

widely over the physiology of plant disease. Among the topics dealt with are the ultrastructural changes produced by disease, the biochemistry of phytoalexins and pectic enzymes, and factors influencing virus multiplication in the diseased plant, all of obvious interest to the physiological plant pathologist. Of less immediately obvious relevancy is a paper offering a scheme for the mechanism for the plasticizing of plant cell walls. That this paper is of interest to all plant physiologists and not only to plant pathologists indicates that the new journal should not be dismissed by botanists as of narrow specialist interest only. The journal's appeal and usefulness will be widely appreciated not only by those for whom it specifically caters but by plant physiologists, mycologists, plant virologists, biochemists and many others.

The authors are drawn from six different countries indicating that the editors intend to make this a truly international journal.

The standard of the articles in this first number is high, the journal is clearly printed on good quality paper and both line diagrams and photographs are satisfactorily reproduced. If these high standards are maintained (and the list of members of the editorial board guarantees that this will be so) the journal will be a welcome addition to biological periodicals. LILLIAN E. HAWKER

Detoxicant Enzymes

Amine Oxidases and Methods for their Study. By R. Kapeller-Adler. Pp. xi+319. (Wiley-Interscience: London and New York, December 1970.) £9.25.

SINCE the discovery of the enzyme monoamine oxidase by Hare in 1928, a bewildering array of amine oxidases has been described. This book surveys the whole of this literature, and provides a valuable guide for enzymologists and others with an interest in this group of enzymes.

After a somewhat lengthy introduction which reviews current theories of enzyme action, the author outlines the classification scheme of amine oxidases and proceeds to describe in detail the biochemical properties, cofactors, inhibitors, reaction mechanisms and biological significance of individual enzymes. A large section is devoted to classical monoamine oxidase, an intracellular insoluble flavoprotein found in many vertebrate and invertebrate tissues. Monoamine oxidase has a fairly well defined and important biological role in the detoxication of a variety of foreign and endogenous amines, such as the catecholamines and 5-hydroxytryptamine in animal tissues. Monoamine oxidase inhibitors include various drugs used in the treatment of depression and angina pectoris in man, and these

various inhibitors and their mode of action and pharmacology are fully described. Numerous other amine oxidases are also described, including diamine oxidase (histaminase), mescaline oxidase, extracellular amine oxidases of plasma, and plant and bacterial amine and polyamine oxidases. Unfortunately most of these enzymes do not yet have clearly defined biological roles; in many cases the natural substrates are not even known.

The second half of the book is devoted to a full description with practical details of laboratory methods used for the assay and for the isolation and purification of each individual enzyme. This very comprehensive collection of techniques will undoubtedly be of considerable value to researchers in this field. More critical comment from the author would have been welcome, however, in this and in other chapters of the book. The reader might like to know, for example, which of the eleven methods described for the assay of monoamine oxidase would best fit his requirements. There is a tendency to quote the conclusions of others too frequently; I would have preferred to see more critical analysis and clearer summaries of the author's own interpretations.

The bibliography with more than one thousand references is on a heroic scale, but its practical usefulness is limited by the non-alphabetical listing of items without titles. Nevertheless, this volume should certainly prove valuable as a reference work for students. It also provides a useful laboratory reference of techniques for biochemists interested in this large and often confusing group of enzymes. L. L. IVERSEN

Metabolism and Cancer

Homologies in Enzymes and Metabolic Pathways; and Metabolic Alterations in Cancer. Edited by W. J. Whelan and J. Schultz. (Proceedings of the Miami Winter Symposia, January 1970.) Pp. ix+529. (North-Holland: Amsterdam and London, 1970.) Hfl. 90; £10.50; \$25.

THIS book contains the full papers presented to the Miami Winter Symposia during January 19-23, 1970, and is the first of a continuing series under the title "Miami Winter Symposia". Associated with the symposia is a lecture named in honour of the distinguished biochemist, Professor Feodor Lynen. The first Lynen lecture, given by Dr George Wald and entitled "Vision and the Mansions of Life", is reproduced in this volume.

The book comprises the first two volumes in the series: one called "Homologies in Enzymes and Metabolic Pathways", and the second called "Metabolic Alterations in Cancer". These volumes will appeal to the same general public,

but will not have identical audiences.

The first volume on evolutionary homology in enzymes includes a number of very thoughtfully compiled papers. Several authors have been working and thinking about their problems for many years; these articles show the fruit of their effort, and will bear rereading over a number of years. Some other articles are of interest as research reports.

The second volume on metabolic alterations in cancer includes five articles on immunochemistry. There are too many diverse subjects dealt with in this book to permit detailed consideration of each of them. By example, only, I shall comment on the excellent review by Weinhouse of his work on Morris hepatomas. The competition between glycolytic and respiratory formation of ATP, discussed as long ago as 1941 by Feodor Lynen and M. J. Johnson, seems to me to be of special significance in this context, although its physiological significance is by no means clear. The inverse relationship between tissue NAD levels, NAD pyrophosphorylase levels and tissue growth rate observed and emphasized by R. K. Morton is not discussed by Weinhouse, but seems very relevant. The absolute level of NAD may be involved in determining the pattern of metabolism, and the patterns observed by Weinhouse may be unrelated to the cancerous state of the cell, but may be a function of their growth rate. To provide a more profound understanding of the nature of the growth processes we need to unify our understanding of growth rate, levels of NAD and ATP, their rates of synthesis and degradation, and the patterns of energy metabolism associated with different growth rates.

These volumes eloquently demonstrate the development of biochemistry. At an early time we had a naive, integrated view of biological phenomena. During the last half century biochemists have analysed a number of biological processes in some detail and we now have a reasonable picture of the component processes of a living cell. Biological science is now entering the third stage; during this period we will evolve an integrated understanding of biological phenomena based on a vast, detailed empirical knowledge. This integrated view will form the starting point for a further progression in our knowledge through the same stages.

I found these two volumes enjoyable reading; they are of such lasting value that I shall strongly recommend them to students. The editors are to be congratulated on achieving relatively rapid publication. The wisdom of publishing symposia proceedings is still uncertain, and equal care will be needed to ensure useful subsequent volumes. Readers will look forward to these, hoping that they will be thoughtful and stimulating as well as providing brief critical reviews of recent new knowledge. SYDNEY SHALL