

Book Reviews

Synthesis and Applications of Isotopically Labelled Compounds 1994. Proceedings of the Fifth International Symposium, Strasbourg France, 20–24 June, 1994. Edited by J. Allen and R. Voges. John Wiley & Sons, New York. 1995. xxix + 935 pp. 15.5 × 23.5 cm. ISBN 0-471-95143-9. \$199.95.

This elegant volume chronicles the fifth meeting of its kind and the second at a European location. Attended by over 500 scientists from 25 countries covering an increasing range of topics in isotope research, the symposium was outstanding with regard to the caliber of participation. The book contains 101 papers starting with the three excellent plenary lectures by R. Voges, D. W. Young, and T. A. Baillie and the Banquet Address by M. Schwartz and continues through the many sessions that comprised the four day meeting in picturesque Strasbourg. Included in the varied topics are papers for the sessions: Stereoselective Procedures in the Synthesis of Enantiomerically Pure Isotopically Labelled Compounds; Synthesis, Analysis and Applications of Organic Compounds Labelled With Isotopes of Hydrogen; Present Status and New Developments in the Analysis of Labelled Compounds; Application of Isotopes in Pharmacology, Medicine and Clinical Research and Synthesis, Analysis and Applications of Organic Compounds Labelled With Isotopes of Carbon. Of useful historical note, too, is the inclusion of a Preface to the volume along with awards presented at the symposium and biographical information of the awardees. Like preceding volumes, this book also contains a helpful author and subject index.

As I have mentioned in past reviews of this series, with each succeeding volume both the technical presentations and quality of the published proceedings increases. This volume is no exception to that trend and is significantly larger than earlier ones. On a personal note, I had the pleasure of visiting with Dr. Allen in Paris and Dr. Vogel in his Basel laboratory earlier this year as they were just completing the last details of this extensive volume. Clearly their hard and careful work has paid off, and both of them are to be congratulated.

Crist N. Filer

*E. I. DuPont de Nemours & Co.
NEN Products, Boston, Massachusetts 02118*

JM9509049

Oxidative Stress, Lipoproteins and Cardiovascular Dysfunction. Portland Press Research Monograph VII. Edited by C. Rice-Evans and K. R. Bruckdorfer. Portland Press Ltd., London. 1995. xvi + 184 p. 15.5 × 23.5 cm. ISBN 1-85587-045-3. \$96.00.

Awareness of the role of free radicals and antioxidants in disease and health by both the scientific community and the public, in general, has increased dramatically in recent years. This is most apparent in the area of cardiovascular research where great strides have been made in understanding the metabolism of cholesterol,

lipoprotein oxidation, and the role of antioxidants in relation to cardiovascular disease. In this book, leading researchers in free radical biology as applied to cardiovascular disease review developments in this field. The part played by lipoprotein oxidation in atherosclerosis is examined from an experimental viewpoint with appropriate reference to clinical observations. Mechanisms of initiation of atherosclerosis and reperfusion injury are presented and areas for future development in this area of research are considered.

Current understanding of the role of oxidation processes in cardiovascular dysfunction is discussed in terms of their chemistry, biochemistry, and cell biology. The book will therefore be of particular interest to medicinal chemists involved in cardiovascular research. Other scientists and clinicians interested in this exciting area of research will also find this a stimulating and informative up-to-date summary.

Staff

JM9509004

Biochemistry of Redox Reactions. By B. Testa. Academic Press, New York. 1995. xviii + 471 pp. 19.4 × 26.2 cm. ISBN 0-12-685391-6. \$75.00.

This monograph on the biochemistry of redox reactions forms part of a larger series appearing under the title *The Metabolism of Drugs and Other Xenobiotics*, which is edited by Bernard Testa and John Caldwell. Nevertheless, this document stands fully alone in its scope of scientific coverage and represents a truly monumental accomplishment by an individual who already has made so many seminal contributions to the field of medicinal chemistry.

The book starts with a general introduction co-authored with Professor Caldwell and a first chapter (Xenobiotic Metabolism: The Biochemical View) which sets the theme of the pedagogic approach (to offer both *information and knowledge*) and reviews basic concepts of enzyme-catalyzed reactions with an emphasis on xenobiotics. This is followed by a series of chapters, each of which undertakes to provide detailed coverage of redox reactions in terms of molecular functionality and the principal known catalysts. A special feature of Chapter 2 (Dehydrogenation of Alcohols and Aldehydes, Carbonyl Reduction) is the detailed mechanistic information (kinetics, stereochemistry, and enzyme active site structure) available on oxidoreductases that catalyze the redox reaction of carbonyl compounds. Chapter 3 (The Nature and Functioning of Cytochromes P450 and Flavin-Containing Monooxygenases), Chapter 4 (Carbon Oxidations Catalyzed by Cytochromes P450), and Chapter 5 (Monooxygenase-Catalyzed Nitrogen Oxidations) provide excellent and timely reviews of the two most important xenobiotic redox catalysts, the cytochromes P450 and flavin-containing monooxygenases. Protein structures, enzyme multiplicities, substrate selectivities, and the catalytic pathways of the cytochromes P450 are considered in detail in Chapter 3.

Chapter 4 reviews in a systematic fashion the types of cytochrome P450-catalyzed carbon oxidations (sp^3 , sp^2 , and sp), while Chapter 5 treats flavin-containing monooxygenase-catalyzed oxidations of aliphatic and aromatic amines as well as related nitrogen-containing systems such as azaheterocycles, hydrazines, and azo derivatives. The material covered in Chapter 6 (Monooxygenase-Catalyzed N–C Cleavage) and Chapter 7 (Oxidation of Oxygen- and Sulfur-Containing Compounds) builds on the fundamentals introduced earlier and provides, through specific examples, a sound appreciation of the scope and diversity of the N-, O-, and S-dealkylation reactions as well as those direct heteroatom oxidations that lead to various oxides and related systems. Chapter 9 (Oxidations Catalyzed by Various Oxidases and Monooxygenases) and Chapter 10 (Reactions Catalyzed by Peroxidases) treat these complex topics in depth and with special attention to the fundamentals of redox biochemistry and how these fundamentals can be nicely illustrated by specific examples taken from both endogenous and xenobiotic substrates. Chapter 12 (Reductions Catalyzed by Cytochrome P450 and Other Oxidoreductases) reviews the enzyme-catalyzed reductions of carbon-, nitrogen-, and sulfur-containing systems as well as less commonly encountered inorganic and organometallic systems. Finally, Chapter 8 (Oxidative Dehalogenation and Dealkylation of Organometallics), Chapter 11 (Oxidation of Mercury, Silicon, Phosphorus, Arsenic, Selenium and Halogens), Chapter 13 (Various Enzymatic and Non-Enzymatic reactions), and Chapter 14 (Conclusion and Outlook) are special topic chapters to complete the coverage of the various classes of xenobiotic oxidation reactions and to set the stage for the future.

This book is beautifully structured, with the reader always in mind. The chapters are outlined in detail, and the index is thorough. The literature citations (which are extensive!) cover publications through 1993. Both the novice and sophisticated student of xenobiotic metabolism will benefit by careful study of this monograph. Those of us who work in the area of drug metabolism owe Professor Testa a vote of thanks for having brought together in a unified volume the diverse elements that constitute the bioorganic chemistry of metabolic redox reactions.

Neal Castagnoli, Jr.

*Department of Chemistry
Virginia Tech
Blacksburg, Virginia 24061*

JM950846R

The Logic of Chemical Synthesis. By E. J. Corey and Xue-Min Cheng. John Wiley & Sons, Inc., New York. 1995. 436 pp. 18 × 25 cm. ISBN 0-471-11594-0. \$24.95 (pbk).

This is the paperback edition of the now standard and widely read book on organic synthesis by Corey and Cheng originally published in 1989. The usefulness of this book has been in no way diminished with time, and the syntheses presented provide clear examples of the manner in which organic chemists approach the construction of complex molecules. As the original publica-

tion date was several years ago, the references are necessarily not up-to-date.

The approach that is taken in this book is the rational analysis of synthetic problems. The book is divided into three parts: (1) an outline of the concepts of retrosynthetic analysis, (2) a representative collection of total syntheses from the Corey group, and (3) a structural guide to the literature on natural products. Part 1 is a discussion of the now familiar concept of retrosynthesis, and the authors present the basis for this manner of thinking about complex syntheses, including the concepts of transforms and retrons. Part 2 is a detailed, thorough presentation (principally graphical) of many of the significant natural products that have been synthesized by Corey and co-workers over the past 35 years. These are divided into structural classes, including macrocycles, heterocycles, sesquiterpenoids, polycyclic isoprenoids, prostanoids, and leukotrienes. Part 3 is a compilation of significant total syntheses by many other workers over the last 40 years. Particularly useful is that, for a given natural product, literature citations are given for each investigator's work.

This book will be of widespread interest by those interested in the synthesis of complex natural and unnatural products. It can serve as both a reference work and a textbook. At such a bargain price, it should become a dog-eared item on the bookshelves of anyone interested in organic synthesis.

Robert S. Coleman

*Department of Chemistry and Biochemistry
University of South Carolina
Columbia, South Carolina 29208*

JM950845Z

Fundamentals of Enzyme Kinetics. Revised Edition. By Athel Cornish-Bowden. Portland Press, London. 1995. xiii + 343 pp. 17.5 cm × 24.5 cm. ISBN 1-85578-072-0. \$29.00.

This is a first revision of the volume originally published in 1979. Biochemistry, aided by molecular biology, has changed considerably during this time; however, the essentials remain the same. The material presented begins on a fundamental level with a discussion of reaction orders and rate constants (Chapter 1) and proceeds through to the complexities of multi-enzyme kinetics (Chapter 10) and estimations of rate constants (Chapter 12). Enzyme inhibition, multisubstrate reactions, and isotope effects are covered in a comprehensive and understandable fashion along the way. By necessity, most of the material builds upon itself, although single chapters can be read for review or reference once the concepts have been mastered.

The text is well organized and presents the early material in a historical context. This is valuable as it reminds the reader that no scientific insights occur in a vacuum. The many necessary derivations and equations are explained thoroughly and set off from the text leaving ample room for marginal notes. As would be expected from a thorough revision, the literature references have also been extensively updated.

Although this volume focuses on the underlying principles of enzyme kinetics, it is not constrained solely

to the theoretical level. Each chapter includes a problem section, many of which are drawn directly from the literature. Additionally, a section is devoted to examining the existence of artificial enzymes, RNA enzymes, and catalytic antibodies.

The book is a valuable resource for those approaching enzyme kinetics for the first time as well as for those wishing to renew their acquaintance with the subject.

Ariane Marolewski

SmithKline Beecham
709 Swedeland Road
King of Prussia, Pennsylvania 19406

JM9508447

New Perspectives in Drug Design. Edited by P. M. Dean, G. Jolles, and C. G. Newton. Academic Press Inc., San Diego, CA. 1995. xiv + 321 pp. 15.5 × 23.5 cm. ISBN 0-12-208070-x. \$50.00.

This volume contains 14 chapters dealing with various aspects of drug design. It documents the proceedings of a 3-day meeting sponsored by a grant from the Rhône-Poulenc Rorer Foundation and held at Turnberry, Scotland, in April 1994. The presentations were made by invited leading academic researchers and by company staff. General discussions following the lectures are recorded as well.

The conference really had two major, separate themes as reflected in the chapters. The more traditional medicinal chemistry and drug design lectures include two useful, well-documented discussions of peptidomimetic research, one by Hirschmann *et al.* and one by Laoui and co-workers. An excellent presentation on E-selectin recognition and other carbohydrate-related topics is given by Wong. Bartlett *et al.* present an informative treatment of enzyme inhibitors, and Nicolau and Guy authoritatively consider taxol and taxoids.

The second theme is essentially computational and structural. Chapters in this area include a discussion of protein crystallography by Ringe and Petsko, modeling of the adenosine receptor by IJzerman *et al.*, and two very nice summaries of computer-based drug design, one by Kuntz *et al.* and one by Mason *et al.* Highly mathematical, and therefore less accessible to many medicinal chemists, are chapters on combinatoric studies by Dean *et al.*, free energy calculations by Mark *et al.*, conformational analysis by Leach, and chemometrics by Clementi *et al.*

It goes without saying that any conference in medicinal chemistry which does not involve the general industrial medicinal chemistry community will suffer from an incomplete scope—and this one is no exception. Moreover, as might be expected in the proceedings of a conference, some of the discussions are well documented whereas others are not—the nice discussion of protein crystallography in drug design by Ringe and Petsko, for example, contains only 13 references.

The book has an adequate index, but its appearance is marred by a very heavy, smudged typeface used for the section headings on nearly every page, smudgy reproductions of the structural formulae in a number of chapters, and some blurry color reproductions of slides shown in a separate section of color plates. It

contains some excellent discussions that will be useful to workers in specific areas. But its expense, considering its small size, limited scope, and sometimes brief documentation, makes it more appropriate for acquisition by large regional libraries than by small institutions and individuals.

Manfred E. Wolff

Technipharm Consultants
Laguna Beach, California 92651-2809

JM950843E

Biochemistry of Cell Membranes. A Compendium of Selected Topics. Edited by S. Papa and J. M. Tager. Birkhauser Verlag, Basel, Switzerland. 1995. viii + 365 pp. 16 × 24 cm. ISBN 3-7643-5056-3. \$149.00.

This book belongs to the *Molecular and Cell Biology* series. It consists of a series of 10–20-page up-to-date reviews on selected topics in the rapidly developing field of membrane biology. The most significant advances that have been made in recent years in understanding the structure, dynamics, and functions of cell membranes are highlighted in seven main sections, namely, Signal Transduction; Membrane Traffic: Proteins and Lipids; Bioenergetics: Energy Transfer and Membrane Transport; Cellular Ion Homeostasis; Growth Factors and Adhesion Molecules; Structural Analysis of Membrane Proteins; and Membrane and Disease. Each review is thoroughly referenced, and a subject index for the book is included.

This monograph should serve as a foundation for future research on the relationship between the structure of membrane proteins and their function, protein transport through membranes, and regulation of membrane flow in the vacuolar system. These and other topics, such as the transport of ions in relation to bioenergetics, signal transduction, and mitochondrial ATP synthase, will be of interest to many medicinal chemists. Institutional library access is recommended.

Staff

JM950842M

The Golden Helix. Inside Biotech Ventures. By Arthur Kornberg. University Science Books, Sausalito, CA. 1995. xi + 287 pp. 16 × 24 cm. ISBN 0-935702-32-6. \$28.50.

Advances in genetic engineering and related technologies over the past 25 years have led to a biotechnology industry with vast economic and social potential. At the end of 1993, there were 1272 biotechnology companies with 80 000 employees in the United States. Many of these ventures were pioneered by biologists and biochemists who invented the new technologies in their academic laboratories. One of these was the author, Arthur Kornberg, who was awarded the Nobel Prize in 1959 for his seminal research with enzymes and his laboratory synthesis of DNA. In 1980, he, along with Paul Berg, Charles Yanofsky, and Alejandro Zaffaroni, founded the DNAX Institute of Molecular and Cellular

Biology. The company was bought by the Schering-Plough Corp. about 1 year later. The venture proceeded to generate multiple candidates for drug development much faster than expected.

In *The Golden Helix*, the author draws extensively on his own experiences at DNAX and other biotech companies, e.g., ALZA, Genentech, Amgen, Chiron, and Regeneron, to provide an insider's view of the biotechnology industry—past, present, and future. Science is a part of this book, but primary focus is on people—scientists, managers, executives, and administrators. Particular attention is directed toward general issues that affect the conduct of science, particularly liaisons and conflicts between academia and industry.

This is both an educating and fascinating book for all who are interested in science and business; it provides an inspiring and entertaining inside story for those who have witnessed the biotechnology revolution.

Staff

JM9508402

Diazo Chemistry. By Heinrich Zollinger. VCH Verlagsgesellschaft mbH, Weinheim, Germany. **I. Aromatic and Heteroaromatic Compounds.** 1994. xiii

+ 453 pp. 17.5 × 24.5 cm. ISBN 3-527-29213-6. DM 198.00; **II. Aliphatic, Inorganic and Organometallic Compounds.** 1995. xvi + 522 pp. 17.5 × 24.5 cm. ISBN 3-527-29222-5. DM 174.00. Set ISBN 3-527-29328-0. DM 348.00.

This two-volume set describes the chemistry of diazo compounds which are so versatile and of such importance as both reaction intermediates and reagents in organic synthesis. Volume I is devoted to aromatic and heteroaromatic diazo compounds. Volume II treats aliphatic, inorganic, and organometallic diazo compounds. In these two volumes the renowned author describes the structure, preparation, and reaction of diazo compounds, their applications in organic synthesis, the kinetics and mechanisms of diazotizations, and metal complexes with diazo and diazonium compounds. Both volumes are critical and well referenced and are written in a clear and readable style. References up to the year of publication are included.

Medicinal chemists and others concerned with the synthesis of novel structures will find these two volumes a source of useful, well researched information and ideas. Access via institutional libraries is recommended.

Staff

JM950903G