

Elsewhere, alginic acid is said to contain L-mannuronic and D-guluronic acids, whilst the authors aver that pectin contains chains of (1→4)-linked β -D-galacturonic acid residues.

The book has laudable objectives, and succeeds in giving a readable account of the importance of carbohydrates in plants. It could, therefore, be read with profit by carbohydrate chemists seeking a broad background in plant biology, provided that they bring a chemical-correction kit, but, for reasons already given, the book cannot be regarded as a reliable, undergraduate text. A more satisfactory treatment of much of the same subject material, although directed less exclusively to plant carbohydrates, is given in "Biological Functions of Carbohydrates" by D. J. Candy*.

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Topics in Enzyme and Fermentation Biotechnology: Volume 8, edited by A. WISEMAN, Horwood, Chichester, 1984, 179 pages, £21.00.

This volume continues the important series of reviews on Enzyme and Fermentation Biotechnology topics that are of interest both to academics and industrialists working in this area. The interdisciplinary approach that is required in any biotechnology venture is reflected in the nature of the reviews published in this series. In Vol. 8, of immediate interest to carbohydrate workers is an article on xylanases, but a chapter on the use of computers and microprocessors in the fermentation industry will be useful to anyone interested in the production of microbial polysaccharides with increased efficiency and at reduced cost.

A chapter on xylanases (D-xylanases) by J. Woodward is concerned with the controlled degradation of the hemicellulose component of hardwoods and softwoods. In this concise review, the author discusses the functions and properties of this group of enzymes. The chapter, surprisingly and refreshingly, brings together information on the sources, production, physiological role, and characterization of xylanases, as well as discussing the chemical aspects of the action of these enzymes. In a section on the biotechnology of xylanases, the author comments on their potential for the production from D-xylans of D-xylose for subsequent use in fermentation to ethyl alcohol. Although some potential for such an application may exist for this venture, it is clear from the review that considerable work lies ahead before commercial viability will be achieved.

The second chapter, by M. Winkler, is an extensive review on a topical, biotechnological subject, *i.e.*, the biological control of nitrogenous pollution in

*For a review, see *Carbohydr. Res.*, 92 (1981) c10.

waste water. The areas covered in depth include mechanisms of nitrogenous pollution, sources of nitrogenous wastes, nitrification, denitrification, and biological processes for the removal of nitrogen.

The final chapter is devoted to an assessment, by R. I. Fox, of the use of computers and microprocessors in the fermentation industry. Although some knowledge of computers and microprocessors is assumed, the review will be of great interest to any industrial fermentologists considering the installation of this advancing technology for application to their process. It is evident that significant advances have been made regarding the on-line physical control, and (to a lesser extent) the biological control, of fermentation systems which will have a great impact in future industrial processes. Useful information on the choices of software and hardware systems available is also presented, along with methods whereby the resulting data can be stored and applied.

Owing to the diverse nature of the reviews contained in this volume, it is unlikely that all three will be of interest to any one reader. However, the chapters are up to date, well written, and well presented, and only a few typographical errors were noticed, although correct enzyme nomenclature and classification, and carbohydrate nomenclature, are, in places, not employed. This well produced volume is reasonably priced for its size, although it could easily have taken a further review. Volume 8 is recommended for library purchase, or for the personal library of workers having sufficient interest in any of the topics covered.

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