

## REVIEWS

*Structure and Function in Biological Membranes.*  
Vol. I. By J. LEE KAVANAU. Holden-Day,  
Inc., 728 Montgomery St., San Francisco, Calif.,  
1965. xiv + 321 pp. 17.5 × 25.5 cm.

The reason given by the author for the writing of this well-produced monograph is to describe the development of his theories regarding membrane structure and function, and to lay the groundwork of knowledge for the proper understanding of such theories. Whether or not one is in agreement with his hypothesis of "disc and pillar" dynamic lipid micellar structure for natural membranes is relatively unimportant in assessing the value of the book, since less than one-fifth of the text is influenced by the hypothesis, and even within these sections (about 45 pages) much other useful information is included. Sixty pages or so are devoted to a very comprehensive review and consideration of micellar theory applied to soaps and lipids. The approach is mainly of a descriptive and qualitative nature with, however, appropriate references to the more quantitative aspects (deliberately avoided in the text). Many of the results of this latter work are quoted as, for example, values for the energies of attraction and repulsion of various molecular and structural configurations. A further 50 pages is concerned with the properties of pure and mixed monolayers so that nearly half the contents are of immediate and direct interest to colloid chemists, biophysicists, and others interested in interfacial interactions. The nearly 80 pages devoted to "water" represent such a good record and review of present knowledge of the influence of the lowly water molecule in biology that it has been reprinted intact as a separate volume by Holden-Day, entitled "Water and Solute-Water Interactions."

The author set out to bring together a wide range of experimental knowledge of the intermolecular and interfacial behavior of molecules and complexes out of which membranes appear to be constructed, so that nearly all aspects of structure and function of such membranes have been included within the two volumes, both of which are now available. The more biophysically minded reader would have wished, perhaps, for the inclusion of some aspects of a more quantitative treatment of macromolecules and polyelectrolytes in relationship with membrane structure.

The molecular pharmacologist will regret the noninclusion of discussions on the possible molecular mode of action of drugs and the function of the Kavanau membrane in drug receptor mechanisms. These more metabolic activities of the membrane have, however, deliberately been excluded from the present monograph, but a somewhat analogous "labile lipid mosaic" theory of the structure of the insect membrane relative to such drug mechanisms was used by H. Hurst in 1945. A more critical

appraisal of the mass of data included would have been helpful in assisting the reader to distinguish the "woods from the trees" but, as the author himself, admits, most major viewpoints of the various problems described are reported without any serious attempt to decide between them, mainly because at the present state of knowledge it is difficult to definitively do so.

The book contains a very extensive bibliography (almost 1500 works are recorded) and is a very valuable contribution to the increasingly important field of investigation concerning the natural membrane.

*Reviewed by A. I. McMullen*  
*School of Pharmacy*  
*State University of New York at Buffalo*

*Emulsions: Theory and Practice.* 2nd Ed., ACS  
Monograph No. 162. By PAUL BECHER. Rein-  
hold Publishing Corp., 430 Park Ave., New York,  
N. Y., 1965. xi + 440 pp. Price \$22.

This book is a comprehensive yet concise presentation of all of the facets of modern emulsion technology. The author has succeeded in combining both theoretical and practical aspects of emulsions to produce an easily read, informative text which will be of considerable value to anyone desiring to study and work in this field.

Approximately one-third of the text is devoted to surface activity and the physical properties of emulsions: particle size and distribution, optical properties, viscosity, inversion, and electrical conductivity. Another third discusses and explains theories behind the formation and behavior of emulsions; and the rest of the book is devoted to techniques of formulation and preparation.

Three particular chapters are outstanding and, in this reviewer's opinion, are in themselves sufficient reason for recommending the book. The subjects presented are: The Chemistry of Emulsifying Agents, The Technique of Emulsification, and Emulsion Applications. The material is presented in a well-organized manner with good supporting data and illustrations.

A laudable feature of this text is the index. It appears to be complete and permits easy location of specific topics. The book is suitable both as a text and a reference and should be in the library of everyone who is involved in emulsion work. It is highly recommended for the pharmacist who has formulation problems.

*Reviewed by Glen J. Sperandio*  
*School of Pharmacy*  
*Purdue University*  
*Lafayette, Ind.*