

endothelial cells, glomerular mesangial cells, parietal cells etc.).

As a final but important point, I should like to stress how useful it is to find plentiful 'useful tips'. Anyone like myself who has tried to adopt a methodology from the printed page must be aware that there are almost always hidden pitfalls for the novice. It is therefore nice to find plenty of warnings and helpful hints. For example, the differential elution of multitruncated 20:4 metabolites (p. 215), or the rival benefits of different separation cartridges (p. 346), or the problems in interpreting LTC₄ 'receptors' (p. 429), the problems with getting RNA from seminal vesicles if you store the glands

(high nuclease content, p. 471), procedures for minimising gastric cell clumping (p. 511) and so on.

My only serious grouse concerns the index. Although large (31 pages, about 1200 entries I guess), when I put it to the test it failed to identify many important things in the text. Thus it is not necessarily a reliable way of searching for information on your chosen topic.

This book will clearly be essential not only for the library, but also for the laboratory, and I am privileged to have been given the opportunity to review it.

R. Hoult

Channels, Carriers and Pumps: An Introduction to Membrane Transport; By Wilfred D. Stein; Academic Press; San Diego and London, 1990; xiv + 326 pages; \$ 59.95

Recent developments in physical and, particularly, molecular biological methods for studying membrane proteins seem likely to illuminate a hitherto intractable problem in classical biochemistry – the mechanism of action of membrane transport systems. However, students – and practising researchers, for that matter – tend to be familiar with molecular biological methods, but far less comfortable with theoretical aspects of membrane transport, i.e. thermodynamics, kinetics, model-building, and so on. There is thus a need for a book that integrates these areas to provide an up-to-date account of structure/function relationships in membrane proteins, while not shrinking from a rigorous treatment of transport theory: this text goes a long way toward fulfilling that need.

Aimed at advanced students and at researchers entering the field, the book covers simple diffusion, ion channels, carrier-mediated transport, secondary active transport by symporters and antiporters, ATP-driven ion pumps, transport regulation and the integration (with particular reference to the kidney) of transport systems. Its opening account of membrane structure is the least successful chapter; it contains some questionable generalizations on the structures of membrane proteins, and in any case most textbooks of biochemistry cover this material in more depth. For most readers, however, this chapter will be superfluous, and no-one is likely to be disappointed with the authoritative and readable treatment of

membrane transport which follows. In each section, essential theory is covered in the main text, with constant reference to experimental evidence, while mathematical derivations that are peripheral to the main thrust of the argument are 'boxed', as are many descriptions of individual transport systems. The result is that the text has a satisfying continuity and clarity, while the boxes not only supplement the argument, but can be read and understood on their own. There is a wealth of quantitative data, presented in tables, and each chapter has a reading list, which includes references up to 1989.

The strength of this book is the way in which rigorous yet lucid expositions of the theoretical basis of various types of transport are integrated with illuminating discussions of experimental results. Numerous ion channels and transport proteins are described, briefly but informatively. The account of P-type ATPases is outstanding, although that of F-type is rather brief, and V-types get only a mention. Respiratory-chain-linked ion transport is not discussed, and the treatment of the ion/ATP stoichiometry of pumps, a difficult and contentious issue, is surprisingly brief.

Any reservations about the treatment of particular examples are trivial when set against the real value of this book. It will continue to be rewarding reading when many symposium reports have become outdated, and it is warmly welcomed and recommended.

D.K. Apps

Molecular and Cellular Regulation of Calcium and Phosphate Metabolism (Progress in Clinical and Biological Research, Vol. 332); Edited by M. Peterlik and F. Bronner; Wiley-Liss; New York, 1990; xv + 239 pages; \$ 72.00

In 1988 the Austrian pharmaceutical company, Chemofux, decided to institute an international award for an outstanding research paper published in the preceding two years in the area of bone and mineral metabolism. A jury was constituted, duly made its decision and then all came together in

November 1988 in Vienna to make the award. This book represents a collection of the award winning article along with presentations by members of the jury of some of their published and unpublished work.

The work comprises 13 articles, the first and longest of