

BOOK REVIEWS

Nucleic Acids and Proteins in Plants II: edited by B PARTHIER and D BOULTER Encyclopedia of Plant Physiology New Series, Volume 14B, Springer, Berlin, 1982 774 pp DM 268

While the first part of this two-volume set on plant macromolecules dealt mainly with the proteins (for review, see *Phytochemistry* 22, 1067) this second part is devoted almost completely to the nucleic acids. Thus the opening four chapters cover different aspects of plant DNA (sequence analysis, organisation and replication) and the following four different aspects of plant RNA (sequence analysis, transcription, post-transcriptional modification and breakdown via ribonucleases). An interlude, an account of the further metabolism of purines and pyrimidines, is followed by three chapters on plant viruses and viroids. There is then a return to DNA in the next contribution on the Ti-plasmids of *Agrobacterium tumefaciens* by J Schell. The chloroplast then dominates with accounts of the plastid genome, the biosynthesis of chloroplast protein, the use of mutants in studying chloroplast biogenesis and compartmentation in *Acetabularia*. The final offering deals with the use, and misuse, of antibiotics for inhibiting gene expression in plant cells.

Curiously, this volume seems to be essentially a European venture, since not a single US scientist is represented among the 21 contributors. The only author

from outside Europe is W Bottomley of Canberra, who writes with H J Bohnert (Heidelberg) on chloroplast proteins. The general standard of the writing is good, although inevitably some chapters are considerably more lucid than others, especially for the tyro. I particularly recommend R B Flavell's review of chromosomal DNA sequence studies. There are occasional infelicitous expressions in some chapters by the German contributors, which the editors were not able to spot in time, but it is a great boon that everything is written in English, unlike the situation in the first series of these encyclopedias.

This is an enormously complex field of scientific endeavour, in which new developments occur almost daily and undoubtedly aficionados of molecular biology will find some parts already out-of-date. Almost none of the information contained here was known ten years ago, so it is all the more welcome to have to hand this excellent overview of plant nucleic acid research for the 1980's. This volume is important not only for its own sake as a summary of these recent developments but also as an essential handbook for those tackling the problems of genetic engineering in plants. Here at least is the blueprint for developing those new crop plants of the future which are at the same time excellent in quality, high yielding and pest- and disease-resistant.

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Metals and Micronutrients: Uptake and Utilisation by Plants: edited by D A ROBB and W S PIERPOINT Phytochemical Society of Europe Symposia Series No 21, Academic Press, London, 1983 342 pp £30

Did you know that a single rye plant can have between 10 and 15 thousand million root hairs, while onion plants completely lack them, that *Phacelia sericea* accumulates so much gold in its tissues that it is possible to squeeze a gold bead from a single plant, and that zinc is present in more than a hundred enzymes? If not, then this book should be put on your reading list immediately. It is a unique collection of wide-ranging essays, describing those processes by which plants absorb, transport and utilise metals especially from the viewpoint of the plant scientist. Although metal ions enter the plant through the root and play many different roles in primary metabolism, their importance is often overlooked or dealt with piecemeal in plant biochemistry texts. This volume has much to recommend it, since it brings together in one place for the first time the many and varied facets of what is termed by the editors as 'phytometallurgy'.

The metals discussed range from sodium and potassium, iron and manganese, vanadium and tungsten to

nickel and zinc. As a bonus, two non-metals are included, namely boron and selenium, because they are required in trace amounts and, like molybdenum, are available to the plant in anionic form. The subject matter falls into three contrasting sections, the first being concerned with ion uptake, adaptations to salinity and to toxic metals, potassium transport and the relationship of boron to membrane function. The second section deals with iron transport and the role of ferrochelatase in porphyrin synthesis while the third covers the essential roles of metals in photosynthesis, respiration, nitrate reduction and plant nutrition. The book concludes with a scholarly epilogue, in which N W Pirie discusses those features which may have led organisms during evolution to select particular elements as micronutrients.

This volume, the twenty first of the Phytochemical Society of Europe proceedings, lives up to the high reputation this series now enjoys. It deserves to be widely available both in University libraries and on the individual plant scientists bookshelf.

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