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BOOK REVIEWS

Frontiers of Plant Cell Tissue Culture 1978: edited by TREVOR A. THORPE. The International Association for Plant Tissue Culture, 1978. 556 pp. Available at $16.00 Canadian (inc. postage) from the Bookstore, University of Calgary, Calgary, Alberta, T2N 1N4, Canada.

This book is the proceedings of the 4th International Congress of Plant Tissue and Cell Culture held at the University of Calgary in August 1978. In the introductory chapter "The Impact of Plant Cell Culture on Industry" Professor Zenk points out that between 1973 and 1978 the art of plant cell culture reached the stage where it could be considered to be of great use in the study of economically important agricultural problems. This marks a tremendous advance from the general mood of those biochemists, physiologists and pathologists who had, in the period 1970–1971, decided that tissue cultures bore little metabolic resemblance to whole plants. This conclusion had been reached because before 1971 it had not been possible to demonstrate any significant accumulation of secondary products in cultured cells. However by manipulating the composition of the growth medium it is now possible to obtain cultures which produce metabolites in amounts equal to or greater than the intact parent plant, and some extremely impressive studies with tissue cultures are reported in this book. There is, for example, the chapter by Hahlbrock and his colleagues who have used cell cultures to study the induction of the enzymes and their *m*RNA's involved in synthesis of the characteristic flavanoid glycosides of parsley.

The six chapters on secondary metabolism and four on primary metabolism together with an excellent review by Lamport on cell wall carbohydrates, in addition to those by Zenk and Hahlbrock, will probably be the ones of most interest to phytochemists. The other topics covered in the remaining 35 full papers are the impact of plant tissue culture on industry and agriculture, regulation of morphogenesis, genetic manipulation and mutagenesis, anther culture, protoplasts and hybridization, synchronous growth and regulation, cell structure, plant/virus and plant/microbe interaction, cell and organ culture, genetic stability and cell preservation, growth regulation, and applied morphogenesis.

A report on the round-table discussions and one on the poster demonstrations is useful and the list of the poster demonstrations gives an indication of the large range of research problems which are now being tackled with the aid of tissue cultures. The material in the book will thus be invaluable both to researchers who are active in the field and to those who are contemplating the use of tissue culture for examining a range of problems in many areas of plant science. The editor must be congratulated both on the high standard of presentation of material in the book, which is reproduced directly from typescript, and also the speed with which it has been produced.

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Progress in Botany, Vol. 40: edited by H. ELLENBERG, K. ESSER, H. MERXMULLER, E. SCHNEPF and H. ZIEGLER. Springer, Berlin, 1978. 495 pp. DM:148, *ca* £41.

This annual series continues to provide a variety of useful, and sometimes stimulating, reviews of the current literature within a wide area of botanical endeavour. I suspect that one of the most useful functions of these reviews is to allow the reader to observe what is going on in fields marginal to his main interest. Certainly, in this particular volume, which has 28 articles, I found one of the most fascinating reviews to be that of S. Vogel on floral ecology from 1974 to 1978. While some progress has been made in bichemical aspects of this subject in recent times, and this is well summarized here, there are still many pollination phenomena awaiting biochemical analysis. This chapter indeed provides an excellent key to contemporary literature on pollination ecology and would be rewarding reading to the discerning phytochemist seeking a

new research problem.

Of the seven reviews within the area of physiology–biochemistry, the outstanding one is that of E. Latzko and G. J. Kelly covering carbon metabolism in photosynthesis since 1976. This review is a model of its kind, perceptive, critical and highly informative and with an attractive style. Latzko and Kelly briefly touch on CAM plants, but the subject is dealt with in more detail in the following chapter by M. Kluge on organic acid metabolism. *Inter alia*, Kluge mentions the recent unexpected finding of crassulacean acid metabolism in several non-succulents. Finally, mention should be made of the excellent review on growth substances in this volume by K. Dorffling. This author presents an admirably critical account of recent studies on auxins and abscisic acid in plants.

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