Phytochemistry, 1976, Vol. 15, p. 850 Pergamon Press. Printed in England.

Metabolism and Regulation of Secondary Plant Products. Recent Advances in Phytochemistry Vol. 8. ed. by V. C. RUNECKLES. 264 pp., Academic Press, New York, 1974. £10.80.

This volume consists of the papers presented at the thirteenth annual meeting of the Phytochemical Society of North America held on August 8th–10th 1973 in Pacific Grove, California. Compilations of papers presented at conferences are frequently very disappointing. The reader can have his appetite whetted by tantalising and intriguing titles only to be sadly disappointed by a stodgy or unsubstantial snack in place of the promised feast. What is advertised as a cosmic survey of an important area of the subject can turn out to be an over-detailed survey of the results of the author's own investigations, discussion of the contributions of other authors being relegated to a secondary position, leading to an inevitable imbalance in the presentation. This problem is inherent in the genesis of such reports of conference proceedings since authors naturally assume that if they have been invited to present a paper, it is their work and not that of others in which the conference organisers are chiefly interested.

Manifestations of this problem have sometimes been evident in previous volumes in this series. A quick glance at the list of contributors to the present volume should, however, reassure even the most timorous of prospective readers. The difficulties have been neatly circumvented by the simple expedient of ensuring that the contributions have all been from people whose own investigations have been of major significance in the fields surveyed. The chapters in the present volume for the most part successfully fulfil the dual role of providing a valuable survey of a particular field and a complementary discussion of recent findings. As a result of this volume is conspicuously more successful than some others of its kind.

In any discussion of regulatory mechanisms in higher plants, the role of phenylalanine ammonia-lyase must be prominent. The first chapter, "Phenylalanine Ammonia-Lyase and Phenolic Metabolism" by Leroy L. Creasy and the late Milton Zucker, surveys the role of PAL in the biosynthesis of phenolics and the regulatory mechanism of its control. This chapter, more than any of the following, is able to live up to the title of the volume, since the regulation of PAL activity in higher plants has probably been more intensively investigated than that of any other enzyme. PAL also features in the following chapter by H. Grisebach and K. Hahlbrock on "Enzymology and Regulation of Flavonoid and Lignin Biosynthesis in Plants and Plant Cell Suspension Cultures", which features the beautiful investigations carried out in the authors' own laboratories that have been largely instrumental in providing a rather complete picture of flavonoid glycoside biosynthesis. PAL also appears in the chapter by H. A. Stafford "Possible Multienzyme Complexes Regulating the Formation of C_6–C_3 Phenolic Compounds and Lignin in Higher Plants". The evidence for such multienzyme complexes is very fragmentary and leans heavily on the analogy with the intensively investigated multi-enzyme complexes of microbial species. In this chapter, as in several others, the gulf between the levels of understanding of higher plant and microbial enzymology is very marked. "Photoregulation of Phenylpropanoid and Styrylpyrone Biosynthesis" is discussed by G. H. N. Towers, C. P. Vance and A. M. D. Nambudiri. The effects of light in stimulating certain plant enzymes has been known for some time and the authors describe parallel investigations in fungal systems which have revealed some interesting differences from the effects observed in higher plants. In the chapter "Non-protein Amino Acids from Plants: Distribution, Biosynthesis and Analogue Functions" Leslie Fowden reviews the extraordinary structural diversity of the non-protein amino acids, which has provided a rich field of research and one in which Fowden's own brilliant investigations have revealed the delicate specificity of the anti-metabolite properties of these compounds. In a highly significant chapter, C. A. Ryan and T. R. Green discuss "Proteinase Inhibitors in Natural Plant Protection". These proteins, which possibly exert a protective action by inactivating the proteolytic systems of insects, are present in high concentrations in certain tissues and may also have a regulatory role. The chapter on "Regulatory Control Mechanisms in Alkaloid Biosynthesis" by Heinz G. Floss, James E. Robbers and Peter F. Heinstein, illustrates, like the chapter by Stafford, how little is known about control mechanisms in higher plants by comparison with those operating in microorganisms, since their discussion largely centres on the control of ergot alkaloid biosynthesis in *Claviceps*. "The Biochemistry of *Myo*-Inositol in Plants" by F. Loewus is a most valuable survey of this rather difficult area. The fundamental importance of the inositols lies for the most part in their role in the biosynthesis of cell-wall polysaccharides. The present state of knowledge is well described although a more explicit treatment of certain stereochemical features of cyclitol metabolism would have benefited the non-specialist reader. The final chapter by T. Galliard is on "Unusual Fatty Acids in Plants".

This volume illustrates very well the considerable progress that has been made in the investigation of plant enzymes; it also reveals the still rather rudimentary character of our understanding of control mechanisms in higher plants. Nevertheless, this is a highly stimulating and rewarding book. The excellence of the contributions is matched by the usual smooth Academic Press treatment.

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