

paste buffer, and various miscellaneous functions. Case control is due in a future version.

Data may be imported from almost any source with defined record format using the LIBIMP program. Field delineated output from STN or other database vendors is ideal. At least nineteen sample import parameter files are provided, including generic Dialog Information Services files, Current Contents online and on diskette, and Pro-Cite output. An import format parameter file for the Chemical Abstracts File on STN was straightforward to create, but Library Master anticipates making one available soon. Library Master handles importing multiple record types by requiring the document type field to lead the record; therefore, the downloaded output must be edited to relocate the "DT" field to the top of each record. Additional shortcomings, which are being addressed by Balboa Software, involve field parsing. For example, author and literature source fields often contain multiple entries. At present, Library Master considers names as consisting of only two parts, last names and all else; "first" names may include middle names or initials. For literature source, Library Master cannot, at this point, separate journal name, volume, issue, pages, dates, etc. from a single source ("SO") field. However, after editing these fields in the Data Input Form, the program will produce appropriately formatted bibliographies and reference lists.

Database content may be searched globally or for contents of specific fields. The Search input screen includes a list of the database's field types for selection and use as search criteria. Selection of an indexed field automatically shows a list of all indexed entries. Field contents can be truncated in the search, and multiple criteria combined with Boolean "and", "or", or "not" operators; numerical "less than", "greater than", "equals", or combination operators; or "approximate" when spelling is unclear. Searching is fast, as Library Master uses "B-tree" indices. However, these may be awkward to most searchers of Chemical Abstracts in which individual words and registry numbers are searchable. In the B-tree, all index entries are phrases, so terms not found at the beginning of the field must be surrounded by preceding and following truncation symbols. Library Master allows separate index fields in the CA file to be read in as separate entries in a "list" index term field, but there is no proximity operator to allow linking of registry numbers with related text descriptors. The records selected as the result of a search may be stored as a record list for later handling.

An entire database or various types of subsets can be effectively and efficiently browsed, deleted, sorted, merged, and repaired. Both browse and delete modes can work on the whole database, a record list from a search, records selected by the contents of indexed fields, or individual

records. The browse function gives access to the entire record via the Data Import Form. However, the record is protected from change during browsing. Should editing be desired, a useful keystroke macro is provided in the User's Manual which switches from browse to edit modes on the same record. Another macro can be written to return to browse mode. Sorting, part of the report generation mode, uses a Sort Order File to designate which of up to three fields will be used in the sort and whether the sorting is ascending or descending on each field. Sort parameters must be set up for each applicable record type. Entire databases or record lists are readily merged into the current database. If the source and destination databases do not have identical structure, Library Master will make some adjustments to make the incoming data fit into the destination database. The manual warns that under these circumstances, "some bizarre results may occur". In any event, repair functions exist to undo the damage, either from this situation or other occurrences such as disk error, loss of power, or rebooting while a database is open.

Report generation is a full-featured function designed to produce a variety of reports from the seven supplied databases. Reports may be sent to the monitor, the printer, or to a disk file. Parameters for twelve printers and eight text editors or word processors are currently supplied, and most of these parameters can be modified using the LIBSETUP program. Among the word processors available are WordPerfect, Microsoft Word, and WordStar. Formatting reports is a two-step process. Individual bibliographic citations use Style sheets, of which 10 are supplied, including standards Turabian and Chicago. Modification of Style sheets is straightforward, so other styles (such as the one for this journal) can be readily created. A clever feature is the ability to preview references in the selected style during the record editing process. The overall report structure is defined by the Format file. The nineteen Format files supplied include those for a full formatted bibliography, annotated bibliography, and mailing lists, labels, and envelopes. While Library Master can output reports in formats which can be directly imported into word processors, it cannot interact with word processor programs to create footnotes "dynamically" during the article writing process, as some specific reference handling programs can.

In summary, Library Master is a well-designed textual database management program. It is economical, easy, and pleasant to use and versatile for many applications. While the number of such programs has grown, Balboa Software has clearly been evaluating other programs while developing one that they personally like to use. It is time for some of the other program developers to look at Library Master to see how so much can be done well.

Thomas E. Wolff, Amoco Corporation

Book Reviews*

Structure and Bonding 75. Long-Range Electron Transfer in Biology. Edited by G. A. Palmer (Rice University). Springer-Verlag: Berlin. 1991. 233 pp. \$98.00. ISBN 0-387-53260-9.

Few chemists escape graduate school without exposure to the mysteries of the "inverted region" or the yang and yin of through-bond vs through-space coupling. *Structure and Bonding 75* applies these and other constructs of electron transfer theory to biological electron transfer reactions, providing a useful snapshot of the chemists' approach to this field.

The profusion of review articles and books on electron transfer reactions reflects the central role that these reactions play in chemistry. Three useful volumes have appeared in 1991 alone: the above, *Metal Ions in Biological Systems 27: Electron Transfer Reactions in Metalloproteins* (Dekker Press), and *Electron Transfer in Inorganic, Organic and Biological Systems* (ACS Advances in Chemistry Series No. 228). There is considerable overlap in the scientific content of the books, which are mostly updates of individual experimental research programs that utilize modified and native proteins as well as model electron transfer compounds to probe the relationship between structure and function in these reactions.

Structure and Bonding 75 is distinct from the other books in its inclusion of two fairly general theoretical reviews by P. Bertrand and by A. Kuki. Five reviews of experimental approaches from the groups of B. M. Hoffman, H. B. Gray, A. G. Mauk, G. McLendon, and A. G. Sykes follow. These papers describe biological electron transfer experiments

on protein complexes, ruthenated metalloproteins, genetically engineered electron transfer proteins, bimolecular electron transfer systems, and blue copper proteins, respectively. Consisting mostly of already published data, the experimental reviews do provide excellent perspectives of multiyear research programs, often absent from the stream of communications on these subjects. The papers in this volume, and the abundant references throughout, should help the uninitiated identify important current research challenges.

The focus of *Structure and Bonding 75* is on chemically modified or genetically engineered proteins. Its limited length prevents it from providing a comprehensive survey of the electron transfer field. For example, little discussion of work on the photosynthetic reaction center or solvent friction is present. This book should be a helpful resource for students initiating research on electron transfer reactions. The articles are typeset, nicely illustrated, and, in general, clearly written and sharply focused on one or two aspects of the problem. A sense of the wide variety of productive theoretical and experimental approaches to this subject is conveyed by these seven papers.

David N. Beratan, California Institute of Technology

Modern Pulsed and Continuous-Wave Electron Spin Resonance. Edited by Larry Kevan (University of Houston) and Michael K. Bowman (Argonne National Laboratory). John Wiley & Sons: New York. 1990. ix + 440 pp. \$95.00. ISBN 0-471-50274-X.

Pulsed, high frequency, and imaging electron paramagnetic resonance techniques have undergone dramatic and important changes in the past five years which merit review such as provided by the anthology edited by Kevan and Bowman. This collection consists largely of reviews of

*Unsigned book reviews are by the Book Review Editor.

work carried out in individual laboratories on specific aspects of instrumentation or methodology development, e.g., development of high frequency continuous wave techniques by Y. S. Lebedev, development of two-dimensional electron spin resonance by J. H. Freed and co-workers, etc. The authors of these selected reviews represent the leaders in the field; thus, extremely useful insight is provided into the detailed effort of specific groups; for example, the chapter by Freed and co-workers provides important access to the tour-de-force development efforts of these workers in the fields of 2-D electron spin echo and electron double resonance techniques. Indeed, this chapter alone warrants the purchase price of the book. Chapters by Lebedev and by Schmidt and co-workers provide an important review of the state-of-the-art of both continuous wave and pulsed high frequency techniques. Both of these chapters are well-written and will be readable by the majority of ESR users. Chapters by K. A. McLachlan and M. K. Bowman provide readable status reports on studies of chemical kinetics (CIDEP) by continuous wave and pulsed Fourier transform techniques; any individual contemplating such measurements would do well to read these chapters in order to adequately understand potential difficulties and appropriate analysis procedures.

This book is a must for ESR/EPR specialists pursuing the use of advanced techniques. I do not recommend it, in general, for those unfamiliar with ESR or for graduate students. No effort has been made to provide introductory material or to provide any integration of topics. As pointed out by Bowman in the first chapter, although common mathematical techniques can be employed in the analysis of both ESR and NMR experiments, very little analogy can be made between the two experiments. Typically, ESR experiments will be both more difficult to perform and more difficult to analyze exactly. To the uninitiated many chapters will appear hopelessly complex and even these presentations are approximate and cannot be readily adapted to other applications. The exceptions to this warning are the last two chapters by Lebedev (high frequency ESR) and by Sandra and Gareth Eaton (ESR imaging); these are written clearly and at a level appropriate for the general scientific community.

Larry R. Dalton, *University of Southern California*

Advances in Photochemistry. Volume 16. Edited by David H. Volman, George S. Hammond, and Douglas C. Neckers. John Wiley and Sons: New York, 1991. ix + 372 pp. \$95.00. ISBN 0-471-81526-8.

Volume 16 of *Advances in Photochemistry* continues the high standard of the previous volumes in this series. There are five contributed articles in this volume covering a diverse set of topics. The articles are not encyclopedic (which is not the intent of the series), but each provides sufficient background so that those who are not experts in the area can profit from the chapter. This is a hallmark of this series, which has emphasized the diversity and breadth of disciplines which contribute to photochemistry.

In the first chapter, Mimicking Photosynthetic Electron and Energy Transfer, Devens Gust and Thomas Moore (Arizona State University) describe the progress of their groups' efforts to separate charge using light through rational design of organic donor-acceptor systems which can mimic the early events in photosynthesis. This chapter is very well organized and presented. Its contents will be of interest to a wide variety of audiences from experts to the merely interested. The authors are among the world leaders in this effort and so their review, while concentrating on their own laboratories' results, presents the state of the art well in this exciting field. In the next chapter, A Unified View of Ketone Photochemistry, Sebastiao Formasinho (University of Coimbra, Portugal) reviews his theoretical work employing tunnel effect theory to describe photochemical reactivity. The author reviews previous theoretical models that have been brought to bear in photochemistry before describing his own work and its application to ketones specifically. He makes a cogent argument that his theory provides the most comprehensive picture of reactivity to date. The third chapter in Volume 16 addresses spectroscopic determination of excited state structure. Jeffrey Zinc and Kyeong-Sook Kim (UCLA) analyze the Raman spectra of inorganic and organometallic compounds to provide information about geometric changes that occur on excitation in this chapter titled Molecular Distortions in Excited Electronic States Determined from Electronic and Resonance Raman Spectroscopy. One of the successes of this chapter is its ability to show how the spectroscopically determined structural distortions relate to the photochemistry of the compounds discussed. The fourth chapter continues the inorganic theme. Leslie Forster (University of Arizona) discusses Primary Photoprocesses in Transition Metal Complexes. This chapter describes the use of lifetimes and quantum yields to provide information about classes of inorganic photochemical reactions, especially photosolvation of various ligands. The majority of the examples cover Cr^{3+} systems, although shorter sections describe $\text{Cr}(\text{CO})_6$, $\text{Co}(\text{CN})_6^{3-}$, and some Rh^{3+} compounds. Solvent motion and dynamics are emphasized in the chapter. The final chapter,

also the longest, describes Photoinitiated Reactions in Weakly Bonded Complexes (by S. K. Shin, Y. Chen, S. Nikolaisen, S. W. Sharpe, R. A. Baudet, and Curt Wittig, UCLA). These authors review progress in our understanding of the partitioning (branching ratios) of reaction paths in photoexcited complexes into one or more possible channels as well as the overall efficiency (reaction probability) of the excitation process. Examples are drawn from three experimental domains: matrix isolation studies, binary gaseous supersonic expansions in jets, and, third, a wide-ranging discussion of results not from the Wittig group on metal atom-molecule complexes. The latter section highlights the orbital orientation of the metal atom vis à vis the complexed molecule and discusses the consequences to the photochemistry. This is an interesting section with a healthy amount of speculation.

This volume of *Advances in Photochemistry* is an excellent addition to the series. The typeface is attractive and the reproduction of figures is generally good—even the largest Gust/Moore molecule can be easily deciphered. This volume has a cumulative index to the previous volumes in the series as well as a modest subject index of the present volume. This volume should find a place on the bookshelf of all working photochemists.

David F. Eaton, *Du Pont Central Research and Development*

Gel Electrophoresis of Nucleic Acids. A Practical Approach. 2nd Edition. Edited by D. Rickwood (University of Essex) and B. D. Hames (University of Leeds). Oxford University Press: New York, 1990. xix + 311 pp. \$50.00. ISBN 0-19-963083-6.

Because an increasing number of chemists are using gel electrophoresis as either an analytical or preparative method of separation, a book on this topic can be a useful addition to laboratory references. This book in particular is an updated edition, the original of which was published in 1982. As part of a "Practical Approach" series, it is a more specific treatise on gel techniques than other more general biochemistry/molecular biology lab manuals, such as the one by Maniatis et al. As such, however, it also covers this subject much more comprehensively. Chapter topics include analytical and preparative electrophoresis methods for both RNA and DNA, pulsed field electrophoresis, electrophoresis of synthetic oligomers, 2-D gels, gel retardation, analysis of DNA-binding proteins in extracts, and electrophoresis of nucleosomes and ribonucleoproteins. The sections on gels for synthetic oligomers and techniques for smaller RNA and DNA fragments are likely to be particularly useful for chemists. Nucleic acid sequencing is covered in a separate book in this series and so is not specifically addressed here. The book also does not address the newer topic of capillary electrophoresis. Aside from these absences, the book is quite admirably comprehensive and each section is accompanied by a list of references. It contains many specific recipes for gel preparations, with procedures and diagrams for the separations, and tips for troubleshooting as well. For these reasons it is highly recommended as a ready reference manual for the laboratory.

Eric T. Kool, *University of Rochester*

Amino Acids and Peptides. Volume 22. A Specialist Periodical Report. Senior Reporter: J. H. Jones (University of Oxford). Reporters: G. C. Barrett, J. S. Davies, D. T. Elmore, P. M. Hardy, R. W. Hay, K. B. Nolan, and C. H. Frydrych. The Royal Society of Chemistry: Cambridge, 1991. xii + 374 pp. £92.50. ISBN 0-85186-204-7.

This specialist periodical report reviews the literature published in 1989. Over 2000 references are listed. The book is divided into the following six chapters: Amino Acids; Peptide Synthesis; Analogue and Conformational Studies on Peptide Hormones and Other Biologically Active Peptides; Cyclic, Modified, and Conjugated Peptides; β -Lactam Antibiotic Chemistry; and Metal Complexes of Amino Acids and Peptides.

The chapter on amino acids focuses on the occurrence of known and new amino acids, the chemical synthesis of amino acids and their novel analogues, and the physical and chemical studies that have been carried out on these compounds. There is also a section on amino acid analytical methods. In Chapter 2 the papers related to the various aspects of peptide synthesis methodology are reviewed. An attractive feature of this chapter is the appendix list of the peptides/proteins whose syntheses were reported in 1989. The subject matter covered in the third chapter on analogue and conformational studies of peptides includes the following: amide bond isosteres and peptide-backbone modifications, conformationally restricted cyclic and bridged peptide analogues, dehydroamino acid analogues, enzyme inhibitors (in particular ACE and renin), side chain interactions studied by residue substitution or deletion, and conformational information derived from physical methods such as NMR spectroscopy, X-ray crystallography, and computational methods. Chapter 4 is divided into three major sections. The first major section deals with cyclic peptides from the dioxopiperazines to those cyclic peptides that contain novel heterocyclic and other non-protein ring systems. Section two on modified linear peptides covers such topics as

dehydropeptides, peptides containing α,α -dialkylamino acids, amide bond surrogate analogues, conformationally constrained peptides, and phosphopeptides. Although this section covers some work not covered in the preceding chapter, there is a fair amount of overlap between this section and several of the sections in Chapter 3. The final section of this chapter reviews the areas of glycopeptides and non-carbohydrate peptide conjugates. The chapter on β -lactam antibiotic chemistry primarily addresses the synthetic approaches that appeared during the year under review for the penicillins, cephalosporins, oxapenam, penems, carbapenems, carbacephem, and azetidinones. The azetidinones are in particular emphasized in this specialist report. The final chapter focuses on the synthesis, crystal structure, and reactions of the metal complexes of amino acids and peptides.

In general, the reporters have done a very good job of summarizing the pertinent points and results of the literature being reviewed. Although the book does not contain an index, each chapter has been divided into numerous sections and subsections such that a perusal of the table of contents should allow an individual to quickly focus in on his or her area of interest. This reviewer feels that an earlier publication date than the March 1991 date would have enhanced the usefulness of the book. Never the less, scientists working in the fields of amino acid and peptide chemistry will certainly find this book to be a very valuable resource for keeping abreast of the ever expanding literature in these areas of research.

Rodney L. Johnson, *University of Minnesota*

Molecular Basis and Thermodynamics of Bioelectrogenesis. By E. Schoffeniels and D. Margineau (University of Liège). Kluwer Academic Publishers: Dordrecht, Boston, London. 1990. vii + 181 pp. \$62.00. ISBN 0-7923-0975-8.

This is a book for those with an interest in bioelectricity. The authors, who are among the leaders in the field, have written an excellent and timely account of this area. It is important to recognize that it is a difficult task to merge molecular aspects of bioelectrogenesis with the dynamic aspects of biochemistry. Schoffeniels and Margineau have put together a valuable collection of chapters that introduce bioelectrogenesis based on biological phenomena at the molecular scale.

The book has seven chapters. In the first chapter properties of the nervous system are described in physicochemical terms. Following a short introduction containing a brief historical review, the authors present in a well-organized manner the following topics: nerve impulse as a bioelectric event, studies of nonelectric aspects of the nerve impulse, and reception and transmission of excitation between cells. The second chapter deals with cell membranes and bioelectrogenesis. The ubiquitous cellular component, membrane molecular components, and silent and excitable membranes are described. The third chapter presents a clear discussion of phenomenological aspects of bioelectricity, i.e. resting potential, charge propagation in cells, propagation of action potentials, and intercellular transmission of excitation. The fourth chapter describes molecular approaches of bioelectricity based on intermediary metabolism in the brain. Control of glycolysis, non-oxidative consumption of glucose during neural activity, and the pentose phosphate shunt are also discussed. The fifth chapter describes nerve impulse thermodynamics related to oxygen consumption and heat production, energy dissipation by Na^+/K^+ pumps in nerves, capacitive energy changes, and energy changes during the action potential. Chapter six deals with thiamine triphosphate as the specific operative substance in spike-generation. In the seventh and final chapter the authors try to merge electrophysiology and molecular approaches.

Unlike several recent books concerning bioelectrogenesis this book does not require extensive knowledge of statistical thermodynamics to be readable. The book is imaginatively and amply illustrated. It is well referenced and the particular topics that are covered are all of current-relevance.

For the biologist who wants to embark upon a quantitative approach to electrogenesis in biomolecular systems, it is as good a starting point and tool as any available.

Tadeusz Malinski, *Oakland University*

Lectins. By N. Sharon and H. Lis (Weizmann Institute of Science). Chapman and Hall: London and New York. 1989. 127 pp. \$42.50. ISBN 0-412-27380-2.

Nathan Sharon and Halina Lis, the most prolific pair of reviewers of the lectin field, present us with a global view of their speciality. This thin volume highlights general features of the terrain with some resolution of detail, much as the earth is seen from a circling satellite in the stratosphere. *Lectins* sequentially displays and briefly discusses each of the subspecialties related to the study of lectins and their uses in chemistry and medicine. Following an introductory overview, Chapter 2, the second longest of 14 pages, details the historic personalities, beginning with

Hermann Stillmark in 1888, influential in the acceptance of lectins as a legitimate field of study. The book succinctly discusses the occurrence and isolation of these proteins and properties of lectins in biological systems. The more chemically oriented chapters which follow are concerned with the carbohydrate binding properties of lectins and their structural and biosynthetic characteristics as proteins. For those with interests in the use of lectins as reagents, overviews focusing on the application of lectins in glycoconjugate isolation and analysis, cell biology, microbiology, and medicine are condensed in 27 pages. The book concludes with a single chapter speculating on the physiological functions of lectins in their natural biological organisms.

As would be expected from a book of little more than 100 pages, *Lectins* reads very much like a condensation of the 600-page *The Lectins: Properties, Functions and Applications in Biology and Medicine* edited by Sharon along with I. Liener and I. J. Goldstein. The shorter book covers the same material but with considerably less detail and employs examples which seem to be most closely associated with the research emanating from the Sharon laboratory. The references to primary sources are scarce, and the rationale for many of the 103 selections is difficult to appreciate. Nevertheless, *Lectins* is ideal as auxiliary reading in a graduate course concerned with glycoconjugate chemistry and biology, or for novices to lectinology. As with an evening of wine tasting, this book can be completed in one sitting, and from this pleasurable experience, the student will gain a greater appreciation of the complexities in the speciality. Like wine tasting, however, the reader of *Lectins* remains far from satiated and the more in-depth, comprehensive treatises which are available must be read.

R. D. Poretz, *Rutgers University*

Water-Soluble Polymers. Synthesis, Solution Properties, and Applications. ACS Symposium Series 467. Edited by Shalaby W. Shalaby (Clemson University), Charles L. McCormick (University of Southern Mississippi), and George B. Butler (University of Florida—Gainesville). American Chemical Society: Washington, DC. 1991. ix + 523 pp. \$99.95. ISBN 0-8412-2101-4.

This book was developed from a symposium sponsored by the Division of Polymer Chemistry, Inc. at the 198th National Meeting of the ACS in Miami Beach, FL, September 10–15, 1989. It consists of 33 chapters in typescript form organized under the following headings: Polymers and Intermediates; Polymer Synthesis and Modification; Physicochemical Aspects of Aqueous Solutions; Biomedical and Industrial Applications; and Advances in Less Conventional Systems. There are indexes of authors, their affiliations, and subjects.

Protein Refolding. ACS Symposium Series 470. Edited by George Georgiou (University of Texas) and Eliana De Bernardez-Clark (Tufts University). American Chemical Society: Washington, DC. 1991. \$49.95. ISBN 0-8412-2107-3.

This book was developed from a symposium sponsored by the Divisions of Biochemical Technology and Biological Chemistry at the 199th National Meeting of the ACS in Boston, MA, April 22–27, 1990. It consists of 16 chapters and indexes of authors, their affiliations, and subjects.

Electron Transfer in Inorganic, Organic, and Biological Systems. Edited by James R. Bolton, Noboru Mataga, and George McLendon (University of Western Ontario, Osaka University, and University of Rochester, respectively). American Chemical Society: Washington, DC. 1991. viii + 295 pp. \$89.95. ISBN 0-8412-1846-3.

This book, No. 228 in the *Advances in Chemistry Series*, was developed from a symposium sponsored by the International Chemical Congress of the Pacific Basin Societies in Honolulu, Hawaii, December 17–22, 1989. This volume of 17 chapters is introduced by a chapter written by the editors and concluded by an epilogue by R. A. Marcus. The editors note that the importance of the subject matter of the book is illustrated by the fact that four of the symposia and 81 of the papers presented at the Conference contained the words "electron transfer" in their titles. The present state of understanding of the subject is perhaps indicated by the title of the last chapter in the book: Puzzles of Electron Transfers. There are author, subject, and affiliation indexes.

Spectroscopy of Biological Molecules. Edited by R. E. Hester and R. B. Girling (University of York). The Royal Society of Chemistry: Cambridge, UK. 1991. xxiv + 464 pp. £55.00. ISBN 0-85186-437-6.

This book consists of articles, in typescript form, prepared by the invited lecturers and those making poster presentations at the Fourth European Conference on the Spectroscopy of Biological Molecules held at the University of York, England, September 1–6, 1991. The 192 articles are organized under the following headings: (I) Theory. Protein structure analysis. Membrane proteins; (II) Photosynthetic reaction systems; (III) Crystallography. Time-resolved spectroscopy. Chirality;

(IV) Phospholipids and membranes. Carbohydrates. Rhodopsins; (V) NMR. Enzyme characterization; (VI) Metalloproteins. Whole cells. Biomedical applications; (VII) Nucleic acids and their interaction with proteins and drug molecules; and, lastly, (VIII) Haem proteins and related systems. The full range of spectroscopic methods is included: IR, NMR, CD, MCD, X-ray absorption and diffraction, optical absorption and fluorescence, molecular graphics simulations, and other theoretical methods. There is an author index at the end; affiliations of authors are given in the headings of each article. There is no subject index, but complete titles are given in the table of contents.

Advances in Steroid Analysis 1990. Edited by S. Görög (Simmelweis University Medical School, Budapest); Guest Editor E. Heftmann. Akadémiai Kiadó: Budapest. 1991. \$58.00. xiii + 493 pp. ISBN 936-05-6034-8.

This volume presents the proceedings from the 4th Symposium on the Analysis of Steroids held in Pécs, Hungary, April 24–26, 1990. The 62 papers, in typescript form, are organized under the following headings: (1) Receptor Binding Studies; (2) Immunoassays; (3) Chromatography; (4) Spectroscopy; (5) Clinical Studies; and (6) Miscellaneous. There is a brief subject index.

Flavins and Flavoproteins 1990. Edited by B. Curti, S. Ronchi, and G. Zanetti (Università Statale di Milano). Walter de Gruyter: Berlin and New York. 1991. xxiii + 945 pp. DM 390.00. ISBN 3-11-012373-8.

This book contains the proceedings of the Tenth International Symposium on the title subject held in Como, Italy, July 15–20, 1990. Following an introductory lecture by K. Yagi, who will be the host to the next symposium on this subject in Japan, there are 175 articles in typescript form with numerous illustrations, figures, and tables. The book is organized into the following sections: Flavin Chemistry and Physico-Chemical Studies of Flavoproteins; Biosynthesis of Flavins and Flavoproteins; Oxidases; Monooxygenases; Flavin Dependent Bioluminescence; Dehydrogenases and Electron Transferases; Disulfide Reductases; Complex Flavoproteins; Folate Dependent Flavoproteins; Flavoproteins of Medical Relevance; and Non Redox-Active Flavoproteins. There are indexes of participants (by countries), authors, and subjects. The introductory lecture gives an interesting history of the discovery of the flavins as well as descriptions of Yagi's contributions. Where else could one learn that a Japanese naval doctor discovered that a component in the bran of unpolished rice could prevent beriberi?

Sulfur-Centered Reactive Intermediates in Chemistry and Biology. Edited by Chrysostomos Chatgililoglu (Consiglio Nazionale delle Ricerche, Bologna) and Klaus-Dieter Asmus (Hahn-Meitner-Institut, Berlin). Plenum Press (in cooperation with NATO Scientific Affairs Division): New York and London. 1990. xi + 451 pp. \$110.00. ISBN 0-306-43723-6.

Anyone doubting the importance of sulfur to organic chemistry and biology should read this book! It contains the main lectures given at the NATO Advanced Studies Institute on the title subject held in Acquafredda di Maratea, Italy, June 18–30, 1989. There are 39 articles based on the lectures and a subject index; affiliations of the authors are given in the headings of each article.

Vibrational Spectra and Structure. Volume 19. Edited by James R. Durig (University of South Carolina). Elsevier: Amsterdam. 1991. xxi + 522 pp. \$260.00. ISBN 0-444-89027-0.

This is the 19th volume in a series dealing with various aspects of vibrational spectroscopy: infrared, Raman, and vibrational structure in electronic transitions. The aim of the series is both to present critical summaries of recent work and to review current fields of interest. The present volume does this in seven chapters: Chapter 1, Advances in instrumentation for the observation of vibrational optical activity (M. Diem, 54 pp, 55 references); Chapter 2, Surface enhanced Raman spectroscopy (R. Aroca and G. J. Kovacs, 59 pp, 224 references); Chapter 3, Determination of metal ions as complexes in micellar media by UV-vis spectrophotometry and fluorimetry (F. F. Lucena, M. L. M. Alegre, and A. R. R. Fernandez, 38 pp, 87 references); Chapter 4, Ab

initio calculations of vibrational band origins (D. J. Searles and E. I. Felsobuki, 64 pp, 235 references); Chapter 5, Application of infrared and Raman spectroscopy to the study of surface chemistry (T. Takenaka and J. Umemura, 100 pp, 342 references); Chapter 6, Infrared spectroscopy of solutions in liquified simple gases (Y. M. Kimel'fel'd, 54 pp, 126 references); Chapter 7, Vibrational spectra and structure of conjugated and conducting polymers (I. Harada and Y. Furukawa, 100 pp, 445 references).

Two general observations are in order: (i) the goals of the individual chapters in the text are each different, making it better viewed as a collection of seven papers, and (ii) with the exception of the ab initio chapter, the references are rather dated, seldom going beyond 1987 despite the 1991 copyright. Bearing in mind that progress may have been made in the last four years, the text nonetheless has some very strong points. Chapter 1 contains an excellent discussion of the instrumental issues involved in digging out a weak signal: vibrational or Raman optical activity is characterized by a differential signal which is 10^{-3} – 10^{-5} of the infrared or Raman signal. The techniques developed in this area are applicable to other areas as well. Chapter 4, with the most current references, contains a thorough presentation of ab initio calculations focusing on the H_3^+ system. Chapter 2 presents a comprehensive discussion of the theory of surface enhanced Raman spectroscopy and the experiments that are designed to test and further the theory. In this regard, this is perhaps the strongest chapter in the text. Chapter 7 is also an excellent chapter, giving a good discussion of polymers, doping, polarons, and solitons as well as resolution of some controversies on conflicting reports in the literature on structural information. Anyone contemplating experiments in this area, or relying on the experimental results of others, would benefit from a reading of this chapter. Chapter 6 on spectroscopy in liquified simple gases would have benefited greatly from inclusion of more illustrations. It is recommended that this chapter be read in a library so that the relevant publications containing the illustrations may be consulted. Chapter 5 concentrates on surfactants despite its title, and the English is rough at times. Finally, Chapter 3 is little more than a guide to the literature. The four stronger chapters in this text should serve both as an excellent launching point for further work in the specific area and as an introduction to the area, and the book is recommended for this purpose.

Mary Jane Shultz, Tufts University

The Concept of Electronegativity and Structural Chemistry. By S. S. Batsanov (Institute of Physico-Technical Measurements). Harwood Academic Publishers: New York. 1990. 79 pp. \$41.00. ISBN 3-7186-5052-5.

The concept of electronegativity (EN) has had a strong pedagogical and descriptive impact on chemistry. Pauling defined electronegativity as the ability of an atom to attract electrons toward itself. This lack of rigor in the definition has led to numerous methods to quantify electronegativity, and many of these are presented in this slim book. Unfortunately, the author does not address the issue of arbitrariness inherent in quantifying electronegativity and frequently ascribes "confirmation of the validity" of methods and definitions, where this is impossible in the sense that there is no *unique* or *ab initio* derivation of EN. EN, atomic charges, and ionicity are most useful concepts, but they are not quantum mechanical observables, and experimental determination rests on arbitrary assumptions and definitions.

Batsanov does review many methods (including those based on bond strength, ionization potentials, electron density, geometry, and optical data) for obtaining EN, compares them, and offers a number of tables suggesting average values for atoms, ions, radicals, and groups. The references include Boyd's application of the topological electron density method to EN, but the text never makes mention of these papers, as if paragraph(s) were eliminated at some later time. References run through 1988, and, therefore, Batsanov does not review Allen's recent contributions to the field. The work does bring to the English audience work that was previously available only in Russian and does supply some history of the development of this important modeling concept.

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