

Membrane enzymes

The Enzymes of Biological Membranes. Vol. 1: Physical and Chemical Techniques. Pp. xiii+257. £10.50; \$20. Vol. 2: Biosynthesis of Cell Components. Pp. xvii+654. £28; \$55. Vol. 3: Membrane Transport. Pp. xv+459. £21; \$39. Vol. 4: Electron Transport Systems and Receptors. Pp. xv+431. £20; \$37. Edited by A. Martonosi. (Wiley: London, 1976.) (US edition published by Plenum: New York, at slightly different prices.)

THESE volumes form the first four of a series which sets out to collect together and evaluate information on membrane enzymes. Most of the information is concerned with the relationship of enzymes to their membrane, and with their involvement in membrane phenomena. Very detailed information on the structure of each enzyme is usually lacking, since the purification and structural analyses of most membrane enzymes have not advanced as far as for their soluble counterparts.

Some membrane enzymes are dealt with singly, others appear as part of enzyme systems. It is clear from the volume titles that the word 'enzyme' has been interpreted very loosely. Thus, in addition to proteins with clear enzymic activity, the coverage includes binding

proteins of various persuasions, transport components without enzymic activity, and light-trapping systems; in short, membrane proteins with clearly documented biological function. This is a reasonable extension in the context of an attempt to provide an insight as to how membranes function. Very few important 'enzymes' have been omitted.

Each volume is a multi-author effort; the cast-list is impressive and most authors do their subject (and themselves) justice. The coverage given to different 'enzymes' varies; in some cases this is an overall view of the 'enzyme' and its relationship to the membrane, whereas in other chapters the emphasis is more firmly on recent developments. On the whole, most contributors reflect the state of knowledge in each field but occasionally reveal a personal bias which may limit the usefulness of their chapter.

In the first volume the uses of various techniques are discussed in establishing the general fluidity of the membrane lipid layer, in demonstrating a collar of lipid around the inserted portions of some proteins, and in interpreting the response of some enzymatic activities to temperature change; all of these discussions use suitable examples. Much of the same work is, however, discussed again in other volumes in relation to the properties of the individual enzymes used as the examples

in volume 1. This excessive overlap could have been avoided, as could the length of those contributions taking over 30 pages to discuss a single 'enzyme'.

Volume 4 is a very artificial assembly; the few chapters on receptors, with the exception of that on rhodopsin, have little in common with those on electron transport systems. The receptor chapters would have been better separated off into a further small volume or would have associated better with the transport components. Such considerations are clearly of importance to purchasers of individual volumes but of less importance when considering purchase of the series for a library.

To have such a convenient and comprehensive source of material on membrane enzymes will be a considerable asset in both teaching and research. The series is clearly one for library purchase since it is too comprehensive and expensive for individual subscription. Each volume deals with a coherent group of topics (with the artificial addition of the receptor section to volume 4); although expensive, they are therefore more attractive for single volume purchase than many serial publications.

Roger Coleman

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Disease resistance in plants

Defence Mechanisms of Plants. By B. J. Deverall. Pp. 110. (Cambridge University: Cambridge, London and New York, 1977.) £5.50.

THROUGHOUT their lives plants are exposed to infection by many parasitic microorganisms. Yet infection often fails and the plants remain healthy. Professor Deverall's excellent book is concerned with the processes by which plants perceive the parasite, and occasionally permit but usually discourage its further progress.

Professor Deverall does not attempt an extensive account of the subject but rather chooses to present a selective personal view of recent research pertaining to the processes of resistance to disease. Emphasis is placed on events which occur after a plant has been infected and covers cytological changes, the production of antimicrobial compounds (phytoalexins), induced resistance and the mediation of host-parasite specificity. Each chapter contains a summary of the facts, which is well supported by reference to original and review papers, an assessment of their significance or otherwise, an indication of the problems remaining, and in some cases how they may

be solved. Few significant errors or omissions have been noticed although the promise to expand the concept of infection type to all host-parasite interactions is rarely fulfilled.

This book is extremely timely in that it appears alongside several other publications, which although containing more detailed information often fail to analyse it critically. In this respect, Deverall, rather than merely providing a list of phytoalexins, presents a welcome evaluation of the evidence for their rôle in resistance and the mechanisms of their induction. The close association between cell death and phytoalexin synthesis rightly receives much emphasis, but his conclusion that phytoalexins are synthesised in living cells may be somewhat premature.

Professor Deverall states that he envisages his readers to be research workers and university lecturers, and their advanced students. The book can be recommended as essential reading for such people. It will convey the progress achieved by and the challenges remaining for physiological plant pathologists.

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