

BOOK REVIEW

Encyclopedia of Plant Physiology, New Series: edited by A. PIRSON and M. H. ZIMMERMANN. **Transport in Plants:** Vol. 1. Phloem transport (1535 pp) edited by M. H. ZIMMERMANN and J. A. MILBURN, Vol. 2A Cells (400 pp); Vol. 2B Tissues and Organs (456 pp), edited by V. LÜTTGE and M. G. PITMAN; Vol. 3 Intracellular reactions and transport processes (517 pp), edited by C. R. STOCKING and U. HEBER. Springer-Verlag, Berlin 1976/7. Price (4 volumes) \$ 233.40.

Most readers of *Phytochemistry* will be familiar with Ruhland's *Encyclopedia of Plant Physiology* which ran to 18 volumes and 22000 pages and which was produced during the period 1955–1967; the rather forbidding massive black tomes occupy a central position in any well stocked plant science library. In spite of the enormous effort put into this production, it is doubtful whether Ruhland has ever been widely consulted. Apart from the problem that much of it was written in German, its main handicap was its determined historical approach to the subject. It was also, unfortunately, caught up by events and plant physiology moved so fast and far during the 1950s and 1960s, largely through developments in biochemistry, that the series became out of date almost before it had been completed.

In the light of this situation, Springer-Verlag have now bravely commissioned a completely new series of volumes to replace and update the old set, and the 4 volumes under review represent the first fruits of the labours of the new editors, Pirson and Zimmermann. Unlike the old series, a new philosophy has been adopted and specific topics will be covered in an appropriate number of volumes in a self-contained way. Further, they will be written throughout in idiomatic English and will generally be shorter than the older set. Judging by the 4 volumes at hand, they are much more attractively produced, more easily handled and better illustrated, with many diagrams, figures, EM and SEM photographs.

What more suitable topic than transport in plants for the first volumes in the new series? Certainly, knowledge of transport processes is basic to plant physiology and all phytochemists will need to consult various chapters in these volumes in order to obtain the latest information in matters of their concern. In volume 1, Phloem transport, the chapters by H. Ziegler on the nature of transported substances and by W. Eschrich and W. Eysner on enzymic

activities of sieve tubes are of special phytochemical interest. After an account of aphids and translocation, there is a chapter on phloem exudation by J. van Die and P. M. L. Tammer who point out that the phenomenon of bleeding from palms and agaves is still largely ignored in spite of its considerable agricultural importance in tropical countries. The remainder of this first volume deals with mechanistic aspects of the varying theories which have been put forward to explain phloem transport.

In Volume 2A on the cell, chapters of particular phytochemical interest are those on transport in algal cells (J. A. Raven), in fungal cells (D. H. Jennings) and in cells of storage tissue in higher plants (R. Poole). One other general chapter of considerable value is that by C. B. Osmond on ion absorption and carbon metabolism in cells of higher plants. Volume 2B on tissues and organs contains many chapters of interest. U. Lüttge and E. Schnepf, for example, cover transport and elimination from the cell of carbohydrates, proteins and secondary products, while J. S. Pate deals with transport in symbiotic nitrogen fixing systems. Hormonal effects on transport are discussed by R. F. M. Steveninck while J. F. Sutcliffe has the final word in the volume, describing in succinct fashion regulation of ion transport in the whole plant.

Volume 3 opens with an excellent chapter on plant membranes by R. H. Falk and C. R. Stocking and then moves on to the plastids (D. A. Walker), compartmentation in C_4 photosynthesis (M. D. Hatch and C. B. Osmond), photorespiration (C. Schnarrenberger and H. Fock), cytoplasm and vacuole (P. Matile & A. Wiemken) and finally mitochondria (R. H. Wilson and R. A. Graesser). The volume concludes with a thermodynamic treatment by D. Woermann of the theories of membrane transport.

Like all good encyclopedias, these volumes contain very complete author and subject indexes and also extensive Contents Lists so that there are no problems in making use of them to the fullest extent. I salute Springer-Verlag on their launching of their new series and certainly on the basis of these 4 volumes one can see emerging a most valuable collection of books which will provide an immensely important reference to all plant scientists during the coming decade.

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