

## BOOK REVIEWS AND ANNOUNCEMENTS

M. V. HOMÈS and Germaine H. VAN SCHOOR: *Alimentation et fumure minérales des végétaux*. Mémoires de la Classe des Sciences 2e série T. XLIV (3). Académie Royale de Belgique, Bruxelles 1982. 360 p., 47 figs., 99 tables. B.Fr. 1000.—.

During a period of 35 years the authors have been active in promoting a technique with which the optimum ratio of the major plant nutrients N, P, S, K, Ca, and Mg can be calculated. In nutrient-culture experiments in which each time the level of two of the nutrients is varied, two ratios of these nutrients are selected. With the yields obtained the ideal ratio of these nutrients is determined through graphical extrapolation. For each couple an optimum ratio is thus obtained, and through algebraic calculations the optimal ratio of the six nutrients is determined. The authors call this technique the "Method of Systematic Variations".

In a similar fashion, the optimal ratio of three nutrients can be calculated by means of extrapolation of data plotted in a triangle.

The authors claim that the optimum ratio of nutrients to be added to soils in the form of fertilizer(s) can likewise be computed with the use of a simple correction term. With this correction term, the interaction between soil and fertilizer is claimed to be taken into account.

To those people who feel that plant nutrition and fertilizer use can be optimized with the aid of some universally applicable algebraic technique, this book will offer interesting information. Those who are of the opinion that physiological processes taking place in the plant and physico-chemical characteristics of soils affecting the behaviour of fertilizers added to soils, are too complex to be taken into consideration in some simple algebraic equations, will not be very much impressed by the approach advocated in this book.

A. VAN DIEST

M. S. YAKOVLEV: *Comparative embryology of flowering plants* (in Russian). Part I. Winteraceae and Juglandaceae, 1981. 264 pp., c. 850 figs. 4r, 30k. Part II. Phytolaccaceae and Thymelaeaceae, 1983. 364 pp. c. 1000 figs. 6 r. Nauka Leningrad branch, Leningrad.

Members of the embryological laboratory of the Komanov Institute, University Leningrad, started a series about "Comparative embryology of flowering plants". Part I, 1981, presents the Winteraceae and Juglandaceae; part II, published in 1983, the Phytolaccaceae and Thymelaeaceae.

The books offer many data about the anatomy of developing anthers, ovules and embryo's, compiled from earlier studies and completed by new own research.

The series is written in Russian and it will be for many scientists very difficult to read the text. However, a high number of illustrations is presented and the legends with references will give a mainly visual entrance to the books. The literature and list of plant names are in English, so looking at the carefully composed figures and literature an embryologist can find useful data and details suitable for his own anatomical, taxonomical or morphological research. The drawings are accurate and the composition of the figures is consequent.

As, however, the special information in the text remains occluded for those not familiar with the Russian language, an English translation would be welcome.

The editor, professor Yakovlev, and his colleagues have taken a very good initiative and the series will offer a valuable collection of a high number of plant embryological studies.

M. T. M. WILLEMSE

W. GOTTSCHALK and H. P. MÜLLER (Ed.): *Seed Proteins, Biochemistry, Genetics, Nutritive value*. Series Advances in Agricultural Biotechnology. Martinus Nijhoff/Dr. W. Junk, Publishers, The Hague, Boston, London, 1983. ix + 531 p., ill, Cloth. Df250,—, c. US\$ 109,—. ISBN 90-247-2789-8.

The book includes seventeen chapters concerning the biochemistry, genetics and nutritional value of the seed proteins both of cereal grains and grain legumes.

In the first two chapters the relevance of protein improvement and international research programmes for genetic improvement of grain proteins are discussed. The third chapter presents methods for quantitative and qualitative characterization of seed proteins in cereals and legumes. Chapter four deals with the genetics of wheat proteins. The chromosomal location of the genes for albumins, globulins, gliadins and glutenins is reviewed. Besides, recent progress in the relationships between gliadins and glutenins and bread- and paste-making quality are discussed. Barley proteins are considered in chapters five and six. Their biochemistry, genetics and possibilities for improvement are dealt with. The characterization and improvement by mutant genes of rice proteins are described in chapter seven. Chapter eight concerns the biosynthesis and genetics of maize proteins. In chapter nine maize storage proteins, zein and glutelin, are compared with corresponding proteins in related cereals like sorghum and millet. Chapter ten deals with the genetic control of seed protein production in legumes. The major proteins, albumins (enzymes, inhibitors, lectins, allergens) and globulins (legumin, vicilin) are considered. In chapter eleven the characterization of the storage proteins in common bean, broad bean and pea is discussed more precisely. Seed protein production of pea mutants and recombinants and behaviour of a protein-rich pea mutant in crossing experiments are dealt with in chapters twelve and thirteen. Soybean proteins, their characterization and molecular structure are discussed in chapter fourteen. Chapter fifteen deals with possibilities of seed protein improvement in (sub)tropical legumes as groundnut, chickpea, pigeon pea, cowpea and mungbean. Seed protein electrophoresis as a significant tool in solving evolutionary problems is considered in chapter sixteen. The last chapter concerns the nutritive value of seed proteins of cereals and legumes, which in a diet complement each other.

This book is an extensive compilation of the knowledge about seed proteins. Although its price is high, it is highly recommended not only for colleagues involved in biochemistry and genetics of seed proteins, but also for those involved in food processing and university teaching.

J. H. E. MOONEN.

R. C. BUCKLEY (Editor); *Ant-plant interactions in Australia*. Geobotany 4. Dr. W. Junk Publishers, The Hague, Boston, London 1982, ix + 162 p., 41 figs., 40 tables. Df 125,—; c. U.S.\$ 54.50.

The title of the publication is misleading. The contributions are not confined to Australian situations, nor can all ant-plant relations dealt with be indicated as interactions in the strict sense. Two important contributions by the editor are a world review and a world bibliography of ant-plant relations. They show the special and many-sided position of ants in the sphere of animal-plant relations and the renewed interest in these relations, resulting in a burst of research and a great many publications within the last decade. They also show that in general the contributions of botanists to research and development of theoretical concepts in this field are rather meagre. Beside the two contributions mentioned the publication comprises ten papers, varying from thorough to rather superficial, most of them by Australian scientists and on Australian situations. Several papers deal with seed-harvesting ants and their relationships with the composition of vegetations. Other papers refer to the significance of myrmecochory in sclerophyllous vegetations and discuss the biogeographical and co-evolutionary aspects of the correlations. Furthermore, attention is paid to ant-epiphytes and the role of ants in other animal-plant relations. The book is of importance not only to those primarily interested in ant-plant relations but also to those who are interested in interaction patterns between animals and plants and plant communities on a more general level.

C. C. BERG.

Ts. KOSUGE, C. P. MEREDITH, and A. HOLLAENDER (Ed.): *Genetic Engineering of Plants, an Agricultural Perspective*. Basic Life Sciences Vol. 26. Plenum Press, New York and London, 1983. xi + 499 p., ill. US\$ 83.40, U.S. and Canada: \$ 69.50. ISBN 0-306-41353-1.

"The Basic Life Sciences", of which Genetic Engineering of Plants forms the 26th volume, may be mentioned for its merits as a series that follows the developments in the fields of life sciences very closely. This book is already the second within a few years to choose the importance of cellular and subcellular techniques for crop improvement as its topic. Because of a wide selection of authors the contents are rather varied. It presents reviews of all aspects of the sophisticated genetic research: gene regulation and structure, localization of extra-chromosomal factors, vector borne gene transfer, chromosome isolation, somatic hybridization, etc. Other contributions again consider in more detail the potentialities and especially, the limitations of genetic engineering for crop improvement and crop production: somaclonal hybridizations, cell selection with the aid of pathogen produced toxins, selection for salt and drought tolerance, contribution to raising the yield potential, biochemical mutants for improvement of crop quality.

The book opens with a condensed, but excellent contribution of N. W. Simmonds: "Plant Breeding, the state of art", which in the end marks the probable role of genetic engineering for plant breeding as 'unlikely more than marginally useful'. Of course, with the exception of the *in vitro* techniques, which have already found general acceptance. To conclude the conference Phillips successfully summarizes the main points of the contributions. He too infers: 'we might expect more of a resurgence of plant genetics than a revolution in plant breeding'.

Although the papers show great difference in style and in approach of the matters, the book as a whole certainly demonstrates a good equilibrium between optimism and reserve with regard to the applicability of genetic manipulation procedures. The editors may be given credit, for many other works on this subject suffer from unboundedly overrating the potentialities. In the present case a clear effort has been made to narrow, if not bridge, the gap between molecular biologists and plant breeders. It is therefore to be regretted that the report of the Round Table Discussion among leading representatives of both fields of science, which ends the book, only mentions the introductory remarks of the participants and not the actual discussion.

G. A. M. VAN MARREWIJK

J. SZUIKÓ-LACZA (Ed.): *The flora of the Hortobágy National Park*. Akadémiai Kiadó, Budapest 1982. 172 p., 151 figs., 17 tables, check-lists. \$ 17.50. ISBN 963-05-2893-2.

This work presents results of a three-year study, by the staff of the Hungarian Natural History Museum, on the flora of one of the prime puszta areas of Hungary: the Hortobágy National Park (64,000 ha). It is largely an annotated checklist for the area and its importance lies in the unusual completeness of the list, which covers all plant groups (vascular plants, bryophytes, lichens, fungi, algae), 1762 species in total. Particularly algae (537 species) are well represented. For vascular plants brief analyses of life forms and geographical elements are also given while for selected macrofungi, especially species of *Agaricus*, ecological and taxonomic observations are included. The book contains a short geobotanical introduction by the editor, which I find much too abbreviated. Such internationally important landscapes certainly deserve a much more comprehensive treatment. Though published in 1982, references are only up to 1976 and such important recent studies as Orban's work on the life strategies of Hortobágy bryophytes are not mentioned. The quality of the printing is reasonable but the reproduction of photographs is very poor. The book should be useful as a source work for those interested in the botany of the Hungarian puszta.

S. R. GRADSTEIN

FLORA MALESIANA Series I: Spermatophyta, Vol. 9, part 2: pp. 237–552: P. S. ASHTON: *Dipterocarpaceae*. Martinus Nijhoff publishers, The Hague 1982. Df 158.—, approx. US\$ 69.—.

Dipterocarpaceae are certainly the most characteristic tree family of tropical Asiatic lowland rain forests and the publication of their treatment for Flora Malesiana, by the leading specialist Dr. Peter Ashton from Harvard University, should therefore be considered a major event in tropical botany. About 500 species, in 16 genera, are currently recognized, which is at least twice as many since the last monograph appeared a century ago. Over two-third of the species are treated in the present volume, including all species known from Asia and Malesia except India and Sri Lanka. Though pantropical in distribution, the bulk of the family occurs indeed in Asia. Africa has about 40 species (in 2 genera) and tropical America has one: *Pakaraimea dipterocarpacea*, a sensational recent discovery from remote table mountain massifs in the Guiana highlands.

Morphologically, the representatives of each continent are so distinct that the author considers them as different subfamilies. If one accepts the principles of continental drift, as the author does, the distribution of the subfamilies is highly suggestive for a Gondwanalandic origin of the family and, in fact, I believe that biogeographers will find this to be one of the finest examples of putative Gondwana-derived distributions among tropical plant groups.

Besides keys, descriptions, line drawings, habit photographs and distribution maps, the work contains a condensed review (about 50 pp.) of the biology of Dipterocarpaceae, including recent approaches such as ecology, reproductive biology, cytogenetics and chemistry. This is an excellent introduction in the broad field of dipterocarp research and shows the considerable amount of new information that has become available recently. Nevertheless, the author has been prudent not to alter existing classifications as 'foresters in tropical Asia would damn the botanist who undertook 86 nomenclatural changes in quest of a spurious taxonomic ideal' (p. 277)! Dipterocarps are indeed widely appreciated timber woods and their future is becoming more and more insecure as most species are confined to the virgin tropical lowland forests now under threat. Protection of representative portions of these forests seems an absolute must to prevent the dipterocarps from untimely extinction or restriction to gardens and herbaria. With this publication Dr. Ashton and the editor of Flora Malesiana have certainly provided a solid scientific background for such actions.

S. R. GRADSTEIN

Sz. PRISZTER: *Arobres Fruticeque Europae, vocabularium octo linguis redactum*. Akadémiai Kiadó Budapest 1983. 300 pp. U.S.\$ 35,—.

This book gives the names of some 1200 trees, shrubs and semi-shrubs endemic in Europe, in eight languages, viz. latin, english, french, german, hungarian, italian, spanish and russian. The dictionary proper is based on the botanical system and nomenclature adopted in Flora Europaea (Cambridge, 1964–1980). The scientific plant names are numbered and arranged according to the latin alphabet. Also the next higher taxonomic category is given, the geographical distribution of the plant, and synonyms. Cultivated or wild species of non-European origin have been left out.

For a specific country the number of listed species is rather limited. Furthermore several misprints are present. This is probably inevitable considering the tremendous work done collecting the equivalents.

Since finding vernacular names of various species in the world languages is always a problem, this dictionary is a welcome supplement to botanical literature. Like the editor the reviewer hopes that it will promote the establishment of standard taxonomic usage.

R. W. DEN OUTER

L. VAN DER PIJL: *Principles of dispersal in higher plants*, 3rd rev. and exp. ed. Springer Verlag Berlin, Heidelberg, New York 1982. x + 215 pp., 30 figs., 5 tables. DM 59.80, approx US\$ 26.60. ISBN 0-387-11280-4.

The fact that VAN DER PIJL's *Principles of Dispersal* required a third edition in less than 15 years is the best proof that it fills a need. The present edition is not just a reprint of the previous one reviewed by me in *Acta Bot. Neerl.* 23: 750 (1974). Several chapters have been largely expanded or have been rewritten. Part of the increase in pages, however, is due to the larger letter type in edition 3.

New is the chapter on Dispersal and Evolution of Grasses. In it a tropical origin of grasses is postulated in open marshes and flood plains. There was an early bond with water and water animals leading to a multitude of dispersal devices comparable to that in Leguminosae and to the diversification of pollination devices in orchids.

*Principles* is replete with vanderpijlisms such as "In the *Oryzae* a dry nut with a still free seed is present in *Luziola* and *Zizanopsis*. It was found inside ducks" (p. 164) and "Fritz Müller already observed epizoochory by means of his beard" (p. 167).

The book on account of its original and stimulating, albeit sometimes speculative ideas deserves to be studied, not just read. Reading, however, is certainly not easy because of the special jargon. Those who do take this trouble will find it rewarding. A few inaccuracies both in spelling and in fact must be mentioned. To give a few examples: *Dysoxylum* is misspelt *Dysoxylon* (p. 25). *Asimina* (misspelt *Asiminea*) is Annonaceae not Magnoliaceae (p. 25). The text on p. 93 suggests that *Tetraplasandra* (Aral.) and *Stenogyne* (Lab.) belong to the Compositae. Fosberg's analysis (p. 109) deals with the origin of the Hawaiian flora not with that of the Pacific. Furthermore *pooles* for *pools* (166), *waive* for *wave* (p. 169) and *Cortadenia* for *Cortaderia* (p. 174). These little shortcomings in no way detract from the value of the book. One could only wish it to be more lavishly illustrated.

M. M. J. VAN BALGOOY

P. BAAS (Ed.): *New perspectives in wood anatomy*. Forestry sciences series. Mart. Nijhoff, 's-Gravenhage 1982. vi + 252 pp., 42 figs., 9 tables. Df 130,—, US\$ 54,—.

On the occasion of the 13th Intern. Botanical Congress in Sydney, several symposia on wood anatomy were organized to celebrate the 50th anniversary of the Intern. Association of Wood Anatomists. Nine of the invited papers are presented in this book, often in more extended form than the paper read at the congress. Some of the contributions, particularly the first one by W. L. Stern who gives a historical survey of the IAWA's origin and its subsequent fate, do not entirely match the title of the book which mentions *New perspectives in wood anatomy*. However, as explained by the editor, P. Baas, in his preface, the history of a science can offer inspiration for new research.

The second paper, written by P. Baas, is titled "Systematic, phylogenetic and ecological wood anatomy - History and perspectives". A short historical survey of botanical anatomy is followed by a paragraph on the development and the meaning of wood anatomy in plant systematics, and by two excellent chapters on phylogenetic and ecological wood anatomy, incorporating the modern trends in anatomical research. We find here an intelligent comparison of wood anatomical and palynological features of non-specialized and specialized families of different geological age, and a very clear survey of the often seemingly contradictory and confusing literature on the impact of ecological factors on the anatomy of the wood.

M. H. Zimmermann deals in his contribution ("Functional xylem anatomy of Angiosperm trees") with the relation between vessel characters and the physiology of water transport in a tree. He discusses the possible ecological significance of number, size, and distribution of vessels. B. G. Butterfield and B. A. Meylan presented a paper on "Cell wall hydrolysis in the tracheary elements of the secondary xylem". An overview was given of hydrolysis during cell differentiation of pit

membranes and vessel perforation plates in the secondary xylem in various groups of woody plants. The combination of recorded data and the, sometimes speculative, interpretation of the SEM-photographs is nicely balanced. Their SEM-photographs are of the high standard we are accustomed to in their work. It is a pity that the reproductions are poorly done and do not do full credit to the authors and their work.

Ph. R. Larson discusses in his paper "The concept of Cambium" the definition of the cambium in relation to the entire meristematic system and their derivatives. It is a lucid paper, highly recommendable reading. In the paper which follows, G. P. Berlyn ("Morphogenetic factors in wood formation and differentiation") deals with the cambium from a different point of view. He describes in his excellent contribution three different types of cell division in the cambium: multiplicative, additive, and transformative. The factors controlling these divisions are discussed. The remaining three papers (J. Burley: Genetic variation in wood properties; J. D. Boyd: An anatomical explanation of visco-elastic and mechano-sorptive creep in wood and effects of loading rate on strength; J. Burley and R. B. Miller: The application of statistics and computing in wood anatomy) cover fields of research beyond the scope of the reviewer's own field. Especially the first two papers give the impression of intelligent surveys of the respective topics.

One of the outstanding features of the book is the extensive lists of literature accompanying all papers. Furthermore, the book is carefully and well edited. It can be recommended to all interested in the latest findings in wood anatomy but also to those interested in the history of this branch of botanical science.

A. M. W. MENNEGA  
J. KOEK-NOORMAN

R. MARCELLE, H. CLIJSTERS and M. VAN POUCKE: *Effects of Stress on Photosynthesis*. Martinus Nijhoff/Dr. W. Junk Publishers, The Hague, Boston, London 1983. x + 388 p., ill., tables. Df 120.—. (c. US\$ 52.—). ISBN 90-247-2799-5.

This book contains the proceedings of a conference by both the Opzoekingsstation van Gorsem and the Limburgs Universitair Centrum at Diepenbeek, Belgium, where this conference was held from 22 to 27 August 1982. After a most interesting inaugural address by H. W. Woolhouse on the effects of stress on photosynthesis, the 15 communications presented at session 1 regard the effects of water stress. The 4 communications of session 2 concern stress and crassulacean acid metabolism, in session 3 temperature stress is considered in 12 communications, whereas the 7 topics of session 4 deal with other stresses and the combination of different stresses. The book is quite recommendable.

J. B. THOMAS

### DE LEVENDE NATUUR, *tijdschrift voor natuurbehoud en natuurbeheer*.

The journal, started in 1897 by the well-known Netherlands naturalists E. HEIMANS, J. JASPERS and J. P. THIJSSSE, will in future be published as a journal for nature conservancy and nature management by a foundation in which "Rijksinstituut voor Natuurbeheer", "Vereniging tot Behoud van Natuurmonumenten" and "Koninklijke Nederlandse Natuurhistorische Vereniging" participate.

A free copy of the first (November 1983) issue can be obtained from: Administratie "DE LEVENDE NATUUR", p/a Schaep en Burgh, Noordereinde 60, 1243 JJ 's-Graveland. Subscriptions (f 42.50 for 6 issues of 32 pages each) are welcome at the same address.