

MENGEL, K., KIRKBY, E. A.: PRINCIPLES OF PLANT NUTRITION. — International Potash Institute, Berne 1978. 581 pp.

The book is meant for students and scientists working in the field of plant nutrition and yield production. It begins with general chapters: plant nutrients, the soil as a nutrient medium, the absorption of nutrients and assimilation, water and the plant, the nutrition and growth of plants, the application of fertilizers. The subsequent chapters deal with individual biogenous elements: N, S, P, K, Ca, Mg, Fe, Mn, Zn, Cu, Mo, B and others, such as Cl, Si, Co, V. The publication ends with the chapters on elements with toxic effects: J, Br, F, Al, Ni, Cr, Se, Pb, Cd. Emphasis is laid on the definition, classification and content of nutrients in plants, with the reference to the biochemistry of elements in the plant organism, *e.g.* the changes in their content in the course of growth. The chapter on the soil is concise and more attention is paid to the dynamics of soil processes, *e.g.* adsorption and ion exchange, especially in clay minerals. The authors did not omit the water conditions in soil, the soil atmosphere, pH of the soil in relation to the availability of nutrients. The soil organic matter, however, is discussed too briefly, although with regard to the significance of humic acids for the exchange capacity, their structure, content and function would require more attention.

A characteristic feature of the book is the dynamic explanation of processes, *e.g.* the nutrient absorption is presented from the point of view of primary processes of ion exchange and diffusion. The chapter on the leaf and tissue analysis is well arranged.

The chapter "Nutrient absorption and assimilation" presents the latest results of the study of membranes, mechanism of nutrient uptake in relationship to metabolism, carrier theory, ion pump, active and passive transport, and refers to the measurement of membrane potentials. A chapter is devoted to permeability, antagonism and synergism of ions. The chapter on CO₂ assimilation elucidates the individual mechanisms of photosynthesis.

The chapter on nitrate and sulfate assimilation gives a good survey of the reduction of nitrates and sulfates and nitrogen fixation, their association with other metabolic processes being emphasized. The chapter concerning water relations of plants deals with phloem transport and its significance in nutrient redistribution. The effects of water stress and antitranspirants are presented with their practical application in view.

If the strong point of the publication for the readership mentioned lies in the chapters on the nutrition and growth, for physiologists there are instructions of the relationships between the production, yield and nutrition. They are accompanied with a great number of tables and figures, as are the other chapters. The explanation of the relationships between photosynthesis, nutrition and yield curves is stimulating in many respects. The chapter on phytohormones would be suitable on this place.

The last of the general chapters involves the application of biogenous elements in the form of chemical fertilizers and manures. Besides general aspects of the application of industrial fertilizers with examples of the relationship between their dose and yields, energy, the concluding chapters discuss the industrial fertilizers and environment, as well as the relationship between industrial fertilizers and manures. The authors' conclusion might be completed as follows: organic matter stabilizes the effect of industrial NPK fertilizers.

The subsequent chapters which deal with the individual biogenous elements, have the same arrangement: the element in the soil and its availability, its physiology, nutrition. The individual chapters again give sufficient data, a large number of references and an excellent combination of theoretical knowledge with the application in agriculture. It is to advantage that the soil types are also taken into account, *e.g.* in the chapter on phosphorus, even if *e.g.* the forms of organic phosphorus in the soil would merit more attention. The advantage of this publication is the combination of chemistry and physiology, leading to practical measures in the production of yields. This is true for all chapters on biogenous elements.

The concluding chapter discusses the elements with toxic effects, especially those whose toxicity is caused by the concentration and biochemical effects, as is the case of F, Cr, Se, Pb, Cd, most of them being major chemical pollutants requiring further investigation.

The book is documented by a rich list of references, which does not involve larger geographical

This would have been to advantage with regard to the theory of yield production under ecological conditions. The book may be recommended to a broad circle of physiologists,

Note those who do not directly deal with nutrition.
acid (ACC) wa
Plant Physiol.
physiol. 92 : 285
to metabolize the

F. POSPÍŠIL (*Praha*)

POTASSIUM IN BIOCHEMISTRY AND PHYSIOLOGY. — International Potash Institute, Berne 1971. 229 pp.

The publication involves the proceedings of the 8th Colloquium of the IPI, which took place in Uppsala (Sweden) on June 14–17, 1971, headed by P. Chaudet, president of the IPI, and with D. Jelenić (Beograd), K. Mengel (Hannover) and R. Bach (Zürich) as chairmen.

The book has two parts dealing with the significance of potassium for plants (150 pp.) and animals (70 pp.). The extensive introductory review by H. J. Evans and A. Wildes (Corvallis, Oregon) "Potassium and its Role of Enzyme Activation" is documented by abundant literature.

The main modern problematics in the discussed field concerns especially two questions. The first may be expressed by the contribution of H. Marschner (W. Berlin): "Why Can Sodium Replace Potassium in Plants?" It was answered and explained by a very erudite contribution by A. Kylin and G. Hansson (Stockholm), based mainly on their study of the activity of transport ATPase. Their thesis of double way of Na^+ secretion from the protoplast is very stimulative: besides the system situated on the plasmalemma secreting Na^+ from the cell, they suggest the presence of a system on the tonoplast in various plants (cultivars), which actively secretes sodium into the vacuole.

The second group is characterized *e.g.* by the contributions of Y. Coïc and C. Lesaint (Versailles) and F. van Egmond (Wageningen). The subject of their study was the overall balance of cations in relationship to potassium, or to anions and metabolic processes in selected cultivated plants.

The following contributions dealt with the role of potassium in the mechanism of stomata movement (W. Höfner — Giessen, and G. Trolldenier — Hannover). A. J. Brereton and G. A. Fleming (Wexford, Ireland) delivered interesting papers considering the relationship between the root sorption and distribution of P, K^+ and other cations in plants.

The book is a suitable aid for biochemists and biologists of various branches, especially for those seeking the explanation of this function on the level of subcellular and molecular processes.

M. DVOŘÁK (*Praha*)

JACQUIOT, C.: ÉCOLOGIE DES CHAMPIGNONS FORESTIERS. — Gauthier-Villars, Paris 1978. 94 pp., F 49,—.

This book is an important contribution to the ecology of forest fungi. It has appeared in the series "Écologie fondamentale et appliquée" edited by R. Dajoz. All fungi groups which are important in forest plant nutrition and their health are described, namely parasitic, saprophytic and symbiotic fungi. The main group of the parasitic fungi includes the fungi attacking the seeds, seedlings, leaves and other tree parts. Especially the wood-destroying fungi are dealt with. Of the symbiotic fungi, ecto- and endotrophic mycorrhizal fungi are discussed in more detail. Less attention is given to antagonism between individual groups of fungi and to the fungi-animals relationships.

This paperback edition will be useful as a source of fundamental information in forest mycology and phytopathology.

VLASTA ČATSKÁ (*Praha*)

POSPÍŠILOVÁ, J., SOLÁROVÁ, J. (ed.): WATER-IN-PLANTS BIBLIOGRAPHY. Vol. 3, 1977. — Dr. W. Junk by Publishers, The Hague 1979. 111 pp. Dfl 55.00, US \$ 28.50.

All scientific workers interested in the physiology of water relations in plants must be pleased by the third volume of bibliography, which, in continuation to the Volumes 1 and 2, included citations of more than 1200 papers and books published in 1977 (references Nos. 2480–3686).

The scope of the bibliography is surprisingly wide — from the state and transport of water studied on the cellular level to the field applications. We can also find here many papers from other branches of science, in which plant-water relations are only of secondary importance, as well as papers describing methods useful for estimation of water state in plants or in their environment.

The references are presented alphabetically according to the names of authors and with the original unshortened title of the paper. Full attention is given to the uniform transcription and transliteration of names from languages other than English, French or German.

Three indexes appended to the book (author, plant, and subject index) are elaborated in detail and very thoroughly. They are most useful for the readers, as to find an appropriate in-

formation is very quick and easy. We can only hope that some further volumes of *Water-in-Plants Bibliography* cumulative indexes will be prepared.

How valuable is a good bibliography for any scientist is generally known. We may only express our thanks to the authors and to the publisher for their perfect work.

J. GLOSER (*Brno*)

BONOTTO, S., KEFELI, V., PUISEUX-DAO, S. (ed.): *DEVELOPMENTAL BIOLOGY OF Acetabularia*. — Elsevier/North-Holland Biomedical Press, Amsterdam—New York—Oxford 1979, pp. 312, US \$ 49,00, Dfl. 110.00.

Owing to its specific features (large unicellular photosynthesizing organism with conspicuous nucleus good for studying metabolic and growth processes as well as genetic problems) *Acetabularia* has become one of the most popular algae used for research. The fifth special international meeting dealing with this organism was the Round Table held in Moscow on 22nd to 23rd August, 1978, during the XIV International Genetical Congress. Its proceedings were published as Volume 3 of the series "Developments in Cell Biology" in a photo-offset form, which ensured an early appearance of the book. 107 participants and contributors given in the list presented 32 papers dealing with three main topics.

The introduction (S. Bonotto) reviews the elementary findings on this organism. Eleven papers of Part 1 deal with the ecology (in the Mediterranean Sea and Japan), biology (modes of reproduction, behaviour in culture, growth substances, effects of γ -radiation, cytosol streaming, membrane potentials), and morphogenesis (formation, regeneration) of the *Acetabularia* cell.

Second part also contains 11 papers, which discuss the most important organelles — nucleus (ultrastructure and its development) and chloroplast (genome and nucleic acids, size, differentiation and evolution, thylakoid arrangement, movements, plastoquinone content, diurnal cycles of photosynthesis and polysaccharide synthesis).

The last part (9 papers) describes the metabolic pathways of nucleic acids and proteins and their migration through cell, cell enzymes (including ribulose-1,5-bisphosphate carboxylase and malate dehydrogenase), catabolism of saccharides, etc.

The editors succeeded in preparing the volume in a very short time, not having unified the abbreviations, units, form of figures, etc. Glossy paper ensured a good reproduction of microphotographs. The editors put some photographs of general informative value on vacant pages (pp. 140, 154, 168, 178, 220, 222, 232, and 254) which is rather misleading. They supplemented the volume with a good subject (why not author?) index.

The volume presents a collection of papers interesting for algologists, plant physiologists, biochemists and geneticists, with a larger participation of papers of Soviet authors (9) than is usual in similar publications.

Z. ŠESTÁK (*Praha*)

MOHR, H., SCHOFFER, P.: *LEHRBUCH DER PFLANZENPHYSIOLOGIE*. Dritte, völlig neubearbeitete und erweiterte Auflage. — Springer Verlag, Berlin—Heidelberg—New York 1978. 608 S. 639 Abb. 35 Tab. Gebunden DM 78,—. US \$ 39.00.

Mit diesem Buch bekommt der fortgeschrittene Student ein ausgezeichnetes, modernes Lehrbuch in die Hand, welches ihm eine völlig neu gestaltete Darstellung der gesamten Pflanzenphysiologie mit molekularbiologischen, biophysikalischen und biochemischen Aspekten bietet. Ausgegangen wird von der Grundeinheit des Pflanzenorganismus — der lebenden Zelle, die zuerst als morphologisches, genphysiologisches und teilungsfähiges System behandelt und die Morphogenese der einzelnen Zellorganellen wie Mitochondrien, Plastiden und Microbodies beschrieben wird. Es folgen Kapitel über allgemeine Gesetzmässigkeiten des Energiehaushalts und des Stoffwechsels der Pflanzenzelle und spezielle Kapitel über Photosynthese, Dissimilation und Photorespiration. Als besonders gelungen finde ich hier das Kapitel über das Pflanzenblatt als photosynthetisches System, wo über dieses komplizierte Multifaktorensystem, die möglichen Regulationen (auch Stomata) und die Adaptationsfähigkeit des Blattes berichtet wird. Der photosynthetische Abschnitt des Buches wird mit einem Kapitel über die C₄-Pflanzen und die CAM-Pflanzen abgeschlossen. Zum Stoffwechselabschnitt des Buches gehören noch Kapitel über den Stoffwechsel der anorganischen Ionen, des Wassers, über den Stoff- und Energiekreislauf und über die Biogenese wichtiger Verbindungen in der Pflanze, z. B. die Chlorophyllbiogenese. Weiter enthält das Lehrbuch Kapitel über die Entwicklungsphysiologie (Wachstum, Differenzierung, Morphogenese) und spezielle Kapitel über Photomorphogenese, die Physiologie der Hormon-

wirkung, der Blütenbildung und des Photoperiodismus, der circadianen Rhythmen, der Seneszenz und Ruhezustände, der Regeneration und Transplantation und der Tumorbildung. Ebenfalls der Wasserfern- und Ionentransport und der Phloemtransport werden gesondert behandelt. Es folgen Kapitel über die Bewegungsphysiologie, einbezogen die Bewegungen der Chloroplasten, Pollenschläuche usw., über die Physiologie der Sexualität, des Generationswechsels und schliesslich über die Physiologie der Ertragsbildung. Das Buch schliesst mit einem Anhang der wichtigsten SI-Einheiten und der zitierten Literatur (kurze Literaturverzeichnisse stehen ebenfalls am Ende jedes Kapitels) nebst einem Sachregister.

Die neue Aufteilung der Pflanzenphysiologie in diesem Lehrbuch (49 Kapitel) hat ihre Vor- und Nachteile. Die einzelnen Kapitel sind bestimmt Übersichten mit präziser Fragestellung und klar abgegrenzter Thematik, jedoch ist man auf der anderen Seite in der Situation, dass man z. B. Informationen über den Wasserhaushalt der Pflanzen in den verschiedensten Kapiteln wie energetischer Stoffwechsel der Zelle (Wasserpotential), Blattphotosynthese (Spaltöffnungen), Stoffwechsel des Wassers, Ferntransport des Wassers usw. findet. Nichtsdestoweniger finde ich das Buch als sehr gelungen für fortgeschrittene Leser, mit einer Fülle von Information, die sehr pädagogisch an experimentellen Beispielen erläutert wird, mit entsprechender weiterführenden Literatur, mit vielen Abbildungen und Tabellen. Das Buch ist tadellos gedruckt. In einer Neuauflage des Lehrbuches würde ich empfehlen die umfangreichen Legenden zu den Abbildungen noch besser graphisch vom eigentlichen Text zu trennen, zu unterscheiden; auf manchen Seiten ist die Gliederung etwas unübersichtlich.

Ich wünsche diesem vorzüglichen Lehrbuch der Pflanzenphysiologie viele begeisterte Leser.

INGRID TICHÁ (*Praha*)

AMBERGER, A.: PFLANZENERNÄHRUNG. ÖKOLOGISCHE UND PHYSIOLOGISCHE GRUNDLAGEN. (Uni-Taschenbücher 846). — Verlag Eugen Ulmer, Stuttgart 1979. 237 S. 103 Abb. 72 Tab. DM 19,80.

Der Inhalt des Büchleins ist in vier Abschnitte eingeteilt. Einleitend wird das Fachgebiet Pflanzenernährung definiert und abgegrenzt und kurz die geschichtliche Entwicklung dargestellt. Es folgen Kapitel über die Bedeutung von einzelnen ökologischen Faktoren wie Licht, Temperatur, Luft (N_2 , O_2 , CO_2), Boden und Wasser für die Pflanzen und deren Ernährung. Der nächste Abschnitt behandelt die physiologischen Grundlagen der Pflanzenernährung und hier wird über den Wasserhaushalt, die Aufnahme und den Transport anorganischer und organischer Stoffe, über Wachstums- und Entwicklungsregulation sowie über die Pflanzenernährung selbst und die Ertragsbildung gesprochen. Weiter werden Ökologie und Stoffwechsel der einzelnen Nährelemente eingehend behandelt. Das Büchlein schliesst mit einem kurzen Literaturverzeichnis (nur Review und Bücher) und einem Sachregister. Die Ausstattung des Buches ist tadellos, sehr instruktiv sind die zahlreichen Abbildungen und Schemata, praktisch ist der flexible Kunststoffeinband.

Vorliegendes Taschenbuch bietet eine Übersicht über die physiologischen und ökologischen Grundlagen der Pflanzenernährung und ist für Studenten der Biologie, Ökologie, Landwirtschafts- und Gartenbauwissenschaften sowie Ernährungswissenschaften, Nahrungsmitteltechnologie und ähnlicher Disziplinen bestimmt.

INGRID TICHÁ (*Praha*)

MÜNTZING, A.: TRITICALE: RESULTS AND PROBLEMS. Fortschritte der Pflanzenzüchtung, Beihefte zur Zeitschrift für Pflanzenzüchtung, Heft 10. — Verlag Paul Parey, Berlin—Hamburg 1979. 103 pp., 15 figs., 2 tabl. Boards DM 58,—.

The name triticale is now used as a technical, not taxonomic, term for allopolyploids produced after crossing different species of wheat and rye, wheat being the maternal plant. Amphiploids, produced from allopolyploid F_1 hybrids by the fertilization of unreduced gametes or by chromosome doubling by colchicine, or another method, have attracted attention of genetic researchers and plant breeders for a long time. Various, often very different findings, have been reviewed and evaluated from different view-points. The last exhaustive and broadly conceived work of this character is the book of Prof. Dr. A. Müntzing, who has spent many years in triticale research and breeding.

The introductory chapter on history and terminology is followed by a survey of findings on the cytogenetics and cytogenetic instability of different types of amphidiploids (primary octoploid, hexaploid, tetraploid and decaploid triticale, secondary, mainly hexaploid types after

crossing octoploids and hexaploids and after crossing hexaploids with hexaploid wheat, during which some chromosome pairs of rye are substituted by wheat D genome chromosomes). The further text concerns the causes and effects of aneuploidy, meiotic irregularities, different cytoplasm, combination of a self-pollinated and allogamic species with different DNA replication time, genes influencing chromosome pairing, and the use of a self-pollinated rye lines for influencing the instability and low fertility of amphiploids. The unfavourable effect of telomeric heterochromatin of rye and the favourable effect of its smaller proportion, and of the substitution of some rye chromosome pairs by genome D chromosomes are described.

The causes of other drawbacks and advantages of different forms of triticale are also discussed, together with the possibilities of further improvement and practical use. This complex range of problems, still remaining obscure in part, and involving contradictory views, is summarized and critically evaluated after a thorough study of world literature. Comprehensive subject and author indexes facilitate orientation.

J. KUČERA (*Praha*)

WAREING, P. F., PHILLIPS, I. D. J.: *THE CONTROL OF GROWTH AND DIFFERENTIATION IN PLANTS* 2nd Edition. — Pergamon Press, Oxford — New York 1978. 347 pp.

Since its first edition in 1970 this title has become one of the most popular textbook on plant development. It deserves such popularity being a reliable source of facts (on quantitative aspects of growth, on patterns in differentiation at tissue and organ levels, on plant hormones and their mode of action, on ontogenetic stages and their intrinsic and environmental control) and at the same time introducing some general principles of developmental biology (as *e.g.* the dogma of molecular biology) to plant physiology. The text is well balanced as the physiological explanation is always extended by structural and ecological aspects.

Besides rewriting and extending large sections of the first edition to make it up-to-date authors added the chapter on Phytochrome and Photomorphogenesis. The 2nd edition thus contains following chapters: Growth in the Higher Plants, Patterns of Growth and Differentiation, Plant Growth Hormones and Their Metabolism, Mechanism of Action of Plant Growth Hormones, Hormonal Control in the Whole Plant, Aseptic Culture Methods in Studies of Differentiation, Growth Responses to Directional Light and to Gravity, Phytochrome and Photomorphogenesis, The Physiology of Flowering — I. Photoperiodism, II. — Temperature and Other Factors, Dormancy, Senescence and Abscission, The Control of Development.

The book is provided with an excellent selection of illustrations from relevant literature (most of the figures became a real visualization of developmental processes for the whole generation of biologists) and each chapter is supplemented by a comprehensive literature for further reading.

I feel the book does not need any special recommendation as it is an improved version of what was already considered an excellent introduction to plant development. It should be on the book shelf not only of undergraduate students but also of professionals in botany and developmental biology.

J. KREKULE (*Praha*)

CALOW, P.: *LIFE CYCLES. An evolutionary approach to the physiology of reproduction, development and ageing.* — Chapman and Hall, London 1978. 164 pp., £ 3.50.

The author considers the problem "how organisms optimize the utilization of their energy and resource input in order to maximize their output of genetic information" to be a fundamental goal of organismic biology and deals with it within this paperback volume. Physiology, developmental biology, ecology and evolutionary biology are employed to treat the organism as a dynamic system in order to answer many "why" related to its ontogenetic and evolutionary strategy of reproduction. Strictly interdisciplinary approach and a continuous attempt to use illustrative material referring to a wide range of taxons makes the book a welcome contribution to the literature in general biology. Whenever possible, the quantitative aspects of the given problem are outlined.

The book consists of four main parts. The introductory one is entitled life's logic and deals with the evolution of self-replicating systems and the cycling of life of an organism. The other three parts are devoted to growing, reproduction and ageing, *i.e.* to common stages of any life cycle. The problems dealt with cover such topics as *e.g.* life as an energy transforming system,

ife as a dynamic steady state, quantitative aspects of reproduction (when to reproduce and by how much), the problem of ageing by accident or by design.

Although the author, himself a lecturer in zoology at the University of Glasgow, includes many examples from plant life, a botanist might still feel there are more possibilities of demonstrating on plant material, *e.g.* ageing by design or adaptive significance of growing which were not fully appreciated. Such bias is necessarily inherent in any one-man written generalizing book but is harmless with respect to its overall character.

The book is clearly written, provided with comprehensive literature and highly illustrative drawings and graphs. An inspiring reading to all-levels specialists in bio-sciences who are aware of the importance of general biology. I read it with pleasure.

J. KREKULF (*Praha*)

SCHÄFER, G., KLINGENBERG, M. (ed.): *ENERGY CONSERVATION IN BIOLOGICAL MEMBRANES*. — Springer-Verlag, Berlin—Heidelberg—New York 1978, 287 pp., DM 68.—, US \$ 37.40.

The 29th Colloquium of the Society of Biological Chemistry in the F. R. G. was held in Mosbach/Baden in April 1978. Its dedication to the 65th birthday of Britton Chance decided the topic of 24 papers presented and published in the reviewed volume.

The papers are arranged in four sections identical to those of the Colloquium. Out of nine papers of the first section, "Organization of Electron Transport Systems", seven are dealing also with plant material: H. Baltcheffsky reviews the evolution of biological energy conversion systems, Y. Hatefi and Y. M. Galante the organization of mitochondrial respiration chain, H. Weiss the biogenesis of ubiquinone: cytochrome *c* oxidoreductase multiprotein complex, G. Buse the common phylogenetic origin of cytochrome oxidase and electron carriers of photophosphorylation, B. Chance *et al.* electron tunneling in the cytochrome *c*-cytochrome oxidase reaction, L. H. Jensen the structures and functions of rubredoxin, ferredoxin and similar compounds, and A. Trebst the localization of photosynthetic electron transport system in the thylakoid membrane. In the second section, "Primary Mechanisms of Energy Conservation", H. T. Witt *et al.* review the function of plastoquinone pool in hydrogen pumping, W. Junge *et al.* time and space resolution of proton pumping in chloroplasts, D. Oesterhelt *et al.* proton translocation in *Halobacterium*, at present a very popular research organism with a special mechanism of photosynthesis, and B. Hess *et al.* the reactivity of bacteriorhodopsin, the acting pigment of *Halobacterium*. Animal and bacterial materials are dealt with in the section "Structure and Function of ATP-synthesizing Systems", except for the papers by G. Schäfer *et al.* on inhibitors of photophosphorylation and oxidative phosphorylation, and by W. Sebald and E. Wachter on the ATPase complex. The last section "Control and Dynamics of Energy Conservation" brings two papers on oxidative phosphorylation.

The editors had probably only one goal: to prepare a rapid publication of the Colloquium papers. They succeeded in this respect. Unfortunately, they did not try to provide all papers with abstracts (only a few of them contain a summary or conclusions), to unify the style of references, and to prepare subject and authors indexes. This lowers the value of the proceedings, which reflect the present state of research in this important field.

Z. ŠESTÁK (*Praha*)

JOHARI, O. (ed.): *SCANNING ELECTRON MICROSCOPY 1978/I. An International Review of Advances in Instrumentation, Techniques, Theory and Physical Applications of the Scanning Electron Microscope*. 898 pp., US \$ 19.—.

BECKER, R. P., JOHARI, O. (ed.): *SCANNING ELECTRON MICROSCOPY 1978/II. An International Review of Advances in Biological Techniques and Applications of the Scanning Electron Microscope*. 1134 pp. US \$ 21.—. Two volumes US \$ 34.50. — Scanning Electron Microscopy, Inc., P. O. Box 66507, AMF O'Hare, IL 60666, USA.

Annual SEM meeting is now organised by the Scanning Electron Microscopy Inc. The Proceedings are edited as an Annual Journal focused on the critical review of all news in instrumentation, techniques of SEM application and results obtained with SEM and related methods. It should be said that the aim was successfully achieved. The improvement of the reviewing system in that the names of the reviewers (if they agreed, of course) were disclosed opened in fact a new way of critical communication, which can initiate new fruitful working contacts.

Fifteen reviews, 8 tutorials and 76 original papers in the first volume serve either directly or indirectly via presentation of new stimulative findings or methods to the idea expressed in the Keynote lecture: "How to get the best from your SEM", by Pfeifferkorn, Boyde and Blaschke. For example, the review of new techniques of STEM lithography or on real TV time 3D SEM systems and many others provide stimulating data for important SEM applications in microelectronics. Besides physicists, biologists can also profit from reading volume I, as papers such as factors in high resolution of biological structures in TEM and Scanning Laser Acoustic Microscope (SLAM) are very topical for them. With SLAM, which uses acoustic waves for generating the image of the internal structures of the observed object on the basis of material and mechanical differences, it is possible to render the interior of a living tissue fragment in organ culture visible which is otherwise opaque for light microscope inspection.

Volume II contains 136 original papers, 9 reviews and 4 tutorials. It is impossible to review all new data and approaches in detail. It is a reliable topical reference book for all kinds of biologists. The most valuable approach I see in communications describing the use of complementary microscopic techniques for either cross-identification of particular cells or functional stage, or for deciphering the relationship between cell interior and surface, such as the study on the mechanism of erythrophagocytosis by stimulated macrophages (Biemesderfer *et al.*) or Chen's "Impact of lipid A from endotoxin on endothelium" and "A systematic SEM analysis of mitotic cells in monolayer culture" by Wetzel *et al.*, who identified mitotic cells by Feulgen staining". A very advanced approach was shown by Tennenbaum *et al.* They employed the combination of secondary electron imaging of cell surfaces and backscattered electron imaging for visualising cell nuclei, and nuclear-cytoplasmic ratio correlated with TEM for analysis of neoplastic uroepithelium dedifferentiation and invasion. The mechanism of invasion in this case between parasitic fungus and rose was studied (Parmer *et al.*) with SEM and LM in order to define a particular stage in the mutual interaction between the parasite and the host, which would be suitable for the development of an efficient control by pesticides. In conclusion, it is necessary to say that both the SEM/78 volumes represent a great leap in the Annual SEM Symposia and bring the information on new data, techniques and instrumentation in a way which is invaluable for workers in various fields.

P. VESELÝ (Prahá)

GRIMME, K.: WASSER- UND NÄHRSTOFFVERSORGUNG VON HANGBUCHENWÄLDERN AUF KALK IN DER WEITEREN UMGEBUNG GÖTTINGENS. Scripta Geobotanica Band 12. — Verlag Erich Goltze KG, Göttingen 1977. 58 pp. DM 15,—, in German.

This specialized booklet deals with the ecological investigation of the Leine-Werra-region — a typical part of the mountain and hill landscape. The main research topics were the annual course of water available for plants in three selected associations (*Carico-Fagetum*, *Melico-Fagetum* and *Vincetoxico-Tilietum*), microclimatic parameters within these plant communities, and nitrogen net mineralization in soil. Experimental data are presented in 14 tables and 24 figures. From the results obtained during investigation the author determined ecological factors decisive for the formation of plant communities in this region.

The booklet is very interesting and will be certainly welcome by specialists in this field as a valuable source of new information.

JANA POSPÍŠILOVÁ (Prahá)

THORPE, T. A. (ed.): FRONTIERS OF PLANT TISSUE CULTURE 1978. — (Proceedings of the 4th International Congress of Plant Tissue and Cell Culture held at the University of Calgary, Alberta, Canada, August 20–25, 1978). Published by the International Association for Plant Tissue Culture 1978, distribution: University of Calgary, Calgary, Alberta T2N 1N4, Canada. XIV + 556 pp. \$ 16.00.

A set of 48 main papers forming the framework of the last world congress of IATPC is published together with a comprehensive report on the round-table discussion — 14 topics — and a report on poster demonstrations (which tries to summarize on less than 9 pages the most remarkable facts from more than 300 reports demonstrated). Thus, the task of the editor was not easy with respect to the significance of the Congress, its extent and the heterogeneity of the problematics dealt with — biochemical, physiological, genetic and others. The book was obviously for this reason divided into individual thematic chapters corresponding essentially to the time program of Congress sessions (The Impact of Plant Tissue Culture on Industry and Agriculture —

2 reviews; Regulation of Morphogenesis — 4; Genetic Manipulation — 4; Anther Culture — 3; Protoplasts and Hybridization — 3; Synchronous Growth and Biochemical Regulation — 3; Secondary Metabolism I — 3; Cell Structure — 2; Plant/Virus Interaction — 2; Cell and Organ Culture — 2; Genetic Stability and Cell Preservation — 2; Growth Regulation — 3; Secondary Metabolism II — 3; Plant/Microbe Interaction — 2; Mutagenesis — 2; Applied Morphogenesis — 4; Primary Metabolism — 4). Although the orientation is facilitated by two supplements — "List of Plants and other Organisms Cited" and "Subject Index", bonds between individual logically related thematic topics (metabolism; regulation of the growth and morphogenesis; genetic manipulation — somatic hybridisation *etc.*) are unpleasantly interfered with. However, this drawback is nearly the only one for which the book can be blamed. Especially agreeable is the high quality of most reviews, which try to confront results obtained with very different model materials — not only with tissue cultures but also with intact plants or with procaryota. This attitude can be appreciated not only as a great improvement on the proceedings of the last Congress (1974) and as a demonstration of methodical advantage of the application of tissue cultures to all branches of experimental botany, but also as a proof of the value of this book for a broad spectrum of the scientific public.

The introductory two chapters — and not only these — exhaustingly document the existing possibilities of commercial utilization of plant tissue cultures especially in plant propagation and in obtaining disease-free plants, as well as the perspectives of their utilization in the fermentation industry. The problematics of the study and application of plant tissue cultures goes through a period of rapid development in the last years; publications summarizing not only basic but also very recent facts concerning this scientific branch should not be overlooked by any biologist.

Z. OPATRŇÝ (*Praha*)

KUČERA, J.: CYTOGENETIKA TRITICALE. [CYTOGENETICS OF TRITICALE] (Review). Number 4. — Institute of Scientific and Technical Information for Agriculture, Praha 1977. Pp. 140, Kčs 19,—.

Although *Triticale* breeding is far from meeting all hopes, much success has been achieved in recent years. The monography presents data from the literature concerning cytogenetical aspects of breeding and research in *Triticale*. The introductory chapters deal with the terminology, cytogenetics and systematics of the initial species of *Triticale*, *i.e.* rye and wheat. The most extensive part of the book presents data on octoploid and hexaploid *Triticale*, on the crossing of both forms and on the crossings with the initial species. Interesting are the data on the reciprocal rye-wheat hybrid, *Secalotricum*, which has the same nuclear gene set but a different cytoplasm. The review presents further data on wheat with additive chromosomes of rye and on substitution and translocation lines. In the last chapter, the causes of cytogenetic instability of *Triticale* are summarized. The number of references is 279. The monography is published in Czech with an English summary and its Russian version was published in the series "Obzor" in 1977.

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