

- PARDI, D., MORGUTTI, S., COCUCCI, S.: K^+ uptake in the early phases of germination of the photoblastic and thermosensitive seeds of *Phacelia tanacetifolia*. — *Physiol. Plant.* **48** : 379 to 384, 1980.
- PECKET, R. C., AL-CHARCHAFCHI, F.: Dormancy in light sensitive lettuce seeds. — *J. exp. Bot.* **29** : 167–173, 1978.
- PETRUZZELLI, L., LIOTI, L., CARELLA, G., MORGUTTI, S., COCUCCI, S.: The effect of fusaric acid and monovalent cations on viability of wheat seeds. — *J. exp. Bot.* **33** : 118–124, 1982.
- TAYLORSON, R. B., HENDRICKS, S. B.: Overcoming dormancy in seeds with ethanol and other anaesthetics. — *Planta* **145** : 507–510, 1979.
- WEBB, D. P., WAREING, P. F.: Seed dormancy in *Acer pseudoplatanus* L., the role of the covering structures. — *J. exp. Bot.* **23** : 813–829, 1972.

BOOK REVIEWS

BRIGGS, W. R., JONES, R. L., WALBOT, V. (ed.): ANNUAL REVIEW OF PLANT PHYSIOLOGY. Vol. 34. — Annual Reviews Inc., Palo Alto 1983. 492 pp. US \$ 27.00/30.00.

The new volume of this well-known review series contains very specialized as well as more general topics. The opening honorary article is written by Pei-sung Tang and describes "The devious trail of a roaming plant physiologist" in the United States and China in the post-war period. Specialized reviews are divided in the list of contents into three sections (Molecules and Metabolism, Organelles and Cells, Tissues, Organs and Whole Plants) but this division is not respected in the sequence of articles.

The review of photosynthetic reaction centers written by R. J. Cogdell describes new developments in studies of reaction centers of anaerobic photosynthetic bacteria and the composition, structure, localization and primary donors of electrons of photosystems I and II in oxygen-evolving photosynthetic organisms. Arabinogalactan-proteins are reviewed by L. G. B. Fincher, B. A. Stone and A. E. Clarke. The reader will find here information about the structure, distribution, biosynthesis and possible functions of these macromolecules, which are probably involved in specific interactions of plant cells and their chemical environment. In the article of W. J. Lucas on photosynthetic assimilation of exogenous HCO_3^- by aquatic plants, attention is paid to freshwater species — to possible mechanisms by which HCO_3^- may be transferred into the cells and to the benefits of bicarbonate transport.

The aspects of hydrogen metabolism in nitrogen-fixing legumes and other plant-microbe associations are reviewed by G. Eisebrenner and H. J. Evans. They discuss the factors influencing nitrogenase-catalyzed H_2 formation, hydrogenases involved in this process, hydrogen oxidation pathways and benefits from H_2 utilization for plant cells. The biosynthesis and metabolism of *myo*-inositol which has a multifunctional role in plant cell is described and analysed by F. A. Loewus and M. W. Loewus. An excellent review of metabolism and biosynthesis of cytokinins written by D. S. Letham and L. M. S. Palni summarizes the naturally occurring cytokinins both free and constituents of tRNA molecules, describes metabolism of exogenously applied cytokinins and enzymes involved in metabolite formation. The total number of 28 so far identified cytokinins in plants or microorganisms demonstrates that cytokinins form a more complex group of plant hormones than was assumed. The possible regulations of stabilization of adenine nucleotide ratios and their importance in energy metabolism is reviewed by A. Pradet and P. Raymond. W. Eisinger deals with regulation of pea internode expansion by ethylene. His review is focused on kinetics of this process, and structural, biochemical and biophysical effects of ethylene on cell wall. He concludes that mechanisms by which ethylene inhibits elongation and promotes lateral expansion of plant organs remains to be explained.

P. A. Castelfranco and S. I. Beale's review of chlorophyll biosynthesis outlines the pathway of chlorophyll formation and its regulation. P. R. Whitfeld and W. Bottomley present the summary of information about the organization and structure of chloroplast genes. They focused their attention to papers that through analysis of cpDNA sequences gave new information about the molecular architecture of the organelle genome. They summarized data on the restriction maps and localization of genes in 20 plant species and describe genes for ribosome RNAs, tRNAs and proteins. Regulation of ion transport is another topic which is reviewed by A. D. M. Glass. The reader will find in this short article information about the recent development in studies of osmotic effects in wall-less and walled-cells and nutrition effects on ion transport. To those interested in the heterogeneity of plant tissues and cloning of plant cells the review by F. Meins, Jr., of heritable variation in plant cell culture is recommended. The author focused his attention

to the sources and nature of heritable variation. Phloem loading of sucrose which has an important role in partitioning of assimilates in plants is reviewed by R. T. Giaquinta. The paper deals with cellular pathway of assimilate transfer to the phloem and the metabolism of sucrose accumulation during phloem loading.

The usefulness of the application of mutants of microorganisms to biochemical and genetic studies is well known. Advantages of such mutants are being recognized in studies of internal factors controlling plant development. The review of G. A. Marx of developmental mutants in some annual seed plants is a valuable source of information about the mutants affecting plant development from seed to flowering and senescence. E. M. Gifford presents a concept of apical cells in bryophytes and pteridophytes, stressing the importance of occurrence of functioning apical cells during evolution for the establishment of apical growth and dominance. The last article of E. Zeiger on the biology of stomatal guard cells presents methodology used in stomatal research, knowledge and problems concerning turgor regulation in guard cells and biology of stomatal responses.

The book is well edited keeping the well-known standard of presentation of this review series. It contains full text references, and a detailed subject index. It can be recommended to both research workers and teaching staff in plant physiology and biochemistry.

M. KAMÍNEK (Praha)

WEBB, D. A., SCANNELL, M. J. P.: *FLORA OF CONNEMARA AND THE BURREN*. — Royal Dublin Soc., and Cambridge Univ. Press, Cambridge—London—New York—New Rochelle—Melbourne—Sydney 1983. 322 pp., 25 figs., 4 coloured tables, 2 maps. H/C £ 35.00.

This monograph on the characteristic region of Western Ireland with the flora of rocky coasts, dunes, bogs, scarce woodland and scrubs in an area deforested long ago is very interesting for a Central European botanist.

A short introduction is followed by a chapter with the characterization of the region and the description of eight constituent districts. The subsequent chapter is devoted to geology and soils and the next one to the climate. This is followed by a sketch of the character of the flora of the region and remarks on some habitats. The last two chapters describe vegetation since the last glaciation (W. A. Watts) and the history of discovering the flora of this region.

The main accent is laid on the enumeration of flowering plants, conifers and pteridophytes. After the name of the plant the corresponding district is indicated by a number and the symbol of the adjacent insular group in which the species was found, further the type of habitation, frequency of occurrence, description of the localities, the first record and often a very expert comment on the distribution in the district or even the whole area (e.g. *Daboecia cantabrica*, some species of the genus *Saxifraga*, *Gentiana verna*, *Neotinea maculata* and others). Signs are added to names of the plants, indicating the certain, probable or possible introduction of the species into a given region. The extinct species are distinguished from those recorded from the territory erroneously by a simple graphical indication. The nomenclature is according to the Flora Europaea, but synonyms are given only incompletely and always without indication of the author. Only some taxa have a status different from that in Flora Europaea (for example *Gnaphalium uliginosum*). In the case of some broader or more difficult genera a remark is given before the enumeration of the species discussed, with differentiating characters or commentary on the ecology.

The system according to which the species are presented is interesting. First Dicotyledons and then Monocotyledons are treated, and the order of families is unusual. After Monocotyledons Gymnosperms and then Pteridophytes are presented. Short chapters comment on the occurrence of mosses and liverworts (A. R. Perry), lichens (M. E. Mitchell), and marine algae (M. D. Guiry). Finally, two pages of the text are devoted to freshwater algae, especially to the representatives of *Characeae*, and one to fungi.

After the bibliography there are maps of the regions, a very useful topographical index and an index of English, Irish and Latin names of higher plants.

In conclusion, a clear survey, informative character and especially the well founded contents should be stressed, which thus makes the book a valuable source of information to those interested in the flora of Western Ireland.

J. TOMAN (Praha)

AKAZAWA, T., ASAHI, T., IMASEKI, H. (ed.): *THE NEW FRONTIERS IN PLANT BIOCHEMISTRY*. — Japan Sci. Soc. Press, Tokyo; Martinus Nijhoff/Dr. W. Junk b.v. Publ. The Hague—Boston—London 1983. Dfl. 110.00, approx. US \$ 48.00.

A symposium entitled "The New Frontiers and Future Perspectives of Plant Biochemistry"

was held in Nagoya, Japan, September 1–3, 1981 in honour of Professor Ikuzo Uritani. This book is a collection of 18 principal papers contributed on this occasion.

The subjects covered in the volume are diverse, reflecting the broad research interests; articles written by experts in each field provide a clear picture of the current frontiers and the future of plant biochemistry. Every paper comprises a brief outline of the development of knowledge and experimental approaches to the specific problem, and current conceptions and further perspectives of the subject under study. The contributions deal with important questions of plant biochemistry and plant disease physiology.

The items discussed are, among others, molecular and catalytic properties and the relationship between the structure and function of important plant enzymes, such as ribulose-1, 5-bisphosphate carboxylase, phosphorylases and regulatory enzymes isolated from different plant sources. Some papers treat the aspects of biosynthesis and metabolism of different compounds, others summarize the current knowledge of biosynthesis and biodegradation of lignin, cyanogenesis, cellulose metabolism, biosynthesis and mechanism of auxin-induced ethylene production. Of great importance is the study concerning the identification of glutamine as the central compound and glutamine synthetase as the central enzyme of nitrogen metabolism. The reports devoted to the regulation and the site of synthesis of specific chloroplast proteins and biogenesis, development and degradation of mitochondria also provide valuable information. The induction of tumors and the relationship of expression of virulence to secondary metabolism in a plant pathogen are also discussed.

The book presents a comprehensive overview of recent results in the field of plant biochemistry. The discoveries have stimulated scores of investigators to use their knowledge to answer a large, even increasing number of questions. The authors succeeded in summarizing the information obtained to date in each field and pointing out the new problems that should first be elucidated. It is hoped that this volume will serve as a stimulating text for scientists in this area.

HELENA BENEŠOVÁ (Praha)

ARORA, S. K. (ed.): CHEMISTRY AND BIOCHEMISTRY OF LEGUMES. — Edward Arnold, London—Oxford, and IBH Publishing Co., New Delhi 1983. 359 pp. £ 19.50.

This specialized book has appeared as a reflection of the current interest in legumes which have played an important and increasing role in human foods, animal feeds, industrial application, and crop rotation. It is generally devoted to the chemical composition of legumes, however, most of the knowledge is, naturally, derived from seed legumes like soybeans, peas, peanut and different beans.

The first two chapters of the book aim at defining the chemical nature of legume carbohydrates (*e.g.* monosaccharides, oligosaccharides, aliphatic alcohols, structural and storage polysaccharides) and lipids (chemistry, technology, nutritional and health importance and toxicology).

Because of a high level of protein content in legumes the most comprehensive information concerns storage proteins (Chapter 3) and nutritive value of food legumes (Chapter 7). Chemical nature, content, accumulation, location and biosynthesis of legume proteins are here discussed in detail. In chapter 7 on the nutritive value of legumes the amino acid composition of seed proteins of common pulses and their biological and nutritive evaluation have been pointed out.

Because a nutritive value of legume seeds, especially at the prolonged consumption, may be improperly affected by the presence of toxic or potential toxic constituents (*e.g.* protease inhibitors, lectins, cyanogenic glycosides, toxic amino acids or other compounds) one special chapter (5) deals with their level and physiological role.

Ureids (allantoin and allantoic acid) which are widespread in *Aceraceae* and *Borraginaceae* have been recently found to be an important transport nitrogen form during N_2 -fixation in several legume genera (*e.g.* *Glycine*, *Vigna*, *Phaseolus*). In chapter 4 up-to-date knowledge concerning pathways of ureid formation, distribution and role in the plants is reviewed.

The last chapter (8) deals with different aspects of the genetic improvement of legume crops — *e.g.* selection of the most physiologically efficient types including an efficient host genotype for *Rhizobium* symbiosis and N_2 -fixation, and breeding for disease and pest resistance and for quality, which are considered to be among the most difficult problems in legume breeding.

Because most of the topics have been presented comprehensively this book may serve as a ready source of information on chemistry and to a certain extent on biochemistry of legumes.

V. ŠKRDLETA (Praha)