New Books

J. F. Gerecht, Book Review Editor

The Applications of Molecular Distillation, Janos Hollo, Eva Kurucz and Attila Borodi (Akademiai Kiado, Budapest, 1971, 210 p.,$4.20).

This English translation of Hollo's monograph represents a well written up to date review on molecular distillation. The book is divided into two main chapters. One is a review on the principles and apparatus and the other is on application. In the first chapter the theory of molecular distillation, apparatus and auxiliary equipment is thoroughly reviewed. In the second chapter both laboratory and industrial applications are presented. Nine supplementary tables provide an excellent summary with original references to the many applications of molecular distillation from the recovery of vitamins A and E to the separation of petroleum products.

The authors recognized that an industrial process had to involve an expensive component such as vitamins A and E in order to provide for an economical application for molecular distillation. It could, for example, be used to recover vitamin E from vegetable oil refinery waste and the vitamin E used as an antioxidant in poultry feeds. Such recovery is carried out in the U.S., but not in Hungary, Bulgaria, Poland or Russia, by all large users of refined vegetable oils. The authors stated that laboratory procedures may provide the most useful applications for molecular stills. This reviewer agrees with this point of view and would like to add that molecular distillation in conjunction with column and thin layer chromatography may provide a useful procedure in future studies.

F.A. KUMMEROW
Burnsides Laboratory
University of Illinois
Urbana, Illinois

Plant Lipid Biochemistry, C. Hitchcock and B.W. Nichols (Academic Press, London and New York, 1971, 338 p., $19.00).

For those trying to assess the suitability of this book for their own specific needs, the subtitle, "The Biochemistry of Fatty Acids and Acyl Lipids with Particular Reference to Higher Plants and Algae," is more informative than the title. Not all plant lipids are covered—only fatty acids and acyl lipids—so readers interested, for instance, in plant sterols should look elsewhere. On the other hand in writing with "particular reference" to the classes of organisms suggested to most of us by "plant," Hitchcock and Nichols have not limited themselves exclusively to lipids in these botanical groups, especially regarding metabolism. In their own words, "Animals, yeasts or bacteria were used for much of the pioneering work in this area, and it is impossible to discuss fatty acid metabolism in plants without reference to data obtained with other biological systems. We shall therefore first describe the biosynthesis of saturated fatty acids in any relevant tissue before turning our attention more specifically to metabolism in higher plants." There is in fact a substantial amount of information and useful leads to original literature on lipid metabolism in general between the covers of *Plant Lipid Biochemistry.*

Starting with the structure and distribution of plant fatty acids (Chapters 1, 3 and 4) and acyl lipids (Chapters 2 and 3), the book moves in logical sequence through biosynthesis of fatty acids (Chapter 5), incorporation of these acids into the more complex lipid molecules (Chapter 6), then reversal of this incorporation by lipolytic enzymes (Chapter 7) and catabolism of the acids (Chapter 8). Two chapters follow on variation in acyl lipid composition and metabolism with the stages in life cycles of plants and on presumed physical and chemical functions of plant lipids, respectively. The final chapter, "The Analysis of Plant Lipids," is one most authors would have put at or near the beginning of the book.

In Chapter 1 the authors make a novel and admittedly arbitrary distinction between minor and unusual acids. The former include all fatty acids other than the familiar major ones that are either saturated or belong to one of the four families of unsaturated acids ($\Delta 9$, $\omega 9$, $\omega 6$ and $\omega 3$). All other nonmajor plant fatty acids are classified as unusual. This system appears to be generally useful, but it does lead to at least two strained categorizations: erucic (13*c*-22:1) acid, a major constituent in seed oils of many cruciferous species, becomes a minor acid, and margaric (17:0) acid is called a minor rather than an unusual fatty acid.

In view of the implied purpose of providing convenient access to an overview of specific subject areas within the broad field encompassed by the whole book, it suffers from a few deficiencies. Granted that both species are discussed elsewhere, *Briza humilis* (formerly *B. spicata*) should have been mentioned in the section on Glycosyl Diglycerides (p. 48) and jojoba *(Simmondsia californica)* in the one on Wax

Esters (p. 51). The seed oils of these species are, respectively, the most abundant source of the first and the only significant plant storage lipid source of the second of these two lipid types. Citation of a reference (JAOCS 47:121 [1970]) on the possible role of singlet oxygen would have been desirable under Autoxidation (p. 223). Countercurrent distribution has certainly proved useful enough in plant lipid research to warrant inclusion in the last chapter. With several discussions of stereochemical points scattered throughout the book, some comment should have been made somewhere on the Cahn-Ingold-Prelog system of configurational nomenclature. Spot checks revealed omissions and incorrect citations in the indexes, so literature searchers should try several plausible entries before giving up on this book as a source of information and original references on a particular topic.

But promptness is more important than perfection in getting a relatively comprehensive book on a fast moving field in print before it is obsolete. The authors purport to have covered the literature up to October 1970, and as far as I can ascertain they have generally succeeded quite well in doing so.

In conclusion, this book is not recommended as a text or as a reader's first exposure to the field. *Lipid Biochemistry: An Introduction,* by Gurr and James and Gunstone's *An Introduction to the Chemistry and Biochemistry of Fatty Acids and Their Glycerides* are better for these purposes, since Hitchcock and Nichols were forced to sacrifice easy readilibity to achieve concentration of information. And for thorough in-depth review of specific and precisely delineated subject areas within the broad field of their book, pertinent selections from the helpfully provided Supplementary Reading List are more appropriate. Between these two extremes, however, are many readers and situations for which *Plant Lipid Biochemistry* will prove to be the most efficient source of information.

W.H. TALLENT
Northern Regional Research Laboratory
Peoria, Illinois 61604

Systematic Analysis of Surface-Active Agents, M.J. Rosen and H.A. Goldsmith (Wiley-Interscience Publishers, 1972, 591 p.).

In the span of 10 years since the first edition was published there has been a vast change in the mode of identification and analysis of surfactants; the authors have updated the field in their latest edition.

For those who have the earlier volume, the added methods, literature references and new instrumental techniques are more than enough reasons to have this second edition. For anyone who works in this field this book is an extremely valuable guide. Not only do the authors refer to and discuss methods, but they give sufficient details so that one can run through the method to see if it fits one's need before tracking down references. With the vast number of journals these days much time is wasted finding the method, then running it only to find it is not applicable; this book eliminates this problem.

The format of the text is in logical order, from classification and detection to quantitation. In the chapter on structural analysis the authors discuss methods that use instruments such as nuclear magnetic resonance, mass spectrometry, infrared, gas chromatography, and ultraviolet spectroscopy. The discussion not only covers procedures but also basic concepts of each instrument and their practicality in the analysis of surfactants. The appendix has been expanded and now includes a table on gas chromatographic columns and 33 infrared spectra of commercial surfactants.

For those with only a limited number of instruments available there are many colorimetric, functional group and spots tests cited. If one has all the latest instruments in the lab, there is a tendency to ignore all wet chemical tests; this book reminds us that there are such methods and they are useful.

There is an inherent problem with a type of book that presents methods written by other authors. As written, they appear to be time honored methods; yet I have tried two or three of the instrumental procedures and they do not work as written. One cannot fault Rosen and Goldsmith; however readers should be aware that all the methods are not infallible. There is also a curious error in the spelling of "chromosorb" from page 189-285—curious since it is spelled correctly before and after.

This book should be available to every chemist and student working or interested in the field of surface-active agents.

L. GILDENBERG
Colgate-Palmolive Co.
Piscataway, N.J. ■