Overall, this is a very nice implementation of Hypercard that represents a real advance in current awareness. Deficiencies are minor and include, in addition to the aforementioned difficulty of scrolling through hits, relatively slow searches. While the current release covers only the life sciences issues of Current Contents, future release of the Physical Sciences issues on diskette is planned.

Book Reviews*

Methods in Enzymology. Volume 158, Part A, and Volume 159. Volume 158: Edited by James F. Riordan (Harvard Medical School) and Bert L. Vallee (Harvard Medical School). Academic: New York and Orlando. 1988. xxv + 464 pp. $59.00. ISBN 0-12-182059-9. Volume 159: Edited by Jackie D. Corbin (Vanderbilt University) and Roger A. Johnson (State University of New York at Stony Brook). Academic: New York and Orlando. 1988. xxxvii + 849 pp. $89.00. ISBN 0-12-182060-2.

Volume 158, Part A, is subtitled "Metallobiochemistry". It consists of 33 contributions under three headings: "Sample Preparation", "Analytical Techniques", and "Analysis of Metals".

Volume 159 is subtitled "Initiation and Termination of Cyclic Nucleotide Action". It consists of 74 contributions, under six section headings: "Cyclic Nucleotide Cascades", "Assays of Cyclic Nucleotide Levels, Turnover, and Transport", "Cyclic Nucleotide Action", "Protein Phosphates", "General Methods for Studies of Phosphodiesterases", and "Methods for Isolation and Studies of Various Phosphodiesterase Isoenzymes". Each book has a true author index and a substantial subject index.

Marvels of the Molecule. By L. Salem (Universite de Paris-Sud). VCH: New York and Weinheim. 1987. xii + 88 pp. $16.95. ISBN 0-89573-345-5.

This little book is essentially an essay, written to "demystify modern chemistry". To do so, it avoids arcane scientific terminology (there is a glossary, however) and relates the phenomena of chemistry to things encountered in everyday life. In a foreword, Roald Hoffmann describes this book as "a modern Baedeker, a guide to the seemingly strange country of the chemists." Indeed, it succeeds in making such concepts as molecular bonding, reaction kinetics, catalysis, etc., reasonably comprehensible at a nearly intuitive level. It is written for the lay reader, but could be very helpful to the beginning student as well (and to instructors looking for ways to explain basic concepts).

Grosse Molekuele. By Hans-Georg Elias. In German. Springer Verlag: Heidelberg and New York. 1985. 204 pp. ISBN 3-540-15599-6 and 0-387-15599-6.

The book *Grosse Molekuele* (Giant Molecules) with its subtitle, Popular Talks about Synthetic and Natural Polymers, is a most delightful book and is recommended for scientists and nonscientists alike. It is one of the few books on scientific subjects that can be understood and appreciated by almost everybody. The author introduces the subjects by saying: "if macromolecules did not exist there would be no life; people, animals and plants would be without structural, storage and transport materials; without macromolecules, life would not propagate."

The author provides an amazing amount of information on how much can be produced on an acre of land in wool, natural rubber, cotton, meat, rice and on synthetic fibers. We find in the book information on fibers, adhesives, motor oils, foams, rubbers, glasses, and many other materials; how they are made and how they are used. The book describes the structures of chemical molecules, monomeric building elements that ultimately result in high molecular weight substances; he describes the enzymatic degradation of polysaccharides and the similar enzymatic tenderizing of meat. He points out the relation between sweet potatoes and tough meat, what happens when spaghetti foams, what happens when bread becomes old, what processes occur when we iron clothes or when we shave, and how the Xerox machine works.

The author educates the reader with the structures of stereoregular macromolecules, helical macromolecules, synthetic and natural fibers. The composition of paper and leather, their fabrication, and the optimization of their properties, including their texture, are mentioned. He emphasizes that some of the polymers are not only cheaper but also stronger than steel; the author takes advantage of his extensive knowledge of history and refers to the use of polymeric materials (not then recognized as such) from the Roman and even Egyptian times.

Elias' book on Giant Molecules is delightful to read; I have read it several times and still occasionally read one or the other chapter. I consequently recommend it for people that enjoy scientific reading that is close to everyday life.

Otto Vogl, *Polytechnic University, Brooklyn*

Teratogens: Chemicals Which Cause Birth Defects. Edited by Vera Kolb Meyers (University of Wisconsin—Parkside). Elsevier: New York, NY. 1988. xii + 472 pp. $171.00. ISBN 0-444-42914-X.

This book is Volume 31 in the series *Studies in Environmental Science*. The stated aim of the monograph is to address the practical aspects of teratogens, particularly the need to obtain information about the potential of chemicals as reproductive hazards. The book consists of eight chapters: (1) How to Obtain Information About the Teratogenic Potential of Chemicals by H. B. Morgan, G. S. Danford, F. M. Holland, K. C. Miller, E. T. Owens, B. E. Ricci, S. Y. Uppuluri, and J. K. Wassom, (2) Registry of Toxic Effects of Chemical Substances as a Source for Compiling a List of Teratogens by V. K. Meyers, (3) Reproductive Hazards in Industry: Identification and Prevention by K. Hemminki and M. Lindbohm, (4) Teratogenic Chemicals in Undergraduate General Chemistry Laboratories by D. K. Kolb, (5) Safe Handling of Teratogenic Chemicals by B. C. McKusick, (6) Use of Registered Data in Studies of Occupational Exposure and Pregnancy Outcome by M. Lindbohm and K. Hemminki, (7) Long-term Effects of Chemicals on Developing Brain and Behavior by M. Mirmiran and S. De Boer, and (8) Teratogenicity of Pesticides and other Environmental Pollutants by M. J. Kland.

The first two chapters provide an introduction to numerous databases of information on teratogenic chemicals. Chapter 2 is followed by two appendices which list over 5000 compounds and mixtures for which reproductive effects have been reported. Substances are tabulated alphabetically by parent compound names, along with CAS registry numbers, as they appear in the Registry of Toxic Effects of Chemical Substances (RTECS). The authors have made an extra effort to provide a comprehensive listing of teratogens. However, the appendices include many laboratory reagents not normally associated with serious toxic hazard (e.g., sodium chloride, magnesium sulfate, most amino acids, carbon dioxide, sucrose, carbon), and no comparative data from animal tests are included with the compounds. Therefore, chemists using the tables must seek more detailed data on the teratogenicity of specific compounds from the original RTECS files or other sources.

The two chapters by Hemmicki and Lindbohm address the occupational risks associated with teratogens. The essays are very general in scope and focus on Scandinavian studies of industrial exposure.

Kolb's discussion of teratogenic compounds in undergraduate laboratories will be of interest to educators. Several compounds with teratogenic potential are widely used in undergraduate laboratories; the potential hazards associated with such substances are described and handling procedures to minimize exposure are suggested. The safe handling of teratogens is given additional coverage in the chapter by McKusick.

The effects of chemicals on neurobehavioral development are reviewed in the chapter by Mirmiran and De Boer. Numerous compounds and their specific developmental effects are discussed. A large number of references to experimental studies are provided.

The chapter by Kland reviews studies on the teratogenic potential of pesticides and other environmental agents. Some particularly notorious compounds, such as dioxins, PCB's, and PBB's, are given special attention; both epidemiological studies and anecdotal accounts of the teratogenicity of these compounds are summarized. One error in this chapter may mislead some readers. It is stated that pentachlorophenol, often called PCP, is the same compound as the street drug, "angel dust"; the latter substance is actually phencyclidine (1-(1-phenylcyclohexyl)-

* Unsigned book reviews are by the Book Review Editor.

piperidine). The two dozen tables and structural figures that accompany this essay are awkwardly collected at the end of the chapter, apparently for the convenience of printing.

The authors have succeeded in putting together a collection of information that will make chemists more aware of the developmental toxicity of compounds. This book would be particularly useful as a practical overview and compendium of substances with teratogenic potential and as an introduction to the literature and databases available on teratogens.

R. Bruce Banks, *University of North Carolina at Greensboro*

Activation, Deactivation and Poisoning of Catalysts. By John B. Butt (Northwestern University) and Eugene E. Peterson (University of California, Berkeley). Academic: New York. 1988. x + 495 pp. $95.00. ISBN 0-12-147695-2.

I find this book to be an excellent addition to the bookshelf of industrial practitioners of catalysis in addition to members of the academic community with an interest in catalysis. The authors have combined many years of experience in both research and teaching into the organization and writing of this book. The book has been organized into three parts. Part I details the deactivation of catalytic surfaces with emphasis on microscopic processes, Part II emphasizes catalyst deactivation through macroscopic processes, and Part III outlines global processes in connection with the deactivation and regeneration of fixed-bed reactors.

Introductory definitions used in catalyst deactivation including a mathematical description of deactivating systems are given in Chapters 1 and 2. An excellent discussion of deactivation by fouling with emphasis on the chemistry of coke formation is given in Chapter 3. Coke formation is presented as an open-ended problem that requires additional study. The relationship between the chemistry of coke formation and surface poisoning by one-to-one site blocking is discussed with suggestions for further study. Catalyst deactivation through the chemical modification of active sites is considered in detail. The geometric–electronic factors that have been of considerable concern to practitioners in catalysis are considered. Deactivation by sintering is discussed in Chapter 5. Current sintering models are discussed in detail, and the effect of particle morphology on catalytic activity and selectivity is detailed. The effect of chloride on redispersion is considered. However, I am of the opinion that this section should have been considered in a little more detail.

Intraparticle catalyst deactivation with emphasis on catalytic hydrodesulfurization reactions is discussed in Chapter 8. Emphasis is on the shell poisoning model in addition to models based on uniform site poisoning. The preferential positioning of the active ingredient in order to take advantage of possible differences in diffusion rates between the main and poisoning reaction is considered. The control of poisoning through the design of new and better shape selective catalysts is discussed. Reaction uniformities are considered in Chapter 8. Isothermal and nonisothermal single-pellet reactors are discussed as an aid in distinguishing between parallel and series poisoning. Detailed information on profile shapes and thermal gradients is obtained through the use of nonisothermal reactors. To conclude Part II, the authors discuss the regeneration of coked catalysts. In particular, the decoupling of kinetic and transport rates is considered in detail.

Catalyst deactivation and regeneration in fixed-bed reactors are considered in Part III. The importance of the poison or coke adsorption capacity is stressed as the single most important reaction–deactivation parameter in the mathematical models used to describe deactivation in fixed-bed reactors. The regeneration of fixed-bed reactors is discussed in terms of the variation of the kinetics of coke burning. The authors conclude with a discussion of kinetic lumping, deactivation, and reaction models for catalytic cracking.

In conclusion, this book presents an excellent compilation of material relevant to catalyst deactivation. The material is well organized and I strongly recommend it to practitioners in catalysis.

Richard D. Gonzalez, *University of Illinois at Chicago*

Spectroscopic Properties of Inorganic and Organometallic Compounds. Volume 20. Edited by G. Davidson and E. A. V. Ebsworth. Royal Society of Chemistry: London. 1987. xvi + 494 pp. £110.00. ISBN 0-85186-183-0.

As the foreword says, "this volume is constructed on the pattern of its predecessors". It will come as no surprise to most readers to discover that it contains a concise and thorough compilation of spectroscopic information appearing in the literature. Most of the references are for 1986. There are eight chapters covering the following areas: Chapter 1. Nuclear Magnetic Resonance Spectroscopy; by B. E. Mann (195 pages including 3217 references). In this chapter details of ^{1}HMR spectra are included only when they make a non-routine contribution, otherwise a complete coverage of solid-state NMR, silicon, and phosphorus is limited due to space retrictions. Nevertheless Dr. Mann has done a remarkable job. The various sections are as follows: introduction, stereochemistry, dynamic systems (fluxional molecules, equilibria, ionic equilibria, equilibria among uncharged species, course of reactions); paramagnetic complexes (transition metals, lanthanides and actinides, solid state); group IIIB compounds, and IVB elements, compounds of group VB, and compounds of group VIB, iodine and xenon. Chapter 2, Nuclear Quadrupole Resonance, by K. B. Dillon (21 pages, 101 references). Again a comprehensive compilation of studies concerning n.q.r. spectra of quadrupolar ($I > {}^1/_2$) nuclei in inorganic or organometallic solids is presented. Chapter 3, Rotational Spectroscopy, by S. Craddock (19 pages, 247 references). Chapter 4, Characteristic Vibrations of Compounds of Main-group Elements, by G. Davidson (35 pages, 413 references). Chapter 5, Vibrational Spectra of Transition-element Compounds, by G. Davidson (37 pages, 405 references). Chapter 6, Vibrational Spectra of Some Co-ordinated Ligands, by G. Davidson (60 pages, 451 references). Chapter 7, Mössbauer Spectroscopy, by S. J. Clark, J. D. Donaldson, S. M. Grimes, and M. J. K. Thomas (101 pages, 653 references). Chapter 8, Gas-phase Molecular Structures Determined by Electron Diffraction, by D. W. H. Rankin and H. E. Robertson. (19 pages, 40 references). All the authors should be congratulated for the high quality of their contributions. This volume, as all its precessors, should be found on the shelves of all good chemistry libraries.

Richard A. Jones, *University of Texas*

Aleksandr Porfir'evich Borodin: A Chemist's Biography. By N. A. Figuroskii and Yu. I. Solov'ev (Institute for the History of Science and Technology, Academy of Sciences of the U.S.S.R.); translated from the Russian by Charlene Steinburg (University of Wisconsin Center—Sheboygan) and George B. Kauffman (California State University Fresno). Springer Verlag: New York and Berlin. 1988. xiv + 171 pp. $79.50. ISBN 0-387-17888-0.

This translation of a short biography, first published in the Soviet Union in 1950, is beautifully produced and well illustrated. The translators have done an admirable job of casting the Russian manuscript into a very readable English text and have helped their readers by writing many elucidating footnotes that do much to clarify chemical, musical, and cultural items in the original manuscript.

Anyone who knows anything about Borodin's contributions to music or science must have great respect for him. Balakirev, the composer, introduced him once by saying, "This is Chemistry; this is Medicine!" Because of Borodin's lofty contributions and his associations with so many talented and famous people, this book is fun to read.

Professor Martin D. Kamen makes the point, in a critical and insightful preface, that the case the Russian authors were trying to make was weakened by "somewhat strident propagandist overtones". It should not be forgotten that the Russian text was published 3 years before Stalin's death, a time when life was made very unpleasant for many Soviet composers and scientists. An objective reader of this particular life of Borodin will be skeptical about many conclusions of its authors because of the political situation in the Soviet Union during the Stalin era.

This reviewer has wished for a long time that more foreign biographical material would be made available in English translation and is delighted that the English speaking world has been presented with this fine translation.

David H. Kenny, *Michigan Technological University*

The Molecular Biology of Receptors: Techniques and Applications of Receptor Research. Edited by A. D. Strosberg (Institut Pasteur). Ellis Horwood: Chichester. VCH: Weinheim and New York. 1987. 235 pp. $57.00. ISBN 0-89573-558-X.

This book is a volume in the Ellis Horwood Series in Biomedicine. It is a review of the current state of knowledge of a select group of receptors as elucidated by application of the techniques of modern molecular biology and immunology. The introduction presents an outline of the strategies used in the cloning of DNA coding for receptors. Each chapter then presents a case study outlining the progression of thought and experiment leading to the isolation of a receptor molecule and the cloning of its structural gene. The resulting primary sequences of receptors and/or receptor precursers is then discussed in regard to structure-function relationships and sequence homologies to other molecules. For receptors that have not yet been cloned, the biochemical and immunological approaches used in their isolation and characterization are described. This volume is not a laboratory manual; techniques are often only briefly described. Further, it is not a review of conventional receptor pharmacology or the biochemistry of second messenger systems; these fields are covered incidentally at best.

The ten chapters cover receptors for EGF, TGF, insulin and insulin-like growth factors, prolactin, glycine, β-adrenergic agonists, interleukins

1 and 2, and low-density lipoprotein (LDL). This selection is dictated by the emphasis of the book, since cDNA has been prepared and cloned for most of these receptors. The chapters are consequently mostly quite concise and focused. This brevity leads to some omissions of interesting but relevant topics that may prove frustrating to some investigators (e.g. there is no discussion of the relation of the EGF receptor to viral oncogene products), but otherwise imparts a readability that is often absent in review texts. As such, this volume should prove especially useful to students, and to biochemists and molecular biologists wishing to apply their skills to receptor studies.

Kevin J. Terrance, *Adelphi University*

Solubility Data Series (IUPAC). Volume 27/28. Methane. Edited by H. Lawrence Clever and Colin L. Young. Pergamon: Oxford and Elmsford. 1987. xviii + 783 pp. $160.00. ISBN 0-08-029200-3.

In this volume are compiled original reports and evaluations of the solubility of methane in liquids: water, seawater, aqueous electrolyte solutions, mixed solvents, hydrocarbons, alcohols, ketones, carboxylic acids, esters, halocarbons, sulfur and nitrogen containing organic compounds, and miscellaneous biological fluids. Information published through 1985 is included. As usual in this series, the data are given in a uniform, explicit manner, and the methods used, source and purity of materials, and estimated error are appended. Indexes of solvents, their registry numbers, and authors are included.

Solubility Data Series (IUPAC). Volume 29. Mercury in Liquids, Compressed Gases, Molten Salts and Other Elements. Edited by H. Lawrence Clever. Pergamon: Oxford and Elmsford. 1987. xii + 255 pp. $120.00. ISBN 0-08-035935-3.

This volume begins with a long (44 pages) entry on the solubility of mercury in water and continues to seawater, electrolyte solutions, various organic liquids, molten and solid salt systems, and various metals and nonmetals. Appendices on the solubility of some other metals (e.g. Cu, Ag, Pb) in water, and on physical properties of mercury, such as density and vapor pressure, are included.

Solubility Data Series (IUPAC). Volume 35. 4-Aminobenzene-Sulfonamides. Part II. 5-Membered Heterocyclic Substituents. Edited by Anthony N. Paruta (University of Rhode Island) and Ryszard Piekos (University of Rhode Island). Pergamon: Oxford and Elmsford. 1988. xxviii + 343 pp. $120.00. ISBN 0-08-034708-8.

This volume gives data on the solubility of 58 sulfa drugs in water, salt solutions, and a few organic liquids. The importance to clinical and pharmaceutical chemists is obvious. The problem of clearly identifying the substances has been met by including the individually drawn structures in the preface. Furthermore, the index burgeons with cross-references, a feature of special importance in a field such as this, in which proprietary and trivial generic names abound.

Characterization of Proteins. Edited by Felix Franks (Cambridge University). Humana: Clifton, NJ. 1988. xix + 561 pp. $69.50. ISBN 0-89603-109-8.

From its title, jacket description, and preface, this volume promised to be a comprehensive, unified, benchside reference work for those involved in the isolation of proteins and their physical, biological, and chemical characterization. A practicing scientist who purchases this book with such high expectations is likely to be disappointed, however, because it does not live up to those expectations.

The work strives toward unification in bringing together "monographs" by six different authors on various aspects of the subject in four or five distinct sections, but it fails in that goal by providing little interaction between those sections. Placing a series of monographs in a common binding does not necessarily unify a subject.

The first section, written by Franks, comprises five chapters presenting an overview of the chemistry and biology of proteins and selected topics of their physical chemistry. This section is very uneven; some chapters are rife with errors in layout, e.g., certain figures and tables bear no relation to their text references, and in one instance the reader is referred to non-existent chapters. Nevertheless, his chapters on conformational stability and on hydration of proteins provide insight to phenomena often neglected or misunderstood by the bench scientist.

The next section (four chapters) by P. J. Thomas delves into peptide hormones and hormone receptors as representative of the characteristics of proteins and peptides in situ. While these chapters provide a good introduction to this specific class of proteins, other important classes, such as metabolic enzymes and storage and structural proteins, are left out.

Probably the most useful major section is the five chapters by Colin Simpson covering chromatographic and electrophoretic methods of protein isolation and determination of amino-acid composition and sequence. This section is up to date, with good discussions of the newest, high-resolution methods, yet it does not slight the older but still useful techniques, such as paper and ion-exchange chromatography. A single, brief chapter by A. W. Schram gives a good introduction to techniques for the production and use of antibodies, while the final four chapters by Peter Lillford and Chester Myers discuss aspects of large-scale protein preparation and characterization, and applications in the food industry.

Although many of the chapters contain descriptions of specific methods, they stop short of providing enough detail to be called a "benchside reference"; they are better suited as an aid in planning experimental approaches with which the reader has little previous experience. References cited (which are generally adequate and recent) must be consulted for actual use at the bench.

Harry C. Winter, *The University of Michigan*

Masters Theses in the Pure and Applied Sciences. Volumes 30 and 31. Edited by Wade H. Shafer (Purdue University). Plenum: New York and London. Volume 30: 1987. xiv + 401 pp. $115.00. ISBN 0-306-42790-7. Volume 31: 1988. xiv + 373 pp. $115.00. ISBN 0-306-43039-8.

These two volumes list the titles and authors of Master's Degree theses, arranged according to broad subject (e.g., "Chemistry and Biochemistry", "Electrical Engineering"), and within these categories, by institution. The 206 institutions from which the theses derive are all in the USA or Canada. Not indexed.

Electron Capture Negative Ion Mass Spectra of Environmental Contaminants and Related Compounds. By E. A. Stemmler and R. A. Hites (Indiana University). VCH: New York. 1988. xvii + 390 pp. $65.00. ISBN 0-89573-708-6.

This book contains the electron capture negative ion (ECNI) mass spectra of 361 compounds that are of general environmental interest, including halogenated benzenes and phenols, nitroaromatic hydrocarbons, polycyclic aromatic hydrocarbons, DDT derivatives, hexachlorocyclopentadiene pesticides, halogenated biphenyls, dioxins, and dibenzofurans. All spectra have been measured in the author's laboratory. Two are reported for each compound using ion-source temperatures of 100 and 250 °C and an ion-source pressure of 0.5 Torr methane. Indexes to the spectra are provided by compound name, molecular weight, and most abundant ion. A preface of 2 pages provides the only discussion present in this book.

The ECNI mass spectrometer is one of the most sensitive tools available for the trace analysis of numerous environmentally important compounds. This high sensitivity along with the chemical specificity inherent in electron-capture reactions virtually ensures the continued use and importance of this form of mass spectrometry for trace organic analysis. The massive compilation of ECNI spectra provided in this book will be a useful reference for environmental scientists who use ECNI mass spectrometry for analysis. To my knowledge, this is the only such collection of ECNI spectra that has been published, to date.

Mass spectra generated by ECNI are not as well understood and are much less reproducible than those generated by the complementary ionization methods of electron impact or positive and negative ion chemical ionization. In fact, the origin of some of the ions observed by ECNI mass spectrometry cannot be attributed to simple electron-capture processes. For example, many of the spectra shown in this book for chlorinated unsaturated hydrocarbons (including the one on the cover) indicate the significant abundance of an ion corresponding to $(M - Cl + H)^-$ where M is the parent molecule. It has been shown elsewhere (Sears, Campbell, and Grimsrud *Biomed. Environ. Mass Spec.* **1987**, *14*, 401–415) that ions of this type are created by a sequence of reactions in which one of the double bonds of the parent molecule is hydrogenated by contact with the H-atom-saturated stainless-steel walls of a methane-containing ion source, and the M + 2H neutral thereby produced then undergoes electron capture to form the $(M - Cl + H)^-$ ion and a neutral fragment, HCl. Another interesting example is provided by the several isomers of dichlorobiphenyl included in this book, for which abundant ions corresponding to $(M - H)^-$ are observed. To my knowledge, the mechanism by which these ions are formed under standard ECNI conditions is unknown. They cannot be formed by simple dissociative electron capture by thermalized electrons because such a reaction would be strongly endothermic. The origin to some of the other ions commonly observed in ECNI spectra is similarly puzzling. Since ECNI spectra may be dependent on factors that are not presently well understood, it is likely that ECNI spectra observed by others may differ from those reported here. Nevertheless, the objective of this book is appropriate, that is, to provide an extensive set of spectra obtained under commonly used, well-controlled conditions. This information will be very useful in ongoing efforts to understand and improve this powerful analytical method.

Eric Grimsrud, *Montana State University*