

Hormone action in plants

Hormone Action in the Whole Life of Plants. By K. V. Thimann. Pp.448. (University of Massachusetts Press: Amherst, Massachusetts, 1977.)

THE biochemical and molecular biological approach to physiological questions has gained such ascendancy in recent years that it is rare indeed to find an author attempting a comprehensive, holistic treatment of a topic such as hormone action in plants. When the author is one who can trace his own commitment back to the beginnings of auxin studies and who has since contributed substantially to every aspect of the study of hormones, the book becomes an obvious must for every developmental botanist. Based on a course of lectures presented in 1974 at the University of Amherst while the author was a Visiting Professor, the book is a highly personalised account of the role of hormones in all phases of plant development. The book is not over-scholarly, the treatment being more conversational, even, in places, anecdotal; but it captures in a most expressive manner the fervent nature of scientific research and the latent excitement which underlies it. It is a book to read, not merely to consult, and in doing so, one is made vividly aware that science is not just a collection of facts and figures, but is a product of human creativity, with the creators themselves often being at least as interesting as the results they obtain.

The book follows a logical sequence through the life cycle of the plant, with eleven chapters covering seed germination, cell enlargement and growth, polarity, geotropism, phototropism, leaf and root development, differentiation (particularly in tissue culture), apical dominance, flowering and fruiting, and senescence. Chapters are also included on chemical aspects of the hormones, and on concepts of their mechanism of action. The real strength of the coverage lies in its integrative quality with particular emphasis being placed on the interactions between the various hormones in the regulation of the specific phases of plant development. The most successful chapters are those dealing with the complex multi-component phenomena such as germination, leaf and root development, apical dominance, and fruiting and abscission, all areas of study in which integration of concepts is sorely needed.

There are, however, certain shortcomings to the book. As the book seems to be based on a verbatim record of the lectures, the overall information content is rather low; and the material

that is presented is rather selective, as it is largely based on the admittedly excellent work of the author and his colleagues. Some of this work stretches back to the 1930s and it is remarkable to see how relevant the discoveries of almost half a century ago are today. On the other hand, very recent developments are only lightly touched upon; for example, I could find no mention of hormone receptor proteins.

There are some quite important errors. For example, Fig. 14.11 is stated in the legend to represent a concentration plot of the effect of auxin on glucan synthetase activity in pea stems, whereas the actual figure seems to be a time course. The legend is corrected in the Errata list supplied, but the figure is still at variance with the text on page 414. Although many of the

typographical errors are obvious and present no problem to the intelligent reader, some, such as the one cited, are serious and could confuse the uninitiated, in spite of the comprehensive Errata list.

These points, together with the minimal bibliographic listings, suggest to me that the book should not be recommended as a student text, even though the original lectures were presented to a student audience. It is more a book to be enjoyed by those who already have a sound background in plant physiology. Such readers would, I guarantee, be substantially broadened by the experience.

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Progress in nitrogen fixation

Recent Developments in Nitrogen Fixation. Edited by W. Newton, J. R. Postgate and C. Rodriguez-Barrueco. Pp. 622 (Academic: London and New York, 1977.) £16; \$31.25.

THE enormous increase of interest in biological nitrogen fixation over the past few years has stimulated the holding of many meetings throughout the world, most of which have resulted in the publication of a symposium proceedings. This has had the effect of flooding the market with such books and compelling the contributors to such meetings to produce appropriate reviews. For many people this has meant the writing of two or more review chapters a year for the past few years. Therefore, one might reasonably ask what yet another collection of such papers has to offer.

In 1974 the Charles F. Kettering Research Laboratory and Washington State University sponsored the First International Symposium on Nitrogen Fixation, with the intention of bringing together scientists from the different disciplines involved in nitrogen fixation research. This facilitated an exchange of ideas between chemists, biochemists, microbiologists, geneticists and others involved in fertiliser technology and nitrogen utilisation. The Proceedings were published in two volumes, edited by W. E. Newton and C. J. Nyman (Washington State University Press: Pullman, 1976). The Second International Symposium on nitrogen fixation was held in Salamanca, Spain in 1976 and the book being considered here is effectively the

proceedings of this meeting, which covered much the same ground as the first Symposium. The papers in this book therefore provide a convenient yardstick for assessing progress over the intervening two years.

How valuable the coverage of the present book is can be surmised from the range of papers and reviews: seven on chemical aspects of nitrogen reduction, five on biochemical and physiological aspects of nitrogenase, thirteen on the physiology and genetics of free-living bacteria and *Rhizobium*, eight on non-legume associations and symbioses, and two on energetic relationships. There are excellent reviews within each area mentioned, as well as a scattering of rather inferior papers that are neither good reviews nor truly original research publications. However the latter are inevitable when all contributors to a meeting have been required to produce manuscripts; they are more than compensated for by the quality of the many other reviews, especially those by the chemically and biochemically orientated authors.

I feel that this book provides a good background analysis of most aspects of nitrogen fixation and that most authors have made some attempt to write reviews that should be intelligible to interested readers from different disciplines. It is a pity that it has taken fifteen months to be published, as this inevitably 'dates' some of the material; it does not, however, seriously affect its value as a reference work and introduction to this fascinating field of research.

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