

their biosynthesis by A. R. Williamson, and on their genetics by C. Milstein and A. J. Munro. The coverage in this area is completed by a chapter by M. J. Crumpton on antigenicity and immunogenicity. In this latter chapter extremely well-chosen examples have been used to illustrate the various points.

P. J. Lachmann has contributed a chapter on complement. Any discussion of this extremely complicated system tends to become something of a list of all the components of complement and their reactions and interactions, but the present author leads us gently through the steps. It is an absorbing topic and one which is becoming more 'biochemical' each day. Here as in the area of immunoglobulin biosynthesis, one must have sympathy for anyone trying to summarise a mass of data into some sort of scheme for presentation to the non-expert.

Other sections of the book deal with such topics as interferon and the more medical parts of immunology such as cellular immunity, tolerance and histocompatibility antigens. The chapter on interferon (the

first in the book) is adequate in its coverage, but failed to convey much excitement to this reviewer. In this field, as in the field of histocompatibility antigens, the isolation of tiny amounts of material from complicated cell extracts presents a formidable problem and the end results so far are not much for the protein chemist to get his teeth into. This is a challenge for the future, when this curious mixture of phenomena we call immunology must eventually be explained in terms of the interactions of chemical structures, that is, become a part of biochemistry.

This volume is, in summary, a useful survey for the non-expert, but one which may rapidly become out-of-date in some areas at least. Many chapters would be useful reading for undergraduates, and research students will find that particular sections will be helpful as starting points for delving into new areas.

E. J. Wood

MTP International Review of Science. Biochemistry Series One. Vol. 11.

Plant Biochemistry

Edited by D. H. Northcote

Butterworths; London: University Park Press; Baltimore, 1974

ii + 287 pages. £10.45

One never knows what to expect under the title of *Plant Biochemistry*. The experienced reader in the field learns to expect nothing, so as not to be disappointed. The present book is a collection of seven independent reviews on specialized topics. Each chapter has a different authorship and, apart from the blanket title of plant biochemistry, there is no unity of theme or approach.

The contribution by D. A. Walker, entitled 'Chloroplast and Cell — the movement of certain key substances, etc. across the chloroplast envelope' proves that a review can be interesting, even entertaining, while retaining minutiae of detail and an

impressive list of references. We learn that the 'starch print', that classic of practical instruction in elementary botany, shows an amazing degree of resolution, approaching that of a photographic print. The reconciliation of this observation with the fact that leaves form starch in the dark when floated on sugar solution, requires an understanding of the translocation of metabolites and inorganic ions within the chloroplast, and between the chloroplast and the cytoplasm and other cell organelles. Students will be grateful for the lucid and comprehensive treatment.

Another highlight of readability is the chapter on the "Biochemistry of Photomorphogenesis", by

H. Smith. We still do not know why various physiological changes and alterations in enzyme activity occur in response to the illumination of plants. Inorganic pyrophosphatase, lipxygenase and that unlikely and esoteric enzyme phenylalanine ammonia lyase appear to be the only three enzymes that show such an immediate response to light that a causal relationship can be suspected. One wonders how many of these data will become trivialized when the true nature of photomorphogenesis is discovered. Naturally, one turns first to the section on phytochrome; it is exciting to read how this photoreceptor is now implicated in the modification of membrane properties, but it must be admitted that we still know practically nothing about its true mode of action.

In the "Chemistry and Biochemistry of Cell-wall Polysaccharides", by A. Haug, separate sections are devoted to the polysaccharides of the Chlorophyta, Chrysophyta, Bacillariophyta, Pyrrophyta, Phaeophyta and Rhodophyta and, where possible, cell wall structure is related to the taxonomic individuality of the algal division. Studies on the conformation and spatial relationships of polysaccharides within the cell wall are very well documented. The review has a certain monotony which is hard to avoid in the description of polysaccharides, but it is well referenced and well up to date for the time of publication.

"Pathways of Carbohydrate Breakdown in Higher Plants", by T. ApRees reviews the properties and distribution of key enzymes in carbohydrate breakdown, and discusses the pathways of carbohydrate breakdown in relation to energy metabolism and the provision of intermediates for biosynthesis.

"Plant growth substances" is an immense field and

cannot be adequately reviewed in a short chapter. The authors (D. G. Morgan and Clare B. Morgan) of this chapter recognise this limitation and they have surveyed selected topics, but even at the time of publication, the material presented was already rather dated. Particular emphasis is given to abscissic acid. Xanthoxin is also discussed at some length and brief mention is made of auxins, ethylene, cytokinins, lunularic acid and senescence factor. Kinetin is discussed in relation to its interaction with auxin. The role of giberellin in seed germination and the role of auxin in cell elongation are also discussed.

The chapter by E. J. Hewitt entitled "Aspects of Trace Element Requirements in Plants and Micro-organisms: The Metallo Enzymes of Nitrate and Nitrite Reduction", is a very welcome review of the dissimilatory and assimilatory reduction of nitrate and nitrite, with emphasis on the properties of the non-haem metalloenzymes, especially those containing molybdenum. There is no better account of this subject in existence. It is packed with information and lists 424 literature sources.

"Enzymological Aspects of Flavonoid and Lignin Biosynthesis and Degradation in Plants" is reviewed by G. H. N. Towers. This area is fairly well reviewed, especially in the organic-chemical, rather than the biochemical literature. By omitting the shikimic acid pathway and concentrating on the metabolism of phenylalanine and tyrosine, the author has nevertheless produced a review that fills a niche. Degradation is treated very briefly.

T. A. Scott

MTP International Review of Science. Biochemistry Series One. Vol. 12.

Physiological and Pharmacological Biochemistry

Edited by H. K. F. Blaschko
Butterworths; London: University Park Press; Baltimore, 1975
ii + 276 pages. £10.45

The title of this volume is likely to provoke intense

curiosity as to its contents. It might well encompass