

specificities. With notable exceptions, Japanese scientists have not been in the forefront of recent advances in this field. One can only guess that the principal aim of the Editor and Publishers of this book has been to bring attention to Japanese work, all but one of the 14 articles coming from Japanese laboratories. As the book has been prepared from camera-ready copy with a variety of typefaces and reference styles, one might suppose that it represented the proceedings of a conference, but there is no statement to this effect. The book is, however, typical of many conference proceedings in having little coherence and no evidence of firm editorial guidance.

There are three sections. The first, on protein structure analysis and folding, starts with chapters on conformational energy analysis and theoretical studies of protein folding. As with most of the book, these chapters make no attempt to review the current state of work in these fields. Simulations of protein vibration modes start from published X-ray coordinates, but make no comment on the precision of the starting values, the difficulties of establishing appropriate force fields or the relationship between the conclusions from the theoretical work and experimental observations by crystallography and spectroscopy. The chapter on prediction seems dated and naive. Other chapters in this section have no pattern; they include one on folding-intermediates of hen-egg lysozyme, bovine α -lactalbumin and on equine lysozyme, recently found to have a calcium-binding site like that of lactalbumin; these observations throw some light on the curious differences in folding behaviour of lysozyme and lactalbumin, two highly homologous proteins, but it is remarkable that the authors manage to avoid any reference to the work of Creighton. Other chapters are on the relationship between neurotoxin flexibility and receptor binding, on

cytochrome *c* flexibility and its susceptibility to protease digestion and on the crystal structure of a plant-type ferredoxin.

The second section of the book, with chapters on subunit organization in fatty acid synthetase, on the denaturation of trans-membrane proteins and on the tendency of bovine serum albumin molecules to form clusters in a velocity gradient, is concerned with higher-order structure of protein systems.

The third section, the most coherent, covers mutation and the structural design of proteins. Three papers on haemoglobin show the value of having substantial evidence from crystallography on which to base interpretation of the effects of mutations – natural, in the case of haemoglobin M's, or synthetic. By far the most informative chapter in the book (incidentally, the only one not from a Japanese laboratory) is that on the role of the distal residues of haemoglobin on the kinetics and thermodynamics of oxygen-binding, on discrimination between O and CO and on protection from auto-oxidation.

The final chapters, on the membrane-bound eukaryotic cytochrome P450d and on tryptophan synthase, confirm the value of site-directed mutagenesis in attempting to understand functional properties, but show how much less informative such studies are in the absence of firm 3-D structural information.

The book covers much ground but often superficially, and only in the three chapters on haemoglobin is there any coherence. It is difficult to suggest its intended readership and it presents little information that is not available elsewhere.

A.C.T. North

Arachidonate Related Lipid Mediators (Methods in Enzymology, Vol. 187); Edited by R.C. Murphy and F.A. Fitzpatrick; Academic Press; San Diego, New York and London, 1990; xxxviii + 628 pages; \$ 85.00

The series 'Methods in Enzymology' is now in its 35th year since its founding by Colowick and Kaplan and occupies an essential place in all serious biological science libraries. In this sense, therefore, it is rather presumptuous of me to attempt to place a value judgement on this book by means of a short review. Indeed, it is rather like being asked to review the Bible or a large telephone directory.

Perhaps I could start by saying that this volume is the second in the series dealing with the lipid metabolites of arachidonic acid (prostaglandins, thromboxanes, leukotrienes etc). The first was Methods in Enzymology Volume 86, published in 1982, and ably edited by Lands and Smith. This is now a classic reference source for research workers in the field, and was written "to provide *in one source* a detailed description of the major techniques currently available for the study of *significant* arachidonic acid metabolites" (my italics). Their objective certainly succeeded. How does the present volume compare?

Well, it is fatter (5.4 cm vs 3.8 cm) and heavier (1.4 kg vs 1.1 kg), presumably on account of the thicker acid-free paper as there are actually fewer pages (628 vs 667). This

expansionist trend is underlined by the authorship: the present volume has 67 chapters by 159 authors (2.4 authors per chapter), whereas in 1982 the figures were 76 chapters by just 100 authors (1.3 authors per chapter). Of the authors, Europeans account for 23% both times – probably a fair reflection of the status of research in this area.

Statistics aside, I must congratulate everyone on this book. It is well presented and the coverage dovetails very nicely with that in the earlier volume. Thus in 1982 the emphasis was on, *inter alia*, enzyme purification and assay (surely the bedrock on which this series is founded), RIA for various arachidonate metabolites, chemical synthesis of eicosanoids, TLC and HPLC separation and GC-MS analysis. Of these topics, newer methods using GC-MS, HPLC for more recently identified metabolites are introduced, including epoxyeicosanoids, as well as areas which did not receive much attention previously, viz. phospholipase assays, receptor binding assays, platelet activating factor methodologies and cloning of various enzymes. A new and useful section comprises details of various different cell type preparations which have underpinned much valuable recent research (e.g.

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