

shackles imposed by the conventional wisdom that 'the proper study of mankind is man'. They were less successful in convincing this reviewer that any of the model systems discussed in the book were currently pertinent to the practising clinical psychiatrist. Nevertheless, the book justifies the claim that model systems in this difficult field have a future, and much of the work is scientifically rewarding.

The primary advantage of a model system is that it is simpler and technically more convenient but is analogous in the properties under consideration to the complicated system from which it is abstracted. Thus functional analysis may proceed with greater ease and often with greater exactness. The practical importance of any deductions made from studies of model systems, however, depends critically on how relevant it is to the real-life situation; there's the rub, especially when the complexity and size of the human brain has no parallel in the animal kingdom.

Sections that are of particular interest to biochemists are the chapters by Matthyse & Haber and Kornetsky & Markowitz, in which the biological correlates of schizophrenia are explored by studying the interactions of psychoactive drugs with brain monoamine neurotransmitter system that have been shown to be altered by these drugs in patients. The contribution by Baldessarini & Fischer is also relevant: these authors discuss how the study of hepatic encephalopathy has been assisted by animal models in which the portal blood has been surgically shunted into the systemic circulation. They also show the value of studies with tissue slices and subcellular fractions rich in isolated nerve endings in providing knowledge of the metabolism of amines and amino acids at the region of the synapse, despite the virtually inaccessibility of this important area in intact living brain.

The presentation is neat, with very few typographical errors.

The book will be of interest to those workers in the field of biological psychiatry and neurobiology, particularly those (probably the vast majority) who favour a multi-disciplinary approach, but it caters for a highly specialized readership and is not likely to be read with enthusiasm by a general scientific audience.

P. R. HULLIN

Biological Membranes

D. S. PARSONS (Editor)

Clarendon Press, Oxford, 1975, pp. 205, £5.00

Membranes and their Cellular Function

J. B. FINEAN, R. COLEMAN and R. H. MICHELL

Blackwell Scientific Publications, Oxford, 1974, Paperback, pp. 123, £2.80

The extensive overlap in the coverage of subject matter by these two books readily enables them to be reviewed jointly. However, the intended levels of presentation and target audiences for each book are sufficiently different that a blow-by-blow comparison would be unfair to both.

Biological Membranes (subtitled 'Twelve essays on their organization, properties and functions') is based on a series of lectures forming a course on Bioenergetics and Membrane Function for the Final Honours School of Biochemistry at the University of Oxford. All of the contributing authors (D. Noble, A. G. Ogston, D. S. Parsons, C. A. Pasternak, G. K. Radda, G. B. Robinson, R. Whittam and R. J. P. Williams), with the exception of Dr. Whittam, are from Oxford. It is 'intended as an introductory account of the organization, properties and functions of the membranes of cells'. The vehicle chosen to present this introduction is by means of twelve chapters, shared between the above authors, in which 'an attempt has been made to describe . . . at an intermediate level, present-day views on some key topics in these areas' (these quotations are from the editors' preface). The chapters are well laid out with extensive sub-heading and sub-division; the illustrations are, for the most part, bold and clear.

Each chapter ends with several problems, many of which are quantitative and many quite searching, which together form an admirably sound basis for self-assessment, by the reader, of his comprehension of the text. The literature cited, in chapter order at the end of the book, is a mixture of good reviews and key research papers up to 1972. Despite its considerably later publication date, therefore, *Biological Membranes* can claim no great advantage of modernity over 'Membrane Molecular Biology' (edited by Fox and Keith), which, to my mind, still remains by far the best intermediate introduction (if that is not a contradiction in terms) to this field. The price of *Biological Membranes*, however, is attractively low.

There is an overall physicochemical bias throughout the book which is readily predictable from its authorship. I particularly enjoyed chapters by Dr. Noble, Dr. Williams and Dr. Ogston, which are most explicitly in this vein. Dr. Pasternak is also to be commended for writing a very concise short chapter on the biosynthesis of membranes which, almost in a few sentences, summarizes the hard facts regarding mitochondrial, chloroplast and bacterial membrane synthesis and then refreshingly spends some time on the less well-publicized problem of animal cell plasma-membrane biosynthesis. My overall criticism of this book is that the generalizing sections of some chapters are either too compressed and vague to be informative to readers unfamiliar with the subject matter (e.g. Dr. Radda's single page on mitochondrial electron transport, coupling and energization), or too elementary for the intermediate readership at which the book is aiming (e.g. Dr. Robinson's early passages on the isolation of membranes). On the other hand, when the authors proceed, sometimes rather abruptly, from these generalizations to a consideration of their own specific interests, the pace hots up quite a bit. It is for these latter sections that I think the book will be read with interest, for instance by those newly working in this field, by final-year honours students and by research workers with interests related but peripheral to the biological membrane field. This book seems to me to be primarily an interesting and largely well-written collection of essays. Only secondarily, and less successfully, is it an introduction to the organization, properties, and functions of the membranes of cells.

Membranes and their Cellular Functions, in contrast, exactly hits its target. The authors have accurately identified the conspicuous absence of, and the need for, an 'introductory text which would present a broad view of the significance of membranes in cellular activities, particularly for use by students and teachers in biochemistry and other biomedical sciences' (Preface). This is exactly what they have written, simply and clearly. The page format is large, with wide margins on each side of the text which are well used for illustrations, diagrams and a very useful marginal notation, which identifies the accompanying subject matter more or less on a paragraph-to-paragraph basis. The original cartoons are, at best, harmless; they may serve as an irritant to the more humourless reader, since they are not funny, and as a confusing distraction to the dogged student who attempts to unravel their symbolism and iconography in terms of membrane function, since this process is not ultimately rewarded by a greater or easier comprehension of these mysteries. This is a small point, however. Overall, *Membranes and their Cellular Functions* is an excellent and up-to-date text supplemented with further reading suggestions which take the reader to the best reviews available in 1973, and the very occasional very important research paper [e.g. Cuatrecasas, P. (1972) 'Properties of the insulin receptor isolated from rat liver and fat cell membranes', *J. Biol. Chem.* 247, 1980-1991]. There are, as is inevitable, occasional errors and omissions; the specialist who reads through the sections dealing with his own subject may experience mild outrage at the simplifying treatment, but only very seldom are established data ignored, perhaps for the sake of clarity. Whether or not one believes that particular means to be justified by the educational ends is a question beyond the scope of this review, and it is, equally, not for the reviewer to say whether this was the authors' intention. In any event, clarity is achieved; the book is most readable and it manages to acquaint the reader very painlessly with some quite sophisticated concepts concerning membrane structure and function. It is a rugged paperback (not one of those which, once opened, cracks down the spine and loses pages from that moment on) and at a price which, though not dirt

cheap, puts it within the range of the student pocket. This book will be of value to all levels of student studying degree or equivalent courses in a variety of biological subjects, and to their teachers.

R. A. CLEGG

Intestinal Absorption and Malabsorption

T. Z. CSAKY (Editor)

North-Holland, Amsterdam, 1975, pp. 308, \$24.95

When one is presented with the fruits of yet another symposium and is asked to review them, it is excusable if the first effect should be the induction of melancholy: at that moment it is more than usually obvious that all the unkind words that have been uttered about works of this class have failed to inhibit the production by workers in one's own field of yet another of them.

Pondering on the uniformly sanguine attitudes of the organizers, editors and publishers of such works, it seems that they must be buoyed up by the knowledge that some good and useful symposia have been held and published, and by the feeling that, since it is demonstrably possible for other people to achieve excellence in this field, they themselves are bound to do so.

If this is so, the sanguine folk are going to be encouraged by this book, which is a clear account of good and useful symposium. Professor Csaky's preface indicates only that he brought together experts in the various aspects of intestinal absorption and that he has published their papers in full, together with brief edited accounts of the discussions. But the unity of the book and the cross-references between contributions suggest that much skilful work went into the preparations for the symposium. It is therefore difficult to believe that Professor Csaky is not being a little too modest in describing his role. This is a pity, since realistic recipes for good symposia are very valuable.

Twenty papers are published in this book. Five are from Professor Csaky's laboratory in Lexington, Kentucky, ten are from other U.S. laboratories and five are from overseas.

I selected for particular attention as useful reviews of current knowledge the paper on the electrophysiology of sodium transport, by W. M. Armstrong, the paper on cation effects on intestinal transport, by P. F. Curran, and those on amino acid transport (Schultz and Frizzell) and peptide transport (D. M. Matthews). Other interesting and useful papers are those of Huang and Chen on the comparative biology of intestinal transport, of D. S. Parsons on the energetics of intestinal absorption and of T. R. Hendrix on the effects of cholera toxin on the small intestine. Waddell's discussion of the distribution of organic electrolytes across the intestinal epithelium and Dietschy and Westergaard's paper on unstirred layers also has interesting features.

Professor Csaky's own contribution is intriguing, though difficult to evaluate. He describes an apparent opening up of the tight junctions when rat intestine is perfused *in vivo* at pH10. Glucose, inulin and polyethylene glycol pass readily from blood to intestinal lumen in these conditions and the increase in permeability of the epithelium to those solutes is reversible. However, the efflux of sodium from blood to lumen is unchanged by alkaline perfusion. This makes it unlikely that the effects on permeability are due to the creation of non-specific intercellular channels in the epithelium.

I believe that this book will be useful to many teachers and investigators of intestinal transport.

R. B. FISHER

Cell membrane receptor proteins help cells communicate with their external environment through the use of hormones, neurotransmitters, and other signaling molecules. Transport proteins, such as globular proteins, transport molecules across cell membranes through facilitated diffusion. Glycoproteins have a carbohydrate chain attached to them. Organelle membranes are important to several vital cell functions including protein synthesis, lipid production, and cellular respiration. Eukaryotic Cell Structures. Artwork of chromosomes. Subscribe to view the full document. Structure & Function of Cellular Membranes I. Membrane functions and cellular compartments II. Lipid components (A) Fatty acid-containing lipids, phospholipids and sphingolipids (B) Phosphatidylinositol, cell signaling lipid (C) Phospholipid synthesis and insertion (D) Cholesterol (E) Lipid asymmetry in membranes III.