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BOOK REVIEW

STOCKING, C. R., HEBER, U. (ed.): **Transport in Plants III. Intracellular Interactions and Transport Processes.** — PIRSON, A., ZIMMERMANN, M. H. (ed.): *Encyclopedia of Plant Physiology.* New Series, volume 3. Springer-Verlag, Berlin - Heidelberg - New York 1976. 517 pp. DM 145.

The new, completely rewritten, series of "Encyclopedia of Plant Physiology" has given enough space to transport processes, so important for plant metabolism. The reviewed third volume on this topic contains four sections with 13 chapters written by 19 scientists from the U.S.A. (7), the Federal Republic of Germany (5), Australia and Switzerland (2 each), Belgium, Great Britain and Japan (1 each).

The section on membrane structure contains a general article on plant membranes, their isolation and composition, specific membrane types (plasmalemma, nuclear, plastid and mitochondrial membranes, membrane models), and solute transport through membrane structures (R. H. Falk and C. R. Stocking). The second section — "Intracellular Interactions" — begins with the article of J. Brachet on the interactions between nucleus and cytoplasm, describing new findings not only on *Acetabularia* and other classical plant material, but also on animal cells. The chapter dealing with plastids (D. A. Walker) describes methods used for studying metabolite translocation in chloroplasts, syntheses of saccharose and starch and their location and affecting by irradiance, transport of intermediates and primary and secondary products of photosynthetic and other carbon cycles, CO₂/bicarbonate, phosphates, ATP, ADP, NADP, protons, etc. H. W. Heldt lists the metabolite carriers in chloroplasts. M. D. Hatch and C. B. Osmond deal with compartmentation and transport in C₄ photosynthesis (use of radiotracers, inter- and intracellular compartmentation of enzymes, carbon fixation reactions and transport of products). The interactions between organelles involved in photorespiration are described by C. Schnarrenberger and H. Fock: they review also the methods for measuring photorespiration and isolating peroxisomes, mechanisms of glycolate metabolism and its peculiarities in C₄- and CAM plants and algae, etc. Transport of metabolites between cytoplasm and mitochondrial matrix is the topic of H. W. Heldt's article; P. Matile and A. Wiemken deal with the interactions of cytoplasm and vacuole, and D. J. Morré and H. H. Mollenhauer with those of cytoplasm, endomembranes and cell surface. The third section "Intracellular Transport in Relation to Energy Conservation" contains three chapters: on ion transport and energy conservation in chloroplasts including H⁺ uptake, formation of electrochemical gradient, and phosphorylation (R. E. McCarty) in mitochondria (R. H. Wilson and R. J. Graesser), and on energy transfer between cell compartments (H. Strotmann and S. Murakami). The last section on theory of membrane transport (D. Woermann) is the physical and mathematical explanation of the problem.

All chapters are written in English, carefully edited by C. R. Stocking and U. Heber (the second editor even did not write any chapter!), supplemented with instructive figures, schemes and tables, and comprehensive lists of full references. The volume contains excellent author and subject indexes.

The book, similarly to other volumes of this series, will certainly form a basis of every library of chairs and institutes of plant physiology and biochemistry. Nevertheless, do not throw away the volumes of the previous series — the new one does not repeat the older findings and references!

Z. ŠESTÁK (Praha)