Publications

Book reviews

Advances in Neurochemistry, edited by B.W. Agranoff and M.H. Aprison (Plenum Publishing Co., 233 Spring Street, New York, NY 10013, 1982, 231 pp. $42.50).

This volume consists of three lengthy chapters. The first, by Louis Sokoloff, is on the radioactive deoxyglucose method. The mathematically unsophisticated should not be dismayed by the detailed section on the mathematical treatment of the model. There is a wealth of well written nonmathematical discussion of the model, its applications, and its usefulness for studies of local cerebral energy metabolism in normal and in neurological and psychiatric disorders.

The second chapter by E. Martin Gál is on the biosynthesis and function of unconjugated pterins in mammalian tissues. It consists of a thorough review of the chemistry, isolation, occurrence, metabolism and function of the pterins. In his conclusion, Dr. Gál takes the opportunity to deplore the increasing tendency for "scientific cannabalism:" the practice of glossing over or ignoring the work of others and refusing to recognize what one's work owes to others. These comments are a delight to read. Dr. Gál can be assured that his own review is a masterpiece of true scholarship.

The final chapter by Herbert Wiegandt on the gangliosides is the one of most interest to *JAOCS* readers. It includes a thorough account of the chemistry and analysis, biochemical properties, and binding properties of the gangliosides. As with the preceding two chapters, this is a balanced and scholarly review.

This is a high-quality volume of major interest to those in neurochemistry. It can be recommended without reservation.

The Prostaglandin System, Endoperoxides, Prostacyclin, and Thromboxanes, edited by F. Berti and G.P. Velo (Plenum Press, New York, NY, 1981, 425 pp., $49.50).

These are the proceedings of a NATO Advanced Study Institute on Advances in Endoperoxide, Prostacyclin, and Thromboxane Research held during September 1979 in Sicily.

Clearly in this rapidly moving field, these proceedings were largely out-of-date by the time they appeared. They do, however, have use as a source of ongoing work in many areas of the prostaglandin system. There are 31 papers covering the prostaglandins and related metabolites in inflammation, immunity, hypertension, kidney function, cardiovascular tissues, reproduction, allergy, the gastric mucosa, and carcinoma. The articles are generally rather short and they do not abound with references. Nevertheless, the volume is often sufficient to get one started on some aspect of prostaglandin work in unfamiliar fields. Therefore, in spite of its shortcomings, it's a useful addition to an institutional reference library. At this price, and after the publication of the other major conferences in this area, it is not recommended for the private bookshelf.

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The Biochemists' Songbook, by Harold Baum (Pergamon Press, Inc., Maxwell House, Fairview Park, Elmsford, NY 10532, 61 pp., 1982, $4.95).

Everyone has his favorite mnemonic device for remembering multiple facts—names of bones, nerves, intermediates and so forth. The devices range from simple sentences to elaborate verses and from innocent to raunchy. This slight (about 6 × 9 in.) volume is a welcome, erudite addition to this literature.

Dr. Baum has written elaborate verses describing enzyme kinetics, the Embden Meyerhof pathway, the TCA cycle, β-oxidation, the mitochondrial respiratory chain, oxidative phosphorylation, photosynthesis, blood sugar, the glyoxylate cycle, the pentose shunt, fatty acid biosynthesis, the urea cycle and protein biosynthesis. Each set of lyrics, which may contain as many as a dozen verses, is accompanied by a lecture or a flow-chart or both. It is an educational experience. The tunes to which these clever parodies are set include melodies such as "Waltzing Matilda" or "Battle Hymn of the Republic," which are familiar to most Americans, and other such as "Lincolnshire Poacher" and the "Eton Boating Song," which are not. However, not to worry, since all but two are accompanied by the music. For those who can't read or play the music, the publisher makes a cassette available (for an added payment).

It's not often that we can be educated and entertained in the bargain. This is a wonderful little book—buy it!

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Photometric and Fluorometric Methods of Analysis Nonmetals, by Foster Dee Snell (A Wiley-Interscience Publica-

tion, John Wiley & Sons, New York, NY, 818 pp., 1981, $80).

For the reader familiar with Wiley-Interscience publications, in the preface the author alludes to a Volume 1 dealing with metals. There are 40 chapters, each a quasi-monograph on determination of one element or radical with over 3,000 citations of substantially all of the literature for more than 25 years. The longest chapter is 113 pages dealing with phosphorus, listing 551 citations to the literature. Organization of the book is easy to follow by either checking the table of contents for the chapter on the element or radical of interest or checking the index. The 103-page index, alphabetically arranged, is cross-listed between matrix and element or radical of interest. Some chemical laboratory training is needed to follow the step-by-step procedures. The procedures are complete in leading the analyst through the determination. Cited literature is conveniently given at the bottom of the page. Unfortunately, explanations are minimal about analytical parameters such as detection limits, working ranges and interferences. Many of the references cited are journals of foreign origin. The book is a collection of analytical determinations in which a scientist used a method for a particular matrix. It is not a book on state-of-the-art procedures for determinations on nonmetals. The book is a valuable reference for libraries and in the personal collection of research analytical chemists.

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Liposomes: From Physical Structure to Therapeutic Applications, Research Monographs in Cell and Tissue Physiology, Volume 7, edited by C.G. Knight (Elsevier/North-Holland, Inc., 52 Vanderbilt Avenue, New York, NY 10017, 1981, 497 pp., $121).

It has been said that 25% (or more) of a physician's time is spent treating the side-effects of therapeutic drugs. Many side-effects could be minimized if drugs or antibodies could be targeted to a specific site and packaged for sustained release. Liposomes, usually either multilamellar or unilamellar vesicles, have offered a potential solution to this targeting and packaging problem. Typically, these vesicles are prepared from a phosphatidylcholine, cholesterol and a charged lipid such as phosphatidylglycerol or phosphatidylserine. Glycolipids and proteins have also been used in small quantities to provide surface recognition signals. Problems have included relatively low fractions of drug encapsulated from solution, difficulties in targeting to any location other than the liver and the need to clear the lipsome packaged drug as a new drug. Best results to date tend to be against unprofitable third-world diseases and only the U.S. Army seems to have actually approached a commitment (schistosomiasis).

The 17 chapters in this volume range from phospholipid synthesis, liposome preparation, physical characterization and interactions with cells, proteins and the components of the immune system to metabolism of the liposome lipids. The last four chapters on pharmacokinetics of liposome encapsulated drugs, systemic and oral administration, targeting and an industrial viewpoint are particularly interesting. Several companies have been formed which include liposomes in their name but the expectation is that initial product offerings will be in the in vitro diagnostic area. As the lipid chemist or biochemist is well aware, mishandling of lipids can lead to serious problems. Liposomes are far more complicated than the intravenous fat emulsions used in total parenteral feedings. The academic work has tended to involve model systems based on simple, pure lipids such as dipalmitoylphosphatidylcholine or the easily prepared egg lecithin. Cholesterol is usually added to improve stability. Very little consideration appears to have been given to the practiced availability of pure lipids in multikilo or ton quantities. Soybean lecithin appears to be viewed with grave mistrust.

This is an excellent book with a balanced authoritative coverage of all significant aspects of the field. The long chapter by Eibl on synthesis of pure lipids reflects the high usage of synthetic lipids in a majority of the published papers. Similarly, the numerous papers on physical chemistry of liposomes tend to be oriented toward materials which may eventually prove to be commercially impractical. This volume is strongly recommended to the academic lipid biochemist and is of more than passing interest to all workers in the field of lipids. Practical applications seem reasonably certain to emerge within the next few years.

Literature Guide to the GLC of Body Fluids, by A.V. Signeur (LFI/Plenum Data Company, 233 Spring Street, New York, NY 10013, 1982, 385 pp., $85).

This book is an unannotated collection of 4,561 references covering the period from the inception of the technique to early 1981. The first 4,354 references are arranged alphabetically by the first author and are followed by an addendum that contains an additional 207 recent references, also arranged alphabetically. In most cases, the *Chemical Abstracts* citation is included to permit retrieval of additional information. Human body fluids covered include amniotic fluid, bile, blood, cerebrospinal fluid, milk, saliva, seminal fluid and urine. Papers are indexed by fluid and analyte. Analytes include drugs, pesticides, gases, metabolites, steroids, pollutants, solvents and some 30 pages of other materials. Although the book is of some use to biochemists, one would expect the principal audience to be toxicologists, clinical chemists and forensic scientists.

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Physical Properties of Food and Agricultural Materials: A Teaching Manual, by Nuri N. Mohsenin (Gordon and Breach Science Publishers Inc., 1 Park Avenue, New York, NY 10016, 1981, 147 pp., $25).

This manual is a composite of instructional material in the physical properties of food and agriculture products. The 147 pages cover primarily physical characteristics plus me-

chanical and thermal properties as presented in two books published by the same author. The first 28 pages are devoted to an audio-visual tutorial aid with selected applications of physical properties of agricultural materials. The 36 figures in this section could be used for a slide preparation to aid the student in understanding key concepts. Very interesting and relevant examples of the use of rheological principles are given. Practical and relevant examination questions are included at the end of this section.

Another section of this manual offers selected experiments to aid the instructor in teaching key principles in the area. Eight experiments addressing such items as strength and rheological properties of agricultural materials in solid state to studies on flow properties of biological fluids are included. Some application problems with answers are given to aid the instructor. Another section is devoted to application problems for graduate and advanced students. These questions address clearly important issues that are relevant to individuals interested in investigating the physical properties of food and agricultural materials. Although this paperback manual should be of benefit to many in the food industry and related areas, the price tag may limit its overall acceptance.

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Electrophilic Additions to Unsaturated Systems, (2nd Edn.), by P.B.D. De La Mare and R. Bolton (Elsevier Scientific Publishers, New York, NY 10017, 1981, 378 pp., $91.50).

This volume, the second edition of that published in 1966, greatly expands the first since knowledge of detailed reaction mechanisms and pathways has grown tremendously within the past decade. The approach taken is quite theoretical with many examples of the reactions being discussed. Much of the discussion deals with additions to unsaturated cyclic systems, but considerable detail is given to noncyclic systems, perhaps of more interest to the chemist dealing with fats and oils and their derivatives. Elements other than halides are discussed in detail as well, with a wealth of ideas for potential development of nonhalide derivatives of fats and oils from the basic reactions presented. These sections should be valuable reading for the research and development chemist in industry. Each section is supplied with references for further entry into the literature. The index deals with specific compounds, whereas the detailed table of contents covers specific reaction types. Between these, the treatment is comprehensive.

The Literature Matrix of Chemistry, by Herman Skolnik (J. Wiley & Sons Inc., New York, NY, 297 pp., 1982, $30).

Anyone who is actively working in some category of research and development related to chemistry is aware that the fight to prevent obsolescence of knowledge is a continuing battle. We can no longer keep up with the literature in our own fields without long hours of reading current journals. Furthermore, the task of carrying out a literature search is formidable due to the sheer volume of published work available. Fortunately, the various awareness services and computerized retrieval systems are available to assist us. However, it is still incumbent upon the researcher to determine the correct literature sources. This is now increasingly difficult unless a compilation of resources is available. The current book is divided into several major sections (most are primarily listings with comments): books, encyclopedias and treatises, numerical data compilations, patents, journal literature, secondary publication operations and services, chemical abstracts service, other indexing/abstracting services, computer-based information services, evolution of the literature, contributions of American chemists to literature. The book contains both a name index and a subject index. This book should be available to any type of chemist who requires use of the chemical literature; it will make the job of literature retrieval and searching less burdensome.

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Designing Machines and Dies for Polymer Processing with Computer Programs—FORTRAN and BASIC, by N.S. Rao (Hanser International, Macmillan Publishing Co. Inc., 1981, 207 pp., $29).

This book, as the title explains, presents both FORTRAN and BASIC computer programs for use in the design of polymer processing machinery for injection molding, film extrusion and the like. The programs are examples and do not offer direct solutions to particular problems. They may serve as basic tools in solving a variety of problems in the field of polymer processing. Polymer processing machinery may be designed on the basis of empirical data derived from experience and then optimized by experiments. Costs by this method are high, however, and the experiments cannot be carried out on large production units without difficulty. Mathematical models are being increasingly used to analyze the processes occurring in the machines and to optimize design of the machine elements on the basis of this analysis. Of course, computers are being used in designing better machines faster.

The more than one dozen programs offered range from calculation of cooling times of amorphous and crystalline polymers to calculation of flow profiles in a tube and in a thin slit. These should be very useful and time-saving for scientists designing polymer processing machinery.

There is no index but the table of contents serves as an index.

Polymer Degradation – Principles and Practical Applications, by W. Schnabel (Hanser International, Macmillan Publishing Co., Inc., 1982, 227 pp., $32).

The author's "aim in writing this book is to improve the reader's understanding of the complex processes by considering the various modes of polymer degradation in separate chapters." This is done very effectively with only minor, unavoidable overlap and repetition. The important degradation processes are discussed in chapters on thermal,

mechanical, photochemical, radiation, biological and chemical degradation. In each case, a concise treatment is presented of the various factors causing chemical changes in polymers resulting in a deterioration of their physical properties. Practical applications of degradation are stressed with each mode; for example, synthesis of heat-resistant polymers and recycling of scrap plastics in connection with thermal degradation, synthesis of biodegradable polymers in connection with biodegradation, and synthesis and application of plastics with adjustable lifetimes in connection with photodegradation. Mechanistic aspects of the degradation are considered in each case. Most of the evidence for the extent of polymer degradation is presented in terms of molecular weight and molecular weight distribution changes most often measured by size exclusion chromatography (GPC), although various other analytical techniques such as DTA, DSC, IR, UV, NMR, and ESR provided evidence also.

In many of the discussions of the degradation processes, the original polymer structure and degradation products are indicated, making the book useful to analytical chemists with a need to know the end-products of degraded polymers. With present U.S. sales of all plastics at nearly 40 billion pounds per year and world production and sales much larger, disposal will become more important with time.

A large number of literature references and a useful index enhance the value of the book.

Plastics Technical Dictionary, Parts 1 and 3, by A.M. Wittfoht (Hanser International, Macmillan Publishing Co. Inc., 1982, Part 1, 550 pp., $59; Part 3, 508 pp., $49).

The *Plastics Technical Dictionary* enjoys wide usage in many parts of the world as a unique bilingual source of technical information and reference work. The plastics business has grown to such an extent since the last edition appeared and the illustrated part became so voluminous that it is no longer combined with the alphabetical part – hence the reason for Part 3. *Part 1: Alphabetical Dictionary, English-German*, is more extensive than *Part 3: Reference Volume*. Part 1 lists the technical terms used in the production and processing of plastics and semifinished products for the associated plant, equipment and fields of application such as building structures, packaging, pipe fittings, relevant standards for test methods and properties. The terminology of marginal and special fields such as adhesives, paints and lacquers, rubber, fibers and foams, is also included. Starting with polymer chemistry, it includes names and abbreviations of polymers, plasticizers and other additives, as well as relevant chemical and chemical engineering terminology.

Part 3, the *Reference Volume* contains bilingual classifications of 26 illustrated groups including blow molding, calendaring, foam, glass fiber, pipe, processing, screw types, welding and others. Each grouping is sectioned into contents, alphabetical listing and illustrations. A condensed text on the structure of macromolecules occupies eight pages. The master language is English and comments are given in the language of the source, including helpful translations. Captions are bilingual. Part 3 contains both German and English subject indices while Part 1 needs none. Parts 1 and 3 are useful to relative newcomers to the plastics field and also to those who wish to use them periodically as references.

Part 2, the *German-English Alphabetical Dictionary,* was to be published in July 1982 at $59.

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Carbon-13 NMR Spectral Problems, by Robert B. Bates and William A. Beavers (The Humana Press, Crescent Manor, PO Box 2148, Clifton, NJ 07015, 1981, 259 pp., $29.50 hardback, $12.95 paperback).

Following a preface and acknowledgments, a nine-page introduction to carbon-13 NMR spectral problems gives an overview of ^{13}C NMR, its advantages and disadvantages, and an ambitious attempt to describe the analysis of ^{13}C spectra in a very concise way. On the whole, this succeeds fairly well, although the uninitiated reader would be well advised to supplement this section by at least reading a basic textbook on ^{13}C NMR. The step-by-step solution to the first problem is offered by way of illustration of the general procedure to be followed.

The spectral problems are divided into two sections. The first section contains 60 problems for which the ^{13}C spectra are resolved, i.e., no accidental overlaps of spectral lines occur. The second section contains 65 problems with more complex spectra, requiring more tenacity and ingenuity on the part of the student. All problems show the broad-band decoupled and off-resonance decoupled ^{13}C spectra, vertically aligned for ease of interpretation. On the facing page, the 60-MHz proton spectrum with integrals is shown. Information about the mass, IR and UV spectra is furnished in most cases.

While similar in purpose and general approach, this book is complementary to the problem set entitled *Carbon-13 NMR Based Organic Spectral Problems*, by Phillip L. Fuchs and Charles A. Bunnell (John Wiley and Sons, Inc.), and is superior in some aspects. The quality of spectral reproduction is uniformly good and the spectra themselves are of consistently good quality, which cannot always be said for the Wiley book. On the other hand, the novice is given less guidance in the systematics of the spectral interpretation procedure.

This book should find widespread use in courses in spectral interpretation for organic chemists as a student exercise book to accompany a standard text. Any chemist planning to use ^{13}C NMR spectra who has not had previous experience would find that working through these problems would be a worthwhile exercise. Chemists with a primary interest in lipids might find the book dealing with molecular structural types quite far from their immediate interests, but could still benefit from following the interpretational procedures through to the solutions since the same principles apply. Several convenient and novel tables of ^{13}C shifts are included which give the book reference value after the problems have been worked.

This reviewer would have appreciated being able to order an answer sheet from the publisher instead of having to go to the literature to verify the answers in spite of the risk of "inadvertent viewing of a structure." It seems likely that instructors planning to use the book as a course supplement

might feel the same way. On the whole, however, the book gives the impression of having been carefully and conscientiously thought-out and executed. It should help to fill a real need for organic chemists and chemists-to-be in overcoming the potential barrier to using a new and unfamiliar technique — i.e., the opportunity to learn by doing, and, in the process, develop the confidence to move on to the application of the method in their own work.

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New publications

The Biochemists' Songbook, by Harold Baum, Pergamon Press, Maxwell House, Fairview Park, Elmsford, NY 10523 (or Pergamon Press offices worldwide), 1982, 61 pp., $4.95 in U.S., £2.45 in U.K. Thirteen slightly irreverent, but probably technically correct, songs for biochemists written "whilst travelling upstairs on the No. 22 bus between Putney Bridge and Manresa Road" and set to familiar (to English biochemists) tunes, with a foreword by Sir Hans Krebs.

AOF Oilseeds '82, annual yearbook of the Australian Oilseeds Federation, John Cameron, Honorary Secretary, 9th Floor, 5 Gresham St., Sydney, New South Wales, Australia 2000, 1982, 200 pp., Australian $20. Includes statistical data on Australian oilseed industry, technical and trading standards.

FOSFA Manual, published by Federation of Oils, Seeds and Fats Association, 24 St. Mary Axe, London EC3A 8ER, England. Contains standard trading contracts, joint and special contracts, arbitrations and appeals rules and guide, standard contractual methods list and FOSFA official methods. Cost is £40 to FOSFA members, £120 to nonmembers (plus postage); amendment service is £15 to members, £45 to nonmembers (postage included). The manual is published in loose-leaf format.

Food Carbohydrates, edited by David R. Lineback and George E. Inglett, AVI Publishing Company Inc., PO Box 831, Westport, CT 06881, 1982, 494 pp., $45 in U.S., $49.50 outside U.S. Report of the Fifth Basic Symposium of the Institute of Food Technologists held June 1981.

Vitamin C in Health and Disease, by Tapan K. Basu and C.J. Schorah, AVI Publishing Company Inc., PO Box 831, Westport, CT 06881, 1982, $19.50 in U.S., $21.50 outside U.S.

Adding Nutrients to Foods: Where Do We Go From Here? edited by James L. Vetter, American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121, 1982, 150 pp., $18 AACC members, $20 non-

members. Based on presentations made at the AACC Workshop on Fortification, January 1982, Arlington, VA.

Lipid Protein Interactions, Volumes 1 & 2, edited by Patricia C. Jost and O. Hayes Griffith, John Wiley & Sons Inc., 605 Third Avenue, New York, NY 10158, 1982. Vol. 1, 338 pp., $75; Volume 2, 307 pp., $70.

Cholesterol Systems in Insects and Animals, edited by Jacqueline Dupont, CRC Press Inc., 2000 N.W. 24th Street, Boca Raton, FL 33431, 1982, 153 pp., $54 in U.S., $62 outside U.S.

Regulation of Serum Lipids by Physical Exercise, edited by Eino Hietanen, CRC Press Inc., 2000 N.W. 24th Street, Boca Raton, FL 33431, 1982, 174 pp., $64 in U.S., $74 outside U.S.

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