Phytochemistry, Vol. 24, No. 7, pp. 1627–1628, 1985.
Pergamon Press Ltd. Printed in Great Britain.

BOOK REVIEWS

Lipids in Plants and Microbes: by J. L. HARWOOD and N. J. RUSSELL. George Allen & Unwin, London, 1984. 162 pp. Price £19.50 (hardback), £7.95 (paperback).

Most textbooks of biochemistry deal with mammalian lipids. Although the differences in molecular types and metabolic pathways between animal lipids on the one hand and plant or microbial lipids on the other are not as great as one might think (but *there are* important differences), it was certainly a good idea to write a small textbook, as this one is, to emphasize the variety of lipid structure, metabolism and function in the plant kingdom and in bacteria. Plant and microbial lipids have tremendous economic importance in the food industry, for instance, and most biotechnologists, researchers and students really need, now, to be aware of the recent advances made in the field of plant or bacterial lipid biochemistry. They will find all that is necessary for a good introduction to this field in Harwood and Russell's book.

Lipids have been defined comprehensively by the authors to include acyl lipids, terpenoids, sterols, pigments, lipopolysaccharides and ether lipids. Both authors are qualified biologists and at the same time as chemical structures are presented, cellular localizations and physiological functions of the main molecular types are dealt with. Taxonomic distribution of major lipids or phylogenetic relationships between organisms differing by their lipid composition give a real biological feeling to this textbook which is not, by any means, only a catalogue of lipid chemistry. For example, the description of the effects of environmental parameters (temperature, pH salinity, oxygenation, etc.) on the lipid compositions of living organisms is really a stimulating chapter.

I am a little bit concerned, however, by the 'density' of the book; written very concisely, illustrated by many tables and figures, the text is perhaps somewhat arduous for a beginner in the field. Each line brings new information and, for economical reasons, I assume the publisher has chosen a format of 50 lines per page! The beginner will be helped, however, by some one hundred essential references given at the end of the book: these are not references to specialized articles published in journals but instead a list of books or reviews or chapters in other books where one will be able to find extended developments. A good subject index is also provided. I must confess that reading this pleasant text book gave me great pleasure.

Department of Plant Physiology, University of Paris 6 P. MAZLIAK

Cellular Interactions: edited by H. F. LINSKENS and J. HESLOP-HARRISON. Encyclopedia of Plant Physiology, New Series volume 17. Springer, Berlin, 1984. 743 pp. DM 360.

With the publication of the seventeenth volume, this new series appears to be nearing completion. Certainly, most major aspects of plant physiology have been reviewed, since the production of volume 1 in 1975. This volume deals with the phenomena of intercellular interactions and thus spans a vast but very fragmented research field. It covers the recognition systems which are involved in the various associations that exist in nature between different plant forms. These may be epiphytic (ferns, orchids), symbiotic (*Rhizobium*-legume) or parasitic (plant fungal pathogens). Recognition is also important at different stages in fungal and algal growth, in pollen–pistil interactions of flowering plants and in the allergic reactions produced in man by certain plant irritants.

For a long time, such interactions could only be described in very general terms but the main recent development has been towards an understanding of cellular interactions at the molecular level. Biochemical investigation has, however, only penetrated into a very few of the many known phenomena and the emphasis in this volume continues to be on the description of the varied types of interaction that can occur throughout the plant kingdom, from slime moulds and cyanobacteria to pollen tube growth and graft incompatibility.

Even in the case of one of the most actively explored symbioses, that of the lichen, biochemical knowledge is still quite limited. The unique chemical products of lichens—the depsides and depsidones—have of course been characterized in much detail, but the roles of the two partner organisms in their production, as discussed here by M. Gahun and P. Bubrick, are still largely unknown. Some progress has been made in identifying the pheromonal substances which trigger sexual differentiation in fungi, but as H. van der Ende points out in a chapter on the lower filamentous fungi, "generally the molecular basis of sex determination is poorly understood" for the great majority of organisms. Even with the pollen–pistil

interactions of higher plants, which have been explored extensively in recent years, much remains to be determined. Here R. B. Knox contributes a masterly overview of the pioneering studies of Heslop-Harrison, Lewis and Linskens. Molecular aspects are detailed, with respect to pollen proteins, pollen wall polysaccharides, wall enzymes and stigma exudates.

As with the other volumes of this series, this one is of a uniformly high standard. The two editors have collected together an excellent team of contributors and in 28 chapters, have skilfully included almost every conceivable aspect of inter-cellular interaction that has been investigated. There are even accounts of the endosymbiotic origins of the eucaryote cell (by J.M. and F. R. Whatley) and of the somatic fusion of plant cells (by T. Nagata). Clearly, much remains to be done on the biochemical front and this collection of essays will hopefully stimulate renewed research efforts into the structure of lectins and other informational molecules. Writing in 1877, Charles Darwin commented, on the angiosperm heterostylous self-incompatibility system, that "it may be said that the two pollens and the two stigmas mutually recognize each other". In spite of over a century of active research, we still cannot define precisely in molecular terms what that surface recognition system is.

Plant Science Laboratories, University of Reading JEFFREY B. HARBORNE