) and some aspects of optical isomerism are mentioned in Chapter 3 and illustrated with examples like opiate analgesics or antimuscarinics. Reversible and irreversible enzyme inhibitors, metal complexes in drug action, and cancer chemotherapy occupy over one-third of this lean book. At the same time the question of QSAR use in drug design barely deserves 25 pages. Poor Corwin Hansch (one of a very few names mentioned in the book) not only has his first name misspelled, the authors dismiss his and Free-Wilson analysis as "lead-optimizing techniques". They also conveniently forget to even mention conformational analysis and related computational methods.

A reader with medicinal chemistry background will find the title of the book misleading since it hardly addresses the principles of drug design. The book itself might serve as a refresher recalling some of the aspects of medicinal chemistry forgotten in overspecialization. The intended reader, a person with little or not knowledge of medicinal chemistry, will be left in wonder.

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Neurology and Neurobiology. Volume 8a. Catecholamines. Part A: Basic and Peripheral Methanisms. Edited by Earl Usdin, Arvid Carlsson, Annica Dahlstrom, and Jorgen Engel. Alan R. Liss, Inc., New York. 1984. xxix + 415 pp. 18 × 26 cm. ISBN 0-8451-2707-1. $120.00.

This volume presents the plenary and symposia talks of the 5th International Catecholamine Symposium, held in Goteborg, Sweden, June 12–16, 1983. In addition, the chairmen of voluntary paper sessions were given the option of summarizing some of the more interesting items in their sessions. The manuscripts are not arranged as they were at the meeting but rather in what the authors felt were the most logical arrangement. In turn, the papers are grouped into three volumes (available separately or as a set): A. Basic and Peripheral Mechanisms; B. Neuropharmacology and Central Nervous System—Theoretical Aspects; C. Neuropharmacology and Central Nervous System—Therapeutic Aspects. There are certain redundancies: complete Table of Contents and Index are included in each volume, as are Abbreviations.

Catecholamines, Part A: Basic and Peripheral Mechanisms focuses on the storage, release, and uptake of catecholamine mechanisms, along with release and metabolism catecholamine synthesis, receptors, and cardiovascular regulation.

Topics of interest include neurotransmitter plasticity during the development of sympathetic neurons, the roles of large and small noradrenergic vesicles in exocytosis, catecholamine surge at birth in the human infant, and a summary of catecholamine degrading enzymes.

Also included in Basic and Peripheral Mechanisms are the following: plasma catecholamines as markers for sympathoadrenal activity in man; similar gene coding regions for catecholamine biosynthetic enzymes; possible existence of ancestral precursor gene; isolation and characterization of dopamine receptor protein; sympathetic neurotransmitter activity and congestive heart failure; role of peripheral dopamine inessential hypertension; summary of plasma catecholamine measurements in stress and hypertension.

This volume will be of interest to pharmacologists, psychiatrists, neurologists, physiologists, histologists, and neurobiologists.

Staff

Books of Interest

Organic Functional Group Preparations. Volume I. Second Edition. Organic Chemistry. A Series of Monographs. Volume 12-I. Edited by Stanley R. Sandler and Wolf Karo. Academic Press, Orlando, 1983. ixv + 657 pp. 16 × 23.5 cm. ISBN 0-12-618560-3. $75.00.