Phytochemistry, Vol. 27, No. 10, pp. 3345–3347, 1988.
Printed in Great Britain. Pergamon Press plc.

BOOK REVIEWS

Combating Resistance to Xenobiotics: edited by M. G. FORD, D. W. HOLLOMAN, B. P. S. KHAMBAY and R. M. SAWACKI, published by Ellis Horwood, Chichester for the Society of Chemical Industry, 1987, 320 pp. $125.40.

The introduction of penicillin for controlling human infections in the 1940s ushered in a new era in medicine which is still with us today. However the dream of controlling disease by chemical means through the discovery of new drugs rapidly faded as microbial strains resistant to such antibiotics became apparent within only a decade. Similarly, the agrochemical industry developed new tailor-made insecticides, fungicides and herbicides during the 1960s and 1970s which at first appeared to solve all the farmers' problems. Again, resistance to such treatments developed within only a short period. One answer to natural resistance to these xenobiotics—to replace the old pesticide by the new—has also failed. The management of antibiotic and pesticide resistance in both the hospital and on the farm is a much more complex matter than this and most of this book is given over to discussions of the methods of combating such resistance. International co-operation is patently essential in any strategy for control and it is good to see in one of the opening chapters by C.N.E. Ruscoe of ICI that the agrochemical industry has set up action committees for this purpose. There is also an excellent opening contribution from Dr Graham-Bryce of Shell outlining the agricultural problems that lie ahead for mankind because of this resistance.

The succeeding chapters of the book consider in turn the present situation that pertains in the case of resistance to such antibiotics, fungicides, insecticides and herbicides as the tetracyclines, ethirimol, synthetic pyrethroids and the triazines. This is often a matter of population genetics and estimates of how best to deal with the new genotypes that arise spontaneously in the pest in question. More interesting to the biochemist are the two final sections of the book which are concerned with mechanisms of resistance and structure–activity relationships. Clearly, there is much more yet to be learnt here. In discussing herbicide resistance mechanisms, D.K. Lawrence of ICI comments that "selective metabolism is the most commonly reported mechanism causing herbicide selectivity. Perhaps the most surprising aspects are the diversity of biotransformations involved, and the lack of any obvious links between taxonomy and the specificity or activity of the enzymes which perform the conversions". The reason why one herbicide works and another does not is still relatively unpredictable as is resistance to that herbicide. The idea of introducing genetically engineered herbicide resistance into crops is highly fashionable today but, as this writer comments, it has yet to prove itself.

This book then provides a useful and pertinent summary of present day problems in pesticide resistance and of the practical measures that can be taken to combat such resistance in agricultural practice. It is a well produced text with much tabulation and good reference lists and it can be thoroughly recommended.

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Solute Transport in Plant Cells and Tissues: edited by D. A. BAKER and J. L. HALL, Longmans, Harlow, 1987, xx + 592 pp. £60.00.

The editors of this monograph remind us in their Introductory Chapter that all forms of life ultimately depend on green plants (and some microorganisms), not only for their organic matter but also for their mineral nutrients. It is the uptake of these mineral nutrients by plants, and the transport of them and of the organic solutes within the plant that form the subject of the 14 chapters collected together here. After an Introductory Chapter from the editors on the fundamentals of solute transport, subsequent chapters deal with transport at the subcellular level—mitochondria and chloroplasts (Prebble), plasma membrane and tonoplast (Poole); the peculiarities of transport in fungi (Sanders) and algae (Raven); transport across the root (Clarkson), through the phloem (Humphreys), and within the whole plant (Pitman); transport in halophytes (Flowers and Yeo), CAM plants (Lüttge and Smith), stomata (MacRobbie), salt glands (Thomson, Faraday and Oross) and nectaries (Findlay). Tucked away among these more conventional topics there is a particularly useful and thought-provoking contribution by Tomos and Wyn Jones, which deals with the transport properties of cells *within* tissues. In this chapter the reader is introduced to the novel concept of a "population of 'independently-minded' vacuoles".

With this volume Baker and Hall have updated and extended their "Ion transport in plant cells and tissues" which was published 12 years ago. Many of the chapters in the new volume cover topics that were covered previously, sometimes by the same authors. However the editors have also introduced new chapters to reflect the change in emphasis that has occurred in the field of plant solute transport during the intervening years. For example increased attention is now given to topics such as CAM and the tonoplast, where significant progress has come from biochemical and physiological studies of isolated membranes.

According to the publisher "The increased intensification of modern agriculture. . . has created a greater need