Publications

Book reviews

Bailey's Industrial Oil and Fat Products, Vol. 1, 4th Edition, by M.W. Formo, E. Jungermann, F.A. Norris, and N.O.V. Sonntag, edited by D. Swern (John Wiley & Sons, Inc., One Wiley Dr., Somerset, NJ 08873, 1979, 841 pp., $45.95).

This book updates and replaces to a large extent the third edition published in 1964. Much has happened in the field of fat and oil technology since then. Volume 1 contains 841 pages and is written in a more general style. The volume consists of 10 chapters written by the four authors of the book as follows: structure and composition of fats and oils; reactions of fats and fatty acids; physical properties of fats and fatty acids; fats in the diet; source utilization, and classification of oils and fats; composition and characteristics of individual fats and oils; handling, storage and grading of oils and oil-bearing materials; soap; fat-based surface active agents; and a final chapter on paints, varnishes and related products.

The authors have undertaken a monumental task and, in general, have done well. The book, however, does have some flaws; the chapter on chemical reactions of fatty acids shows a lack of mechanistic detail, and the discussion of the optical properties of fatty acids lacks detail. For instance, only one page is devoted to infrared spectroscopy, and about the same amount of space to X-ray diffraction and polymorphism. These very important topics should have been covered in more detail. Some of the material in other chapters has also been treated in a general fashion. The references generally are to much older literature, when much of the work on the chemistry and physical properties of fats and fatty acids was carried out. However, there are numerous references from the late 1970s, and the most recent citations are from 1979. One of the more valuable features is the references; there are more than 2,600 of them. The use of references to the patent literature is commendable in areas such as detergents, soaps and other surface-active agents for which patents are the primary source of information. The index appears to be extensive; those citations checked were accurate as was a sampling of the reference listings. While the high price may deter individual ownership, this book would be a valuable asset to libraries.

Quantitative Toxicology (Selected Topics), by V.A. Filov, A.A. Golubev, E.I. Liublina and N.A. Tolokontsev, based on the 1973 Russian Edition, and translated by V.E. Tatarchenko (J. Wiley & Sons, New York, 1979, 462 pp., $32.50).

This volume consists of a series of chapters covering various aspects of industrial toxicology. The relationship between poisons and the living organism and the toxic effect, electrolytes, quantitative effects of poisons, and methods for the calculation of toxicity parameters are discussed. An excellent chapter discusses the kinetic aspects of the absorption of poisons in the body. The relationship between structure and toxicity also is discussed in detail. Since its original publication, the book has been expanded, updated, and revised to include more recent material. This book will be of interest to many members of the Society involved in and aware of the toxicological implications of chemicals.

E.G. Perkins
Department of Food Science
University of Illinois
Urbana, IL 61801

Lipid Biochemistry: An Introduction, 3rd Edition, by M.I. Gurr and A.T. James (Chapman and Hall, New York, 1980, 247 pp., $15.95; available in U.S. from Metheun, Inc., PO Box 978, Edison, NJ 08817, paperback).

The recent publication of the third edition of this volume is an indication of its value. The authors have retained useful portions of the previous editions with judicious revisions and have rewritten the chapter on "Lipids in Nutrition, Health and Disease." Titles of other chapters are: "Lipids: What They Are and How the Biochemist Deals with Them," "Fatty Acids," "Neutral Lipids," "Phospholipids," "Glycolipids and Sulpholipids and Lipids as Components of Macromolecules." There are useful tables and illustrations and each chapter is followed by a list of general references. Supplementary indices of diseases, species and tissues add to the value of the book and other authors should take note.

The book is a must for students and we use it in one of our advanced courses. In my opinion, that is the best volume on the subject and should be available to all even with a peripheral interest in the subject.

Robert G. Jensen
University of Connecticut
Storrs, CT 06268

Thin Layer Chromatography: Quantitative Environmental and Clinical Applications (by J.C. Touchstone and D. Roger Swiley, Interscience, New York, NY, 561 pp., $31.25).

This volume of 36 chapters is the proceedings of a symposium on clinical and environmental applications of quantitative thin layer chromatography held in Philadelphia during January 1979. A second volume may be forthcoming, as Touchstone ran a similar meeting in December 1980. The book starts with a series of introductory chapters including: history, technology of sorbents, sample preparation and application, derivative formation, newer instrumentation and quantitative densitometry. HPTLC is illustrated in a chapter on therapeutic drug monitoring. There are a number of chapters of interest to the lipid chemist. These include chapters on gangliosides, HMG-CoA reductase, free and esterified cholesterol, sebaceous gland lipids, prostaglandins, thromboxanes and prostacyclins,

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amniotic fluid lipids and a flame ionization detection system for TLC of lipids on Chromarods. Chromarods are an interesting Japanese innovation. Since the plate is actually a rod, it becomes possible to advance the developed sample through the flame for sensitive detection.

Other topics covered include aflatoxins, mycotoxins, nitrosamines, hazardous wastes and polycyclic hydrocarbons. Aflatoxins and their precursors and metabolites receive extensive coverage. The chapter on other mycotoxins by P.M. Scott seems quite good. With the recent surge of interest in hazardous wastes, one is a little disappointed to see only toxic metals and pesticide residues covered in this chapter.

Thin layer chromatography is a simple, widely used technique that permits rapid screening of a large number of samples. There has, however, always been a serious problem in quantitation of the separated sample constituents. In a previous volume, "Densitometry in Thin Layer Chromatography" (Wiley Interscience, 1979), Touchstone and Sherma made a concerted effort to convince the reader that modern instrumentation had largely overcome the problems of quantitation (Reviewed in *JAOCS*, August 1979).

The chapter on safe use and disposal of hazardous chemicals in the laboratory, while well done, appears somewhat extraneous.

The text appears to have been produced from camera-ready copy but is clear and the illustrations are of good quality. While this book is not directed specifically toward the lipid chemist, it contains a reasonable amount of interest to those in this area.

The Lipid Research Clinics Population Studies Data Book Vol. I: The Prevalence Study (Lipid Metabolism Branch, NHLBI, NIH Publication No. 80-1527, 1980, 136 pp.).

Large-scale intervention studies on atherosclerosis have a rather dismal history not only in the United States, but throughout the world. The response to vague or unsatisfactory statistics seems to be ever larger studies. This particular study would seem to be a long overdue return to square one for a fresh start on epidemiological data acquisition. In 1971, the Lipid Research Clinics Program was initiated. There are 12 Lipid Research Clinics using standardized methodology and identical protocols studying 14 separate well-defined populations; 10 in the United States, two in Russia and one in Israel. The stated major objectives are: to evaluate current techniques for diagnosis of hyperlipoproteinemia; to acquire data across all age groups on the prevalence of different types of hyperlipoproteinemia, particularly genetically determined forms; to collect high-quality data on the prevalence and incidence of atherosclerosis in different patterns of hyperlipoproteinemia; and to improve methods for detection, diagnosis and medical care of coronary heart disease.

The population studies are composed of three sequential studies, prevalence, family and mortality follow up. Since approximately 60,000 subjects were screened in the first visit and approximately 14,000 in the second visit, the amount of data collected is enormous. In the first screening, estimates of prevalence of dyslipoproteinemia in various populations were obtained, the distribution of cholesterol and triglyceride levels in specified populations was investigated and participants were selected for the second visit. In the second visit (85% response rate) the objectives were: to identify patients with primary or secondary dyslipoproteinemia, to determine prevalence of lipid and lipoprotein patterns and their associations with coronary heart disease and other vascular diseases and other risk factors for coronary heart disease; and to determine the relationships between lipids and lipoprotein patterns and selected physiologic, nutritional and sociodemographic variables. According to B.M. Rifkind, Chief of Lipid Metabolism, the data will be distributed as fast as it can be analyzed.

This volume contains data on plasma total cholesterol and triglyceride, plasma lipoproteins, education and occupation of head of household, sex hormone usage (women), smoking, blood pressure, height, weight and skinfold in 62 tables and 103 figures. There is essentially no text. Analysis of data is restricted to statistical treatment with presentation of cumulative frequencies, selected percentiles and standard errors. To a very great extent, this volume is an elaborate numerial description of a starting point in terms of specified parameters. As such it is important, but dull reading. The mortality follow-up study should be of particular interest. Perhaps this study will shed some light on the recently reported inverse correlation of cancer incidence with serum cholesterol levels. As an apparently freely available government publication, this volume can be recommended to all interested parties.

Silylated Surfaces, by D.E. Leyden and W. Collins (Gordon and Breach Science Publishers, Inc., One Park Ave., New York, NY 10016, 1980, 379 pp., $63.50).

Lest the title discourage the browser, it should be noted immediately that the topics covered include HPLC, affinity chromatography and immobilized enzymes. This volume is derived from a symposium designed to cross traditional disciplinary boundaries and contains 18 chapters. Quite naturally, this means that the basic chapters on glass and silica surfaces get to be rather heavy going. If, however, the potential reader has been through the second edition of Iler's "The Chemistry of Silica" (Wiley-Interscience, 1979) and Unger's "Porous Silica" (Elsevier, 1979), the current volume will be relatively easy reading. There are three chapters on enzymes: fundamental and analytical characteristics of immobilized enzyme reactors; the use of silylated derivatives of porous glass as enzyme supports, stability of the silylated surface; and the physicochemical properties of siliceous enzyme supports and their effects on composite performance. The chapters on HPLC include: chemically bonded charge transfer acceptors by Lochmuller; reversed-phase chromatography with alkyl-silica stationary phases by Horvath; and the use of outersphere and innersphere metal-solute complexes by Grushka. Arkles, Miller and Brinijar have a rather interesting chapter on whole-cell and cell organelle immobilization on siliceous surfaces. Other chapters include: characterization and analytical applications of chelating silylated surfaces; use of silane coupling agents for the immobilization of metal complex catalysts on inorganic supports: and probing the

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structure of silanized surfaces with secondary ion mass spectrometry and thin-film analysis. A short discussion—questions and answers from the participants—follows each chapter.

Recent advances in chromatography have relied heavily on relatively sophisticated modification of the support. This treatment is an invaluable background for understanding this type of process. Unfortunately, there are probably relatively few analysts with the depth of interest to read through this volume.

This could be a possible reference source for those interested in developing new chromatographic materials.

Lloyd A. Witting
Technical Director
Supelco Inc.
Bellefonte, PA 16823

New Publications

Biochemistry of Plants, Volume 4, Lipids: Structure and Function, edited by P.K. Stumpf, 1980, 693 pp., $65.40, Academic Press, 111 5th Ave., New York, NY 10003 USA.

Introduction to Analytical Gas Chromatography: History, Principles, and Practice, by John A. Perry, Marcel Dekker Inc., 270 Madison Ave., New York, NY 10016, 1981, 448 pp., $29.75.

Fats and Oils: Chemistry and Technology, edited by R.J. Hamilton and A. Bhati, Applied Science Publishers Ltd., Rippleside Commercial Estate, Barking, Essex, U.K. IGII OSA, 1981, 263 pp., $48.

Guide to Chemical Education in the U.S. for Foreign Students, Committee on International Activities, American Chemical Society, 1155 Sixteenth St. NW, Washington, DC 20036 USA, $7.50, 106 pp., 1981. Descriptions of curricula for general, analytical, organic, inorganic, physical chemistry and biochemistry are provided. Useful to students considering attending U.S. institutions.

Soaps and Detergents, informational, 32-page booklet designed to provide information about consumer cleaning products. Some semitechnical information, but designed essentially for the layperson, including consumers, educators and news media. Single copies available free from the publishers, The Soap and Detergent Association, 475 Park Ave. South, New York, NY 10016.

Paints and Coatings Industry is a new bimonthly Chinese-language magazine published by the Paints and Coatings Industry Research Institute of the Ministry of Chemical Industry, in Lanzhou, China. Annual subscription rate is US $7.20 with airmail postage an additional $10 annually. Subscription payments may be mailed to, and advertising rates are available from: Paints and Coatings Industry, 317 Dong-gang Dong-lu St., Lanzhou, China.

Latest in *Lipids* – June 1981

Analysis of Autoxidized Fats by Gas Chromatography-Mass Spectrometry: VII. Volatile Thermal Decomposition Products of Pure Hydroperoxides from Autoxidized and Photosensitized Oxidized Methyl Oleate, Linoleate and Linolenate

Composition and Variability of the Branched-Chain Fatty Acid Fraction in the Milk of Goats and Cows

Phospholipid Acyl Group Composition in Normal and Tumoral Nerve Cells in Culture

Acyl Exchange between Oleoyl-CoA and Phosphatidylcholine in Microsomes of Developing Soya Bean Cotyledons and Its Role in Fatty Acid Desaturation

4-Demethyl-, 4-Monomethyl- and 4,4-Dimethylsterols in Some Vegetable Oils

Effect of 2-Hexadecynoic Acid on Cultured 7288C Hepatoma Cells

Iodination of Docosahexaenoic Acid by Lactoperoxidase and Thyroid Gland in vitro: Formation of an Iodolactone

Thyroid Control over Biomembranes: VI. Lipids in Liver Mitochondria and Microsomes of Hypothyroid Rats

Effects of Acute Administration of Chlorinated Water on Liver Lipids

Temperature Acclimation in the Crayfish: Effects on Phospholipid Fatty Acids

Free Radical Polymerization and Lipid Binding of Lysozyme Reacted with Peroxidizing Linoleic Acid

Eicosa-5,11,14-trienoic and Octadec-5-enoic Acids of the Reproductive Tract of the Male House Cricket (*Acheta domesticus*) and Field Cricket (*Gryllus* spp.)

METHODS

Separation of Wax Esters from Steryl Esters by Chromatography on Magnesium Hydroxide

Syntheses of Radioactive Furan Fatty Acids

Dry Column Method for the Quantitative Extraction and Simultaneous Class Separation of Lipids from Muscle Tissue

Letter to the Editor: Modification of Phenol-Sulfuric Acid Method for the Estimation of Sugars in Lipids

COMMUNICATIONS

Relationships between Levels of Essential Fatty Acids and Zinc in Plasma of Cystic Fibrosis Patients

Formation of γ-Ketols from 13- and 9-Hydroperoxides of Linolenic Acid by Flaxseed Hydroperoxide Isomerase

Lipoprotein Lipase in Cholesterol-Fed and Control Guinea Pigs

Lack of Specificity in Accumulation of Sterols by *Phytophthora cactorum*

Lack of Catabolism of Brain Cholesterol

Fatty Liver of Growing Rats Fed Excess Lysine and Its Prevention by Adenine or Allopurinol

Regulation of 3-Hydroxy-3-methylglutaryl CoA Reductase by Analogs of Cholesterol and Bile Acids in Cultured Intestinal Mucosa