

BOOK REVIEWS

D. J. F. BOWLING: *Uptake of ions by plant roots*. 212 p. £ 6.50. Chapman and Hall, London, 1976.

This book differs from existing texts in the field of ion transport in plants (Lüttge, Epstein) by a more limited scope. The author deals exclusively with ion transport in roots and disregards results obtained with algae or leaf cells. Furthermore questions of mineral nutrition in a wider sense are not considered.

After a brief introduction into root morphology and anatomy the chain of events eventually leading to translocation of ions to the aerial parts is discussed in consecutive chapters interspersed with more theoretical considerations. At the end there are some summarizing conclusions and outlooks.

The style of the book is clear and controversial views – many in this field – are set distinctly against each other. Whenever the author takes sides, he does not do so without giving the opposite view a fair deal. Criticism, of course, is possible in some cases: ion interactions receive relatively little attention, absorption of ions from the free space is taken for granted and the effect of metabolization of such ions as nitrate, fosfate and ammonium on the absorption process is not discussed. These, however, are minor points. Taken as a whole the text gives a clear and not too diffuse view on the present state of our knowledge – or lack of knowledge – in this field.

G. G. J. BANGE

G. HERKLOTS: *Flowering Tropical Climbers*. 1976. Wm. Dawson & Sons Ltd., Folkestone, Kent. 4°. 194 pp., 270 fig., 16 col. pl. £ 17.50.

The general sections of this work are concise and consist of a brief geographical account and a more detailed illustrated treatment of the various modes of climbing, a paragraph on the notation of flower colours, a glossary, a bibliography, and an appendix with hints for collecting and cultivation. The major part of the book is devoted to descriptions and notes accompanied by excellent clear habit figures (mostly half nat. size) of climbing plants from all tropics of the world, in all some 320 species. They are arranged alphabetically by families and genera. Species names are often provided with some references and synonymy, but this is inconsistent; the native country is always given. The text under each species contains sometimes a popular description, but consists often mostly of all kinds of notes, personal observations and experience of the widely travelled author; nomenclature is reasonably up-to-date.

The tropics and subtropics abound in climbing plants, so that their representation must be very restricted, but most families with climbers are represented, although we miss e.g. Cucurbitaceae, Dioscoreaceae, Pandanaceae, and Vitaceae. The choice of the species must have been rather opportunistic with distinct preference for showy or peculiar forms.

The author stated that the book is intended primarily as a guide to students who are studying the ecology of tropical plants. It is indeed a most welcome introduction to form-knowledge of climbing plants for both students and amateurs, especially by the profuse, lively and accurate, original illustrations.

A fair number of climbers have been drawn in out of the way places and a few may have never been pictured before, all after living specimens; this, together with the original observations of the author, provides also some scientific merit to this excellently printed semi-popular work.

C. G. G. J. VAN STEENIS

R. C. KING (Ed.). 1974. *Handbook of genetics*. Volume 2: *Plants, Plant viruses, and Protists*. Plenum Press. New York/London. 631 p. \$ 42.00 for U.S.A.

Plenum Press is issuing a five-volume Handbook of Genetics. Volume 1 of the series deals with Bacteria, Bacteriophages and Fungi. Volumes 3 and 4 treat the genetics of invertebrates and vertebrates respectively, while volume 5 is on molecular genetics.

The Preface of Volume 2 explains the purpose of the Handbook, which is "to bring together a collection of relatively short, authoritative essays or annotated compilations of data on topics of significance to genetics". The essays are or will be written in a language more understandable to a broader public than just the specialist-geneticists. For this broader public especially the book tends to be an introduction.

Fourteen plant species or groups of related species have been selected: maize, rice, wheats and relatives, barley, cotton, *Cucurbita*, *Cucumis*, *Arabidopsis thaliana*, pea, *Oenothera*, tomato, *Nicotiana*, *Antirrhinum majus* and *Collinsia*. The last chapter of part D, The Plants, discusses the duration of chromosomal DNA synthesis, the mitotic cycle, and meiosis of higher plants.

An overall impression suggests that the authors were instructed to write an introduction giving general information on the taxonomic place and origin of the described cultivated plant(s), to present a chromosome map, a gene list and a list of reference for further reading. However, not all chapters conform to such an arrangement. For instance, for maize we find 3 pages of text, 17 pages of tables, 3 pages of figures and 5 pages of literature, and for wheat these numbers of pages are 21, 5, 2 and 3, respectively. For *Arabidopsis* there are 18 pages of text and 16 pages of literature. The introduction to the maize chapter is very concise, no information on its taxonomic place and origin is given. It is questionable whether it is instructive enough for the non-specialist. This short introduction also explains that the US name corn is preferred to the international name maize, as there also exists a vernacular name milo maize for a sorghum type. This argument is peculiar as the Handbook is obviously written for an international public. For this public the term corn has many meanings, it is therefore confusing and should not have been used in this Handbook.

The other chapters present a better balanced text, but we do miss lists of genes for *Arabidopsis*, *Oenothera*, *Nicotiana* and *Collinsia*. The chapter on rice is concluded with a discussion on breeding for higher productivity and wider adaptability. Although breeding is applied genetics, I think that this paragraph should have been omitted since breeding is not the subject of the book. Nor has the breeding of other crops been presented. The term is even not indexed. The 18 pages of text on *Arabidopsis* probably give a full compilation of what is known about the genetics of this crop of laboratories. The long list of (some 300) references will cover most of the literature. No list of genes and no chromosome map is presented. Why not?

The Handbook is very useful as it provides an easy access to today's knowledge of the treated plants. Of course not all interesting plants could have been included, although we miss plants as potato and relatives, and flax/linseed. We wish the book a wide circle of readers.

A. C. ZEVEN

M. M. YEOMAN (ed.): *Cell Division in Higher Plants*. Academic Press, London, 1976. pp. 452. \$ 41.—.

This book has been published as the 7th volume of a series of monographs in experimental botany. The present state in research on cell division in higher plants is well documented in the contributions of a number of authors, who have furthered our knowledge of the cell cycle and its impact on plant morphogenesis. These two topics are the heart of the present treatment. It is one of the merits of the book that it shows not only how much insight has been gained in the last decades but also how much work has to be done yet. The gaps to be filled

are enormous. Little is known about the factors that control the induction of mitosis (or meiosis) and the pace at which cell division proceeds in different tissues. The same can be said about the initiation of unequal division and the determination of the plane of division, processes which are at the core of differentiation in plant cells.

Most studies on such issues have been purely descriptive and research in depth is needed. Systems suitable for this type of research are available as is pointed out in many chapters of this book. One of the purposes of the authors has been to encourage the study of mitosis in plant cells, and they amply provide the tools for such studies.

The book can be recommended to anyone who is interested in cell division and differentiation.

A. F. CROES

I. K. FERGUSON and J. MULLER (eds.): *The evolutionary significance of the exine*. 1976. Linnean Society Symposium Series, No. 1, 591 p. Academic Press, London, New York. Price £ 28.—, \$ 71.—.

During the last decade a rapid development has been made in palynology, partly as a result of the modern microscopical techniques by numerous specialists from various disciplines. In particular the knowledge of the structure and function of fresh spore and pollen walls has been increased considerably. It has been an excellent initiative by the editors to organize an International Symposium on the phylogenetic and adaptive significance of the exine and to publish its results. This meeting has been held in London and Kew, september 1974, under the auspices of the Palynology Group of the Linnean Society of London in association of the ICP, the International Commission for Palynology. Its proceedings constitute the first volume of a new Linnean Society Symposium Series.

This excellently printed book with numerous splendid EM and SEM pictures is a welcome review of the present state of the extensive knowledge on various aspects of pollen morphology. Unfortunately, some hardly indispensable contributions which might have been written by eminent scientists are lacking, in particular on the fossil evidence, structure and function of the exine. Besides, though some authors reported about chemical experiments, in the meeting too little attention has been paid to the important and indispensable chemical aspects of fossil evidence and sporoderm structure. Without any blame to the editors, this may be due to a disadvantage of symposia. In view of the still growing number of meetings it is not easy for research workers in the borderland of some sciences like this, to produce an increasing number of results of such time consuming research to be presented on meetings or even to attend them.

Nevertheless, the papers presented here are of high standard, dealing with the detailed knowledge of the sporoderm development of numerous plant families, genera or species in relation to their taxonomy and evolution. Some contributions pay special attention to the physiology of the sporoderm, the configurations of germinal apertures and the elements of sculpture and ultrastructure, but also to the unusual phenomenon of pollen dimorphism.

The results of this Symposium show the considerable progress that is still under way in achieving a more complete resolution of the sporoderm structure and function and the meaning of this resolution to the phylogeny of fossil and living material. The advance in histochemical, cytochemical and biophysical analyses for the study of pollen and spore development is of basic importance for future work. This book is of great importance to every worker in this field and must be warmly recommended.

P. VAN GUJZEL

H. WALTER: *Die Vegetation Osteuropas, Nord- und Zentralasiens*. Vegetationsmonographien der einzelnen Grossräume, Band VII. Gustav Fischer Verlag, Stuttgart. XII + 452 S., 363 Abb. Price DM 149.—.

The series vegetation monographs of the major regions of the world is planned in ten volumes and edited by the author of this volume, H. Walter. So far the volumes 1, N. and M. America by Knapp; 2, S. America by Hueck; 3, Africa by Knapp and 10. Climate-diagrams and climatological division of the World have appeared. Although Prof. Walter did not intend to write this volume himself we may be happy that he changed his intention since the result is splendid! This badly known, huge area (covering 20% of the world's land surface) is treated in a surprisingly systematical and thorough way.

Since the author only knew parts of Russia from private field trips he had to rely on Russian sources, which he had available because of his relation with V. V. Alechin and the Botanical Institute at Leningrad and which he could fully use because he reads Russian.

The main source was Alechin's book on the vegetation of the USSR in their main zones. (An earlier account in the vegetation of the USSR by Alechin served as a basis for Walters earlier book *Die Vegetation Osteuropas*.) A major additional source was the vegetation map of the USSR with an elucidation by Lavrenko and Soczava.

The vegetation is treated in seven parts, which are preceded by a short introduction. The vegetation description is based on Alechin's association concept. It is suggested that this concept fits into the internationally established association concept. However, this seems to refer to the original definition from the 1910 Botanical Congress. The associations mentioned in this book are certainly not identical with associations according to the Braun-Blanquet approach and often have a deviant nomenclature.

Walter puts much emphasis on the concept of zonal vegetation and elucidates the differences between zonal, extrazonal and azonal vegetation.

The major zones described are arctic deserts and tundras, boreal needle-leaf forests (taiga), mixed needle-leaf/broad-leaf forests, nemoral broad-leaf forests, steppes, semi-deserts and deserts.

In addition the multizonal mountain vegetation is described.

The reference list is comparatively short, the first part contains the most important Russian titles (in German translation), the second part of non-Russian publications.

An extensive index of plant names (with very useful family indications for lesser known genera) and a short subject index conclude the book. The production of this book is conform the Publishers standard, i.e. very good. The illustrations are numerous and especially the vegetation maps and large photographs (of Russian origin) are helpful. The price is high for a private purchase but reasonable for any library in the field.

E. VAN DER MAAREL