

## BOOK REVIEWS

**The Control of Growth and Differentiation in Plants:** P. F. WAREING and I. D. J. PHILLIPS, Pergamon Press, Oxford, 1970. 303 pp. Price £2.50.

THIS book, written by two physiologists, is an admirable presentation in an integrated manner of both the morphological and physiological approaches to plant growth and development.

Following the first chapter on growth in the higher plant there is a concentration on structural aspects in chapters entitled "Patterns of Growth and Differentiation" and "General Aspects of Differentiation". The chemistry and biochemistry of plant hormones is described briefly in the next chapter, followed by chapters in which hormonal control of root and shoot growth, fruit growth, abscission, apical dominance, phototropism and geotropism are discussed. This section is extremely well integrated by its emphasis on biological phenomena rather than on separate effects of the individual hormones and this approach is continued throughout the book. Following is a chapter on the use of tissue culture methods in studies of differentiation and then chapters on flowering, dormancy and senescence. In the final chapter on the control of development the authors discuss the present state of knowledge in what might be termed the molecular biological aspects of plant growth.

The authors have managed to present the experimental evidence for statements in the text without including therein references to authors and dates. This makes the book particularly easy to read and it is a welcome change from the fairly common practice of presenting a text-book in the style of a literature review.

This book can be highly recommended both as an undergraduate text and for general reading for postgraduates.

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J. FRIEND

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**Progress in Phytochemistry, Vol. 2:** edited by L. REINHOLD and Y. LIWSCHITZ, John Wiley & Sons Ltd, London, 1970. 512 pp. Price £10.

VOLUME 2 contains eight articles and, as in the first volume of this excellent series of reviews, the editors, in choosing their topics and contributors, have maintained a nice balance between the static and dynamic aspects of plant biochemistry. Two articles which will interest plant physiologists as well as biochemists are those by Hatch and Slack on the C<sub>4</sub>-Dicarboxylic Acid Pathway of Photosynthesis and by Mapson and Hulme on the Biosynthesis and Function of Ethylene. These are excellent accounts of two fashionable and important areas of biochemical study. Both topics have actually been covered also in the 1969 or 1970 issues of 'Annual Reviews of Plant Physiology'. There is, however, no comparison in that the depth of treatment here is much greater and the policy of the editors in allowing authors the space to provide well rounded accounts of their subjects has paid off.

Three chapters of more strictly biochemical interest are those of T. Akazawa on Fraction I Protein, of Wallwork and Crane on Prenyl Phytoquinones and by L. Fowden on Non-Protein Amino Acids. The latter is a masterly and timely account of this continually expanding research area—according to the latest count, there are no less than 200 such substances known in plants. The author compares the time in the 1950's when he had to start with 250 kg of *Litchi* fruits in order to isolate 1.5 g of a new amino acid with the present-day much reduced scale of operation. After discussing the chemistry and biosynthetic origins of these amino acids, he then reviews in depth their comparative phytochemistry and antimetabolite actions. A chapter which caters mostly for the organic chemist is that of Connolly, Overton and Polonsky on the Limonoids and Quassinoids, complex terpenoid constituents occurring mainly in the plant families Meliaceae, Rutaceae and Simaroubaceae. These authors also provide a valuable set of tables listing the structures, melting points and optical rotations of all known substances of this type.

Finally, there are two chapters which will interest all phytochemists and which I found particularly fascinating to read. The first by M. Barbier, on the chemistry and biochemistry of plant pollens, touches on pollenins, allergens, pigments, vitamins, lipids, carbohydrates and steroids. The second, by V. Herout, discusses the role of isoprenoids in plant-insect interactions. In this last chapter, I was a little taken aback to see the potato alkaloids solanine and demissine written (on p. 178) with 'tri- and tetraxyloses' as their sugar moieties, but I suppose some errors are inevitable in a volume with several formulae on almost every page. To my mind, the role of these teroidal alkaloids in deterring the Colorado beetle from feeding on potato plants is still to some extent controversial. However, there are many more convincing associations discussed by V. Herout—for example the very elegant series of experiments carried out by Parsons, Reichstein, Rothschild and their collaborators linking the cardiac glycosides of the Asclepiadaceae with the toxins which the Monarch Butterfly accumulates in order to preserve itself from predation by the Blue Jay. Herout's article covers a wide range of similar topics from sex attractants to defensive secretions and concludes with a useful account of the ecdysone moulting hormones.

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**Progress in Phytochemistry, Vol. 2:** edited by L. REINHOLD and Y. LIWSCHWITZ, Interscience, London and New York, 1970. 512 pp. Price \$27.50.

THE QUALITY of this volume ranks it at the top of the field. Individual chapters represent full and critical treatments of a series of subjects that have been explored in some depth prior to the review dates. The authors seem to have been selected with care and with a sense of cosmopolitan awareness. This is a no-nonsense volume for the specialist, and it makes good reading for the natural product chemist, the biochemist and the plant physiologist.

M. Barbier (Gif-sur-Yvette) describes the chemistry and biochemistry of pollens. Pollen collection, germination, biological properties including allergenesis, insect attraction and chemical composition are covered. M. D. Hatch and C. R. Slack (Queensland) present a