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BOOK REVIEWS

FOTOSINTEZ, RAZVITIE I PRODUKTIVNOST' SEL'SKOKHOZYAÏSTVENNYKH RASTENIÏ. [PHOTOSYNTHESIS, DEVELOPMENT AND PRODUCTIVITY IN CROP PLANTS.] (Trudy priklad. Bot., Genet. Selektsii 72/2). — Izd. VIR, Leningrad 1982. 136 pp. 1.00 Rbl.

This booklet is the fourth in a series of similar volumes which were published in the Institute of Plant Production in Leningrad, U.S.S.R. in 1975, 1978 and 1980. This volume contains 18 contributions concerning problems of special plant physiology, development and productivity of wheat, barley, potato, sugar cane and melilot plants. Plants from the collections of the Institute of Plant Production were compared with respect to photosynthetic gas exchange, photochemical activity and energetic functions of chloroplasts, to elements of growth analysis and of the production process. Additionally, some methodological questions, correlation analysis, the influence of external factors (photoperiod, mineral nutrition, growth regulators) on the production process and yield formation are dealt with. The aim of the volume is to establish correlations between physiological characteristics and characteristics relevant for agriculture, namely productivity and yield. Individual contributions are arranged as self-contained papers with illustrations, references and summaries in English. Also captions to figures are written in Russian and English. The booklet is a good representation of research made in one department of the Institute of Plant Production in Leningrad.

INGRID TICHÁ (*Praha*)

PROCEEDINGS OF THE SYMPOSIUM ON ROCKPHOSPHATE HELD AT MARATHWADA AGRICULTURAL UNIVERSITY, Parbhani (Maharashtra) on November 27—28, 1982. — The Indian Society of Agricultural Chemists, Department of Chemistry, University of Allahabad, Allahabad 1983. 178 pp., Inland: Indian Rs 35.00. Foreign: £ 4.00, US $ 7.50 per issue.

The special third number of the fifteenth volume of the Indian Journal of Agricultural Chemistry contains 19 reviews and original papers presented at the symposium entitled "Rock phosphate, its chemistry, technology, production and other aspects relating to phosphatic fertilizers, including phosphorus efficiency, fertilizers response and productivity potential". The main objective of this symposium was to draw attention to rock phosphate and stimulate further research for its efficient use as an alternative P ferilizer instead of more expensive chemically processed water soluble sources. The papers presented and discussions served as a basis for recommendations of the use using and efficient utilization of phosphatic rock for acid, neutral and alkaline soils and also its use in the process of composting. The symposium's organizers and journal's editors hope that the special number will be helpful to those who are interested in the efficient utilization of a low-cost phosphorus material as fertilizer for improving crop production.

JARMILA SOLÁROVÁ (*Praha*)

VINCE-PRUE, D., THOMAS, B., COCKSHULL, K. E. (ed.): LIGHT AND THE FLOWERING PROCESS. — Academic Press, Orlando—San Diego—New York—London—Toronto—Montreal—Sydney—Tokyo 1984. 301 pp. $ 27.50.

This book contains proceedings of the 3rd International Symposium of the British Photobiology Society held at Glasshouse Crop Research Institute, Littlehampton, England in September 1983. Nineteen contributions mostly of review character are divided into six parts: Light and the Flowering Process, Photoreception and Transduction of Daylength Signals, Light-dependent Changes at the Apex — Evocation, Genetic Studies, Flower Development and Light, and Conclusions.

Introductory contribution (D. Vince-Prue) reviews basic knowledge of the natural light environment and its role in control of flowering. E. Schäfer and co-workers summarize recent knowledge of the properties of phytochrome in etiolated as well as in light-grown seedlings and discuss the action of stable and labile phytochromes. In the contribution of K. E. Cockshull is suggested that all effects of light on induction of short day plants are quantitative responses to radiant energy. The facts about the role of light quality in long day plant induction are summarized by G. F. Dietzer.

This book proves that in the last years more attention is paid to inductive effects of light other than photoperiodic. They are summarized by A. H. Halevy in a contribution dealing with self-inductive plants: "...There is a triple effect of light on flowering in autonomously induced plants: a general non-specific effects on photosynthesis and on directing the available metabolites towards the flower sink, and an activation of inhibited meristems...". The relations between photosynthesis and flowering are also discussed in contributions Assimilates and Evocation (M. Bodson), Light and Flower Development (J.-M. Kinet and R. M. Sachs) and in The Interaction of Photosynthesis and Photoperiodism in Induction (D. J. C. Friend).

Editors and contributors were successful in keeping an optimal balance between the summarization of basic knowledge and the addition of new facts and ideas. Accordingly, this book is compulsory for people actively working in the research of flowering, important to people working on flowering in practice giving them a possibility to better understand this process, and very interesting for people studying developmental processes in general.

LIBUŠE PAVLOVÁ (*Praha*)

SCHLECHTER, R.: DIE ORCHIDEEN. 3. Auflage. — BRIEGER, F. E., MAATSCH, R., SENGHAS, K. (ed.): Vol. 1, Issue 15; 881—944 pp. 1984. — Vol. 2, Issue 11—12; 641—727 pp. 1985. Paul Parey, Berlin 1984—1985.

K. Senghas continues with the further genera of the subtribe *Bletiinae* (Subfamily *Epidendroideae*): *Phajus, Gastrorchis, Spathoglottis, Bletia, Pachystoma, Ipsea, Chysis, Pheoglottis, Anthogonium, Drymoda, Coelia* and *Botriochilus. Phajus* is one of the most expanded genera of the subtribe *Bletiinae*, with a large area of distribution, from Africa to all tropical and subtropical countries of the Old World, Australia and Oceania, but most of the species are confined each to only one territory. The genus *Gastrorchis* with 9 species colonises the highland forests of Madagascar. The genus *Spathoglottis* includes mostly terrestrial species, expanded from New Guinea to the whole East-Asian continent and Indomalaysian archipelago. The genus *Bletia* occurs only in the countries of the New World. It propagates by terrestrial bulbs, sprouting rhythmically with the leaves of inflorescences. A number of different generic names were earlier attributed to this genus but now, after its taxonomical revision, some 25 good species are found in Mexico, Central America, Caribbean islands, Argentina, Brasil and the Andean countries.

The next subtribe *Coelogyninae* with 13 genera is represented among the cultivated orchids especially by the very large genus *Coelogyne*, divided into four subgenera. The subgenus *Coelogyne* includes more than 205 species. Typical and most common in cultivation is *Coelogyne cristata* and many other beautiful species and hybrid forms. The issue 15 ends with three other genera of the same subtribe: *Nabaluia, Bracisepalum* and *Dendrochilum.*

The 11th and 12th issues of the second Volume continue with the chapter on parasitic diseases caused by animal parasites, especially the parasitic insect groups: *Aphidina, Coccina, Coleoptera, Formicidae,* Chalcid wasps and midges. — The second volume is closed by an interesting chapter on the protection and preservation of natural orchid habitats and all rare orchid species, highly endangered in all biotopes. This chapter has been written by the outstanding German ecologist W. Haber.

DAGMAR DYKYJOVÁ (*Třeboň*)

HAMEL, G.: ORCHIDEEN. Bildtafeln mitteleuropäischer Arten, Formen und Bastarde. Teil 1. Nach Aquarellen von HERMANN WALTHER. — VEB Gustav Fischer Verlag, Jena 1984. 25,— M; Ausland 32,— DM.

The working group "Heimische Orchideen in Kulturbund der DDR" (The native orchids of the German Democratic Republik) has published 60 full-page orchid plates of aquarelles by the German artist Hermann Walther. All the illustrations have been drawn from actual flowering plants and include typical good species and some taxonomically important subspecies or hybrids. The first part of the plates contains only the typical species, highly endangered in German Democratic Republik. A little booklet prepared by four German orchid-specialists: G. Hamel, H. Illig, H. Kümpel and U. Wegener completes the colour plates by descriptions of individual species, of their biology, variability, hybrids, biotopes and areas of distribution. The arrangement follows the national names complemented by scientific names with general data excerpted from Rothmaler's "Exkursionsflora".

The basic aim of the editors was to present very detailed original drawings to the broad public. The colour-printed plates, however, are of inferior quality. The failure of the "detailtreu" reproduction is not the artist's fault but that of the printing technique: All the green organs of many of the species have the same pale green colour resembling the famous Schweinfurther green, without any differentiation of various tones which are characteristic of these mycotrophic plants. Another group of pale-green species is reproduced in a yellowish colour, again the same for all the species, such as *Orchis palens*, *Himantoglossum hircinum* or *Spiranthes aestivalis*. Also the pink or purple colour distinguishing many species is the same. It would have been better to reproduce the chlorophyll-lacking species against a dark background. That is perhaps why, *e.g.*, *Epipogium aphyllum* is reproduced so badly.

In the present abundance of very good books or plates with distinguished colour photographs such detailed original drawings should be printed more carefully to ensure and maintain the high quality of the artistic originals.

DAGMAR DYKYJOVÁ (*Třeboň*)

GRANT, W. F. (ed.): PLANT BIOSYSTEMATICS. Based on the Symposium of the International Organization of Plant Biosystematics, McGill University, Montreal, Canada, July 17—21, 1983. — Academic Press, Toronto 1984. US $ 49.50.

The reviewed book is a 650 page volume of proceedings of a symposium entitled "Plant Biosystematics: Forty years later" to recognize the significance of Camp and Gilly's introduction of the term in 1943. The aim of the symposium was" to consider biosystematics in its broadest sense in which not only the traditional themes of speciation, karyology, polyploidy, hybridization and specialized systems (apomixis, incompatibility, pollination) would be considered, but also some of the current methodologies and future trends, as well as some of the practical aspects (agriculture, conservation, horticulture and medicine)." The book concentrates mostly on conceptual issues; no attempt is made to review systematically all the methodological variety of biosystematics, nevertheless, many methods are considered and their logic and problems are discussed in detail. Such conceptual issues are clearly illustrated by examples drawn from particular studies of individual taxa; further, general articles and reviews are accompanied by more specialized studies of individual plant groups, employing the concepts and techniques discussed in the general articles.

The contributions are divided into several sections, intended to deal with different methodologies and ideas of the biosystematics. Despite the claim in the introduction, the main emphasis of the book is genetic. In the first section (Cytology and Cytogenetics) various karyological approaches to species delimitation are discussed. The main drawback of this area is the very unclear relation between genotype and phenotype, which hinders development of taxonomy based on both types of characters. Second (Breeding systems and hybridization) and third (Plant reproduction and reproductive isolation) sections deal mainly with the possibility to use reproductive criteria and biological species concept in biosystematics.

Further four sections are less compact than the preceeding ones. They include: Methodologies in Biosystematics; Population Biology and Biogeography: Biosystematics of Mosses and Ferns; Biosystematics and Its Practical Implications. In the fourth section, the contribution of Morisset and Boutin on Biosystematic importance of phenotypic plasticity is very important, showing the partial inadequacy of a strictly genetic and/or reproductive approach to the biosystematics and advocating consideration of ontogenetic and epigenetic mechanisms. The paper of B. Schaal (Population biology and biosystematics) from the fifth section tries to exploit

the connections between these two fields. However, should such an interface not remain at the stage of collecting demographic features as other characters for taxonomic work, a much broader outline for such a connection would be needed. Few chapters on practical application of biosystematic results and ideas close the book, but these chapters are by no means marginal. They either deal with problems resulting from recognition of a complex biological structure behind the simple taxonomic unit for medicine and conservation, or point out the enormous difficulties when the biosystematics of cultivated plants is dealt with.

Needless to say, this is a superb book; such a review of the biosystematics state-of-art may provide ideas for the next 40 years.

T. HERBEN (*Praha*)

GAHAN, P. B.: PLANT HISTOCHEMISTRY AND CYTOCHEMISTRY. AN INTRODUCTION. — Academic Press, Orlando—San Diego—New York—London—Toronto—Montreal—Sydney—Tokyo 1984. 300 pp., 46 figs., US $ 41.00.

An important book presenting a survey of histochemical methods applied to plant material appeared after more than twenty years. Many new methods were elaborated and new techniques adopted during that period. This book which appears as an 18th volume of the International Series of Monographs on Experimental Botany reflects the progress. It was not intended to offer a comprehensive compendium of all methods and their modifications and it will not substitute the broadly used compendia on general, mainly animal histochemistry. The present book will rather help in choosing an appropriate method, in understanding the principles of different techniques and their contribution in resolving the botanical problems. In the first part methods for tissue preparation are described, starting with the various modifications of freezing and followed by chemical fixation. The main body of the book is divided into chapters devoted to nucleic acids, structural proteins, enzymic proteins, lipids, carbohydrates and soluble compounds and ions. The use of vital dyes is included, too. About one third of the book is written as a practical guide to some of the methods which the author himself found to work satisfactorily in plant tissues. A short introduction to physical techniques is added. The reader will find information on microdensitometry, phase contrast, interference and polarized-light microscopy, on ultra-violet light absorption and fluorescence microscopy, on autoradiography and X-ray microscopy and other promising techniques.

The chapter on nucleic acids also includes the methods used in the study and calculations of the cell cycle. The chapter devoted to enzymic proteins provides an excellent source of information on the problems which have to be solved if an adequate method of histochemical localization is applied to answer a specific question of plant biology. The great advantage of the book is the critical approach: warning but not discouraging. Examples of elegant and successful application of histochemical methods in plant biology are given throughout the book and about 700 references of the selected publications are given. The present book may be recommended to those who are engaged in plant histochemistry as well as to other experimental botanists who are interested in obtaining some information on structure and function at the cellular and tissue levels.

FRIDETA SEIDLOVÁ (*Praha*)

WHITE, R. A., DICKISON, W. C. (ed.): CONTEMPORARY PROBLEMS IN PLANT ANATOMY. — Academic Press, Orlando—San Diego—San Francisco—New York—London—Toronto—Montreal—Sydney—Tokyo—São Paulo 1984. 600 pp. Cloth $ 49.00.

The chapters of the volume dedicated to Katherine Esau represent the proceedings of a plant anatomy symposium held at Duke University and The University of N. Caroline at Chapel Hill in 1983. The contributions written by fourteen authors reflect the new trends in the structural plant sciences, as well as new information obtained by more precise methods of microscopy. The close relationship between plant cytology, anatomy and morphology is stressed. The aspects of development and morphogenesis and the influences of the environment are integrated to solve the problems of plant architecture. Four of the twelve contributions are devoted to the problems concerning anatomy and cytology of the vascular tissue formation and differentiation. Connections between leaf and stem are discussed. Examples of ferns, monocotyledons and dicotyledons are presented. Leaf anatomy and development is the central topic of the next three contributions. The understanding of the structure of an adult functional leaf is obtained

by detailed study of its formation. The third block of three contributions is concerned with inflorescence and floral anatomy. Attention is paid to the mode and order of initiation of different floral structures. Correlations of plant structure and function are dealt with in the last two chapters. Formation of plant habit and wood architecture are described and discussed from the point of view of environmental influences.

The volume presents the top achievements in the above fields of plant anatomy and thus will be of primary interest to plant anatomists, morphologists and evolutionists, but experimental botanists may also find here some important information. Certainly, this volume should find readers among scientists engaged in transport, photosynthesis and plant growth and development. It is a pity that the methods are not described adequately. One can miss *e.g.* more detailed explanation of the techniques by which the beautiful figures were obtained.

FRIDETA SEIDLOVÁ (*Praha*)

MARGARIS, N. S., ARIANOUSTOU-FARAGGITAKI, M., OECHEL, W. C. (ed.): BEING ALIVE ON LAND. — Dr. W. Junk Publishers, The Hague—Boston—Lancaster 1984. Pp. 322. Cloth Dfl. 175.00; £ 44.50; US $ 72.00.

This book is the 13th volume of the series Task for Vegetation Science. It includes papers presented at the International Symposium on Adaptations to Terrestrial Environment held in Halkidiki, Greece in 1982. The range of papers concerning adaptations of the variety of organisms (from microorganisms to higher plants) to different abiotic and biotic factors is very extensive. Therefore the reader will find here rather substantial contributions to the individual problems than a survey of this research field.

The papers are divided into eight parts. In Part One: System's Adaptations the different types of plant communities (from Mediterranean type to Tundra ecosystems) are described. Part Two: Adaptations to Water (Availability or Deficiency) starts with the paper dealing with the root sheaths — the peculiar adaptation of grasses in the arid zone sands. Particular attention is given to the seasonal and diurnal osmotic adjustment of the natural vegetation as well as of cultivated plants. The adaptations of the photosynthetic pigments are also included. Finally, one paper concerns the adaptation of some blue-green algae and diatoms to desiccation. The papers of Part Three: Adaptations to Temperature discuss the dependence of gas exchange of different plant species on leaf and soil temperature. The third paper of this part shows the possibilities of cold acclimation of alfalfa and other forage plants and cereals in dependence on soil moisture. The adaptations of understorey species in deciduous forests to light-limited conditions, or better, to strong seasonal dynamics, the shade phase in summer and light phase in autumn, winter and spring and comparison with the conditions in open sward is the main item of papers in Part Four: Adaptation to Light. In addition, the growth model of *Anacystis nidulans* under limited irradiance is described. Part Five: Nutrition contains only two papers concerning the effect of microelements on growth, yield and nitrogen-fixing activity of soybean. Part Six: Interactions begins with the paper on statistical methods for the evaluation of sensitivity of the particular genotype to changes in the environment. It is followed by very specialized papers on the branching patterns in the columnae cacti and the submicroscopic studies of orchid retinacles. The restriction of some terrestrial plant species to extreme substrates, the regeneration techniques, interactions between the higher plants and soil fungi or between mosses and the bacterial flora are other topics of this part. Part Seven: Pollution deals with the importance of forests in the regions of industrial agglomerations, the interaction of pollutants with ecological conditions, the tree bark as a natural sink for pollutants, the heavy metal uptake by plants, the determination of some metals by atomic absorption spectrometry and the decomposition of some herbicides.

The individual papers are richly illustrated and have extensive bibliography. The book is well arranged and printed.

As the papers included are of a high standard, the book brings a significant contribution to the analysis of the adaptations of plants to stress habitats.

JANA POSPÍŠILOVÁ (*Praha*)

ROBERTS, J. A., TUCKER, G. A. (ed.): ETHYLENE AND PLANT DEVELOPMENT. — Butterworths & Co. Publ., London—Boston—Durban—Singapore—Sydney—Toronto—Wellington 1985. 416 pp., 135 figs. Hardcover £ 55.—.

This book contains proceedings of the 39th University of Nottingham Easter School in Agricultural Sciences held at Sutton Bonington, Eng and, 26—30th March 1984. In 33 contributions

all aspects of ethylene biochemistry and physiology are covered. Individual chapters deal with ethylene biosynthesis, interaction with CO_2, relation to pollination, flower and foliar senescence, abscission, regulation of ripening genes expression, lateral bud growth, regulation of waterplants growth, waterlogging, and target cells for ethylene. Further, ethylene is discussed as an air pollutant and its significance in horticulture, fruit storage and post-harvest handling of tropical fruit, vegetables, ornamental plant, and apples is reviewed. Individual chapters are written by leading authorities in particular fields, *e.g.* F. B. Abeles, S. F. Yang, H. Kende, A. R. Smith, E. M. Beyer, Jr., D. J. Osborne, J. R. Hillman, J. Bruinsma and represent an up-to-date summary of our knowledge of ethylene synthesis, metabolism and action.

The book can be recommended to all research workers engaged in ethylene studies and to all workers interested in practical use of ethylene in horticulture and post-harvest handling of fruits.

IVANA MACHÁČKOVÁ (*Praha*)

HENKE, R. R., HUGHES, K. W., CONSTANTIN, M. J., HOLLAENDER, A. (ed.): TISSUE CULTURE IN FORESTY AND AGRICULTURE. Basic Life Sciences, Vol. 32. — Plenum Press, New York—London 1985. 390 pp. US $ 55.00 (+20% outside USA).

Cell genetics is one of the most vigorously developing areas of plant biology and its theoretical and practical importance is becoming increasingly evident to the molecular biologist as well as to the plant breeder. This timely book contains 20 plenary lectures and 49 abstracts of posters presented at the Third Tennessee Symposium on Plant Cell and Tissue Culture held in 1984 at the University of Knoxville. The first Tennessee symposium on tissue culture entitled "A Bridge between Research and Application" was held in 1978, the second symposium "Emerging Technologies and Strategies" was held 2 years later. The keynote address to the present symposium, given by Lean Dure, discusses specific problems involving the "genetic engineering era" and illustrates some naive visions of the early boosters of this period. Many of the present obstacles to practical application of higher plant cell genetics arise from limitations in our understanding of plant cell biology and from an often forgotten fact that plants are not *E. coli* cells.

The first part of the book is arranged in 3 sections: 1. Regeneration phenomena, 2. Developmental mechanisms and 3. Applications of developmental systems. The papers cover topics such as somatic embryogenesis for mass cloning of crop plants, patterns of development in culture, somaclonal variation in progeny of plants. The core of the book focuses on the problem of tissue culture technology for propagation of woody species and for forest improvement. Included are papers on somatic embryogenesis in tropical fruit trees, propagation of coffee and loblolly pine, countering the effects of tropical deforestation with modern technology, micropropagation of tropical conifers *etc.*

This book will be a valuable source of information to all those engaged in the possible application of plant tissue techniques in agriculture and forestry.

J. VELEMÍNSKÝ (*Praha*)

BONNER, J. T. (ed.): EVOLUTION AND DEVELOPMENT. (Report of the Dahlem Workshop on Evolution and Development, Berlin May 10—15, 1981.) — Springer Verlag, Berlin—Heidelberg—New York 1981. 356 pp. Cloth DM 46.—; approx. US $ 21.50.

Since the emergence of the synthetic theory of evolution, genetics has become the key discipline in evolutionary thinking. Study of ontogeny, dominant evolutionary discipline of the last century, has played only a minor role. This book, designed as a real interdisciplinary undertaking, may help to reverse this trend. It is a report on 1981 Dahlem conference, an informal discussion meeting of *ca.* 50 students of various fields of biology, united by their common interest in the evolution/development interface. The discussions at this meeting were held in four sections, which dealt with biological systems of increasing complexity of organization, beginning with molecular genetics and regulation of gene expression to paleontology and macroevolution. Discussions in these sections are summarized into four group reports, which form the main part of the book and around which the more specialized articles are clustered. These group reports contain: Genomic change and morphological evolution, reported by I. Dawid; The cellular basis of morphogenetic change, reported by J. C. Gerhart; Adaptive aspects of development, reported by H. S. Horn; The role of development in macroevolutionary change, reported

by P. F. A. Maderson. These sections differ in their problems, language and inspiration. Each of them is a brilliant summary of thinking in the field, but the division adopted here makes the gaps between the levels very clear. Each discipline developed an evolutionary perspective of its own, designed to its particular problems, and they may be diffcult to reconcile. The book clearly shows the absence of basic organizational level for understanding evolution, at least at the present state of knowledge.

The book is an intriguing reading for all biologists. A general reader will enjoy it as a report on state-of-knowledge in the field; since the general theme is put into the framework of related disciplines, such as genetics, ecology, paleontology, life history theory, it is useful to specialists in all these fields. It is provoking to any plant physiologist or developmental biologist that the overwhelming majority of examples are drawn from zoology and most of the concepts were developed on animals. If this awareness of important gaps in evolutionary understanding spreads into plant science as well, botanists may only benefit from it.

T. Herben (*Praha*)

Cereal Grain Protein Improvement. — International Atomic Energy Agency, Vienna 1984. 388 pp. ÖS 760.—.

Cereals provide a major portion of the calories and proteins in human diets in many developing countries. Unfortunately, the storage proteins of cereal grains are of poor nutritional quality for human beings. The Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture established in 1969 an international programme to improve the protein content and quality in seed crops. The scientific programme ended in 1982 and this publication provides the presentations of the final Research Co-ordination Meeting held in Vienna. The publication is arranged in four sections. Section I provides data on the results of mutation breeding in improving the grain protein content and nutrition quality. Most papers deal with the mutation breeding of wheat and barley, but presentations on mutation induction in triticale, rice and mungbean are also included. Section II covers cross-breeding with mutants and other protein gene resources. Presentations focus on weakening the negative correlation between protein content and grain yields which makes the breeding of high protein and high yielding cultivars very uneasy. The biochemical and genetic characterization of lysine genes is the main topic of papers presented in sections III and IV. The evaluation of the protein quality of cereal mutants, determined in nitrogen-balance trials, is also included. The annex to the publication includes conclusions and recommendations of the FAO/IAEA working group, and a summary of breeding achievements and suggestions for further breeding and research work in improving the grain proteins.

Those engaged in plant breeding, genetics and physiology of cereals, will find this publication very useful.

J. Bříza (*Praha*)

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Polynuclear Aromatic Compounds, Part 2. Carbon Blacks, Mineral Oils and Some Nitroarenes, Vol. 33. — IARC, Lyon 1984. 254 pp. Sw. fr. 50.—; Us $ 25.—.

The second of four-volume IARC Monographs dealing with the polynuclear aromatic compounds and complex mixtures containing these substances considers carbon blacks, mineral oils and six nitroarenes. The data concerning these issues represent the views and opinions of the IARC Working group which met in Lyon, 7—14 June 1983.

Carbon blacks are powdered forms of elementary carbon manufactured by the controlled vapour phase pyrolysis of hydrocarbons. The commercially produced acetylene blacks, channel blacks, furnace blacks, lampblacks and thermalblacks are described as to their occurrence, use and composition, and the biological data relevant to the evaluation of carcinogenic risk of these substances to man follow. The available evidence shows that after the exposure to carbon blacks some elution of polynuclear aromatic hydrocarbons may occur depending on the relation between the amount of adsorbed material and the available adsorptive surface. There is sufficient evidence that benzene extracts of most carbon blacks tested are carcinogenic to animals, the available data on carbon blacks are, though, inadequate to evaluate their carcinogenicity to experimental animals or humans.

Mineral oils, a group of petroleum-derived products, include lubricant base oils and derived various products. Epidemiological human data suggest that there is sufficient evidenc efor the carcinogenicity of mineral oils containing various additives and impurities that have been used in occupations such as mulespining, metal machining and jute processing.

Six monographs have been prepared on the nitroarenes, 1,8-dinitropyrene, 9-nitroanthracene, 6-nitrobenzo(a)pyrene, 6-nitrochrysene, 3-nitrofluoranthene and 1-nitropyrene. Nitroarenes occur in dieselexhaust particles and may be found in carbon blacks contaminants. Although all 6 substances were mutagenic to *Salmonella typhimurium*, the other experimental or epidemiological data do not allow to evaluate their carcinogenicity to humans.

All those interested in the genotoxic effects of environmental pollutants will find this IARC publication of a great value.

KATEŘINA PÁNKOVÁ (*Praha*)

DATENSAMMLUNG ZUR TOXIKOLOGIE DER HERBIZIDE. Fünfte Lieferung. 1984. — Verlag Chemie Weinheim—Deerfield Beach, Florida—Basel 1984. 182 S., DM 98.—

Die Arbeitsgruppe Toxikologie der Kommission für Pflanzenschutz-, Pflanzenbehandlungs- und Vorratsschutzmittel der Deutschen Forschungsgemeinschaft (BRD) gibt seit 1974 eine „Datensammlung zur Toxikologie der Herbizide" heraus. Der Möglichkeit der Ergnäzung dieser Datensammlung wurde dadurch Rechnung getragen, dass zur Veröffentlichung eine ergänzungsfähige Ringbuchausgabe gewählt wurde. Die fünfte Lieferung 1984 bringt Angaben über die Toxikologie von 4 Herbiziden: Bromacil, Clormequat, Deiquant und Flurenol-n-Butylester. Zur Charakterisierung der einzelnen Herbizide werden die wichtigsten chemisch-physikalischen Daten sowie weitere Daten über den Anwendungsbereich, über das Schicksal in tierischen Organismen, zur Kanzerogenität, Mutagenität, über das Schicksal in Pflanzen, Boden und Wasser und über die Wirkungen auf Haus-, Nutz- und Wildtiere als auch über den algemeinen Wirkungscharakter, die Therapie bei Vergiftungsfällen und die entsprechende Literatur angegeben. Die 5. Lieferung enthält auch neue, ergänzende Angaben über 34 Herbizide, die in früheren Lieferungen angeführt worden sind. Der Anhang bringt die Anschriften der Herbizidhersteller.

Leserkreis: Agronome, Biochemiker, Umweltschutzbeauftragte.

T. GICHNER (*Praha*)

BELL, P. R., WOODCOCK, C. L. F. (ed.): THE DIVERSITY OF GREEN PLANTS. — Edward Arnold Publ., London 1983. 360 pp. £ 9.95.

Botany in Czechoslovakia is traditionally divided in two branches: systematics, geobotany — but also morphology on the one hand and, on the other, physiology, genetics *etc.* The former branch used to be characterized as field botany, descriptive, the latter as laboratory botany, experimental. In other countries, the situation seems to be more or less analogous. In recent years distinct integrative tendencies became apparent on both sides. For example the developmental processes are studied using various cryptogams. Thus the experimentalist must be familiar with taxonomy, life cycles *etc.* and the taxonomists must be fairly informed in biochemistry and molecular biology to be able to understand the metabolic peculiarities of different taxa. The attempts to help and to strengthen this highly desired attitude are few but welcome. The book we are dealing with may be regarded as a successful attempt in this respect. It is a textbook of systematics of green plants (fungi are thus omitted) concerning anatomy, embryology, life cycles and reproduction. It seems that it will be useful not only for students, but also for experimentalists, working with or interested in "lower" plants. Looking upon details, one will disagree *e.g.* with some definitions in the glossary, *etc.* An extension of the present work, including an atlas of light and electron microscope structures would be highly desired. Thus the present book could be taken as a useful textbook and versatile handbook, but also as a promising starting point in the respect mentioned above.

K. BENEŠ (*Praha*)

SHAINBERG, I., SHALHEVET, J. (ed.): SOIL SALINITY UNDER IRRIGATION. PROCESSES AND MANAGEMENT. — Springer-Verlag, Berlin—Heidelberg—New York—Tokyo 1984. 349 pp. Hard cover DM 148.—; approx. US $ 52.—.

Soil salinity is the most prevalent and widespread problem limiting crop productivity in irrigated agriculture and therefore attracts attention of the scientific community. The purpose of this book is to bring together and critically examine accumulated information in this field. Individual chapters are based on the contents of the invited lectures for international symposium of the same name, which took place in March 1984.

The book is introduced by the historical survey of the research on salinity and is divided into two parts as suggested by the book's title — Processes and Management. The first two chapters of the Processes cover the basic chemical reactions taking place in saline and sodic soils and their effects on the soil structure and hydraulic properties. The salt and water movement in the soil profile and the accumulation of salts in soils are the main items of the following chapter. The deterministic and the stochastic models of these processes are also included. The last chapter of this part is devoted to the comparison of different methods of measuring soil salinity and to the evaluation of quality of water for irrigation.

The part Management starts with the description of the technologies of leaching and drainage. The second chapter shows the possibilities for the reclamation of sodic soils. Finally, the crop production under salinity is discussed. This chapter is focused on the physiological principles of the salt tolerance of individual crops. The prediction of crop yield and water consumption as well as the various management practices are also included.

The book has 133 instructive figures, tables and detailed subject index; it is well arranged and printed. The editors succeeded in presenting all contributions in a uniform way and the book brings a very informative overview of this research field.

JANA POSPÍŠILOVÁ (*Praha*)

MÜNTZ, K.: STICKSTOFFMETABOLISMUS DER PFLANZEN. — VEB Gustav Fischer Verlag, Jena 1984. 331 S. 131 Abb. 33 Tab. Brosch. M 60,—. Ausland M 72,—.

Das Buch erscheint in der Reihe „Bausteine der modernen Physiologie". Prof. K. Müntz aus dem Zentralinstitut für Genetik und Kulturpflanzenforschung der Akademie der Wissenschaften der DDR in Gatersleben hat die Aufgabe auf sich genommen den Stickstoffmetabolismus der Pflanzen mit Rücksicht auf die ausserordentlichen Fortschritte, welche während der vergangenen 10 bis 15 Jahre erzielt worden sind, neu zu bearbeiten. Er tut dies in 16 Kapiteln dieses Bandes. Zuerst wird Stickstoff als chemisches Element in der Biosphäre vorgestellt und sein Kreislauf beschrieben. Fortgesetzt wird mit Darstellung der verschiedenen Arten der Stickstoff-Assimilation (biologische Fixierung von Luftstickstoff, Nitrat-Assimilation, Ammoniumaufnahme, Nitrifikation und Denitrifikation) und dem Stoffwechsel niedermolekularer Stickstoffverbindungen (proteinogene und nichtproteinogene Aminosäuren, Alkaloide, Porphyrinverbindungen, Nucleotide und Ureide). Es folgt ein Abschnitt über den Ferntransport stickstoffhaltiger Verbindungen in den Pflanzen und ein weiterer, der sich mit dem Metabolismus hochmolekularer Stickstoffverbindungen, d. i. Nucleinsäuren und Proteine, beschäftigt. Es werden besonders der Nucleinsäure- und Proteinstoffwechsel in Samen und Früchten, in Pflanzenblättern und während der Samenkeimung behandelt. Das Buch ist mit einem umfangreichen Literaturverzeichnis (Vollzitationen), einem Artnamen- und Sachregister ausgestattet. Der Band ist reich illustriert, wobei die photographischen Beilagen ungünstigerweise am Ende des Buches zwischen Literaturverzeichnis und Register als unpaginierter Bildteil eingeordnet worden sind. Der Text ist übersichtlich gegliedert. Vorteilhaft ist das Abkürzungsverzeichnis auf den inneren Deckblattseiten des Buches.

Das Buch fasst den gegenwärtigen Erkenntnisstand über den Stickstoffhaushalt der Pflanzen zusammen. Es ist sehr sorgfältig zusammengestellt worden und enthält konzentriertes Wissen. Es wird deshalb Studenten und Wissenschaftlern auf dem Gebiet der Pflanzenphysiologie und benachbarter Interessengebiete gute Dienste leisten.

INGRID TICHÁ (*Praha*)