NEW BOOKS

J. F. GERECHT, BOOK REVIEW EDITOR

TRITICALE: First Man-Made Cereal, Edited by Dr. Cho C. Tsen (The American Association of Cereal Chemists, 1974, 291 p., $15.00).

This paperbound book represents the first compendium on Triticale and provides, in many instances, the first information published on its potential use as a human foodstuff. The book was fashioned around a symposium presented at the American Association of Cereal Chemists Annual Meeting in the fall of 1973 but also contains several important additional invited papers. Four papers are presented on the current status of Triticale production in different parts of the world, and four papers review the breeding and genetics status of the new plant. Three papers are devoted to the gross and fine physical structure characteristics of the kernel.

The core of the book emphasizes the biochemical and functional food and feed uses of the new grain, with seven presentations dealing with the proteins, enzyme systems, starch, and lipids of Triticale. Two papers on nutritional value are presented, five on functional properties as affecting use in cereal-based foods, and two on use as animal feed. The book assists the researcher by providing a very good index to the contents.

This book will not only bring the reader up to date on the current state of the art but will undoubtedly find a permanent place in scientists' bookshelves as a reference book and as a historical document about this new crop.

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Bonded Stationary Phases in Chromatography, Edited by Eli Grushka (Ann Arbor Science Publishers, Ann Arbor, Mich., 1974, 237 p., $18.75).

Bonded stationary phases represent a considerable advance in the art of chromatography, about which many will want to be informed. Editor Eli Grushka, of the State University of New York, has collected the expertise of 16 authors from universities and instrument companies to write about 10 aspects in this first book on the subject. It is a source for the preparation and study of bonded phases, though it will be more important to many for their selection and application in high performance liquid chromatography (HPLC). There is interest for gas chromatographers mainly for gas chromatography-mass spectrometry and for support deactivation. Biochemists will be interested both in the ultra-specific affinity chromatography and in the synthesis of peptides, which is begun advantageously on porous particles.

Bonded phases reduce bleeding in GLC and allow the use of higher temperatures. In HPLC, liquid phase solubility restrictions disappear, the troublesome saturation of mobile phases and use of precolumns is eliminated, gradient elution is made possible, and collected fractions are uncontaminated by a liquid stationary phase. Bonded phase use is described in partition, reverse phase, and ion exchange; chromatography on microparticulate and pellicular and porous larger particles. Yet, despite wide acceptance, one discovers that there are important differences to physically held liquid phases and that much remains to be learned about them. This is exemplified by contradictory statements in chapters 3 and 4 that "The chemically bonded packings are less efficient . . ." and "The efficiency . . . is much better on the bonded support . . ."

The obvious errors seem confined to figures 6.3 and 9.4. Each chapter has its own references, ranging in number from 3-68; likewise the chapter lengths vary from 11-33 pages. There is no tabulation of the commercially available bonded phases, for which current literature can be consulted. While the book has interest to all using chromatography and also to those engaged in peptide synthesis, it will be of greatest value to those interested in HPLC. All using any bonded phase will gain an appreciation of the entire subject, from support characteristics to mode of separation, from what was known (in early 1974) to where research is still needed.

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Natural and Synthetic Polymers: An Introduction, Henry Bolker (Marcel Dekker, New York, N.Y., 1974, 668 p., $29.75, [$19.75 textbook]).

With the large number of books that have been published in the field of polymer chemistry and that continue to be published in this field, one may properly ask "why another one." The book under review is a worthwhile addition to the rapidly growing list of books in the field, because the author has taken a somewhat different approach to the presentation of the subject.

First, the book attempts to give a unified view of organic polymer chemistry in which natural and synthetic polymers are given nearly equal emphasis, in contrast to most books in which synthetic polymers are emphasized.

Second, this book resists the usual trend of introducing a scientific subject by extended discussion of its fundamental principles, sometimes extremely difficult ones, while using as examples substances and compounds of which the student may have no knowledge. Although this reviewer prefers the approach in which the fundamental principles are introduced first; nevertheless, Bolker's approach is a valid one and works out effectively. Of necessity, the book can be only an overview of the field of polymer chemistry and should make a useful textbook for first year graduate students or advanced undergraduates.

The book is divided into three major parts: "Linear Homopolymers," "Branching and Molecular Heterogeneity," and "Cross-Linking and Cross-Linked Polymers." Perhaps because of the author's interest, the major emphasis is on carbohydrates in the natural polymer field, although there are significant sections on nucleic acids, proteins, and polypeptides. This reviewer appreciated the brief, but more than adequate, description of the NMR characteristics of polymers and the use of such information in assessing tecticity. There is little in the book that would apply directly to lipid chemistry, but, since lipids and their derivatives are replete with double bonds, information on the polymerization of unsaturated materials with structures similar to those present in lipids should supply any ingenious chemist with many good ideas. The book is easy to read and appears to be photo-offprinted in large and clear type. The book was remarkably free of errors. The subject index is somewhat sparse, and this reviewer found many subjects missing from the index that were described in the book (NMR is one example).

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Fundamentals of Lipid Chemistry, Edited by R.M. Burton and F.C. Guerra (BI-Sciences Publications Division, Webster Groves, Mo., 1974, 750 p., $29.50).

This book contains 26 chapters and 5 appendices on a wide variety of lipid chemistry topics, written by 28 authors, most of whom are familiar to those interested in lipids. It is the product of a course presented in Portugal in 1972 on most of the major aspects of lipids and membranes.

As with many multi-author volumes, quality, coverage, and continuity are spotty. In some areas, there is noticeable overlap, and some of the chapters and appendices could well have been omitted, since the subject matter has been covered more thoroughly elsewhere or does not appear to be applicable. In my opinion, a book on lipid chemistry should not have eight or more chapters on isolation and separation of lipids. There is only one chapter on phospholipids as such and four on glycolipids. In other chapters, fatty acids, steroids, lipoproteins, membranes, and the physical structure of lipids are discussed.

Yet, in spite of these mild editorial quibbles, the book contains much useful information on lipid nomenclature, methodology, and metabolism all in one volume, plus many important references. On this basis, I have no hesitation in recommending it for the personal, as well as the depart-

mental or organizational, libraries of all who are involved directly or indirectly in lipid research.

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Form and Function of Phospholipids, Edited by G.B. Ansell, R.M.C. Dawson, and J.N. Hawthorne (Elsevier Scientific Publishing, Amsterdam, The Netherlands, 1973, 494 p., $44.25).

This is a second edition of the volume, revised from the original published in 1964. In the intervening decade, new areas of phospholipid research have been explored, and phospholipid methodology has been refined. The original authors (Ansell and Hawthorne) have been joined by Dawson, and a multi-author format has been adopted.

The present volume contains 16 chapters: "Historical Introduction" (G.B. Ansell, University of Birmingham); "The Chemistry of Phospholipids" (K.P. Strickland, University of Western Ontario); "Separation and Analysis of Phospholipids" (S. Spanner, University of Birmingham); "Phospholipid Metabolism in Animal Tissues" (G.A. Thompson, Jr., University of Texas); "Specificity of Enzymes Involved in the Metabolism of Phospholipids" (R.M.C. Dawson, University of Cambridge); "Phospholipids as Model Membranes: Monolayers, Bilayers and Vesicles" (D. Papahadjopoulos, Roswell Park Memorial Institute); "Phospholipids in Biological Membranes and the Study of Phospholipid-Protein Interactions" (J.B. Finean, University of Birmingham); "Phospholipids in Subcellular Organelles and Membranes" (W.C. McMurray, University of Western Ontario); "Phospholipid Metabolism in Photosynthetic Plants" (T. Galliard, Agricultural Research Council, Norwich, England); "Phospholipids in Micro-Organisms" (R.T. Ambron and R.A. Pieringer, Temple University); "Phosphonolipids" (H. Rosenberg, Australian National University); "Phospholipids and the Hepatoportal System" (R. Coleman, University of Birmingham); "Phospholipids and the Nervous System" (G.B. Ansell, University of Birmingham); "Phospholipid Metabolism and Transport of Materials across the Cell Membrane" (J.N. Hawthorne, University of Calgary); and "The Phsopholipid Composition of Mammalian Tissue (D.A. White, Johns Hopkins University).

There have been few books devoted solely to this important class of lipids. Witcoff's monograph, published over 20 years ago, was largely chemical in nature, and Ansell and Hawthorne's earlier edition was not as complete as is the present book.

This book offers something for all segments of the AOCS membership. The chapters on chemistry and analysis will be of great utility to chemists and biochemists working with phospholipids. There are several useful chapters on the function and role of phospholipids in biological systems, membranes, and subcellular particles. Monographs devoted to materials prominent in mammalian systems rarely devote space to plants and micro-organisms, but this book offers excellent discussions of these topics. The phosphonolipids (compounds carrying a covalent phosphorus-carbon bond) have been known only since 1959. They are components of protozoa, bacteria, mollusks, and bivalves. Their biology and chemistry are discussed clearly.

Several chapters are devoted to phospholipid physiology. These chapters will be of use as references to a wide cross-section of scientists. They contain lucid expositions of the transport of phospholipids and of their role in developing tissue. The final chapter presents an up-to-date compendium of the phospholipids of mammalian tissues.

This is an excellent book. The various discussion (all by acknowledged experts) are clear and concise. The type is readable and the graphs, tables, and photographs are of good quality. This book will become a frequently used adjunct to the libraries of chemists, biologists, and physiologists. The price is high but is not excessive in the current market. Even at the present cost, this book will give the buyer his money's worth.

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New Developments in Tritimetry (Treatise on Tritrimetry) Vol. 2, Edited by Joseph Jordan (Marcel Dekker, New York, N.Y., 1974, 200 p., $19.75).

The authors of the first chapter, "Applications of Thermometric Tritimetry to Analytical Chemistry" (89 pages, L.D. Hansen, R.M. Izatt, and J.J. Christensen), have dealt with the application of thermometric techniques to a wide variety of problems. The chapter consists of a general review, a theoretical discussion involving the basic fundamentals of thermograms, their interpretation, and application considerations. A larger section is given with "real life" examples which are referenced clearly for detailed study. This section covers several areas: aqueous acid-base, precipitation, metal complexation reactions, redox reactions, reactions in organic solvents, and reactions in molten salt solvents. A brief overview of the techniques of determining the stoichiometry of the reaction, the determination of equilibrium constants, and calorimetric titration methods also is discussed. A section is devoted to the design and construction or selection of commercial thermometric titration equipment. Enough information is provided to begin laboratory experiments and possible growth into the commercial instruments that are available. The material covered certainly will strike the interest of the analytical

chemist working in solution chemistry.

The second chapter, by D.J. Curren, "Some Unusual End-Point Detection Methods Involving Heterogenous Processes" (90 pages), presents presuremetric, cryoscopic, phase transitions, and flame photometric titration techniques. The common bond between these four techniques is that each system has more than one phase present. The techniques and principles behind the operations involved in each subarea are quite diverse and are not related. The author has attempted to present the theoretical basis for each of the techniques, show ways in which it can be implemented, and review the applications that have been made. This varies greatly for the four techniques in that the phase titration has over 200 example systems that have been studied, whereas the flame photometric method has been used on only a few systems. The latter, however, has promise for being used extensively if phase separation procedures are employed.

As indicated in the preface of the book, this volume is devoted to developments which are likely to have a significant impact on titrimetry. The book is oriented toward the researcher and practicing analytical chemist. As might be expected, the two chapters are presented somewhat differently. Each chapter is outlined and referenced thoroughly, so as to be useful as a starting point for further studies and investigations. The book would be a worthwhile addition to any technical library.

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THE BOOK SECTION