Book Reviews*

Photography for the Scientist. Edited by Richard A. Morton. Academic Press: London. 2nd printing. 1986. 452 pp. $99.50. ISBN 0-12-508370-X.

This book is a compilation of chapters by individuals expert in specific fields of scientific photography. Topics range from photographic materials and processes to optics, photogrammetry, infrared, ultraviolet, and fluorescent recording, photomicrography, close-up photography, photomacrography, photographic copying, and analysis with use of film. Topics are described for their techniques with emphasis on the chemical and physical nature of the processes. This text could be a valuable tool for scientists in all fields interested in photography, especially those interested in the scientific aspects of photographic techniques and processes. It would be found most useful as a departmental or library reference due to the high cost.

J. R. Nyckel, *Glenbard North High School, Carol Stream, IL*

Techniques for the Automated Optimization of HPLC Separations. By John C. Berridge (Pfizer Central Research). John Wiley and Sons: New York. 1985. xii + 203 pp. $39.95. ISBN 0-471-90861-4

This book is a well-written, thorough review of methods development, and "optimization" in High Performance Liquid Chromatography. Oddly enough though, it should be of as much value and interest to chemists not directly involved in research in methods-development automation as to scientists in HPLC research per se. The reason for this, which makes the book so informative, is that the first step in automating the process of methods development is to understand how and what methods development is, which in turn requires a thorough comprehension of basic chromatographic principles. Thus, I feel that the book succeeds very well in teaching systematic approaches to the development of an HPLC separation.

The book is divided into 7 basic chapters, which include a discussion of Optimization Criteria, Simple Methods, Solvent Selectivity, Window Diagrams, directed Search and Adaptive Intelligence, and Post-Chromatographic Techniques. In addition, there are five appendices, four of which are source listings in BASIC implementing several of the concepts developed in the text. Although these programs were not run, examination of the code indicates that they are sufficiently interactive to be useful as practical methods development aids.

While a comprehensive review of the state of the art of automated methods development was undertaken, one problem that the author freely discusses is that the field itself is still largely evolving. There remain two widely accepted problems in implementing automated methods development in HPLC (and to a lesser extent, in GC). These are that (1) no solid theoretical models exist for the physical-chemical interactions comprising the liquid chromatographic system and (2) no universal "optimization criteria" exist to allow for computer-based decisions to be made regarding the "quality" or "adequacy" of a chromatogram. The author underscores this problem when, for example, on page 34 he states that "... At the end of the run the chromatographer can select the best (although not necessarily the optimum) separation conditions by inspection."

The scientist using chromatography as a separation tool must make many subjective judgements as to the "adequacy" of a separation, judgements that must include not only scientific but also economic and personal decisions. An "adequate" separation that is far from some arbitrary "optimum" might be entirely preferable to a theoretically optimized condition and will suffice quite well for the routine separation of an organic intermediate or a metabolite. The flexible definition of an optimization criterion may be a gossamer pursuit, despite the real advances made in that direction. Again, to paraphrase the authors, all optimization criteria developed thus far are strongly model-dependent, producing similar numbers for different chromatograms, or vice versa. One is led to believe from this that the reduction of a chromatogram to a single number (in terms of a separation factor or response function) represents a fundamentally inadequate (and flawed) approach to automated methods development.

The second major limitation of current approaches to methods development is that of the lack of a firm theoretical model describing equilibrium conditions within the column. Virtually all methods-development algorithms to date must assume some type of functionality for the solvent composition/retention relationship, functionalities that are usually empirical, rather than fundamental. Consequently, the accuracy of such methods cannot be better than the models themselves, which often try to force the retention data to a logarithmic linear first- or second-order equation, without any fundamental reason for doing so, and often in the face of conflicting physical-chemical data.

In spite of these limitations, which again are not the fault of the text, but rather of the field that it describes, I found myself enthusiastically supporting the text as a highly valuable aid to scientists using HPLC as a tool. The reason for this is that the book teaches systematic methods development and approaches to separations problems. In teaching graduate courses in both Separations Science and Chromatographic Theory, the one approach that students could carry away as being most economical of their time and efforts is that of systematic experimentation in methods development. In the long run, until the advent of truly "expert systems", optimization decisions might best be left in the hands and minds of the scientists using HPLC as a problem-solving tool. Consequently, the best feature of automated methods development remains that of forcing a systematic approach to data acquisition. This, plus the definition of what steps are required in order to achieve systematic data acquisition, may represent the best results to come of automated methods development to date. In any event, the book represents an excellent piece of scholarship in a complex and rapidly changing field, and it is highly recommended to layman and professional alike as a useful textbook for practical HPLC separation approaches.

Richard A. Hartwick, *Rutgers University*

Adsorption and the Gibbs Surface Excess. By D. K. Chattoraj (Jadavpur University) and K. S. Birdi (The Technical University of Denmark). Plenum Press: New York and London. 1984. xiii + 471 pp. $59.50. ISBN 0-306-41334-5

It is often said that more scientists speak of the Gibbs surface excess than understand it. For both these groups, this recently published book is a "necessary" addition to their professional libraries. Even those of us who have never been concerned with Gibbs surface excess will also do well to review this important text.

The text is a well-written, concise, and comprehensive treatment of surface adsorption from the liquid phase, and it contains a wealth of information on interfacial adsorption phenomena. Using the underlying concept of the Gibbs surface excess and relating whenever possible surface-excess quantities to thermodynamic properties, the authors explore interfacial adsorption as it relates to a host of problems in a broad range of research areas. Drawing heavily on current literature examples, surface adsorption from the liquid phase is addressed from both theoretical and experimental approaches. A particularly strong emphasis is placed on surface adsorption as it relates to biochemical and biological systems. Even with this heavy emphasis on biosystems, readers interested in other fields of research where surface adsorption is also of importance will have little problem in finding examples and applications relevant to their work.

Individuals unfamiliar with surface and interfacial adsorption may find the first several chapters inadequate as an introduction to the theoretical and experimental aspects of the subject material. Nevertheless, extensive background references are provided to aid the reader.

The comprehensive treatment of the subject matter, extensive literature references, and numerous example studies of surface adsorption phenomena make this text a valuable source of research ideas and a succinct guide to the existing literature. Both theorists and experimentalists from a wide range of scientific fields will find the subject matter of interest and value.

Gerald M. Korenowski, *Rensselaer Polytechnic Institute*

The Synthesis of Carbon-11, Fluorine-18, and Nitrogen-13 Labeled Radiotracers For Biomedical Applications. By J. S. Fowler and A. P. Wolf (Brookhaven National Laboratory). National Technical Information Service, US Department of Commerce: Springfield, VA 22161. 1982. vi + 124 pp. $11.25. Report No. NAS-NS-3201 (Order No. DE82014870).

Compounds of biochemical and pharmaceutical interest, labeled with short-lived radionuclides, can be used for in vivo imaging of many interesting physiological and biochemical processes. The preparation of such radiolabeled compounds has become a new area for the application of synthetic methods. This small book provides a useful, practically oriented review of this area, quite complete up to the date of its publication.

The book is organized, roughly, in three sections: radiotracer design

*Unsigned book reviews are by the Book Review Editor.

and synthesis, specific radiosyntheses utilizing carbon-11, fluorine-18, and nitrogen-13, and experimental design specific to radiochemical syntheses. Discussed in the section on radiotracer design and synthesis are issues of synthetic strategy unique to synthesis with radiotracers: time of synthesis (of concern because of the short half-life of the radiotracers, that ranges from 10 to 110 min), reagent stoichiometry (of importance, because the radiotracer is almost always the limiting reagent), specific activity (which has to be high, especially with receptor-binding ligands), and chemical and radiochemical purity. The second section details synthesis of compounds labeled with C-11 (acids, amino acids, sugars, drugs), F-18 (utilizing nucleophilic and electrophilic sources of fluoride for the preparation of aromatic and aliphatic compounds), and N-13. Useful synthetic data are included, together with a tabular listing of most compounds known at the time of publication. The final section presents useful information on radioactivity detectors, shielding, and experimental design to simplify sample manipulation during synthesis and purification, as needed to minimize worker exposure to radioactivity.

This practically oriented book is useful to synthetic chemists interested in learning about radiochemistry and radiochemists interested in learning more about synthesis. Although it is limited in scope to the three positron-emitting radionuclides most commonly used in synthesis, it presents a review of the area that is complete, up to its date of publication, which is September 1982. Even though there have been major developments in the radiochemistry area since 1982, much of the general sections of the book are of lasting value, and it presents a very complete guide to the earlier literature.

John A. Katzenellenbogen, *University of Illinois, Champaign—Urbana*

Topics in Current Chemistry. Volume 135. Edited by A. de Meijere. Springer-Verlag: New York. 1987. 158 pp. $70.40. ISBN 0-387-16662-9

Volume 135 in this fine series continues the report on small-ring compounds in organic synthesis which was begun in volume 133 and focuses on the synthesis and reactions of functionalized cyclopropanes. Professor A. Krief presents the first chapter, which covers metallated silyl- and selenocyclopropanes. The chapter covers quite thoroughly the preparation, reaction, and further conversion of these compounds and frequently compares them to their sulfur counterparts. The mention of drawbacks and limitations of the various methods was quite informative and should be helpful to one considering the use of these reagents.

The second chapter, authored by Professor P. Binger and Dr. H. M. Buch, deals with the preparation and reaction of methylenecyclopropanes and is quite complete. It covers extensively the transition-metal-catalyzed reactions of these compounds and compares them to the 2-((trimethylsilyl)methyl)allyl carboxylates. Here, too, the author is very thorough and points out the limitations of each method.

This volume completes a useful review of the chemistry of three- and four-membered carbocycles and should not be overlooked by the academic or industrial synthetic organic chemist.

Thomas N. Nanninga, *Warner-Lambert/Parke-Davis Pharmaceutical Research*

Organophosphorus Chemistry. A Specialist Periodical Report. Volume 17. Edited by Senior Reporters: D. W. Hutchinson (University of Warwick) and B. J. Walker (The Queen's University of Belfast). The Royal Society of Chemistry: London. 1986. xiv + 457 pp. £88.00 (ca. $142.00). ISBN 0-85186-156-3 (Available from the American Chemical Society, Washington, DC)

Volume 17 of this specialist periodical report contains a review of the major publications in the field of organophosphorus chemistry published between July 1984 and June 1985.

The first nine chapters are divided into types of compounds: Phosphines and Phosphonium Salts (49 pp, 388 ref), Quinquecovalent Phosphorus Compounds (31 pp, 56 ref), Phosphine Oxides and Related Compounds (22 pp, 51 refs), Tervalent Phosphorus Acids (36 pp, 130 ref), Quinquevalent Phosphorus Acids (46 pp, 157 ref), Phosphates and Phosphonates of Biochemical Interest (24 pp, 111 ref), Nucleotides and Nucleic Acids (107 pp, 364 ref), Ylides and Related Compounds (57 pp, 150 ref), and Phosphazenes (24 pp, 172 ref). Chapter 10 is devoted to Physical Methods (33 pp, 312 ref) and also includes some relevant theoretical and inorganic studies. References are at the ends of chapters and an Author Index with chapter and reference numbers is included.

In each chapter the areas of most intense research are pointed out, but with some variation in emphasis. Chapters seven and eight (on Nucleotides and Nucleic Acids and on Ylides and Related Compounds, respectively) give more complete summaries of individual articles than do the others. The more complete discussions will appeal to many readers; however, in the interest of cost, it should not be allowed to get out of hand.

The camera-ready copy used in the last volume is continued in Volume 17, resulting in variations in font and pitch. This is not a distraction except in Chapter 10 where the print is rather small for comfortable reading.

Charles N. Robinson, *Memphis State University*

Preparative Chromatography Techniques. Applications in Natural Product Isolation. By K. Hostettmann, M. Hostettmann, and A. Marston (University of Lausanne). Springer-Verlag: Berlin and New York. 1986. iv + 139 pp. $55.00. ISBN 0-387-16165-1

This book is best considered in terms of the strong emphasis on matter pertaining to the subtitle, for indeed it is largely devoid of material of concern to other than natural-product chemists. While it does make a sound effort to cover the range of techniques available for preparative chromatography employing liquid mobile phases (preparative gas chromatography is not mentioned), it cannot be considered as a detailed theoretical work or an exhaustive practical manual. Its limited aims are well achieved: to illustrate from the authors' extensive experience and that of other experienced laboratory workers practical examples of preparative separation equipment and its usage.

The overwhelming emphasis in modern chromatography on high-resolution analytical applications has certainly placed traditional preparative chromatography in a less prominent perspective. This book is written for scientists who wish to discover practical routes to the solution of their purification and isolation problems. The authors consider planar chromatographic methods and emphasize modern developments of thin-layer separations. They cover all of the traditional and modern methods of column chromatography, both low and high pressure. Coverage of the less familiar methods of counter-current chromatography will perhaps alert many to the potential of these procedures for their applications.

The book is divided according to experimental method rather than by sample type, and thus novice preparative chromatographers will need to seek applications of particular interest to them in the various chapters. The relative brevity of the book will facilitate this, however. This will probably not be a text to find a prominent place in the library of analytical chromatographers, but they may certainly benefit from its practical insights and could certainly emulate its concise style in conveying the usefulness of well-devised preparative chromatographic procedures.

Peter C. Uden, *University of Massachusetts, Amherst*

Radiation Physics and Chemistry. Volume 23. No. 1-2. Edited by A. J. Swallow. Pergamon Press: Elmsford, NY. 1984. 291 pp. ISSN 0146-5724

This softbound volume is a special issue of the journal *Radiation Physics and Chemistry*, dedicated to the memory of the late John H. Baxendale, of the University of Manchester, and consisting of a large number of reports of original research on aspects of radiation chemistry.

Fluid Properties and Phase Equilibria for Chemical Process Design. Edited by H. Renon (Ecole des Mines, Paris). Elsevier: New York. 1986. xi + 973 pp. $230.00. ISBN 0-444-42724-4

This volume represents the proceedings of the Fourth International Conference on Fluid Properties and Phase Equilibria for Chemical Process Design held in Helsingor, Denmark, in May 1986. The text is reprinted from Volumes 29 and 30 of *Fluid Phase Equilibria*, and although quite expensive, it costs considerably less than the journal subscription price.

The main emphasis of this book is on the determination and prediction of those physical and thermodynamic properties of fluids important in the design of industrial-level solvent extraction processes. Although much of the content is directed specifically toward the petroleum industry, many of the concepts and methods presented have universal application.

This first section contains 9 papers that outline the types of data and other information required in process design. The evaluation of data quality, process sensitivity to physical properties, and methods of solvent selection are discussed. The following section covers experimental methods. Techniques and apparatus presently used in the experimental determination of PVTX and calorimetric fluid properties are presented and evaluated. Much of the remainder of the book deals with the formulation of solution models and equations of state and their use in predicting fluid properties in multicomponent systems. These sections include a wealth of experimental data allowing direct comparison between observed parameters and those calculated with a given formulation. A final section describes phase equilibria in complex mixtures including solution modeling of electrolytes and chemically reactive systems.

This volume presents a well-balanced cross-section of empirical and theoretical methods for describing fluid-phase equilibria. The numerous papers which combine aspects of each approach serve to illustrate their complimentary nature. This book should be useful to anyone interested in the properties of fluids, particularly those involved in chemical process

design.

S. Michael Sterner, *Virginia Polytechnic Institute and State University*

A Dictionary of Scientific Units. 5th Edition. By H. G. Jerrard and D. B. McNeill (University of Southampton, UK). Chapman and Hall: London and New York. 1986. ix + 222 pp. $19.95 (paperback). ISBN 0-412-28100-7

The more than 850 entries in this book describe the natural or arbitrary quantity on which a particular unit is based, together with its primary field of application, common abbreviation, and often its historical origin. The citation to the first introduction of a particular unit is frequently included and, where appropriate, the necessary information is provided for conversion to more universally accepted units. In cases where the prescribed quantity upon which a particular unit is based has been altered through the years, or when a given unit has different values in different contexts, a discussion is provided that is sufficiently detailed to resolve any ambiguities.

In addition to the main body of the book in which the units are presented alphabetically, sections are provided containing tables of physical constants, weights and measures, and conversion factors and a discussion of presently recognized international systems of units and those used historically by the scientific community. While this book was clearly compiled with the field of physics in mind, from a background in geochemistry and geology I was hard pressed to find any noteworthy omissions. In this respect, the book offers very comprehensive coverage. However, regarding routine conversion between different units I found the conversion factors included in the appendix to be less useful than those included in a typical physics textbook. The inclusion of only one of the many forms of the gas constant can make these computations particularly cumbersome.

Although the majority of the information presented in this book is rigorously scientific, occasional entries of a less-scientific nature are encountered, including wire gauges, screw sizes, beer, wine, and spirit measures, and the misery index as described in "The Times".

S. Michael Sterner, *Virginia Polytechnic Institute and State University*

Enzyme Nomenclature 1984. Prepared for Publication by Edwin C. Webb (Macquarie University). Published for the International Union of Biochemistry. Academic Press: Orlando, FL. 1984. xx + 646 pp. $19.50. ISBN 0-12-227163-7 (paperback)

In "The Naming of Cats" it is recorded[1] that a cat has three names. Similarly in "Enzymes Nomenclature 1984" we find that an enzyme has three sanctioned names: a recommended name (its ordinary, everyday name), a systematic name (which summarizes the reaction catalyzed), and a code number. The IUB committee, which began its naming of enzymes in 1955, structured its classification on the basis of the reaction catalyzed. What we have now, after 30 years and six versions of the *Enzyme List*, are 2477 entries that are meant to cover all known enzyme-catalyzed reactions. If two enzymes catalyze the same overall reaction but use a different mechanism or cofactor, then two separate entries are created. Each item on the *Enzyme List* is referenced to one or more of 4478 bibliographic entries which describe either the discovery of a canonical enzyme in this category, or preferably its purification to homogeneity, or review the relevant area of enzymology. The code number ($W.X.Y.Z$) specifies one of six major reaction classes (W), the subclass (X), and subsubclass (Y), and the serial number (Z) of the enzyme. The rules and guidelines for generating this hierarchy are clearly spelled out in 14 pages at the beginning of the volume. An untidy aspect of this approach is that a code number and systematic name frequently are assigned to an enzyme before its mechanism or true physiological role or roles are known. Subsequent information may necessitate reassignment of the enzyme to another category and hence a new systematic name. The current edition contains 148 enzymes that have been so transferred and 103 that have been deleted completely. For example: phosphoglucomutase (recommended name), α-D-glucose 1,6-phosphomutase (systematic name), was EC 2.7.5.1 and now is EC 5.4.2.2 (code name). Each discarded code number is retired to avoid future confusion and cross referenced in the index along with names commonly used for the enzyme that differ from the recommended one.

As in the past, some enzymologists will not feel obliged to change their nomenclature in response to these recommendations. In comparison with the previous edition, more emphasis appears to be placed now on providing a dictionary of current usage and less on promoting new names that may or may not stick. Realization that the desired nuance between "synthase" and "synthetase" was lost on the general biochemical public has resulted in the recommendation that "synthase" be used for all cases. A new feature of the 1984 edition is a form on which an enzyme *not included* can be reported to the Nomenclature Committee. Although not expressly sanctioned, this form also could be used to report possible errors, omissions, or inconsistencies.

Whereas the cat's third name is said to specify its "ineffable" identity,[1] the exact nature of the enzyme (i.e., its sequence and structure) is not yet built into the IUB nomenclature. It frequently is not enough to give the *EC Code* and species of origin to specify a particular enzyme molecule; one needs in addition knowledge of its sequence, processing steps, cofactor or ion requirements, and so on. Mutant or variant enzymes pose an additional nomenclature problem. How are new mutant enzymes being made in the laboratory by protein engineering methods to be identified and named? The Chemical Abstracts Service has taken a step in the right direction by indexing enzymes in the same way as other chemical substances and by assigning separate *CAS Registry Numbers* to them; cross references are provided to the IUB nomenclature.[2] *CAS Registry Numbers*, however, are not keyed to a sequence or structure data base. The best solution to the problem known to this reviewer is that of the Protein Identification Resource of the National Biomedical Research Foundation which now attaches an accession number to each entry in its protein sequence data base and cross references this to the *IUB EC Code*.[3] It may be hoped that this unique number will become the universal standard used to specify a particular protein molecule.

"Enzyme Nomenclature 1984" focuses narrowly on enzyme proteins. Future editions may be expected to recognize the role of RNA molecules as biological catalysts. The current scheme neglects a set of proteins of direct enzymological interest, namely, naturally occurring inhibitors or activators of enzymes. A useful service would be performed by expanding the scope of the volume to include their nomenclature.

This volume is an important resource for the fields of catalysis and biochemistry. It offers a concise and fascinating overview of the scope of enzyme-catalyzed reactions. It provides a preliminary categorization of enzymes with names that can be recognized by the scientific community. In more neutral matters, it constitutes a handy reference to usage and style: Which term is to be used, "proteinase" or "protease"? (Proteinase is preferred.) How might one abbreviate "ferredoxin"? (Fd is recommended.)

The naming of enzymes obviously is a more complex matter than the naming of cats.

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(1) Eliot, T. S. *Old Possum's Book of Practical Cats*; Faber and Faber; London, 1939.

(2) Abstracts Service, *Naming and Indexing of Chemical Substances for Chemical Abstracts*, American Chemical Society: Columbus, 1985.

(3) George, D. G.; Mewes, H. W.; Kihara, H. *Protein Sequence & Analysis 1*, in press.

John L. Markley, *College of Agricultural and Life Sciences, University of Wisconsin—Madison*

Emulsions and Solubilization. By K. Shinoda (Yokahama National University) and S. Friberg (University of Missouri–Rolla). John Wiley & Sons: New York, NY. 1986. xiii + 174 pp. $45.00. ISBN 0471-03646-3

The authors are very knowledgeable surfactant chemists. Both have extensive contacts with industry and are familiar with practical problems and the needs of industrial scientists. They have therefore given the book a practical slant.

Heavy emphasis is placed on the behavior of nonionic surfactants, particularly the polyethylene glycol alkyl(aryl) ethers. The effects of temperature on phase stability in systems consisting of water, surfactant, and hydrocarbon are discussed in detail. The change of nonionic surfactants from water soluble to oil soluble as the temperature is raised to pass through the phase inversion temperature is well presented. The effects of the type of oil used, of changing the length of the oxyethylene chain, and of mixing surfactants are also given.

Extensive discussion is presented of the hydrophile–lipophile balance or HLB number system of classifying surfactants as emulsifying agents, wetting agents, etc. The HLB number approach is compared with the HLB temperature or PIT approach. Numerous tables are given to facilitate the comparison and to aid the scientist in using these concepts in solving practical problems with various aspects of formulations involving surfactants. The ease with which the HLB number of nonionic surfactants can be changed simply by changing the temperature receives some emphasis.

The authors also point out that ionic surfactants do not, in general, show the PIT behavior. Thus the only ways presented for changing the HLB of an ionic surfactant are to add salt, change the valency of the counterion, use a double chain surfactant, or mix the ionic surfactant with an appropriate nonionic substance.

The book is well-written and easy to follow. It should be of considerable value to both the beginning surfactant chemist and the more experienced scientist. As stated above, there is heavy emphasis on non-

ionic surfactants. The citation of ref 17 on page 22 should be to ref 16.

Raymond L. Venable, *University of Missouri—Rolla*

Volumes of Proceedings

Metal Complexes in Solution. Edited by Everett A. Jenne, Enrico Rizzarelli, Vincenzo Romano, and Silvio Sammartano. Piccin Nuova Libraria: Padova, Italy. 1987. viii + 317 pp. $30.00. ISBN 88-289-0679-4

The 20 typescript papers in this softbound volume were composed from the lectures given at the International School in Metal Complexes in Solution, which was held in Palermo in 1983. Since the preface tells us that "it was the intent of the organizing Committee that the School would provide an up-to-date picture of metal complexes in solution," it is a pity that it took 3 years for the book to reach the copyright stage, and over $3^1/_2$ years for a copy to be put in the mails for review. However, the book provides a broad review, ranging from classical methods of equilibrium analysis to computer calculations, structure, phenomena in nature, and metal-ion equilibria in the human body. A subject index of 30 pages is included.

Advanced Magnetic Resonance Techniques in Systems of High Molecular Complexity. Edited by Neri Niccolai and Gianni Valensin. Birkhäuser: Boston. 1986. 525 pp. $119.00. ISBN 0-8176-3340-5

In Siena in 1985, a symposium on the title subject was held. The 38 papers in this volume include all the plenary lectures and "a wide selection among the huge amount of contributions collected by the organizers". The papers are in uniform typescript, and an extensive subject index is provided.

Zinc Enzymes. Edited by I. Bertini, C. Luchinat, W. Maret, and M. Zeppezauer. Birkhäuser: Boston. 1986. 662 pp. $130.00. ISBN 0-8176-3348-0

In this volume, the 45 papers are called "Chapters"; some of them are reviews, but most are reports of original research. The occasion that generated them was a conference on "Comparative Analysis of Catalytic Mechanisms of Zinc Enzymes", held in Pisa in 1985. The opening contribution, by B. L. Vallee, "A Synopsis of Zinc Biology and Pathology", gives the background to the subject. Many of the papers are concerned with carboxypeptidase A. The papers are nicely set in type, and a subject index, which is essentially an index of enzymes, is provided.

Bioluminescence and Chemiluminescence: New Perspectives. Edited by J. Schölmerich, R. Andreesen, A. Kapp, M. Ernst, and W. G. Woods. John Wiley & Sons: New York. 1987. 600 pp. $110.00. ISBN 0471-91470-3

Chemiluminescence has become a subject of intense interest in recent years, especially in the area of biological/biochemical assay. The symposium that followed its predecessor by only 30 months therefore had a full program (about 100 papers). The typescripts in this volume are arranged in these sections: Cell-dependent Chemiluminescence; Immunoassays; Luminescence Biotechnology/Biochemistry; and Luminescence—Applications. There is an index of contributors, which is longer that the short subject index.

Synthesis and Applications of Isotopically Labeled Compounds 1985. Edited by R. R. Mucino. Elsevier Science Publishers: Amsterdam and New York. 1986. xxxiv + 558 pp. $129.75. ISBN 0-444-42612-4

Contains the typescript texts of six plenary lectures plus short (ca. 2 pp) versions of a very large number of papers from the Second International Symposium, held in Kansas City in 1985; author and subject indexes.

Gangliosides and Modulation of Neuronal Functions. Edited by Hinrich Rahmann. Springer-Verlag: Berlin and New York. 1987. xviii + 647 pp. $138.00. ISBN 0-387-17587-3

The University of Stuttgart hosted a NATO Advanced Research Workshop on the title subject in 1986. The purpose was not only to present recent results but also to examine the present state of knowledge so as to outline the proven facts and the open questions, in such a way as to lead to recommendations for future research. The many typescript papers are arranged in six Sections, as follows: Fundamentals for Research on Function of Gangliosides; Brain Ganglioside Metabolism; Cell specific distribution and differentiation-related expression of brain gangliosides; Gangliosides and neuronal plasticity; Bio-medical potential of exogenous ganglioside-application on nuronal functions; and Round Table Discussion. Each of the Sections is followed by a succinct summary. There is a good subject index.

The Organization of Cell Metabolism. Edited by G. Rickey Welch and James S. Clegg. Plenum Press: New York. 1986. xiv + 389 pp. $69.50. ISBN 0-306-42554-8

The title refers to a NATO Advances Research Workshop, which was held in Denmark in 1985. The 31 typescript papers are grouped into six sections; Organization of the Cytomatrix and Aqueous Compartments; Organization of Macromolecular Synthesis; Organization of Biosynthetic and Biodegradative Processes; Organization of Energy Metabolism: Enzymological Approaches, and *in situ* Approaches; and Experimental and Theoretical Modeling of Metabolic Organization. Indexed.

Industrial Applications of the Mössbauer Effect. Edited by Gary J. Long and John G. Stevens. Plenum Press: New York. 1986. x + 796 pp. $115.00. ISBN 0-306-42463-0

The International Chemical Congress of Pacific Basin Societies, held in Honolulu in 1984, hosted many symposia, among which was one on the title subject. The large number of papers presented have been developed into groups: Introduction; Techniques and General Applications; Applications to Steel and Steel Alloys; Applications to Amorphous Alloys and Glasses; Applications to Coal, Minerals, and Mineral Processing; Applications to Catalytic Materials; and Miscellaneous Applications. The papers appear in uniform typescript, and they are accompanied not only by a very thorough subject index but also by an index of authors cited.

Physics of Complex and Supermolecular Fluids. Edited by Samuel A. Safran and Noel A. Clark. John Wiley & Sons: New York. 1987. xvi + 720 pp. $49.95. ISBN 0471-85081-0

In 1985, an International Symposium on the title subject was held at Exxon Research and Engineering, New Jersey. Supermolecular fluids have a degree of micro-organization, up to the micron level, and are widely encountered in substances of the highest importance, such as soaps, blood, and milk. The Symposium stressed unifying principles and generated 34 papers dealing with colloid dispersions, membranes, phase transitions, nematic phases, aggregation, transport, and rheology. Not indexed.

Biocatalysis in Organic Media. Edited by C. Laane, J. Tramper, and M. D. Lilly. Elsevier Science Publishers: Amsterdam and New York. 1987. xii + 426 pp. $131.75. ISBN 0-444-42785-6

Typescripts of eighteen lectures from six sessions make up about half of this book. The two largest sessions are on biocatalyst and medium engineering and engineering aspects. The other half consists of poster presentations. There is an index of contributors, but no other index.