

Birch trees regenerated from the same mother tree showed similar properties. All plants produced appeared to be identical to the mother plant. Obtained results indicate that regenerated birch trees are genetically uniform in comparison with the original genotypes.

The described method of micropropagation of birch trees could accelerate breeding programmes by allowing the multiplication of superior trees at a fast rate.

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Figures at the end of the issue.

BOOK REVIEWS

WRIGHT, R. C. M.: SO VERMEHRT MAN PFLANZEN IM ZIMMER, IM GARTEN UND IM GEWÄCHSHAUS. — Verlag Paul Parey, Berlin—Hamburg 1978. 128 S., 85 Abb., DM 12,80.

Dieses neue Buch der Reihe „Pareys bunte Gartentips“ ist eine deutsche bearbeitete Übersetzung des englischen Originals „Simple Plant Propagation“. Mit leichtverständlichem Text und zahlreichen, meist farbigen Abbildungen beschreibt es in 19 Kapiteln die verschiedenen Methoden der geschlechtlichen und vegetativen Pflanzenvermehrung in der gärtnerischen Praxis. Neben den allgemeinen Hinweisen über die Vermehrung durch Samen, Zwiebeln, Steckhölzer, Knollen, Stecklinge, Ableger oder Veredlung, findet der Leser auch viel Wichtiges über die spezifischen Ansprüche den einzelnen gärtnerischen Pflanzenarten. Obwohl dieses Buch besonders für Pflanzenfreunde, Hobby- und Zimmergärtner bestimmt ist, kann es auch als ein wertvolles Hilfsmittel für alle praktischen Fragen der Vermehrung bei experimentellen Pflanzen in der botanischen Forschung dienen.

J. TUPÝ (Praha)

STANGL, M.: OBST AUS EIGENEM GARTEN; ÄPFEL, BIRNEN, PFLAUMEN, KIRSCHEN, NÜSSE. — BLV Verlagsgesellschaft, München—Wien—Zürich 1981. 126 pp. Paperback DM 9,80; \$ 80.—; Fr 9,80.

This beautiful booklet appeared in the series “BLV Garten- und Blumenpraxis” and deals with fruit tree growing in gardens. In the first part it describes briefly the basic botanical and pomological properties of the main fruit tree species and cultivars together with their specific environmental and growing requirements. The practical part provides in a facile form short instructions on fruit tree planting, cultivation, pruning, grafting, nutrition, protection against diseases and on fruit harvesting and storage. The booklet is well produced with many beautiful coloured illustrations. It is of very good value as a practical introduction to fruit tree growing for beginners.

J. TUPÝ (Praha)

BOOK REVIEWS

LESINS, K. A., LESINS, I.: GENUS *Medicago* (Leguminosae). A Taxonomic Study. — Dr. W. Junk BV Publ., The Hague—Boston—London 1979. 228 pp., 72 figs., 2 colour plates. Dfl. 100.—; US \$ 52.65.

Karlis and Irma Lesins (or better: Lesiņš, they are of Latvian origin) present a really unusual monograph of a genus. Most such monographs deal mainly with herbarium material. This book is based on live plants, collected during several trips to the Mediterranean and cultivated afterwards.

In the general part, the authors explain their theoretical and methodical approach, which differs from the "orthodox" plant taxonomy; they call it "taxogenetic systematization". They suggest that together with the herbarium type specimen viable seeds should be deposited in seed banks, so that their crossability and other genetic properties could be tested, when necessary. In studying each species, they observe its chromosome number and morphology, morphology of pollen grains, morphology of vegetative and generative organs, especially of pods and seeds, its ecology, crossability, its flavonoid (9 in number) and carotenoid (25) flower pigments etc.

The authors consider numerical taxonomy with several reservations, as the crossability, mode of inheritance of characters, chromosome complements and meiotic processes, important as they are, cannot be easily incorporated into systems of other operational taxonomic units used in numerical taxonomy.

A special chapter deals with the isolating mechanisms, speciation, evolution of the genus *Medicago* and its relationships to the other genera. Besides isolating mechanisms based on differences in ploidy, several other mechanisms were found and evaluated in the taxonomy of the genus.

As to the speciation process, the authors maintain that a species may originate only under environmental stress. They are of the opinion that *Medicago* is a Mediterranean genus. They describe the dramatic palaeogeographical history of this region in connection with the evolution of the genus. The oldest member of it is probably *M. arborea*, which originated in the first part of the Tertiary. Perennial, but not arborescent species seem to be somewhat younger and the youngest branches of the genus are formed by annuals. The area of origin of the genus appears to be the northern coast of the Mediterranean resp. the NW coast of the Tethys. *Medicago falcata* and *M. sativa* belong to the younger members of the genus.

The specific part contains descriptions of the genus and subgenera, sections and individual species; there are 4 subgenera and 56 species. In every species its morphology, chromosome number, habitat, distribution, crossability and agricultural value are discussed. Every species is illustrated by a photo of a branch, enlarged pod and seed.

The origin, taxonomy and variability of *M. sativa* and *M. falcata* are discussed in detail. It is shown that in the northern temperate zone, the species cultivated under the name alfalfa is *M. × media* (= *M. × varia*, i.e. *M. sativa* × *M. falcata*), whereas in the south it is *M. sativa*. Its cultivation started probably in Near East and coincides with the taming of the horse.

The book is well written and well illustrated; it brings a wealth of information not only on the genus *Medicago*, but also on plant genetics in general. It is worth reading.

E. HADAČ (Praha)

MACMILLAN, J. (ed.): HORMONAL REGULATION OF DEVELOPMENT I. Molecular Aspects of Plant Hormones. Encyclopedia of Plant Physiology, New Ser. Vol. 9. — Springer Verlag, Berlin—Heidelberg—New York 1980. 681 pp. Cloth DM 228,—; approx. US \$ 134.60.

Since the publication of Encyclopedia of Plant Physiology, Volume XIV, Growth and Growth Substances, in 1961 the research of growth substances, or growth regulators as it is called today, has progressed considerably. New Series of this Encyclopedia dealing with plant hormones and other substances regulating growth is a response of the editor to this rapid development. The present volume is the first of the planned set of three volumes which pay attention to (1) molecular aspects of plant hormones, (2) roles of plant hormones at the levels of organization from the cell to the whole plant, and (3) interrelations between hormones and factors in the environments of tissues, organs and whole plants.

The present volume of this ambitious series is divided into six chapters dealing with plant hormones from the points of view of their (1) chemistry and occurrence, (2) extraction, purification and identification, (3) quantitative analysis, (4) biosynthesis and metabolism, (5) molecular and subcellular aspects of action and (6) molecular effects on plant tissue.

In the first chapter the reader finds suitable table arrangement of the known structures of individual plant hormones and related compounds and sources from which they were isolated. Methods of extraction, purification and identification are presented according to the individual techniques. This approach made it possible to give a good description of techniques the use of which is demonstrated on a few examples of isolation of individual plant hormones. Unfortunately, some important procedures are not given in necessary detail, as *e.g.* prevention of enzymatic degradation of phosphorylated cytokinins during extraction, and data concerning thin layer chromatography of cytokinins. Extremely low concentration of plant hormones in plant material is the primary factor affecting the accuracy of their analysis. From this point of view one welcomes the extensive description of sources of basic analytical errors and verification of accuracy. Experimenters will enjoy the table arrangement and comparison of detection limits of various bioassays and physicochemical detections.

The main chapter dealing with biosynthesis and metabolism of plant hormones is exhaustive in all respects. The rapid progress in this field is especially evident here — several new important data were published during the processing of the manuscript (*e.g.* biosynthesis of ethylene and cytokinins). Chapter on molecular and subcellular aspects of hormone actions reflects the present state of investigation of specific receptors, especially in the case of auxins, while less attention is paid to the structure-activity relationships. Molecular effects of hormones on tissues are discussed in relation to growth and other processes, as specific enzyme synthesis and differentiation. This last chapter is a source of theoretical data for practical use of plant hormones.

As it is the tradition of this Encyclopedia the book is well edited. It contains over one hundred instructive figures, author and detailed subject indexes and numerous references. As an encyclopedia the volume is recommended to all those who need both general and special information not only in the field of plant hormones but also about closely related phenomena as *e.g.* plant growth, differentiation and development.

M. KAMÍNEK (Praha)

SENGER, H. (ed.): THE BLUE LIGHT SYNDROME. Proc. in Life Sciences. — Springer Verlag, Berlin—Heidelberg—New York 1980. 665 pp., 432 figs. Cloth DM 98,—; approx. US \$ 57.90.

This book contains contributions presented at the "International Conference on the Effects of Blue Light in Plants and Microorganisms", which was held in July 1979 at the Philipp's University in Marburg.

The first part of the book reviews various topics of blue light effects: movement of microorganisms (W. Nultsch), intracellular movements (J. Zurzycki), transcription (J. Gressel), regulation of cell growth and cell cycle in *Adiantum* gametophytes (M. Furuya), sensory transduction in *Phycomyces* photoresponses (E.D. Lipson), and the role of bacteriorhodopsin (R. J. Strasser, H. Sigrist). Evolution of photosensory systems and their biological significance is dealt with by M. J. Carlile. Chloroplast movement in fresh water algae as photoresponse mediated by yellow pigment as well as phytochrome is discussed by E. Schönbohm. H. Mohr reports on the blue and red light interaction in higher plant morphogenesis (including chlorophyll and carotenoid biogenesis). Very interesting contribution written by D. G. Stavenga surpasses the limits of systems treated within the conference but excellently demonstrates parallels between invertebrate vision and other photobiological phenomena.

The second part of the book is entitled: Photoreceptors and Primary Reaction. The identity of blue light receptors is neither certain nor unique. The role of the two chromophore candidates, flavin and carotenoid, is excellently discussed by P. S. Song. W. Shropshire was requested by the organizers of the conference to plead for carotenoids as primary photoreceptors in the cause flavins versus carotenoids. The author argues by known facts (absorption spectra, localization of pigments, inhibition of photoresponses by carotenoid specific chemical inhibitors) very impartially and concludes: "... the data may ultimately force us to acknowledge that there is not just a single photoreceptor capable of explaining all blue light responses ... Only future research will resolve the issue." Flavins as a primary photoreceptor were defended by D. E. Fabo. His conclusion is: "... in fact two photoreceptors can exist ... One photoreceptor is

postulated to be a carotenoid and the other a flavin. If the idea of more than one blue light photoreceptor gains momentum as it seems to be doing, then we may hope the further searching for the photoreceptor(s) by blue light scientists will be at least twice as interesting, and as fascinating as has been the search for a single blue light photoreceptor the last four decades."

The following parts of the book are devoted to carotenogenesis, effects of blue light on carbon metabolism, respiration and nitrogen metabolism.

The sixth part is devoted to chloroplast development and is opened by contribution: Blue Light Effect on Plastid Development in Higher Plants. In this treatise L. O. Björn summarizes data on special blue light effects which cannot be duplicated by red light.

The last part of the book focusses on physiology of blue light effects. New data on the role of blue light in modulation and differentiation of fungi, algae as well as of high plants are presented.

This book shows the variety of responses and the broad range of organisms affected by blue light and summarizes facts on blue light syndromes as perfectly as possible. It is a valuable reading for all students of photomorphogenesis.

LIBUŠE PAVLOVÁ (*Praha*)

SKOOG, F. (ed.): PLANT GROWTH SUBSTANCES 1979. Proceedings of the 10th International Conference on Plant Growth Substances, Madison, Wisconsin, July 22–26, 1979. Springer-Verlag, Berlin–Heidelberg–New York 1980. 527 pp. Cloth DM 98,—; approx. US \$ 57.90.

The present volume contains proceedings of the last Conference on Plant Growth Substances organized regularly by the International Plant Growth Substances Association (IPGSA). Two novel features appeared in the program of this conference as compared with the last one held in Lausanne in 1976: retrospects of the plant hormone research and present progress of practical utilization of its results. First of the two lectures dealing with the history of plant hormone research commemorates the hundredth anniversary of Charles Darwin's publication "The Power of Movement in Plants" which represents a milestone on the way to the discovery of plant hormones. The contribution of Helslop-Harrison on Darwin's work, hypothesis and its acceptance by plant physiologists at that time is an interesting recollection of events which helped and/or complicated understanding of the nature and function of plant hormones. The development following this discovery is recollected by K. V. Thimann.

Practical aspects of plant hormone research are presented in three chapters: (1) Hormonal regulation in plant reproductive development, (2) morphogenesis and (3) agricultural uses of plant growth regulators. The first chapter contains 15 papers presented by invited speakers. The dramatic progress in this field is demonstrated by the rise of agrochemical industry after introduction of the first selective herbicide (2,4-D) into production after World War II. Data presented in this section (as e.g. control of flowering and fruit set, breaking dormancy of seeds, propagation of plants, prevention of pre-harvest fruit drop, protection against climatic hazards) can help to recognize points where growth regulators can be used to solve practical problems. Arguments are also collected to attract funds necessary for basic research. As mentions K. V. Thimann in his contribution: "... the main driving force (in plant hormone research, M. K.) has been curiosity. Many applications have come ... but these applications have not been the initiating reasons for the research ... one would not start to develop new types of herbicides by studying the tropism of seedlings in an airconditioned dark room. It is the fundamental approach which leads to broadest applications".

As at the previous conferences, special sections are devoted to auxins, gibberellins, ethylene and abscisic acid. It should be mentioned that the two elongation responses to auxin ("fast" and "slow") explained on the basis of cell wall acidification and gene expression, respectively, are discussed in separate papers and that a "summary" hypothesis is given by L. N. Vanderhoef. Two-pages' report on the new growth factors gives some interesting data especially on the brassins — steroidal substances which induce several growth responses.

¹ Seven contributions which were presented at the Symposium on Plant Movements, which was attached to the Conference are also included in the volume. Much attention is paid to the inhibitory phenomena which participate in the regulation of phototropic and geotropic movements.

The book is well-edited, 209 high-quality figures contribute to an easy understanding of the presented facts and ideas. A detailed subject index helps in orientation. With respect to the review character of most of the contributions the book is recommended to both scientists and advanced students in plant science.

M. KAMÍNEK (*Praha*)

SÖLL, D., ABELSON, J. N., SCHIMMEL, P. R. (ed.): *TRANSFER RNA: BIOLOGICAL ASPECTS*. — Cold Spring Harbor Laboratory, New York 1980. 578 pp.

The book appeared in the Cold Spring Harbor Monograph Series as the second part of the ninth volume consisting of papers presented by invited lecturers at Cold Spring Harbor Laboratory meeting on tRNA in 1978. The broad field of tRNA was in this volume divided into two parts. Part A with title *Transfer RNA: Structure, Properties and Recognition*, is focussed on the structure and properties of tRNA and aminoacyl-tRNA synthetases and the interaction of tRNAs with proteins, including ribosomes.

This review deals with part B of this volume, which summarizes current knowledge of tRNA biosynthesis, tRNA gene organization and structure, genetic suppression and coding, and the role of tRNA in regulatory processes. This part is divided into four sections.

The first section (13 papers) deals with conversion of precursor RNA to mature tRNA. Most of contemporary knowledge of the processing of tRNA precursors has come from experiments on *E. coli*, where two approaches have been used: mutant methodology, which makes available mutants altered either in processing enzymes or in the tRNA genes and *in vitro* reconstructions of partially purified precursor RNA intermediates and enzymes.

Eukaryotic tRNA processing is not presented in details. Two papers are devoted to investigation on yeast tRNA biosynthesis, where biosynthetic pathway involves elimination of the intervening sequences.

The second section (11 papers) discusses two main topics: the organization of individual transcription units and the general arrangement of tRNA genes in a chromosome. This investigation is most intensive in *E. coli*, but in eukaryotes partial answers to these questions were achieved for several experimental systems. In *Xenopus* it is possible to inject cloned tRNA genes directly into the large oocyte nucleus. Localization of RNA genes in *Drosophila* has been studied by *in situ* hybridization to the polytene chromosomes. In addition, the genes coding for chloroplast tRNA have been mapped on spinach chloroplast DNA.

The third section (8 papers) which is devoted to suppression and coding, is concerned with the genetic approach to tRNA based on the study of suppressor mutants in *E. coli*. The last section (7 papers) deals with other roles of tRNA. The individual papers refer to the role of tRNA in the regulation of amino acid biosynthesis, to their role in the attenuation, to tRNA as a primer for reverse transcriptase, and review the tRNA-like structures in viral RNA genomes, etc. Three appendices are inserted: they bring the localization of tRNA genes on *Drosophila* polytene salivary gland chromosomes, and on the *E. coli* map and present the tables of codon usage in several organisms.

The tRNA genes provide on attractive system for studying the gene structure and expression both in procaryotes and eukaryotes. The book, the quality of which is high, contains a large amount of theoretical and practical material. Scientists interested in molecular biology research will find not only a good source of necessary information but also a picture of overall prospects in the rapidly expanding field of tRNA.

J. ZADINA (*Praha*)

LANGHAMMER, L.: *GRUNDLAGEN DER PHARMAZEUTISCHEN BIOLOGIE*. Basistext Pharmazie, Band 197. — Springer Verlag, Berlin—Heidelberg—New York 1980. 485 pp., 286 figs. Paperback DM 38,—; approx. US \$ 22.50.

In the past, presence and probably in distant future the pharmaceutical industry and science cannot do without utilization of the substances of plant origin, due both to a limited knowledge and the economics of pharma production. For this reason even in times to come the pharmacutists will have to deal with plant biology.

The present publication gives fundamentals for this study. It is assigned especially to the students of pharmacy, giving a competent survey of one part of pharmaceutical biology — plant biology. Despite a very extensive subject the author managed to present comprehensively, on 485 pages, fundamental knowledge of cytology, genetics, physiology, morphology, histology and anatomy of plants as well as fundamentals of the phylogenetic evolution and plant systematics. The common denominator of all chapters is the pharmaceutical aspect which the author kept in mind at the explanation of processes, description of structures and choice of suitable examples.

The many-year pedagogic activity at the university as well as her rich experience gathered at the "Institut für Pharmakognosie und Phytochemie" became evident in the overall conception of the textbook and in a didactically well-thought-out presentation of the matter. The book is drafted as an accompanying text to the "Gegenstandskatalog GKPI". The subjects (objects of instruction) are denoted with numbers of the decimal classification and arranged in the table with references to respective pages. The facts are presented unambiguously, mostly without alternative views, which is, after all, given by the extent and purpose of the publication. The detailed description of metabolic processes is substituted by a number of explanatory schemes and figures. The publication is engaging to readers at the first sight due to a number of first-rate reproductions of microphotographs of plant structures, often originals; the book contains 222 black-and-white and 64 coloured figures.

The orientation in the matter is facilitated by abundant summaries (at the end of each chapter). The author consistently supplements the special terms by their verbatim translation, thus enabling the understanding of connections of the functions, etc. In this respect the vocabulary of special terms in the concluding part of the book is a good aid. A survey of the recommended literature for the study is not lacking in the publication, either.

The conception of the chapter on systematic botany is clear already from its title: "The classification of plant kingdom with respect to the plant families of pharmaceutical importance". An insufficient practical knowledge of systematic botany may be redressed, to a certain extent, by coloured pictures (aquarelles) of plant organs and whole plants.

The practical diagnostics of drugs is not only referred to in the chapters on anatomy, histology, morphology, and others, but also in the supplement of the book. It deals with the microscopic technique of drug diagnostics and the methods of determination of the plasmolytic effect of pharmaca.

The publication will doubtless well fulfil its aim. By its vivid comprehensive presentation of the problematics of plant biology and especially by its view of the plant kingdom from the standpoint of a pharmacist it will decidedly be useful to all those interested in plant biology.

J. ŠANTRŮČEK (Praha)

KULMUS, H., HECK, C.: DAS ALLGÄU-WANDERBUCH. Zwischen Isny, Oberstdorf und Pfronten mit Tannheimer und Kleinwalsertal. — BLV Verlagsgesellschaft München—Wien—Zürich 1981. 159 S. und 64 S. Begleitbuch. Gebunden DM 39,—; ÖS 318,—; SF 39,—.

Das Allgäu-Wanderbuch enthält die Zusammenstellung und Beschreibung von 50 Wanderungen im Allgäu, beginnend mit ganz bequemen Spaziergängen und Wanderungen bis zu klassischen Höhenwegen und Klettersteigen für Geübte mit guter Kondition. Es handelt sich eigentlich um zwei Bücher: den mit herrlichen Farb- und Schwarzweissfotos ausgestatteten Band mit genauer Beschreibung der Touren und Bemerkungen über die Geschichte der Ortschaften, Besonderheiten der Landschaft, das Freizeitangebot, Veranstaltungen usw. und ein Begleitheft, ein schmales, leichtes Büchlein, das der Wanderer auf seine Wege mitnimmt. Es enthält gekürzt alle wichtigen Hinweise zu den einzelnen Touren nebst der übersichtlichen Skizzen mit eingezeichneten Wanderrouten.

Als Biologin möchte ich ausser der wunderbaren Naturaufnahmen und Fotos der Vegetation und seltener Pflanzen besonders das empfindliche Verhältnis der Verfasser zur Natur und der Pflanzenwelt des Allgäus hervorheben: wo immer möglich wird der Wanderer auf seltene Pflanzen, geschützte Gewächse, Naturschutzgebiete und besondere Naturschönheiten aufmerksam gemacht und es wird an den Wanderer appelliert die Alpenblumen und Alpenwelt zu schützen, damit sich auch zukünftige Generationen noch an all dem Schönen erfreuen können.

Abschliessend möchte ich konstatieren, dass ich nach dem Durchlesen des Buches selbst Lust bekommen habe die Wanderschuhe anzuziehen; dies dient wohl als beste Empfehlung für das Allgäu-Wanderbuch.

INGRID TICHÁ (Praha)

ROLAND, J.-C., ROLAND, F.: *ATLAS OF FLOWERING PLANT STRUCTURE*. — Longman, London — New York 1980. 103 pp. Net. £ 6.25.

Eine gute Kenntnis der Struktur der Pflanzen ist die Voraussetzung zum erfolgreichen weiteren Studium botanischer und biologischer Disziplinen. Vorliegender Atlas der Pflanzenstruktur bietet in sehr instruktiver Form an Hand von exzellenten schwarzweissen Mikrophotographien, Zeichnungen und graphischen Darstellungen in der Begleitung von einem kurzen, erklärenden Text einen fundierten Einblick in die Grundlagen des Aufbaus des Pflanzenkörpers. Der Atlas bildet in gewissem Sinne die Fortsetzung des "Atlas de Biologie Cellulaire", Masson, Paris 1974 und ist im Jahre 1977 in demselben Verlag zum ersten Male erschienen. Schon 1980 folgt eine französische Neuauflage des Buches und eine englische Übersetzung von Dennis Baker.

Die Autoren des Buches Jean-Claude Roland und Françoise Roland von der Université Pierre et Marie Curie, Paris haben den Atlas in 11 Kapitel gegliedert. Der Leser wird nach und nach mit der Primär- und Sekundärstruktur einzelner vegetativer Organe der höheren Pflanzen (Wurzel, Spross, Blatt), der Struktur der generativen Organe (Frucht- und Staubblätter, Blüten, Früchte, Samen) und mit dem Aufbau einzelner Gewebetypen wie Parenchym, Epidermis, Kollenchym, Sklerenchym, Leitbündel usw. bekannt gemacht. Bei einzelnen Strukturen wird ebenfalls auf ihre physiologische Funktion hingewiesen und Aspekte der Pflanzenevolution berücksichtigt. Der grosse Vorteil des Buches liegt in der Fülle von Mikrophotographien, Photos aus Elektronen- und Rasterelektronenmikroskop und klaren und übersichtlichen Zeichnungen (226 Abbildungen auf 103 Seiten!), die es zu einem wirklichen Bilderbuch der Pflanzenstruktur werden lassen. Besonders die REM-Aufnahmen tragen zum räumlichen Verständnis der Objekte bei. Als weiteres Positivum des Bandes möchte ich die Spannweite von anatomischer Makrostruktur bis zur Feinstruktur hervorheben.

Das Büchlein wird bestimmt vielen Studenten und Naturfreunden zum guten Begleiter werden.

INGRID TICHÁ (Praha)

LARCHER, W.: *PHYSIOLOGICAL PLANT ECOLOGY*. Second Edition. — Springer-Verlag, Berlin — Heidelberg — New York 1980. 303 pp., 193 figs. Soft cover DM 59,—, approximately US \$ 34.90.

This book is the second English edition, translated, thoroughly revised and extended from the German edition "Ökologie der Pflanzen", first published by Eugen Ulmer, Stuttgart 1973. It was probably very difficult to complement the book with all recent knowledge without extending its volume excessively. As seen from the cited papers of 832 references 45 were issued in 1973 and 365! in the following years. The content of the book is divided into six chapters according to the principal environmental factors and under these headings the interactions of plants with environment are dealt with. First, the very brief chapter "The environment of plants" on 4 pages points out characteristic properties of hydrosphere, atmosphere, lithosphere together with soil and ecosphere. The next chapter "Radiation and temperature: Energy, information, stress" is divided into three subchapters dealing with radiation, temperature and periodicity. Further well arranged division of subchapters makes possible a quick orientation in the text. The most voluminous third chapter "Carbon utilization and dry matter production" deals in consecutive order in four subchapters with carbon metabolism in plant cells and in plants and carbon budget of the plant and of the plant communities. The fourth chapter devotes 48 pages to "The utilization and cycling of mineral elements". Its subchapters deal with the soil as a nutrient source, uptake of mineral nutrients, utilization and metabolism of nitrogen, relation between plant habitat and mineral metabolism, toxic effect of environmental pollutants and mineral balance and circulation in plant communities. The last but one chapter "Water relations" refers to differences between poikilohydric and homoiohydric plants, and in the further text it deals with water relation of cells, plants and plant communities. The final chapter "Synopsis" emphasizes the goal of ecology, i.e. the integrate view of the diverse and numerous interactions of organisms and their environments in their full complexity and ranges of variability, points out the necessity of analysing the effects of single ecological factors, exhibits peculiarities of research and selection of useful methods and presentation of results in different form and models. The book is complemented by a list of literature, subject index and useful table of abbreviations, symbols and conversion factors.

The author successfully condensed into this relatively small book a large amount of information, well illustrated by numerous instructive pictures. The book represents a good review suitable for a wide range of readers.

JARMILA SOLÁBOVÁ (Praha)