

BOOK REVIEW

Nitrogen Assimilation of Plants: edited by E. J. HEWITT and C. V. CUTTING. Academic Press, London, 1979. 708 pp. £39.50.

In this book, the proceedings of a symposium held at Long Ashton in September 1977 are to be found; not only are the invited contributions presented at the symposium reported but also summaries of the demonstrations presented and an unusually full transcript of the discussions following the papers. The result is a volume which leaves the reader with a real feeling for the current status of research, and for the achievements and problems of workers in the field of nitrogen metabolism, a field identified by Dr. Fowden in his inaugural chapter as "The keystone to plant growth and metabolism". The generally excellent balance achieved in this volume reflects the editors' wise selection of speakers. Between them they cover an enormous range of topics.

The 36 chapters have been grouped into six sections. The first, concerned with the utilisation of atmospheric nitrogen, contains two chapters on symbiotic nitrogen fixation and other associations of nitrogen-fixing prokaryotes with plants, but is mostly concerned with the chemistry and biochemistry of the fixation process itself. The complexity of this process and of its regulation puts in perspective the currently popular idea of extending nitrogen fixation or nitrogen fixing associations to a wide range of plants. The second section deals with the utilisation of fixed nitrogen and primarily with the effect of nitrogen supply on growth rates, either in relation to agronomic practice or under controlled conditions. There follows a long section on the regulation of nitrate assimilation to which the Long Ashton group not surprisingly makes a substantial contribution. If after reading the chapters in this section the reader is not left any

more certain of the relative significance of the bewilderingly large number of factors and mechanisms which have been found to regulate nitrate assimilation, this is probably a true reflection of the current state of research. There is a serious discrepancy between what we know about potential mechanisms of control and our understanding about their roles in the whole plant.

Further sections deal with organic nitrogen metabolism, and the efficiency of nitrogen usage. There is a section entitled "Relationship to carbon metabolism" which actually contains an assortment of papers including photocontrol and hormonal control of nitrate reduction as well as several chapters on the extremely important interactions between nitrogen and carbon metabolism. Although the chapter headings look reasonable, I felt that less than full justice was done to this particular aspect.

All in all, however, I found this volume stimulating reading. It is too piecemeal a work to be suitable as a text for undergraduates but represents a handsome collection of the most recent research of many of the principal contributors in this increasingly important field. I particularly enjoyed reading the chapters by Kennedy and Eady (a particularly lucid analysis of the regulation of nitrogen fixation), Dale (nitrogen supply in relation to the development of the cereal seedling) and Notton and Hewitt (structure and properties of higher plant nitrate reductase). However, such selection is quite unfair: I was most impressed by the high standard achieved by all the contributors. Many may be put off by the price but I would argue that the volume (700 pp.) represents excellent value for anyone with an interest in this field.

*Department of Botany,
University of Reading*

C. JOHNSON