JOHRI, B. M. (ed.): EMBRYOLOGY OF ANGIOSPERMS. — Springer-Verlag, Berlin—Heidelberg—New York—Tokyo 1984. 830 pp. Cloth DM 290.—, approx. US $ 113.70.

Written by a team of authoritative contributors, the present volume represents the first comprehensive account of the whole field since the publication of the late Professor P. Maheshwari's book "An Introduction to the Embryology of Angiosperms" in 1950. In 16 chapters it concentrates on the classical structural aspects and on the vast progress of our knowledge achieved by investigations using various modern microscopical, cytochemical and histochemical techniques. The techniques to study embryology are briefly mentioned in the introductory chapter dealing also with ovule and seed nutrition and with some unusual and interesting features such as embryo sacs in anthers, antipodal endospermal embryos and gymnospermous characters in angiosperms. Morphology, structure, cytochemistry and development of microsporangium, ovule, female gametophyte and of pollen grain are the topics of the next 4 chapters; the chapter on fertilization includes structural and functional aspects of stigma and style and of the whole process from pollen germination and pollen-pistil interactions to pollen tube entrance and discharge in embryo sac and fusion of gametes. The endosperm is shown in its developmental and organization diversity in various taxa and it is pointed out to the complex problem of its role in nourishing the proembryo during early embryogenesis. The description of embryo development brings information on the morphological aspects and embryogenesis classification together with the more recent achievements obtained by electron microscopical and cytochemical studies. Special chapters are devoted to different types of polyembryony and its possible causes, to various aspects of gametophytic apomixis, to the role of polyploidy in reproductive organs and tissues and to the seed structure and germination. The important role of embryology in taxonomy is demonstrated and discussed in a number of examples. Chapter 15 "Homologies and Phylogeny" examines the possibilities to answer questions of phylogeny of angiosperms on the basis of comparative studies of structures and functions of the sexual reproduction process. The concluding chapter is a brief review of problems of experimental embryology and is focused on *in vitro* cultures of reproductive organs, tissues and cells for various purposes.

The book is profusely illustrated (278 drawings and photographs) and is divided by frequent subheadings which together with general plant and subject indexes provide quick orientation. As an excellent comprehensive account and reference manual it will undoubtedly be appreciated by university teachers and students and by researchers within many fields of botany.

J. TUPÝ (*Praha*)

ADDICOTT, F. T. (ed.): ABSCISIC ACID. — Holt-Saunders Ltd. Publ. Eastbourne, East Sussex 1983. 607 pp. Cloth £ 52.95.

Rapid progress of plant hormone research based on the modern methods of chemical analysis can be demonstrated on the present state of knowledge of the abscisic acid (ABA). The existence of compound(s) which interfere with auxin action was considered in late 1940s. However, it is only 20 years that its chemical structure was determined, and since that time a considerable amount of knowledge has been accumulated of this interesting plant hormone and the first book dealing exclusively with ABA has appeared. This fact makes this publication a unique source of comprehensive information about chemistry, biochemistry, biological activity and possible physiological roles of ABA.

The introductory chapter contains basic data on the history of research leading to ABA discovery and summarizes the basic facts of its occurrence and possible actions in plants. The following four chapters deal with chemical and biochemical topics: detection and estimation of ABA, pathways of its biosynthesis and degradation, structure-activity relationships and biochemical mode of action of ABA. Possible physiological roles of ABA and related compounds are described in nine chapters which represent the main part of the book. The reader will find there information about effects of ABA on plant cell and tissue structure and membrane transport, role of ABA in drought avoidance, abscission, bud dormancy, apical dominance, seed germination and dormancy, root growth and geotropism and senescence of plant cell and tissues. Effects of ABA on animals are described in a special chapter. The closing part of the book summarizes the significance of ABA in plant life.

The interest of plant scientists in ABA is partly motivated by prospects of practical application of the present theoretical findings. These promises are unique among all classes of plant hormones, which makes this book attractive not only for plant biochemists and physiologists but also for those who deal with applied research. The editor succeeded in organizing a team of authors to present their contributions with a minimum overlaps, avoiding presentation of too many details

at the expense of a clear description of basic facts and their mutual relationships. The book contains numerous graphs, schemes and photographs and a detailed subject index. One can congratulate the authors on this successful publication.

M. KAMÍNEK (*Praha*)

PROCEEDINGS OF THE HUNGARIAN-ITALIAN PLANT GENETIC CONFERENCE ON THE POSSIBILITIES OF INCREASING GENETIC VARIABILITY IN THE PLANT KINGDOM. — Interpress, Budapest 1985. 208 S.

Vom 26.—30. Juni 1984 hat im Landwirtschaftlichen Forschungsinstitut der Ungarischen Akademie der Wissenschaften in Martonvásár eine gemeinsame Konferenz italienischer und ungarischer Wissenschaftler und Pflanzenzüchter stattgefunden, die im Rahmen der Zusammenarbeit zwischen dem Italienischen Forschungszentrum und der Ungarischen Akademie der Wissenschaften organisiert worden ist. Vorliegendes Büchlein enthält 15 Beiträge, die auf dieser Konferenz vorgetragen worden sind. Sie sind in vier Sektionen aufgeteilt worden. In der ersten Sektion wurden Vorträge gehalten, die den Stand der Forschung in der Pflanzengenetik und Züchtung in Italien, der Induktion von Mutationen in Italien und Ungarn, die Aufgabe der Polyploidisierung und intervarietalen Hybridisierung in der Pflanzenzüchtung zusammenfassen. In der zweiten Sektion wurden die Möglichkeiten zur Erhöhung der genetischen Variabilität durch intraspezifische Hybridisierung oder durch Selektion, und die Aufgabe der genetischen Variabilität in der Maiszüchtung behandelt. Die dritte Sektion berichtete über cytogenetische Aspekte der Pflanzenzüchtung: über durch Strahlung induzierte Chromosomveränderungen, über Chromosommanipulationen, Induktion von Amphiploidie und Aneuploidie, usw. Und die vierte Sektion beschäftigte sich schliesslich mit weiteren modernen Züchtungsmethoden wie somatische Hybridisierung, Genmanipulation, und mit den Fragen der Erhaltung der genetischen Variabilität in Populationen.

Diese gemeinsame Konferenz war bestimmt beiderseits ein sehr nützlicher Informationsaustausch.

INGRID TICHÁ (*Praha*)

SCOTT, T. K. (ed.): HORMONAL REGULATION OF DEVELOPMENT II. THE FUNCTIONS OF HORMONES FROM THE LEVEL OF THE CELL TO THE WHOLE PLANT. Encyclopedia of Plant Physiology, New Series. Vol. 10. — Springer-Verlag, Berlin—Heidelberg—New York—Tokyo 1984. 309 pp. Cloth DM 134.40; approx. US $ 52.70.

Three volumes of the Encyclopedia of Plant Physiology, New Series are focused on hormonal regulation of plant development. The first volume Molecular Aspects of Plant Hormones (J. MacMillan, ed.) was published in 1980 and the last third volume Role of Environmental Factors (A. Pirson and M. H. Zimmermann, ed.) is in preparation. With respect to this division of the subject the second volume is focused on biological functions of plant hormones on various levels of plant organization. The authors chose a new approach for presentation of information, trying to find what is common to all classes of plant hormones in relation to particular processes. This arrangement and classification of data give an integrate picture of complicated hormonal actions. It simultaneously shows the existing poorly understood points and sometimes the weakness of hormonal concept application on the regulation of certain biological processes, às. *e.g.* flowering. On the other hand it demonstrates the enormous progress which has been achieved in many areas, especially in understanding of hormone functions at the cellular level of organization (Chapter 2, M. L. Evans).

The introductory chapter Hormonal Regulatory Systems in Plants (A. C. Leopold and L. D. Noodén) defines the concept of plant hormone as a chemical messenger and discusses the complexity of simultaneous action and interaction of various hormone classes and problems connected with their analysis. H. Kaldewey in his chapter on the transport and other modes of movement of hormones, especially auxins, pays attention namely to the methodology and interpretation of data, which is often the main source of conflicting results in this field. In the following chapter W. P. Jacobsis deals with functions of hormones at the tissue level. He describes the role of hormones in differentiation of vascular tissues in shoots, roots and tissue cultures. Attention is paid especially to regeneration of vascular tissues in shoots of herbaceous plants, to its quantitative aspects and effects of different classes of plant hormones. The functions of hormones at organ level from embryogeny to flower and seed development are described and discussed by A. W. Naylor. The author correlates biological effects of externally applied plant growth regulators and their quantitative effects on structural differentiation of tissues and organs both *in vitro* and

in vivo and evaluates the relationship between morphological and structural differentiation and the level of endogenous hormones. In the chapter of A. G. Matthysse and T. K. Scott on the function of hormones at the whole-plant level of organization there are presented very informative schemes of sites of hormone synthesis and transport, and different stimulatory and inhibitory effects of different classes of hormones on biological processes. In the same way relationships between hormone synthesis and accumulation and responses of plants to different environmental factors are described. The last specialized chapter of S. Zajaczkowski *et al.* describes possible functions of auxin waves in plant morphogenesis.

As compared to the first part of the Encyclopedia series dealing with plant hormones, the second part presents carefully selected data in a condensed form. This makes the book very useful to those who need to get the most important information and to find references to further study of special problems. All important aspects of this field are presented in balanced proportions. What only seems to be missing in this interesting book is more information about the plant hormone involvement in correlative effects existing between different organs and tissues of a developing plant.

M. Kamínek (*Praha*)

Muhammed, A., von Borstel, R. C. (ed.): Basic and Applied Mutagenesis. With Special Reference to Agricultural Chemicals in Developing Countries. — Basic Life Sciences. Volume 34. Plenum Press. New York—London 1985. 441 pp. US $ 55.00

It is ironic that toxic chemicals are used as a humanitarian device to rid the world of Pestilence and Famine — two of the Horsemen of The Apocalypse. If we do not wish poisonous chemicals to become the fifth Horseman of the Apocalypse, then we must begin to identify and regulate the large-scale usage of toxic substances everywhere. The above chapter is included in the preface to the proceedings of a Symposium on agricultural genotoxicity in developing countries, held in Islambad, Pakistan, and shows the main objective of the meeting. Three main areas of interest are covered in the proceedings: 1. pesticide-induced risk to human health, including contributions of toxins in food, mycotoxins as carcinogens, problems associated with the use of chemicals by agricultural workers and water contamination and environmental mutagens, 2. basic studies related to mutagenesis and carcinogenesis, covering topics such as mutagenesis-enhancement by plasmids, situation-dependent repair of DNA damage in yeast and the role of polysubstrate monooxygenases and, 3. mutagenic, teratogenic and predictive carcinogenic studies of pesticides, focusing mainly on the evaluation of the genotoxic potential of certain pesticides used in Pakistan. In the Appendices 5 methods for identifying mutagens are described in detail: the yeast, maize, soybean and drosophila assays and the micronucleus test on exfoliated human cells. In addition, a list of agricultural chemicals registered for sale in Pakistan and used throughout many developing countries is presented. Geneticists, environmentalists, toxicologists, and many other specialists, not only in developing countries, will find this book a valuable acquisition.

T. Gichner (*Praha*)

Ory, R. L., Ritting, F. R. (ed.): Bioregulators. Chemistry and Uses. ACS Symposium Series 257. — American Chemical Society, Washington 1984. US + Canada $ 44.95; elsewhere $ 53.95.

Plant growth regulators (PGR) are often considered to be tomorrow's tool for increase of yield and improvement of quality of crops to meet the needs of rising world population at a decrease in land available for production of food and fiber. The first practical application of auxins as root inducers was realized more than fifty years ago. However, most of inspiration in this respect was created in the 1950' after a successful use of gibberellin antagonists for reduction of lodging and increase of yield of cereals. During the last two decades considerable knowledge has been accumulated of biological functions of individual classes of plant hormones. For practical use of PGR it is especially important to know how to influence synthesis, accumulation and action of natural fytohormones using their analogues, antagonists and generators and some other compounds which interfere with their metabolism. This knowledge has already been used for large-scale practical application of PGR as ripeners of sugar cane, stimulation of latex flow in *Hevea*, for reduction of growth and increase of yield of cereals and cotton, and for programming rice seedling propagation. Some of these achievements and other promising prospects of use of physiologically active substances in agriculture are described and discussed in the present book, which is based on the symposium sponsored by the Division of Agricultural and Food Chemistry of the American Chemical Society in Washington, D.C., 1983.

Most of the 21 contributions deal with the use of PGR for improvement of the quality and/or increase of yield of different crops including cereals, rice, legumes, soybeans, peanuts, fruit trees, beans, pecan and cotton. PGR realize their effect by influencing growth and structural and metabolic differentiation, which involve many processes of practical importance as *e.g.* apical dominance, senescence, organ abscission, fruit color development, induction of flowering and fruit set. These aspects of action of of PGR are described and discussed in chapters devoted to special crops. Specialized chapters deal with effects of PGR on toxin production in fungi, production of biologically active compounds by these organisms, chemical modification of plant resistance to insects and temperature extremes and with microbial induction of phytoalexin synthesis in plants. Information about the chemistry of PGR is mostly focused on problems of structure-activity relationships.

As is usual in books based on symposia, the present one is not a comprehensive source of information. On the other hand the reader finds there detailed information about specialized topics. It can be recommended to plant physiologists, molecular biologists, agronomists and chemists interested in pesticides and herbicides. They find there not only valuable data and information but also stimulating ideas for further research.

M. KAMÍNEK (*Praha*)

SUNDERMAN, F. W. JR. (ed.): NICKEL IN THE HUMAN ENVIRONMENT. IARC Scientific Publications No. 53. — International Agency for Research on Cancer, Lyon 1984. 530 pp. £ 30.00.

The interest in and awareness of the quality of our environment has increased over the years. Several metals occurring in the natural environment are widely recognized as constituting a carcinogenic and mutagenic risks to humans. The objective of this volume, representing the proceedings of a symposium held at IARC, Lyon, France 1983, is to give an overview of the potential health effects of nickel. The metal is of great economic importance and finds its use in welding, alloying, plating *etc.* The introductory part of the publication covers epidemiological studies on nickel exposure in refineries and hazards outside refineries, *e.g.* in nickel alloy and nickel salts manufacture. Health risks of nickel compounds are focused mainly on the potential effects of low-level chronic exposure. The subsequent presentations cover various aspects of nickel carcinogenicity. Objects of discussion are topics such as the effects of nickel in cell culture, the mutagenicity of nickel and nickel compounds, the molecular basis of nickel effects, Z-form induction in DNA by nickel compounds *etc.* The section on metabolism and toxicity includes presentations on nickel as an essential element and on toxicity and genotoxicity as well as clinical effects of this element. Finally, current knowledge of environmental nickel pathways to man, human exposure to nickel and analytical chemistry of nickel are reviewed. Leading experts have contributed up-to-date articles covering all aspects of nickel health hazards. A broad spectrum of users, ranging from chemists working in industry and toxicologists to public officials engaged in control of pollution problems will find the book very interesting.

J. ŠATAVA (*Praha*)

TIMMERMANN, B. N., STEELINK, C., LOEWUS, F. A. (ed.): PHYTOCHEMICAL ADAPTATIONS TO STRESS. Recent Advances in Phytochemistry, Vol. 18. — Plenum Press, New York—London 1984. 334 pp. Hardcover US $ 49.50.

Adaptations of plants to various abiotic and biotic stresses allow them to survive adverse environmental conditions, frequently imposed by the man. Knowledge of adaptation mechanisms can help not only to prevent damage to plants but also to influence accumulation of certain secondary metabolites in plants of economic importance. The present book deals with phytochemical aspects of this problem. It originated from contributions presented at the 23rd Annual Meeting of Phytochemical Society of North America, Tuscon, Arizona, 1983, and is focused especially on the production of secondary metabolites by higher plants in response to stress conditions. The authors paid attention to the (1) synthesis and accumulation of various secondary metabolites, (2) their function in plant adaptations and (3) the potential use of knowledge of adaptation mechanisms to influence production of economically important metabolites, in both intact plants and tissue cultures.

Readers will find here information about the relation of diamine putrescine in plants to potassium deficiency and its relation to nitrogen nutrition (T. A. Smith), and aspects of osmotic adaptations and function of organic cytosolutes in these processes (R.G.W. Jones). Adaptation of plants to various mechanical perturbations (thigmomorphogenesis) is discussed from the point of view of the role of plant growth regulator ethylene and 1,3,-β-glucan callose in structural changes of plant organs (J. Jaffe and F. W. Telewski). The effect of stress on secondary metabolism

in plant tissue cultures is discussed by F. DiCasmo and G. H. M. Towers. Manipulation with and easy control of chemical composition of the nutrient media and of other conditions of cultivation are unique advantages of tissue cultures. Secondary metabolites produced *in vitro* include some compounds which have not been found in respective intact plants. Temperature stress and its relation to the membrane lipid modification which involves accumulation of unsaturated lipid fraction is described by M. N. Christiansen, and the adaptation of *Gossypium* to pests by A. A. Bell. Slightly out of scope of this volume is the chapter on bioregulation of synthesis of plant constituents, isoprenoid compounds in particular. Production of resins by arid-adapted plants is one of many mechanisms of plant adaptation to heat and water-deficiency stresses. J. Hofman *et al.* discuss this problem using the tribe of *Asteraceae* as example, having in mind that resins represent a potential intermediates for chemical industry. A similar point of view presents J. Gershenzon in the closing chapter dealing with changes in the levels of plant secondary metabolites under water and nutrient stress.

Most of the chapters of this interesting book deal with very specialized topics. This makes the book interesting especially to advanced students and researchers in plant physiology, biochemistry, genetics and ecology. They will find there up-to-date information and original ideas which can be used in plant biotechnology, especially in tissue cultures. For easy orientation the book contains species and subject indexes and full text references.

M. KAMÍNEK (*Praha*)

WALTER, H., BRECKLE, S.-W.: ÖKOLOGIE DER ERDE, BAND 2. SPEZIELLE ÖKOLOGIE DER TROPISCHEN UND SUBTROPISCHEN ZONEN. — Gustav Fischer Verlag, Stuttgart 1984. 461 pp., 330 figs. DM 48,—.

The second of the three volumes of the book Ökologie der Erde is devoted to the terrestrial ecosystems in the tropical and subtropical zones of the Earth.

The conception of the work issues from modern ecosystem analyses of biomes of the individual zones (incl. the altitude zonation and azonal biomes) and from the interrelations between the system components (producers, consumers, destroyers) documented by a number of new interesting data. The biome environments are characterized mainly by macro- (or micro-) climatic and soil conditions. Attention is naturally centred on the vegetation, with emphasis on its functional, morphologic-anatomical adaptations to the environment. Information on the water relations, transpiration, photosynthesis and production of plants is included. Within each climatic zone an area is chosen, which is analysed in detail and serves as an example of the ecological pattern of the whole zone.

Although some data and figures are known from the earlier books of prof. Walter, their use and presentation of the matter is new and enriched by numerous valuable results of field measurements. The individual chapters will be appreciated for assembled quantitative data, *e.g.* concerning transpiration or production of tropical and subtropical plants, which characterize the biotome types most adequately. Although there is a conversion table of old to SI units in the Appendix, the SI units are not used consistently in the text.

The book is again written with clarity and pedagogical explicitness, so characteristic of the first author, and an abundance of thought-provoking ideas, as well. In the period of "ecological biome" the book, in presenting serious information and considerations, will successfully outweigh the heaps of publications that deal with ecological problems on a superficial and often utilitarian level.

JIŘINA SLAVÍKOVÁ (*Praha*)

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to the paper by S. STROTHER, R. VATTA, Biol. Plant. **28** (3) : 211—218, 1986; p. 212. — Paragraph Catalase Activity: For (2000—4000 mg) read (200—400 mg), and

to the paper by K. AULIO, Biol. Plant. **28** (3) : 234—236, 1986; p. 235. — Caption to Table 1 : For X.E. read S. E.

We apologize to our authors and readers for this inconvenience.