

Book Reviews*

Lipid and Biopolymer Monolayers at Liquid Interfaces. By K. S. Birdi (The Technical University of Denmark). Plenum: New York and London. 1989. x + 325 pp. \$59.50. ISBN 0-306-42870-9.

This book offers a broad survey of studies of monolayer films, predominantly lipids and proteins. The principal experimental viewpoint is that of pressure–area isotherms, and the principal theoretical viewpoint is that of surface thermodynamics, mainly using the Gibbs adsorption approach.

Following a brief introduction, the second chapter is a review of elementary surface thermodynamics. Brief overviews are given of standard subjects such as wetting and spreading, the Gibbs dividing surface, and the definition of surface viscosity. Somewhat more unique is a discussion of phenomenological models for the temperature dependence of surface tension. The next chapter is a brief review of experimental methods and instruments, such as the Langmuir film balance and Wilhelmy plate method. This section describes the various states of monolayer organization—gaseous, liquid expanded and condensed, and solid—and reviews spreading methods.

Chapter 4 begins with an elementary review of the Fowler and Guggenheim lattice treatment of monolayers in the Bragg–Williams approximation. Then it briefly describes van der Waals and electrostatics interactions, followed by two-dimensional phase transitions and miscibilities. Chapter 5 is similar, but for polymers and proteins at surfaces, beginning with a discussion of hydrophobicity. Although these chapters aim to be more molecular than earlier chapters, they are rather cursory and do not discuss recent developments. One example is protein adsorption equilibria and kinetics; most developments cited are more than about 20 years old, and more recent work, for example of Andrade, Norde and Lyklema, and Horbett is not discussed. As another example, the theory of polymeric monolayers is that of Singer (1948), and there is no discussion of the considerable body of modern theory of polymer interfaces.

Fick's law is applied to diffusion and surface adsorption and desorption kinetics in chapter 6. The next two chapters review pressure–area isotherm experiments on monolayers of lipid–protein mixtures and membrane proteins, principally mellitin and valinomycin. The final two chapters are principally applications: Langmuir–Blodgett films—their construction, molecular organization, and electrical properties—and foams and immobilized biomolecules.

This book reflects the varied research interests of the author. Its limitation for use as a textbook, in my opinion, is some lack of depth and rigor. A strength of this work, however, is that it takes a look at many nooks and crannies in the field and surveys an extensive literature, summarized in about 1000 references at the end. Examples of such nooks and crannies include effects of pH on phospholipids, phase transitions in branched-chain lipids, monolayer miscibility effects on lateral pressures, reactions and decomposition in monolayers, lung surfactant composition changes with early organismal developments, and pressure–area isotherms of vitamins, steroids, and quinones just to mention a few. This text is therefore likely to be of interest to those wanting access to a broader variety of monolayer science than is generally found in standard texts.

Ken A. Dill, *University of California, San Francisco*

Mechanistic Principles of Enzyme Activity. Edited by Joel F. Liebman (University of Maryland Baltimore County) and Arthur Greenberg (New Jersey Institute of Technology). VCH: New York and Weinheim. 1989. xii + 404 pp. \$89.00. ISBN 0-895-73706-X.

A volume in the Series *Molecular Structure and Energetics*, edited by Liebman and Greenberg, *Mechanistic Principles of Enzyme Activity* is the first of two volumes whose aim is to treat the activities of enzymes from the perspective of molecular structure and energetics. This volume contains 9 chapters, contributed by a total of 10 authors that represent the rich diversity of present-day research into mechanisms of enzyme catalysis.

The importance of structural studies in providing a foundation for enzyme mechanisms has long been recognized, and the contributions of X-ray crystallography to such studies have been prodigious. Thus, it seems fitting that the first chapter, by David W. Christianson and William N. Lipscomb, deals with elucidating the role of zinc in the catalytic mechanisms of zinc proteases through crystallographic studies of enzyme–ligand complexes. After describing the difference Fourier method,

enzyme–ligand complexes. After describing the difference Fourier method, the authors present results from difference Fourier studies of carboxypeptidase A complexed with several transition-state analogues, ketones, and aldehydes designed to “map out” a sequence of steps comprising the mechanistic pathway. Evidence from these and other studies supports the view that zinc acts mainly as a water activator in a promoted-water hydrolytic mechanism.

In the second chapter, Steven A. Benner applies stereoelectronic theory to enzyme catalysis. Noting that stereoelectronic theory is well-known to physical organic chemists who are generally less familiar with problems in enzymatic reaction mechanisms but largely unfamiliar to biochemists, the author attempts to bridge the gap between the language of physical organic chemistry and mechanisms of enzyme catalysis. After introducing stereoelectronic principles, estimating the magnitude of their effects, and applying them to “anomeric effects” observed with oxacyclohexanes, Dr. Benner proceeds to consider their application to enzymatic activity and specificity. Included are enzyme-catalyzed enolizations, decarboxylations of β -keto acids, and pyridoxal phosphate-dependent reactions (which involve rather large energetic preferences predicted by stereoelectronic “rules”), olefin and vinyl addition/elimination reactions (with intermediate energetic consequences), and a number of enzymatic reactions for which stereoelectronic effects have small energetic consequences, including NADH-dependent oxidoreductases.

The third chapter, by Anthony W. Czarnik, describes the well-known accelerating effects of intramolecularity which compose part of the catalytic effect of enzymes that results from binding of their substrates to form enzyme–substrate complexes. Following definitions of strain and proximity effects in relation to enthalpy and entropy terms, the author considers, in turn, rate accelerations due to covalently enforced proximity, accelerations due to noncovalently achieved proximity, accelerations due to covalently enforced strain, and accelerations due to noncovalently achieved strain. Included are discussions of Koshland's orbital steering concept and Menger's spatiotemporal hypothesis and reviews of enzyme models relating to chymotrypsin, the design of biomimetic synthetic catalysts, and the role of strain in lysozyme-catalyzed hydrolysis.

In Chapter 4, Richard L. Schowen examines the importance of protolytic catalysis, with particular emphasis on the charge-relay system and its role in catalysis by serine proteases. The chapter reviews studies of the charge-relay concept based on wide-ranging experimental and theoretical approaches, and provides a thoughtful assessment of the findings and their significance.

The next three chapters deal with various aspects of porphyrin-containing enzymes. In Chapter 5, Dabney White Dixon examines electron transfer in cytochromes *c* and *b₅*. After consideration of cytochrome structure, electron transfer theory, and experimental methods, she explores factors governing intramolecular and intermolecular electron transfer, including structural, conformational, and energetic requirements. The following chapter, one and two contributed by Thomas C. Bruice, examines mechanistic implications of reactions related to the organometallic chemistry of the iron protoporphyrin IX (heme) prosthetic group contained in mixed-function oxidases. After comparing the heme–iron ligands in peroxidase, catalase, and cytochrome P-450, he reviews the preparation and properties of model compounds for postulated oxygen-transferring intermediates, and considers mechanisms for a variety of reactions that involve metal(III) porphyrins. David K. Lavallee reports on the biochemistry of porphyrin metalation reactions in Chapter 7. Key considerations include the stage at which the metal atom is inserted during biosynthesis of iron porphyrins, chlorins, and corrinoids and the fundamental mechanistic factors responsible for the sequence. The author reports on studies of metalation *in vitro* and then turns his attention to what is known concerning metalation *in vivo*: the apparently nonenzymatic insertion of Mg(II) into chlorophylls, the incorporation of Co(II) into cobalamins, and the ferrochelatase-catalyzed binding of iron to protoporphyrin IX, including a synopsis of pathological conditions that are associated with ferrochelatase.

In Chapter 8, Dr. Bruice applies mechanistic organic chemistry to the study of flavin mixed-function oxidases (flavomonooxygenases) and, as in Chapter 6, emphasizes the contributions of synthetic models for enzymic intermediates to the elucidation of enzymatic mechanisms. The final chapter, contributed by Donald J. Creighton and Tayebah Pourmotabbed, considers glutathione-dependent oxidation of biogenic aldehydes to carboxylic acids, reviewing information on the glyoxalase and formaldehyde dehydrogenase enzyme systems.

*Unsigned book reviews are by the Book Review Editor.

Overall, the book is well-written and directed in such a way that it should be of value not only to researchers who are already specialists in the field of enzyme mechanisms but also to chemists and biochemists who have interests in current thinking and future prospects in the field. The diversity of chapters and contributing authors attests to the vast range of theoretical considerations and experimental approaches that are included in the study of enzyme mechanisms.

H. Robert Horton, *North Carolina State University*

Silicon Reagents in Organic Synthesis. By Ernest W. Colvin (University of Glasgow). Academic: London and New York. 1988. xxii + 147 pp. \$54.00. ISBN 0-12-182560-4.

This is one in a series of *Best Synthetic Methods*, which aims to sort through the "vast and bewildering array of synthetic methods and reagents ... from a practical point of view" and to provide "just the information needed to smooth our way painlessly into the unfamiliar territory". This book contains a 4-page introduction to organosilicon chemistry and chapters on various types of organosilicon compounds, featuring experimental procedures for preparations and/or synthetically useful reactions. References and a very brief discussion are also included. The topics covered are vinylsilanes, α,β -epoxysilanes, allylsilanes, arylsilanes, alkynyl- and propargylsilanes, silyl anions, oxidative cleavage via organofluorosilicates, Peterson olefination, β -ketosilanes, acylsilanes, aminosilanes, alkyl silyl ethers, silyl enol ethers and ketene acetals, silyl-based reagents, and silanes as reducing agents. In addition, the second chapter provides a superb 1-page summary of important review articles and a brief list of commercial sources of organosilicon compounds, and the final three chapters provide a concise summary of procedures to be found in *Organic Syntheses*, *Organic Reactions*, and *Organometallic Syntheses*.

The book is written in a very concise manner, and in some cases, topics and references which I consider desirable were omitted. For example, in Chapter 3, although the preparation of vinylsilanes by hydrostannylation and hydroalumination of alkynylsilanes is discussed, the hydroboration of alkynylsilanes is not even mentioned. And for the hydroalumination of alkynylsilanes (pages 11–12), only two references are provided. Both are communications which appeared (in 1980 and 1984) several years after full papers by other workers had been published. [The earlier papers are cited in Colvin's first book: *Silicon in Organic Synthesis*. Butterworths: London, 1981; revised edition, Krieger Press: Malabar, FL, 1985.] In contrast, for the preparation of vinylsilanes from arenosulfonylhydrazones (pages 12–13), the three references provided are the very first communications on this reaction by three separate groups; a later (1980) full paper by one of these groups is not cited.

In view of the growing importance of organosilicon compounds in organic synthesis, this book will be very useful to synthetic organic chemists as a convenient access of "recipes" for important reactions using organosilicon compounds. Since the introduction and discussion areas are very brief, people wishing to understand organosilicon chemistry will probably need to consult one of the review articles or books listed in Chapter 2. Colvin's first book is very good in this regard.

Paul F. Hudrlik, *Howard University*

Practical High Performance Liquid Chromatography. By Veronika R. Meyer (University of Berne). Translated from the original German edition by Valerie Cottrell. John Wiley & Sons: New York and Chichester. 1988. xiii + 310 pp. \$64.95. ISBN 0-471-91140-2.

This is really the second edition of a book first written in 1977, but is the first English-language edition. The author states in the preface that this book was first written "for a training course in high-performance liquid chromatography for laboratory technicians" and says that "the theoretical background is restricted to the minimum". The author has provided an excellent book for the intended audience and within the prescribed ground rules.

Only 29 pages are devoted to Theoretical Principles, and the reader is given a very nonmathematical, descriptive overview of the chromatographic process. Only the necessary practical aspects of theory are covered, such as band-broadening processes, the fundamental resolution equation, plate counts, etc. The author also provides many problems, with worked solutions, during the presentation of the material. Approximately the same length is devoted to equipment, including pumps, detectors, etc., and again the reader is given a thorough overview, with little extraneous material. The largest section of the book (121 pages) is devoted to columns and stationary-phase chemistries, but is divided into 10 chapters, which gives a good indication of the level of coverage of any individual technique. This is not meant as a disparaging remark; the author has attempted to include sections on every relevant technique. There are individual chapters on hydrophobic interaction chromatography and on ion-pair chromatography, for instance.

The only negative aspect of the book is the material of the last two

chapters. Chapter 24 is six pages of listings of review articles on the separation of individual classes of compounds. Chapter 25 is 33 pages of tabulations of commercially available stationary phases. The type of material contained in these two chapters rapidly becomes out of date and seems out of place in a book with goals as stated in the preface. The *Journal of Chromatography*, for instance, periodically publishes bibliography issues covering all of the chromatography literature, which would be a much more up-to-date source for review articles.

In summary, the book is recommended for technicians and for scientists trained in disciplines other than analytical chemistry who need an uncomplicated introduction to modern liquid chromatography. The author has included many valuable up-to-date references which should lead the curious reader to more comprehensive coverage of any particular topic. The book provides little new information, however, for those with a moderate level of knowledge of liquid chromatography.

John G. Dorsey, *University of Cincinnati*

Surfactant-Based Separation Processes (Surfactant Science Series/33). Edited by John F. Scamehorn and Jeffrey H. Harwell (University of Oklahoma). Marcel Dekker: New York and Basel. 1989. x + 342 pp. \$115.00. ISBN 0-8247-7929-0.

The book is one volume of a series on surfactant science. The main justification of the book is to give an overview of the various analytical techniques used to separate surfactants. The techniques which are addressed are as follows: membrane separations (micellar-enhanced ultrafiltration), extractions, adsorption (including admicellar-enhanced chromatography), foam separations, and precipitations using metal ions.

The purpose of the volume is "to summarize the most important current surfactant-based separations...". If this was the justification of the volume, the reviewer is dismayed that a section was not devoted to liquid chromatographic methodologies. The reviewer would hope that some of the contributing authors and/or the editors are pursuing studies with high-performance liquid chromatography (HPLC) (reversed-phase as well as normal phase). Another study which the reviewer feels should be undergoing investigation and included in the volume is the use of the solid-phase extraction (SPE) technique to concentrate the surfactants for subsequent determinations. There may be investigations of these types going on and they will appear in a future volume. However, it seems that some discussion should have been included in this volume.

The chapters and topics which are presented are up-to-date and well-written. A large percentage of the references are from the 1985–1988 years. This speaks to the organization of the editors. However, little information is provided in many of the chapters for someone new to or interested in the field of surfactants. This seems unfortunate because the editors state in the preface that they hope the book will "alert both academic and industrial researchers to this promising field". Overall the volume will be of interest to those working in this area of research and development. The reviewer does feel that the book is highly overpriced.

Robert L. Grob, *Villanova University*

Hazardous Chemicals Desk Reference. By N. Irving Sax and Richard J. Lewis, Sr. Van Nostrand Reinhold: New York. 1987. xi + 1084 pp. \$69.95. ISBN 0-442-28208-7.

Hazardous Chemicals Desk Reference is by its name a publication that is designed to fulfill a need for those individuals who work with and evaluate the hazards of chemicals, and is available at the finger tips. This publication satisfies this need, but is not so detailed as to overwhelm the user.

Almost 5000 substances are included and were selected on the basis of their importance in industry. Entries comprise a range of materials from basic chemicals, pesticides, dyes, detergents, lubricants, and plastics to drugs, food additives, preservatives, industrial intermediates, waste products from production processes, and others. The substance's name is listed with an extensive cross-indexing by synonyms, and the material's physical properties are described. A hazard rating is assigned on a scale of 1–3 referring to the relative level of toxicity (3 being the most toxic). Other toxicity data are also presented including RTECS (Registry of Toxic Effects of Chemical Substances) accession number, the OSHA (Occupational Safety and Health Administration) Permissible Exposure Limits (PEL), a brief narrative of the toxicity, and a discussion of the symptoms caused by exposure. The substance's reactivity and fire/explosion hazards are briefly summarized in terms of flash points and explosion limits. The Department of Transportation (DOT) hazard code and classification are also included for completeness.

The text is broken into two sections. Section one includes five chapters that deal with the safe storage and handling of chemicals, respiratory protection, chemical protective clothing, general fire protection, and first aid in the workplace. These chapters, prepared by experts in their fields, are very short and could be used as background for training sessions.

Section two comprises all of the citations of the general chemicals and a list of abbreviations. Two appendices include the alphabetical synonym cross-reference and CAS number cross-reference.

Below is a typical entry for interest:

TRIETHYLAMINE HR:2
 CAS: 121-44-8 NIOSH: YE 0175000
 DOT: 1296
 mf: C₆H₁₅N mw: 101.22
 PROP: Colorless liquid, ammonia odor. Mp: -114.8^o, bp: 98.5^o, flash p: 200^oF (OC), d: 0.7255 @ 25^o/4^o, vap d: 3.48, lel = 1.2%, uel = 8.0%. Misc, in water, alc, ether.
 SYNS: (Diethylamino)ethane * Triethylamin (German) * Trietilamina (Italian)
 OSHA PEL: TWA 25 ppm
 ACGIH TLV: TWA 10 ppm; STEL 15 ppm
 DFG MAK: 10 ppm (40 mg/m³)
 DOT Classification: Label: Flammable Liquid

THR (Toxic and Hazard Review): Moderately toxic by ingestion, inhalation, and skin contact. A mild skin and severe eye irritant. Can cause kidney and liver damage. Dangerous fire hazard when exposed to heat, flame or oxidizers. Highly dangerous; keep away from heat or open flame; can react with oxidizing materials. When heated to decomposition it emits toxic fumes of NO_x. To fight fire, use CO₂, dry chemical, alcohol foam. Incompatible with N₂O₄.

I find this information to be very valuable to the reader because of the simple and very understandable format. This text should be on the book shelf of managers of hazardous materials programs, individuals tasked with response, and personnel who handle chemicals in the workplace.

Thomas J. Haas, *United States Coast Guard Academy*

Principles and Practice of Chromatography. By B. Ravindranath (Vittal Mallya Scientific Research Foundation). John Wiley & Sons: New York. 1989. 502 pp. \$79.95. ISBN 0-470-21328-0.

This is a textbook written for the beginning student and also for those more experienced in chromatography in a general way who want to familiarize themselves with particular types of chromatography that may be applicable to a given separation problem. The book begins with a brief look at separation processes related to chromatography, such as distillation, goes on to the history of chromatography, and presents nomenclature. Extensive discussion of chromatographic theory follows. The remainder of the book is devoted to roughly one-fourth gas chromatography, one-half liquid chromatography, and one-fourth applications.

Injection, detection, and columns are covered in the gas chromatography section. Supercritical fluid chromatography is considered under gas chromatography. In addition to the types of liquid chromatography commonly examined in textbooks, such as partition and adsorption, the book presents hydrodynamic chromatography and field-flow fractionation. A significant amount of space is given to affinity and planar chromatography. Liquid chromatographic instrumentation is also covered. As one might expect from space limitations, representative applications are found in the application section, and no attempt is made to cover this subject completely.

The book is well illustrated with figures and tables. There is a chemical index based on chemical nomenclature and a good general index. Each chapter has many references, and to a great extent these are to books and review articles rather than to specialized research papers.

The subjects covered are very comprehensive, and in such a short space one could not expect in-depth treatment. However, the author has done an admirable job of focusing on principles and, thereby, offsetting the breadth of his undertaking.

Norman E. Hoffman, *Marquette University*

Bioorganic Chemistry. A Chemical Approach to Enzyme Action, Second Edition. By Hermann Dugas (University of Montreal). Springer-Verlag: New York. 1989. xii + 651 pp. \$59.00. ISBN 0-387-96795-8.

According to the author, this book is meant to serve as a text for upper-level undergraduate and graduate courses in bioorganic chemistry. There is certainly a need for an up-to-date text in this area, and I reviewed this book in the hope that it might represent the meeting of this need. Unfortunately, however, I am unable to recommend it.

Beyond the Introduction, which purports to cover basic concepts, the text is divided into six chapters: bioorganic chemistry of amino acids and peptides, bioorganic chemistry of phosphate groups and polynucleotides, enzyme chemistry, enzyme models, metal ions, and coenzyme chemistry. In principle, coverage of these topics should allow a useful overview of

modern bioorganic chemistry. In practice, however, this book does not succeed in providing this. The early chapters are marked by disjointed development and poor definitions and descriptions of basic concepts. It is unlikely, for example, that a student would get a coherent idea of how enzymes catalyze reactions or the nature of the hydrophobic effect from this book. Throughout, the emphasis seems to be on the introduction (name-dropping), but not the explanation of buzz words, such as "molecular engines", "supermolecules", and "molecular recognition". Further, there are many loose and incorrect statements. We learn for example that "high affinity" (of what?) is a requirement for catalysis, that "the binding of OH⁻ to Zn²⁺ makes it a good nucleophile", and that "the occurrence of D amino acids in nature is very rare". Although the book is generously provided with chemical structures and reaction schemes, most of them are unlabeled, and at times it is not clear just which diagram is being discussed; students found this particularly annoying.

The best chapter, reflecting the author's principal interests perhaps, seemed to be Chapter 5, which gives a good overview of host-guest chemistry. Some parts of the final chapter are also good, for example, the section on vitamin B₁₂, but others are strangely deficient. It is difficult to understand, for example, since references run into early 1988, how a section on cytochrome P₄₅₀ models could not mention the work of J. T. Groves, on copper-containing enzyme models that of K. D. Karlin, and on flavin chemistry that of T. C. Bruice. Nonetheless, the material that is covered is well-referenced. Indeed, I suspect that my main use of this book will be as a source of references on exotic host-guest systems.

Overall, I have the impression that students are most likely to be frustrated by this book; at best, they might be titillated. The latter, in itself, would not be a bad thing if the underlying chemical concepts were usefully and correctly presented in passing, but my feeling is that they really are not. Thus I would not use this book myself as a class text, nor recommend it to others for this purpose.

R. F. Pratt, *Wesleyan University*

Books on Medical and Biological Subjects

Mineral Absorption in the Monogastric GI Tract. Advances in Experimental Medicine and Biology. Volume 249. Edited by Fredrick R. Dintzis and Joseph A. Laszlo (U.S. Department of Agriculture). Plenum: New York and London. 1989. ix + 214 pp. \$55.00. ISBN 0-306-43200-5.

This book is a collection of papers from a 1988 symposium held in Toronto. They are arranged in two sections: Mechanisms of Mineral Absorption and Dietary Influences on Mineral Uptake. The papers are set in type, and there is a good index.

Psychoactive Drugs. Tolerance and Sensitization. Edited by A. J. Goudie (University of Liverpool) and M. W. Emmett-Oglesby (Texas College of Osteopathic Medicine). Humana: Clifton. 1989. xv + 600 pp. \$79.50. ISBN 0-89603-148-9.

This volume of contributed chapters is divided into three parts: Behavioral Mechanisms, Molecular Mechanisms, and Summary Chapters. There is much to interest the pharmaceutical and medicinal chemist, but the essentially nonchemical emphasis is indicated by the absence of any structural formulas or equations. The index is substantial.

Food Additives Tables. Updated Edition. Classes XIII-XV. Edited by M. Fondu (University of Brussels) et al. Elsevier: Amsterdam and New York. 1988. 124 pp. \$197.25. ISBN 0-444-42867-4.

This book lists additives of various types, such as anticaking agents, coloring agents, and thickening agents, according to types of food and according to country, with a concise indication of the regulations on use or presence for each country.

Books on Applied Subjects

Fatty Acids in Industry. Processes. Properties. Derivatives. Applications. Edited by Robert W. Johnson and Earle Fritz (Union Camp Corporation). Marcel Dekker: New York and Basel. 1989. xv + 667 pp. \$150.00. ISBN 0-8247-7672-0.

The editors recommend this book to a wide range of readers, from plant operating personnel and engineers to chemists and plant managers. The 23 contributed chapters vary somewhat in adaptation to such a broad readership, and the text is not always easy reading, owing in part to the density of information it contains. Topics include raw materials, separation, purification, hydrogenation, esterification, polymerization, fatty alcohols, synthetic fatty acids, uses (in such areas as emulsifiers, lubricants, oil field chemicals, metal-working fluids, flotation, textiles, paper, cosmetics), and pollution and toxicological aspects.

Volumes of Proceedings

Structure and Reactivity of Surfaces. Studies in Surface Science and Catalysis 48. Edited by Claudio Morterra (Università di Torino) et al. Elsevier: Amsterdam and New York. 1989. xiv + 970 pp. \$184.25. ISBN 0-444-87465-8.

A conference held in Trieste in 1988 was the source of the large number of typescript papers that make up this volume. The topics covered include photoluminescence, catalysis, spectroscopy, adsorption, etc. It is not indexed, and the table of contents has no obvious order.

Guanidines 2. Further Explorations of the Biological and Clinical Significance of Guanidino Compounds. Edited by Akitane Mori (Okayama University Medical School) et al. Plenum: New York and London. 1989. xiv + 365 pp. \$85.00. ISBN 0-306-43223-4.

One of the editors opens his foreword with the observation that etymologically "guanidine" means "dung-like" before warming to his subject. Interestingly, there is a Guanidine Society, which was apparently involved in a symposium held at the foot of Mt. Fuji in 1987. This volume is the proceedings and contains the typescript texts of the many papers presented. They are arranged under six headings: Analytical Method for Guanidino Compounds and New Guanidino Compounds; Metabolism of Guanidino Compounds; Physiological, Pharmacological and Toxicological Aspects of Guanidino Compounds; Involvement of Seizure Mechanism; Hyperargininemia; and Involvement of Guanidino Compounds in Renal Dysfunction. There is a general subject index and an index of guanidines in organs.

The Immune Response to Structurally Defined Proteins: The Lysozyme Model. Edited by Sandra J. Smith-Gill (National Cancer Institute) and Eli E. Sercarz (University of California, Los Angeles). Adenine: Schenectady. 1989. 416 pp. \$90.00. ISBN 0-940030-27-6.

A workshop sponsored by the National Cancer Institute, held in Bethesda in 1988, gave rise to the 37 papers in this volume, which is nicely produced and typeset. Hen egg-white lysozyme has become a model protein for investigating immune response because it is so well characterized. It is the main focus of the papers, which are mostly reports of original research. There are four sections: Lysozyme: The Protein; Molecular Recognition; Antigen Processing and Presentation, and the T Cell Response; and B Cell Response and Its Regulation. The quite thorough index will enhance the reference value of this book.

Arachidonic Acid Metabolism in the Nervous System: Physiological and Pathological Significance. *Annals of The New York Academy of Sciences Volume 559.* Edited by Amiram I. Barkai and Nicolas G. Bazan. New York Academy of Sciences: New York. 1989. xii + 504 pp. \$125.00. ISBN 0-89766-503-1 (paperback).

The New York Academy of Sciences held a conference on the title subject in 1988. The papers (oral and poster) are set in type in this soft-bound volume. They fall into six categories: Modulation of Arachidonic Acid Release and Metabolism in the Nervous System; The Arachidonic Acid Cascade in the Nervous System; Arachidonic Acid and Its Metabolites in Signal Transduction; The Role of Cerebral Blood Flow and Arachidonic Acid Metabolism in Brain Injury and Ischemic Damage; Arachidonic Acid Metabolism and Convulsive Disorders; and Arachidonic Acid and Its Metabolites in Normal and Abnormal Brain Functions: Sleep, Temperature Regulation, Alcohol Effects, and Mental Disorders. Not indexed.

Calcium Channels: Structure and Function. *Annals of The New York Academy of Sciences Volume 560.* Edited by Dennis W. Wray (Royal Free Hospital School of Medicine) et al. New York Academy of Sciences: New York. 1989. xiv + 479 pp. \$120.00. ISBN 0-89766-520-1 (paperback).

The passage of calcium ions through membranes is of great interest biochemically, clinically, physiologically, and pharmaceutically. A conference on the subject was held in 1988 at the Royal Society, London, and sponsored by The New York Academy of Sciences. The large number of reports (oral and poster) are set in type in this soft-bound volume. They are arranged in seven groups: Structure of Calcium Channels; Function of Calcium Channels; Reconstitution and Expression of Calcium Channels; Channel-Ligand Interactions: Drugs, Toxins, Antibodies; Channel-Ligand Interactions: Modulation of Calcium Channels; Calcium Channels in Secretory Cells; and Calcium Channels During Development. Not indexed.

Viral Oncogenesis and Cell Differentiation: The Contributions of Charlotte Friend. *Annals of The New York Academy of Sciences Volume 567.* Edited by Leila Diamond (The Wistar Institute) and Sandra R. Wolman (Michigan Cancer Foundation). New York Academy of Sciences: New York. 1989. iv + 356 pp. \$90.00. ISBN 0-89766-549-X.

A conference sponsored by The New York Academy of Sciences in 1988 consisted of a keynote address, oral accounts of original research, poster presentations, and a closing address. These are collected here in typeset form. Retroviruses, viruses, and oncogenesis were the principal concerns. Not indexed.

Sickle Cell Disease: Current Perspectives. *Annals of The New York Academy of Sciences Volume 565.* Edited by Charles F. Whitten (Wayne State University) and John F. Bertles (Columbia University). New York Academy of Sciences: New York. 1989. xiv + 476 pp. \$119.00. ISBN 0-89766-512-0.

A conference held in 1988 in Bethesda, and sponsored by The New York Academy of Sciences, provided the papers included in this typeset volume. They are grouped in six parts: The Molecular Genetics of Hemoglobin, Pathophysiology: Cellular and Molecular, Clinical Aspects of Sickle Cell Disease, Psychosocial Dimensions, Clinical Modifiers of Sickle Cell Disease, and Hemorheology and Microcirculation in Sickle Cell Diseases. In addition, abstracts of a large number of poster presentations are included. There is no subject index.

Representation of Three-Dimensional Space in the Vestibular, Oculomotor, and Visual Systems. *Annals of The New York Academy of Sciences Volume 545.* Edited by Bernard Cohen (Mount Sinai School of Medicine) and Volker Henn (New York University School of Medicine). New York Academy of Sciences: New York. 1988. viii + 263 pp. \$66.00. ISBN 0-89766-501-5 (paperback).

This is the account of a symposium held in Bologna in 1987. Although there is a great deal of interesting material on sense perception, it is not at all chemical, and the chemistry of vision, for example, is not taken up.

Materials-Processes: The Intercept Point. 20th International Sample Technical Conference. Volume 20. Edited by Henry L. Chess (Xerxon) et al. Society for the Advancement of Material and Process Engineering: Covina. 1988. xvi + 727 pp. \$70.00. ISBN 0-938994-45-X.

This is a collection of the typescript papers given at a 1988 conference. Polymer composites, fibers, and coatings are the major topics of concern. The most intriguing titles are Your Future with CFC's and Change-can Mixing Technology. Not indexed.

Nutrition and the Chemical Senses in Aging: Recent Advances and Current Research Needs. *Annals of The New York Academy of Sciences Volume 561.* Edited by Claire Murphy (San Diego State University) et al. New York Academy of Sciences: New York. 1989. iii + 339 pp. \$85.00. ISBN 0-89766-511-2 (paperback).

A conference held in Florida in 1988 was the source of the papers in this soft-bound volume. They are arranged in six groups: Characterization of Chemosensory Changes in Aging, Food Intake in the Elderly, Special Problems in Elderly Populations, Nutrient Choice, Preferences, and Mechanisms Underlying Chemosensory Deficits in the Elderly. In addition seven poster presentations are included, and an introductory lecture on nutrition and the chemical senses, but no subject index.

Membrane in Cancer Cells. *Annals of The New York Academy of Sciences Volume 551.* Edited by Tommaso Galeotti (Catholic University, Rome) et al. New York Academy of Sciences: New York. 1988. v + 455 pp. \$114.00. ISBN 0-89766-491-4 (paperback).

This soft-bound collection of reports of original research is the result of a conference held in Perugia in 1988. The typeset papers include an opening lecture on NMR of hypoxia in tissue and tumors and shorter contributions arranged in four groups: Oxygen Radicals, Ionic Signals, Growth Factors and Oncogene Product, and Therapeutic Strategies. There is no subject index.

Prenatal Abuse of Licit and Illicit Drugs. *Annals of The New York Academy of Sciences Volume 562.* Edited by Donal E. Hutchings (Columbia University). New York Academy of Sciences: New York. 1989. v + 388 pp. \$97.00. ISBN 0-89766-522-8 (paperback).

Natural and synthetic narcotics, alcohol, marijuana, and tobacco were the principal concerns of a conference held in Bethesda in 1988. The oral and poster reports of original research are presented in this typeset, soft-bound volume. There is no subject index.