

## BOOK REVIEWS AND ANNOUNCEMENTS

W. B. TURNER and D. C. ALDRIDGE: *Fungal Metabolites II*. Academic Press, London, New York, Sydney, Toronto 1983. X + 631 pp. £ 44.–; US \$ 80.–.

As the authors state in their Preface, “the first volume of ‘Fungal Metabolites’ attempted to present a comprehensive list of the secondary metabolites of the fungi, classified according to their biosynthetic origin”. In “Fungal Metabolites II”, new metabolites are listed which have been isolated and characterized in the twelve years that have elapsed since volume I was published. It only lists new information where appropriate, frequently referring the reader back to volume I. For convenience, the authors have used the same headings and numbering in both volumes for sections dealing with similar subject matter.

Like “Fungal Metabolites”, this supplementary volume is a very rich source of information for fungal physiologists and other research workers interested in fungal metabolism. In seven chapters plus an addendum, it gives the chemical names, structural formulae and sources of nearly two thousand metabolites, in addition to the text and cited literature. “Fungal Metabolites II” includes over 2500 references on a total of 90 pages. Further it contains 70 index pages with a very useful formula index, an organism index listing over 1000 fungal species, and a subject index. The lay-out of “Fungal Metabolites” is excellent, and the printing – including that of thousands of structural formulae – is most perfect.

In conclusion, “Fungal Metabolites II” is a source of information which should be present in the libraries of all institutes and laboratories engaged in research on fungal metabolism.

A. FUCHS

C. R. METCALFE (Ed.); *Anatomy of the Monocotyledons*. VII. P. B. TOMLINSON: *Helobiae (Alismatidae)*. Clarendon Press, Oxford 1982. XV + 522 pp., 94 figs., 16 plates. Cloth. £ 50.–. ISBN 0 19 854502 9.

This volume in the series “Anatomy of the Monocotyledons” treats 16 families assigned to the Helobiae or Alismatidae and grouped in the orders Alismatales, Hydrocharitales, Apogetonales, Scheuzeriales and Triuridales. More than is the custom in this series, information on vegetative anatomy is complemented with data on growth habit and architecture, floral organization, and biochemistry. Full attention is also paid to developmental and functional aspects, so that a more pretentious title, viz. “Morphology and Biology of the Helobiae” would have been justified. Fortunately the attention to various aspects has not gone to the cost of the amount of descriptive information on the vegetative anatomy of this largely aquatic super-order, showing many parallel developments inherent to their ecology. The descriptions are detailed and as comprehensive as can be expected from a survey covering the literature and adding original observations on a limited number of species in each group.

The broad approach has allowed the author to make meaningful suggestions on the classification and affinities of the Helobian families, integrating arguments derived from several disciplines. The questions whether the Helobiae constitute a monophyletic group and whether they can be considered primitive or even ancestral are addressed, but the hoped-for answers are replaced by a critical discussion of what others have contributed to the controversies. Apparently the author believes in the monophyletic nature of the group and ascribes to the consensus that despite the bewildering diversity “the members are indeed a natural assemblage, but with a remarkable array of morphologically specialized features” (p. 16).

A general problem for any anatomist producing family surveys of this kind is the reliability of the identification of the material for study. The present survey has not escaped this almost unavoidable source of error. H. W. E. van Bruggen, the world monographer for the genus *Aponogeton* informed me of several misidentifications in the book, including one of a pictured species, allowing

re-identification from the habit drawings (Fig. 5,2. *Aponogeton natans* which should almost certainly be *A. crispus*). Such mistakes could easily mislead the uncritical user into abusing differential anatomical characters for diagnostic purposes below the genus level. Fortunately the author is careful enough not to jump to conclusions based on inadequate coverage of species at this taxonomic level.

The volume is well illustrated with histological line drawings and half-tone plates of light- and scanning electron micrographs. In addition there are several exquisite drawings of the vegetative and reproductive morphology for each family by Priscilla Fawcett.

This is the third contribution by Dr. Tomlinson to the "Anatomy of the Monocotyledons". It deserves our congratulations and inspires the hope that it will not be his last in this important series.

P. BAAS

R. SATTLER (Editor): *Axioms and principles of plant construction*. Martinus Nijhoff/Dr. W. Junk, publishers, The Hague, Boston, London. 1982. 186 pp., 33 figs. Df 80,—, approx. US \$ 35,—.

This book cannot be reviewed by a hasty reader. It is one of those works that are taken up once and again, to be savoured bit by bit and reread carefully. This is true not only for plant morphologists, for whom it is primarily meant according to its title. Every scientist whose interest is linked to the plant world should take it to hand. For, the subject matter is as much the working of the scientific mind as the objects studied: plants and their construction. After a deceptively mild preface and introduction by Sattler, the editor and convenor of this symposium at the XIIIth International Botanical Congress, the reader plunges headlong into the *pièce de résistance*, a highly erudite chapter on the history of morphological thinking by G. Cusset. In this chapter, built as a tree itself with the numerous branchings of morphological thoughts and schools which it covers, an invitation is felt to find oneself back. After trying in vain to resolve whether Cusset has succeeded correctly and truly in assessing one's own thoughts, the commentary by S. V. Meyen efficiently pulls the reader back to earth posing the essential remark that it doesn't matter so much who is right and who is wrong as to understand the different models of plant construction and their principles which were developed in such a profusion during the preceding centuries.

The next pairs of chapters and commentaries offer a choice in essentially complementary and contemporary ways of considering plant construction. Here, the Cusset chapter proves invaluable in finding one's way through Mohr's strict and physiologically biased approach, Sachs's development of the concept of homology in terms of morphogenesis, Erickson's crystal-clear and crystal-like analysis of plant construction and Tomlinson's bright and empirical balancing of patterns and hazards leading to the plant forms one can observe. The counterpoints by Knox and Considine, Lindenmayer, and Philipson, respectively, have been very well written and masterfully orchestrated by the editor.

This book is a gem, for which one should take his or her time carefully, once and again. It is timeless insofar as it will continuously inspire new thoughts with the developing of the reader's own mind. Beginning as a student of Nature and taking up reading it again every year or two, it will yield new aspects every time. The volume will undoubtedly be symptomatic of the libraries of such plant scientists as take seriously the art and knowledge of thinking about plants without taking themselves too seriously. In this sense it is warmly recommended.

R. A. A. OLDEMAN

FLORA MALESIANA Series I: *Spermatophyta*, Vol. 9, part 3: pp. (1) – (47) + 553–600. Martinus Nijhoff publishers, The Hague 1983. Df 50,—.

This issue of Flora Malesiana contains an extensive bibliography and short biography of Odoardo Beccari: "the greatest botanist to study in Malesia" (by R. E. G. Pichi Sermolli and C. G. G. J. van Steenis), as well as an index and addenda to systematic revisions published thus far. The fascicle completes volume 9 of the Flora.

C. R. METCALFE and L. CHALK: *Anatomy of the Dicotyledons*. 2nd Ed. Vol. II: *Wood structure and conclusion of the general introduction*. Clarendon Press, Oxford 1983. XI + 297 pp., 43 figs., 11 plates. Cloth. £ 35.-. ISBN 0 19 854858 2.

This second volume of the second edition of "Anatomy of the Dicotyledons" completes the general introduction to comparative anatomy. Family treatments are to be followed in subsequent instalments. The volume contains the following chapters: Wood structure. Anomalous structure; Secretory structures; Secreted mineral substances; Anatomy, phylogeny and taxonomy; Ecological anatomy and morphology; Chemotaxonomy; The application of statistics and computing in wood anatomy; and the Systematic arrangement of dicotyledonous families. The last chapter is by A. Takhtajan; the statistical chapter is by J. Burley and R. B. Miller; J. B. Harborne, E. M. Chenery, C. R. Metcalfe and P. J. Peterson contributed to the chemotaxonomical part; wood anatomical chapters were drafted by L. Chalk and completed after his death in 1979 by C. R. Metcalfe. The latter is the author of all other chapters. Lists of families in which certain diagnostic characters occur are appended to facilitate the identification of incomplete botanical material. A rich bibliography, an index and a fine set of plates conclude the book.

From the listing of chapters and their authors it will be evident that they cover a great diversity of topics and that the subject matters are treated by most knowledgeable authors. Apart from general praise for offering the botanical community such a useful and unique work of reference, comments can thus be reduced to minor criticisms or deviating points of view.

The surveys of wood anatomy and of its phylogenetic and taxonomic significance are very comprehensive. Uninitiated readers may be confused by the different classifications of rays, especially the recommendation of Kribs' ray classification of 1950 in the first chapter and the elaborate discussion of ray phylogeny using the substantially different classification by Kribs of 1935 in a later chapter is unfortunate.

The chapter on ecological anatomy and morphology has the merit of its broad approach linking gross morphology, phenology and anatomy. On the other hand one might wish a more comprehensive coverage of anatomical aspects. As anticipated in the preface, a chapter on chemotaxonomy comes rather as a surprise in a book on plant anatomy. Yet Harborne's contribution is meaningful in this context because it also discusses the common ground of chemotaxonomy and systematic anatomy.

Takhtajan's classification will serve as a framework for the future family treatments. It is richly annotated with references to papers giving anatomical evidence supporting the system.

The role of plant anatomy in taxonomy is certainly not overemphasised by Metcalfe when he stresses that "histological data are not especially significant except as additional characters" (p.98). Such modesty is also evident from the choice of examples illustrating the usefulness of vegetative anatomy in taxonomy. These are either cases of confirming suspected identities or of elucidating the systematic position of so-called incertae sedis genera or monotypic families. This attitude is reminiscent of the practical views voiced several decades ago by I. W. Bailey. In my opinion, however, the greatest challenge to systematic anatomists now and in the future is to contribute to plant taxonomy at all levels. Comprehensive studies of larger families, covering all genera and many species are now in order. Volumes I (1979) and II of the second edition of *Anatomy of the Dicotyledons* will certainly be most useful guides for students embarking on such ambitious research programs. Botanists from other specialised fields will also find these books a useful source of inquiry.

P. BAAS

A. M. MAYER and A. POLJAKOFF-MAYBER: *The germination of seeds*. 3rd ed. Pergamon Press, Oxford, New York, Toronto, Sydney, Paris, Frankfurt 1982. IX + 211 pp., 68 figs., 57 tables. £ 9.50, \$ 10.-; cloth £ 19.-, \$ 38.-.

This third edition of "The germination of seeds" follows upon a first edition in 1963 and a second in 1974. Although every section of the book was revised, the authors maintained the overall structure

of the two previous editions. In the first two chapters the seed is presented in its structure and chemical composition. Thereafter, the authors describe in succession the external factors affecting germination, and the causes of dormancy in combination with the stimulation and inhibition of germination. In the last chapter those same external factors are described in the habitat of the germinating seed, followed by a discussion of their ecological role. Between the physiological and ecological description of germination control the book contains a description of the metabolism of germinating seeds and of the effect of the regulatory compounds on metabolism. The rather rigid separation of physiological, biochemical and ecological aspects of seed science hinders their integration. Moreover, it dispenses the information about a certain environmental factor like e.g. light, over several chapters. The interest of the authors in the seed starts at the moment of rehydration of the harvested seed. The previous developmental phase on the mother plants is hardly touched upon. The authors maintained the greater part of the original editions, thereby retaining the older classical data which they feel to be the basis for much modern research. Their preference for older data is at some places debatable, e.g. where they maintain a lengthy section about the effects of coumarin. Important new data were added, however. It is regrettable that these new data are hardly represented in the illustrations. At a few subjects new developments escaped their attention, e.g. where the "inverse dark reversion" is still described as a possible transformation of phytochrome. The production of the book is reasonably well. The indices contain serious errors.

C. M. KARSSSEN

C. D. BRICKELL, D. F., CUTLER and MARY GREGORY (Eds.): *Petaloid Monocotyledons, Horticultural and botanical research*. Linnean society symposium series no. 8. Academic Press London and New York, 1980. XII + 222 pp., plates. £ 26.80 (U.K. only); US \$ 62.00. ISBN 0-12-133950-5.

This volume contains 17 representative papers of a Symposium organized jointly by the Linnean Society and the Royal Horticultural Society. Two introductory papers emphasize the advantages and limitations of Monocotyledons for horticultural purposes by their morphology and physiology. The following four sections deal with: Problems in propagation and flowering (4); Anatomy and its applications to taxonomy (5), Plant breeding and cytology (4) and Exploitation and conservation (2).

Some of the papers present the results of pure research, while others have a more applied character.

Progress of in vitro propagation with a large number of genera of bulbs and corms is presented in the section on propagation. The second paper on propagation shows the morphogenetic effects of gibberellins and growth retardants on rejuvenation and branching of palms. Control of flowering by photoperiod and temperature is discussed for *Alstroemeria* "Regina", *Freesia* × *hybrida* and *Lilium longiflorum*, in particular with respect to the similarity of responses of the different species. Partly out of the scope of this volume is one paper on *Narcissus* diseases, although in itself it presents a good survey, in particular on basal rot.

The significance of anatomical and morphological characters for the classification of taxa is stressed in five papers. Studies are presented on the use of numerical analysis for a re-evaluation of the Melanthioideae; the vegetative anatomy of *Galanthus* and *Zephyranthes*; leaf anatomy of the genus *Kniphofia*; the vascular system in stems of certain Araceae and the use of androecial characters to determine the evolution of Velloziaceae. Furthermore the origin of some *Crocus* cultivars was established by the use of cytological studies.

The section on breeding has one paper on the history of *Freesia* breeding with emphasis on the significance of modern freesias for horticulture. Furthermore there is one paper on *Pleione* species and their breeding behaviour and one on breeding of *Lilium* in particular on interspecific hybridization with the use of embryo culture and cut-style techniques.

Finally in the last section two papers deal with exploitation and conservation of petaloid monocotyledons. Distribution, taxonomy, breeding and horticultural importance of species in Southern Africa are outlined. The second paper deals with endangered species in Europe and South West Asia with special attention to the situation of orchids.

This volume offers a great variety of papers and will be of interest for all those interested in petaloid monocotyledons and in particular to breeders and taxonomists.

J. BERGHOF

G. EDWARDS and D. A. WALKER: *C<sub>3</sub>, C<sub>4</sub>: mechanisms, and cellular and environmental regulation, of photosynthesis*. Blackwell Scientific Publications, Oxford, London, Edinburgh, Boston, Melbourne, 1983. X + 542 pp., many figs. £ 32.—. ISBN 0-632-00757-5.

As far as I am aware this is the first complete textbook where a full treatment is given of the principles, characteristics and properties of the photosynthetic carbon assimilation in C<sub>3</sub> and C<sub>4</sub> plants. In the first part (A; five chapters, over 100 pages) the elements of biological energy conversion in general and more especially of photosynthetic energy conversion are given. It contains necessary information about energy (thermodynamic principles and laws), light, structure and function of the photosynthetic apparatus, and about the way in which ATP and reducing power are formed in the photosynthetic electron and hydrogen transport chains.

The style is clear and the authors' argumentation is illustrated with carefully chosen, usually simple and clarifying figures and schemes. In a few cases, however, the interpretation of a figure by the reader is hampered by too concise an explanation (e.g. fig. 7.24, p. 182; fig. 8.3, p. 208).

The contents of part A is also found in other textbooks on photosynthesis. The basic information it contains is, however, indispensable for the understanding of the contents of part B. Moreover, in the high level treatment also the specialist will find much to his taste, whereas for the non-specialist and the student it is a clear-cut preparation for the study of the second part.

In the eleven chapters of part B the kinetic, energetic, enzymatic, inductive, and structural aspects of the CO<sub>2</sub> reduction cycle in C<sub>3</sub> and C<sub>4</sub> plants are treated. The Calvin cycle, here called reductive pentose phosphate (RPP) chain, is amply discussed in the next three chapters. An important part is devoted to the function, properties and localization of transport systems in the chloroplast outer membrane, especially in relation to the regulation of the CO<sub>2</sub> assimilation.

In three chapters the CO<sub>2</sub> assimilation is treated in C<sub>4</sub> plants with differentiation in mesophyll- and bundle-sheath cells (PEP- and RPP-carboxylation, respectively). Attention is paid to the discovery, biochemistry, photochemistry and taxonomy, and the regulation. A separate chapter is devoted to photorespiration. Ecological aspects receive attention chiefly in relation to CO<sub>2</sub> concentration, temperature- and water-stress, followed by treatment of CO<sub>2</sub> fixation in plants with crassulacean acid metabolism (CAM). In the last chapter attention is paid to C<sub>3</sub> and C<sub>4</sub> metabolism in different plant organs, e.g. fruits. In an appendix important information is given about isolation of intact chloroplasts and the test criteria for their intactness, essential for the study of photosynthesis in higher plants.

The book can be warmly recommended as a source of information as well as inspiration.

W. J. VREDENBERG

F. K. FONG (Ed.): *Light Reaction Path of Photosynthesis*. Molecular Biology, Biochemistry and Biophysics Vol. 35. Springer Verlag, Berlin, Heidelberg, New York 1982. XI + 342 pp., 118 figs., 30 tables. Cloth DM 138.—, c. U.S. \$ 55.20. ISBN 3-540-11379-7.

This book is no. 35 in a series of monographs on molecular biology, biochemistry and biophysics, and the first on photosynthesis in this series. The title already suggests that we are dealing here with a rather specialised area of research, and the subjects chosen are restricted to the primary processes of photosynthesis. The book is a collection of review articles which discuss several physico-chemical aspects of light absorption and its conversion into chemically useful energy in photosynthesis. The techniques used in this research are presented sometimes in great detail, and this is in general necessary for non-specialists, however the strictly biophysical treatment of the subject matter makes

the book poorly accessible to the more physiologically interested reader. The book contains two chapters on excitation energy transfer, two on charge separation, and two on model systems which mimic the in vivo systems (biomimetics). These three topics represent the most important developments of recent years in this area. The remaining two chapters are written by the editor Fong himself: the first a short introduction, and the last a contribution on possible carbon dioxide involvement in primary reactions.

The chapter by Scheer on the organisation of phycobiliproteins within light-harvesting pigment-protein systems from blue-green and red algae, gives a clear illustration of the dependence of function on structure in those systems. Beddard and Cogdell discuss several theoretical aspects of excitation energy transfer both in isolated chlorophyll- and bacteriochlorophyll-proteins and in more intact systems (e.g. chloroplasts), and illustrate these with some well-chosen examples from the literature. The picosecond laser spectroscopic techniques, used in this type of research, are also discussed. Hoff has once again taken on the difficult task of describing the primary electron transfer processes – with measurements on photosynthetic reaction-centres, probing in particular the structure of the primary donor in bacteria and plants, and which employ electron spin resonance and fast optical techniques. The chapter by Levanon and Norris is more specialised and is restricted to the chlorophyll triplet associated with the charge separation process. A certain overlap can be detected between the contributions of Hoff and of Levanon/Norris, and also with that of Clarke, which is devoted to the chlorophyll triplet state in in vitro model systems. Wasielewski gives a clear and comprehensive review of the literature on the synthesis of models of the photosynthetic reaction centre.

To summarise: this is a specialised book on the physical chemistry of an important biological process, and it contains several interesting contributions from internationally recognised authors.

G. F. W. SEARLE

H. J. TEAS: *Biology and ecology of mangroves*. Dr. W. Junk Publishers, The Hague, Boston, Lancaster 1983. (Tasks for vegetation science 8.) 188 p., many maps, photographs and plates. Price (clothbound) Dfl. 160.-; US \$ 64.-. ISBN 90-6193-948-8.

The 20 chapters of this book, by various authors, can be divided into some 7 categories of subjects. Geology: fossils from Grand Cayman reef (South of Cuba), c. 1500–200 years old and Upper Carboniferous coal of Cordaitean mangrove in Iowa. Local mangroves: descriptions and analysis of mangroves in Fukien (China), Princess Charlotte Bay and Townsville in North Queensland, survey of Australian mangroves with the distribution of each species mapped (by dots), New Guinea and New Zealand. Faunal: mangrove fishes of New Guinea and faunal communities in Australia. Single species: ecology of cryptovivipary in *Aegiceras* seedlings, and albino propagules in *Rhizophora mangle*, probably due to a recessive one-gene following self-fertilisation. Succession in zoned mangroves with a discussion of mangrove-“climax”, a term which as a “steady state” concept loses its meaning in this mobile, gradient vegetation type. Decomposition of leaf-litter discussing food chains and analysis of nutrient. Impact of sewage and oil-spill: 5 chapters, e.g. the role of Phycomycetes in degrading cellulose, chitin, and keratin all over the world; capacity of mangroves towards enrichment by degrading organic wastes from sewage seems rather high (South Africa, Bombay, Darwin) and impact of oil spills in the New World, in which it is surprising to learn that mangroves suffer less than anticipated, by the mobile environment and their capacity of regeneration.

The chapters are rather concise but well-composed and readable. Botanically some are of distinct interest: in continental China mangrove depauperates towards the north in the same way as in the East Asian island chain, it ends in China at 27°20' N with stands of *Kandelia kandel*, whereas in the islands it ends up with the same tree species in Kyushu at 31° N. The chapter on Australian mangrove species is most instructive by the 33 detail maps; *Dolichandrone spathacea* is for the first time recorded from Australia on the north tip of Cape York Peninsula.

An instructive, well executed book, aptly dedicated to the memory of the late Prof. V. J. Chapman, of Auckland, who spent much of his very active life on the study of coastal life of algae and mangroves.

C. G. G. J. VAN STEENIS

W. BRAUNE, A. LEMAN, H. TAUBERT: *Pflanzenanatomisches Praktikum I*. 4. Aufl. VEB Gustav Fischer Verlag, Jena 1983. 279 p., 417 figs. Cloth M 36.—. In the D.D.R.: M 26.30.

This fourth edition of "Pflanzenanatomisches Praktikum I" differs only in minor details from the third edition of 1979 which was reviewed in *Acta Bot. Neerl.* 29 (1980) p. 318. Some corrections and improvements are based on suggestions in the largely positive reviews which the third edition received. Once more the success of this manual giving a practical as well as fundamental background for a very comprehensive course in plant anatomy shows that the botanical curriculum at universities in at least some countries has not yet deteriorated to the minimum level we are faced with in The Netherlands. Four editions within 15 years, with three additional printings may serve as self evident recommendations of this excellent teaching aid.

P. BAAS

C. BAS, J. VAN BRUMMELEN, F. TJALLINGII, G. TJALLINGII-BEUKERS: *Standaardlijst van Nederlandse paddestoelnamen*. Wet. Med. KNNV no. 156. Koninklijke Nederlandse Natuurhistorische Vereniging, Hoogwoud 1983. 72 pp. Paper, Df8.50 (members KNNV: Df7.50). To be ordered from: Bureau KNNV, Hoogenboomlaan 24, 1718 BJ Hoogwoud. Postgironr. 1 30 28.

In 1969 the Netherlands' Mycological Society set up a committee with the task to prepare a list of recommended Dutch names of macrofungi. The committee drew up an inventory of all names used in the past, selected the most suitable ones and created many new ones for common species not yet having a popular name. The present publication is the result of the committee's efforts. It contains an alphabetical list of scientific names with the matching recommended Dutch names and, when useful, some synonymous Dutch names. The alphabetical list also contains the more important scientific synonyms. An index to all Dutch names has been added.

The list should not be confused with a checklist; only a minority (c. 1200 species) of all native macrofungi (c. 3500) have been provided with a Dutch name and, on the other hand, several of the listed fungi have never been found in The Netherlands so far, e.g. *Amanita caesaria* and *Marasmius alliaceus*. It was unavoidable that the efforts of the committee resulted in some rather artificial or very long names, e.g. "Kleine loofbostrechterzwam", "Gegordelde berkegordijnzwam", "Paarssteel-schijnridderzwam". It is a pity that some common and well-known species did not yet receive a Dutch name, e.g. *Conocybe rickeniana* and *Entoloma lazulinum*. Printing errors are fortunately few. A more serious error is that *Cortinarius obtusus* and *C. orellanus* are provided with the same popular name: "Jodoformgordijnzwam" (p. 18). In spite of these small shortcomings the present publication is a great improvement of the rather chaotic situation of the past years. It is to be hoped that the recommendations of the committee will be followed in all new publications using Dutch names of macrofungi.

The publication is in particular useful for professional and amateur mycologists, teachers in biology and publishers of popular books on biology.

E. J. M. ARNOLDS

M. H. ZIMMERMANN: *Xylem structure and the ascent of sap*. Springer series in wood science vol. 1. Springer Verlag, Berlin, Heidelberg, New York, Tokyo 1983. X + 143 pp., 64 figs. Cloth. DM 54.—, c. US \$ 22.30.

The structure and physiology of forest trees is a fascinating field of study, which many modern biologists have turned away from in favour of more simple systems such as bacteria, or more manageable plants such as *Avena*, *Pisum* and *Phaseolus*. Fortunately there are some who still carry on the tradition established well over a century ago of integrated structural and physiological research

of inconvenient but important organisms. They are facing busy times now the general public wants to understand why trees and forests die at such alarming rates in our polluted environment.

Dr. M. H. Zimmermann and his research group at the Harvard Forest belong to those few who actively study whole tree biology. Zimmermann's book on the ascent of sap in relation to wood structure contributes greatly to our understanding of how cleverly the xylem is built, but at the same time which risks are at stake with respect to the supply of water and nutrients to the crown in various stress situations. The book is not an encyclopaedic compendium nor a textbook, but a source of ideas in which the author freely offers speculative hypotheses which still have to await experimental testing.

The contents include a survey of the structure of the conducting units (vessels, tracheids) and the three-dimensional network in hardwoods and arborescent monocotyledons; the cohesion theory of sap ascent with the additional concepts of "designed leaks", "capillary water storage" and "sealing"; the hydraulic architecture of plants treating among others leaf-specific conductivity and the functional anatomy of branch and leaf insertions; miscellaneous adaptations, including the conductive system of aquatic plants; failure and senescence of xylem function and finally xylem pathology. All chapters are written in a personal and very stimulating style, which makes the book palatable for research workers as well as advanced students.

No doubt some of the hypotheses offered are open to criticism. The anatomist may wonder about the structural basis for the "designed leaks" and the available space for "capillary water storage". The physiologist may still find it problematic to bring the cohesion theory, implying considerable negative pressures at the top of tall trees, in agreement with guttation phenomena. The only reaction to such question marks should be to take up further studies and collect more experimental as well as descriptive data.

The book is well illustrated and has an attractive lay-out. It will hopefully stimulate a renewed interest in the study and teaching of wood structure and function. This we owe to the trees as well as to the author as a reward for his fine contribution.

P. BAAS

C. KALKMAN: *De twee vragen van de plantensystematiek*. Publ.: Rijksherbarium P.O. Box 9514, 2300 RA Leiden, 1982. 19 p., 5 ill. Df 2.50.

This pamphlet in Dutch aims at explaining in a nutshell the nature and definition of plantsystematics as a scientific discipline in biology. Classification and phylogenesis are identified as the main areas with which plant systematics is concerned. The concepts are clarified by means of diagrams. In addition, the products and practical uses of plant systematics are briefly reviewed. The text, primarily written for students and other non-specialists, is condensed and theoretical but some references for further reading are given. The price is remarkably low and should just cover mailing costs.

## ANNOUNCEMENT

In 1985 a symposium on Nitrogen Metabolism will be organised by the Department of Plant Physiology of the University of Groningen and the Institute for Soil Fertility, Haren, The Netherlands, entitled:

### NITROGEN METABOLISM IN HIGHER PLANTS, PHYSIOLOGICAL, ECOLOGICAL AND APPLIED ASPECTS

Those wishing to participate should (before 1 September 1984) contact the secretariat:

Department of Plant Physiology, University of Groningen,  
P.O. Box 14,  
9750 AA Haren (Gn), The Netherlands