

BOOK REVIEWS

H. Ettl: *Grundriss der allgemeinen Algologie*. G. Fischer Verlag, Stuttgart, 1980. 549 pp., 260 plates with numerous figs. DM 98.–.

According to the preface this book has two main purposes. In the first place to provide a general phycological text for the users of the “new edition” of Pascher’s “Süßwasserflora” (one of whose editors is Dr. Ettl), and in the second place for teaching general phycology. Dr. Ettl states that he has a descriptive morphological approach for didactic reasons.

There are ten chapters. Chapter 1 delimits the algae, chapters 2–7 are devoted to cytology, morphology, reproduction, life cycles, the algal system, and ecology and distribution; chapters 8, 9, and 10 to the references, the subject index, and the taxonomic index, respectively.

Chapter 2, on algal cytology, contains a wealth of information and is lavishly illustrated with numerous unsurpassed classical and many more recent (especially electron microscopical) figures of high quality. This is the largest chapter, and it testifies to Dr. Ettl’s expertise on unicellular and colonial freshwater algae.

Of the 74 pages of chapter 3 (on algal morphology) 42 are devoted again to unicellular algae. This results in much repetition. E.g., the diatom frustule is treated on p. 134 and p. 218, the cytology of *Euglena* on p. 187 and pp. 141, 142, a.o., the dinoflagellate “amphiesma” on p. 143 and p. 192. These are only a few examples. On the remaining 32 pages the morphology of multicellular and siphonous algae is treated. This part gives an inadequate overview over the diversity of multicellular structures in algae. The vast modern literature in this field is virtually disregarded. This is illustrated by the fact that, with few exceptions, the figures are borrowed from Oltmanns (1922). One example: a picture is given of a longitudinal section of the young *Laminaria*-stipe (borrowed from Oltmanns, 1922), but the characteristic differentiation of the tissues and its mode of growth by a meristoderm are not treated.

Moreover, this scarce elementary information is burdened with an unwieldy and unusual terminology. See, e.g., the definition of the “symphyoblastem” on p. 152 (section 3.6.5): “Schnusnig summarizes under symphyoblastem as a unit formed by union of two or more subordinated units, all orthotropic and plagiotropic thallus formations whose inner structure results from the allelotactic growth of nematoblastic, stichoblastic or also siphonoblastic axial units.” This is meant to introduce the reader to the multiaxial structure of the thallus of *Nemalion*, & c. The author does not give definitions of the majority of these terms. A glossary is lacking. Moreover some implications of this terminology are incorrect. E.g., the *Fucus* thallus is treated as a “stichoblastem”, which implies that it starts as a uniseriate filament which later becomes pluriseriate. This, however, is not the mode of germination of the *Fucus* egg.

The trichal (filamentous) organisation level (blastonema) is considered to be originally a series of autospores (p. 234). *Ulothrix* is given as an example in which the daughter cells, after mitosis, surround themselves with individual walls. This is incorrect: a common cell wall is deposited in the ingrowing cleavage furrow. According to recent work of Lokhorst, Steward, Mattox et al. cytokinesis in *Ulothrix* is fundamentally different from that in Chlorococcales. Moreover, Dr. Ettl’s interpretation is based on a chlorophycean filament; what about phaeophycean and rhodophycean filaments with apical growth?

The next chapter (4), on reproduction, contains much interesting information on reproduction of unicellular and colonial freshwater algae. However, this chapter again is repetitive in several respects, e.g. “schizotomy” is treated on p. 287 and 217; the interpretation of the uniseriate filament as a series of autospores on p. 291 and 234. The treatment of the typical growth of the *Oedogonium* filament under “asexual reproduction” is unusual. The recent knowledge about the role of gametes in the sexual reproduction of various groups (Volvocales, Oedogoniales, Phaeophyceae) is not, or hardly presented.

Again, the multicellular algae are neglected. The statement (p. 349) that reduction division takes place immediately after fertilization in rhodophytes with carposporophytes is incorrect, not only

as a generalization, but also for the example pictured, the freshwater alga *Batrachospermum* (*Batrachospermum* and *Lemanea* have vegetative meiosis in the *Chantransia* stage). This error is rather amazing, as on p. 296 the author correctly describes rhodophycean tetraspores as meiospores, and on p. 382 he presents a correct diagram of the rhodophycean life history (polysiphonia-type), borrowed from the 1971 edition of "Strasburger's" *Lehrbuch der Botanik*.

Unfortunately chapter 5, on life cycles, does not reflect the present (or near-present) state of knowledge on this subject matter. In *Acetabularia* (presented as an important example) meiosis does not take place in the cysts, but in the large nucleus. It is uncertain whether *Codium* has a diplontic life history because of the lack of adequate karyological data. The various types of life history receive only a cursory treatment, and the many recent developments in our knowledge on the environmental regulation of algal life histories are not included at all.

The chapter on taxonomy is rather conservative. The Chrysophyta encompass a large number of classes, including the Haptophyceae with their divergent flagellar apparatus. The Craspedomonadophycidae are included as a subclass in Chrysophyceae, notwithstanding ultrastructural data indicating that they differ fundamentally from the Chrysophyceae. The Phaeophyta, on the other hand, are placed in a separate division, notwithstanding the close ultrastructural and biochemical resemblance between Phaeo- and Chrysophyceae. The class Loxophyceae is still recognized. *Spongomorpha* and *Urospora* are still ranged under the Siphonocladales and not in the Acrosiphonales. The recent exciting discussions on phylogenetic relationships in the green algae and higher plants in relation to zoid-type and type of mitosis-cytokinesis remain regrettably unmentioned.

Cyanophyta are unfortunately not treated. Although these "algae" are procaryotes they largely belong to the expertise of phycologists rather than to that of microbiologists, especially with regard to problems in hydrobiology. Moreover, several of Dr. Ettl's compatriots have made valuable recent contributions to our knowledge of freshwater bluegreens.

Chapter 7, on the ecology of algae consists of inventories of species in various biotopes and it does not give an introduction to the role of algae in aquatic ecosystems.

The principle of structuring the text on the basis of descriptive cytological and morphological categories is, I think, rather unfortunate for two reasons: in the first place it leads almost inevitably to much unnecessary repetition; in the second place it results in a rather disturbing fragmentation of the information. If diversity in form and in reproductive mechanism are the subject matter, taxonomy and phylogenetic theory are the best leading principles for a book of this type. For these reasons, and because of the rather ponderous terminology, I would hesitate to recommend Dr. Ettl's "Grundriss" as a textbook for students, and as an introduction to the algae for the users of the "new edition" of Pascher's *Süßwasserflora*. However, phycologists and limnologists will find in this book a wealth of well-illustrated information on a diversity of unicellular and colonial freshwater algae.

C. VAN DEN HOEK

B. HALLER und W. PROBST: *Botanische Exkursionen Band II: Exkursionen im Sommerhalbjahr*. Gustav Fischer Verlag Stuttgart-New York 1981, 249 S. 99 Tab., 46 Abb. DM 28,-.

Nachdem in 1979 Band I: *Exkursionen im Winterhalbjahr* (besonders den Kryptogamen und Gymnospermen gewidmet, Besprechung in *Acta Bot. Neerl.* (29(4): 320, 1980) erschien, sind diese "Anleitungen zu Übungen im Gelände" jetzt vollständig.

Dieser Band enthält einen sehr komprimierten Text zur Unterstützung für die Ausübung der "Freilandbotanik" in Deutschland, hauptsächlich aus biotaxonomischer und morphologischer Sicht. Kurze Texte und reichlich mit Zeichnungen versehene Tabellen geben Übersichten der wichtigsten heimische Angiospermenfamilien, der wichtigsten Arten der Gräser, Juncaceae und Cyperaceae, Ruderalpflanzen, Kulturpflanzen und Unkräuter, Kapitel über "Frühjahrsblüher" (anhand des Lebensformensystems nach Raunkiaer), Blütenökologie und über einige wichtige Landschaftstypen (Wiesen und Weiden, Ufer, Auen, Sümpfe und Moore). Es handelt sich um ein "gedrucktes Notizenbuch" und Anregung zu eigener Tätigkeit anlässlich Exkursionen welche man unter Füh-

rung eines Dozenten gemacht hat, eignet sich also besonders für Studenten des ersten botanischen Studienjahrs und ist nicht gemeind um Flora bzw. Lehrbuch zu ersetzen. Umfang und Qualität des Bandes eignen sich zur Mitnahme ins Gelände.

Man kann nur Bewunderung haben für die Fülle und Vielseitigkeit des Inhalts innerhalb diesem beschränkten Umfang. Da es in der Praxis nie genügend Zeit gibt um mit Studenten oder Schülern Exkursionen in alle Landschaftstypen zu machen, oder alle Familien zu behandeln, ist die Auswahl aus den möglichen Themen sehr verständlich. Jedenfalls ist diese meines Erachtens sehr glücklich ausgefallen und fast in jeder Gegend gut auszunutzen. Mann könnte höchstens dagegen einwenden, dass jeder Autor es wieder anders gemacht hätte. Druck- und inhaltliche Fehler sind nicht leicht aufzufinden. Die Tabellen sind nicht immer konsequent, z.B. fehlen ökologische, blütenbiologische, pflanzengeographische oder andere Besonderheiten in den Tabellen bei vielen Arten, ohne dass der Grund dafür klar ist. Die Wiedergabe der Braun-Blanquet Skala (kombinierte Schätzung der Artmächtigkeit) auf S. 108 stimmt nicht.

Eine Übersetzung und Bearbeitung für niederländische biologische und landwirtschaftliche Studenten würde sich wohl lohnen.

H. DOING

G. J. SAMUELS: *An annotated index to the mycological writings of Franz Petrak, Vol. 1, A-B*. New Zealand Department of Scientific and Industrial Research Bulletin 230, Wellington, 1981, 240p, price NZ \$ 11.- (including portage).

The austrian mycologist F. Petrak (1886–1973) was probably the last classical taxonomist of microfungi working exclusively with fresh collections and herbarium specimens. During a period of more than 50 years he published about 400 papers, some voluminous, which appeared mainly in *Annales Mycologici* and *Sydowia*. He described or redescribed numerous new and old taxa of fungi from all over the world. The often long descriptions were given in German and usually no illustrations were added. An annotated index to these publications is now in preparation by G. J. Samuels. It will comprise about 10 volumes, which will be published annually. This first volume contains a list of all the papers written by Petrak, with or without co-authors. In addition a first list of generic and specific fungal names is given, viz. those beginning with the letters A and B. This list contains about 1550 names with full citation of authors, place of enumeration or description given by Petrak and other data including later name changes. The substrate (host plant) is also mentioned and a separate substrate/fungus index is added at the end of the book.

This index will be welcomed by all mycologists working with microfungi, providing easier access to Petrak's papers which cannot be neglected in further taxonomic work. It is a pity that the entire series of publications will cover a period of ten years.

J. A. VON ARX

J. VISSER. *South African parasitic flowering plants*. Juta and Company Ltd. Kenwyn 7790 (Republic of South Africa), 1981. 177 p., 220 ill. (of which most are colour photographs), 67 distribution maps. Price R 45.00.

A unique book treating the South African genera of parasitic flowering plants. In South Africa ten families of parasitic plants occur: Loranthaceae, Viscaceae, Santalaceae, Balanophoraceae, Rafflesiaceae, Hydnoraceae, Lauraceae, Convolvulaceae, Scrophulariaceae, and Orobanchaceae. Out of these ten families 26 genera and 67 representative species were selected by the author. The treatment of each family starts with a short written comment on the various characters of the family like distribution, gross morphology, floral biology, seed dispersal, and parasitism. These various aspects are extensively illustrated with many superb colour photographs. These photographs, covering 124 pages, form by far the most attractive part of this book. The book includes also a chapter dealing with the vegetation of South Africa, treating topography, climate, soil, and vegetation types. Another chapter is that on distribution and phenology, in which distribution maps, graphs

of the flowering time and host range are given. Appendix I gives a useful glossary to the (c. 200) botanical terms used in the book.

Two of the most spectacular plants treated in this book are in my opinion the Balanophoraceae *Mystroptalon polemanii* and *M. thomii* of which excellent photographs are given of habit, pollination, seeds (SEM-photograph), and seed dispersal by ants. Another unique family treated is that of Hydnoraceae. This very rare family is hardly ever described and illustrated so well as in this book. The biology of *Hydnora*, which parasitizes on species of the genus *Euphorbia*, is depicted by colour photographs of flower, fruit, and root connection with the host.

The author is professor of Plant Physiology in the Department of Botany at the University of Stellenbosch, South Africa. His book is based on many years of field observations by the author and his assistants.

I can recommend the book to anyone with a special interest in parasites, although the price is rather high.

P. J. M. MAAS

G. FELLEBERG: *Pflanzenwachstum; Physiologie, Regulation, Ökologie*, UTB 1023. Gustav Fischer Verlag, Stuttgart, New York, 1981; 232 pages, 45 figures, 9 tables. Price DM 22.80. ISBN 3-437-20233-2.

Awareness of growth as a fundamental process and its control by exogenous and endogenous factors appears to be low among students. The lack of integrated knowledge of a process so fundamental for food production and for the response of plants to changes in their environment probably results from teaching growth as a number of separate processes with too much attention paid to cell division and cell enlargement, so that these two topics are particularly remembered by students when they are asked "What is growth?"

To fill this gap Dr. Fellenberg emphasized in his book the influence of environmental factors on plant growth and the controlling action of genes and growth regulators. The space devoted to the various topics clearly reflects this, because treatment of the fundamental growth processes has been restricted to one third of the text, but the influence of ecological factors, the significance of endogenous and synthetic growth regulators, and the genetic control of growth received the remaining space. This part includes the human influence on plant growth by, for instance, breeding, air pollution and the application of synthetic growth regulators. Compared with the commonly used text books growth control received much more attention. In my opinion, the integration of the various aspects of plant growth during the life of plants is a true achievement of this book. The text is well-written. Each chapter is preceded by a summary which facilitates the introduction to, and the recollection of its contents. For further reading a rather extensive list of publications is added, grouped per chapter.

As the consequence of the emphasis of the book, plant development is treated very concise, so that terms like seed germination, regeneration, polarity and senescence, to mention a few, do not receive attention. In the paragraph on the influence of the composition of the surrounding air on plant growth poor ventilation of the soil, which so strongly affects it, is not mentioned, which I feel as a serious omission.

Some statements need a little modification. For instance, to say that root geotropism is predominantly regulated by unequal distribution of auxin (p. 56) does not correctly represent the ideas on the mechanism of the geotropic curvature as they have been developed during the past fifteen years. Further, production of auxin by root tips (p. 144) has not been convincingly demonstrated for intact roots. It is better not to write that ethylene action has a high tissue specificity, as might be suggested by the response of cells in the abscission zone of leaves (p. 104), because present knowledge of the mechanism of action of growth regulators indicates that tissue response is not specific but changes with its stage of development and the related variation in number and specificity of growth regulator receptors (p. 152).

Finally, the endogenous plant growth regulators have been divided into a group of "hormones" i.e. auxins, gibberellins, cytokinins and abscisic acid and a group of "other plant growth regula-

tors" like ethylene, phenolic compounds etc. However, ethylene and the "hormones" have so much in common and do have so many interactions, that ethylene should not be treated separately, unless for very good reasons. The only reason why ethylene is considered not to be a "hormone" seems to be its gaseous state, which does not fit in the definition of "hormones". I would prefer then to alter the definition of "hormones" or drop the term entirely and speak of growth regulators only.

These critical remarks, however, do not affect the value of the book as a whole and I would like to recommend it to students in particular, and further to anyone interested in plant growth.

H. KONINGS

A. H. FITTER & R. K. M. HAY: *Environmental physiology of plants*. Academic Press, London, New York, Sydney, Toronto, 1981, 355 pp., £ 32.60, \$ 75.00.

This book deals with the effects of environmental factors on growth and functioning of higher plants (Angiospermae). The approach is comparative which means that ample attention has been paid to both similarity and diversity between species and populations, treated from the concept that the environment functions as a source of energy and material on the one hand and as a potential stress factor on the other hand. The responses of plants to environmental factors in their natural range are shown in a rather enlightening way. Basic physiology and ecological significance are combined in a well-balanced treatment of existing knowledge. A very comprehensive up-to-date list of references provides an easy access to the relevant literature.

After a general introduction into the field of physiological ecology, the chapters are arranged in two sections viz. "The acquisition of resources" and "Responses to environmental stress". The first mentioned part deals with light, mineral nutrients and water, the latter with temperature, ionic toxicity, gaseous toxicity and interactions between organisms. In any one of these chapters the subject-matter is conveniently-arranged starting with a short introduction in basic physiology and leading to discussions of the problems in complex situations. This treatment ensures a feed-back to the literature at any level of complexity. It makes this book suitable for advanced undergraduate students but thank to the references it is also indispensable for general use in research institutes.

It certainly deserves a place in the library besides Bannisters' Introduction to Physiological Plant Ecology and Larcher's Physiological Plant Ecology.

R. BROUWER

J. A. DUKE: *Handbook of Legumes of World Economic Importance*. Plenum Press, New York and London, 1981. XI + 345 pages, 146 figures, 7 tables. Price Us \$ 45.-, Dfl. 126.90.

This book is the result of extensive computer searches combined with recent research on nearly 150 economically important species of legumes. Each legume is listed under its scientific name, and nearly always accompanied by a line drawing. Relevant information is further grouped under the headings: common names, synonyms, uses, folk medicine, chemistry, description, germplasm, distribution, ecology, cultivation, harvesting, yields and economics, biotic factors and selected references.

Tabulated information is further presented on toxins (toxicity and genetic distribution); genera and their toxins; ecosystematic attributes (precipitation, temperature, pH; economic legumes and their tolerances, yields, centres of diversity, and ecocentres; recommended inoculants for various legumes; zero-moisture nutritional analyses; and amino acid composition.

The idea of compiling relevant and up-to-date information on legumes is not a new one. A handsome crop and product digest on the main food legumes by Kay appeared already in 1979. However, the information presented by Duke is so overwhelming that a concise presentation of data under subheadings is essential. This objective has largely been achieved in this publication. Some

parts suffer from a surplus of completeness like the list of biotic factors mentioned for *Phaseolus vulgaris*, *Pisum sativum* and *Vigna unguiculata*. The choice of the drawings has certainly not always been easy, the quality is consequently rather uneven. Many drawings are reasonable, but some are rather poor indeed (e.g. figures 19, 24, 29, 34, 72, 137, 141) and disfigure this book.

The curious *Cordeauxia edulis*, the yeheb nut of the Horn of Africa, figures only in one of the tables, although more attention would be justifiable as the late botanist Bally proved.

It would have been of much help, especially for the agronomist, if indexes on scientific plant-names and their synonyms as well as on common plant names (including french and spanish ones) had been included.

In conclusion: in spite of the signalled shortcomings this book is a very useful compilation of the various aspects of economic important legumes, and as such recommendable for economic botanists and agronomists.

The price of the book will keep it out of reach of those who will want to possess it, like students.

E. WESTPHAL

D. R. CAUSTON and J. C. VENUS: *The Biometry of Plant Growth*. Edward Arnold, London, 1981. 307 p. £25.-.

The main objective of this book is to provide mathematical models for the description of growth of whole plants and their organs. It is not meant as a statistical handbook for botanists and hence it does only deal with statistics if necessary for the understanding and interpretation of the mathematical models. After a short introductory chapter, the second chapter is devoted to the description of whole-plant growth. The theoretical models are illustrated with data obtained by the authors. A large part of the book (chapters IV and V) deals with the description of growth according to the function developed by the late professor Richards. This function appears to be useful to describe the growth of plants and their organs, but like all other functions developed up to now the parameters used do not have direct physiological relevance. The authors mainly apply this function to describe single-leaf growth.

Another section of the book deals with the relationship between the growth of different plant parts (allometry). In the final chapter a model describing whole plant growth is discussed.

Chapter III, on regression theory, is the most mathematical part of the book, and it does not specifically deal with biological problems. Nevertheless, curve-fitting is an important aspect of the modelling of plant growth.

In conclusion, this book gives a useful, although sometimes narrow-scoped, description of plant growth.

D. VREUGDENHIL

J. ROSS: *The radiation regime and architecture of plant stands*. Dr. W. Junk Publishers, The Hague, The Netherlands. T: VS 3, 1981. Dfl. 220.-/US \$ 115.-. Cloth, 391 pp., 115 figs, 40 tables.

Because of the dominating influence of solar radiation on photosynthesis, transpiration and morphogenesis of plants the study of the transfer of radiation in plant stands has become a separate branch of science. Ross, who founded and guided the school of Tartu in Estonia, has given a major contribution to the development of this field. He first wrote this book in Russian in 1973, hence the translation into English, which is of great importance for his Western colleagues, has unfortunately come rather late. This fact does stress the originality of the work of Ross.

The English version has been updated with some new chapters and reviews over a hundred new titles. This book combines a great number of original experimental data, a general theory of radiation transfer and many interesting discussions and comments concerning the work of other scientist. It is testimony of many years of thorough investigation. The theory of radiation transfer is

developed along analytical-mathematical lines. The results are presented in many figures and are well commented. An extensive list of symbols helps the reader not to lose the track. For the reader not trained in atmospheric physics, however, the theory would have become more accessible by a clearer and more punctual presentation.

Although expensive, this book is recommended as the standard reference work to all those working in this complex borderfield between plant science and environmental physics.

J. GOUDRIAAN

R. STAPLES and G. TOENNIESEN (Ed.): *Plant disease control, resistance and susceptibility*. Interscience Series on Environmental Science and Technology, John Wiley and Sons, New York, 1981, 339 pp., 14 figs., 15 tables. £ 20.—.

In fundamental research on the elucidation of physiological and biochemical events in the relation between the host plant and its parasites, so much progress has been made in recent years that vista's emerge for new ways of plant disease control in the future. It seems therefore quite appropriate that a number of renowned scientists met in August 1979 at the Rockefeller Foundation's Bellagio Study and Conference Center in Italy, to reflect upon these developments and the perspectives they offer for innovation in disease control.

This book contains 18 chapters based on papers presented at this conference, which were rewritten after the discussions had taken place. The book is divided into three parts. Part I deals with processes that occur when a pathogen successfully infects a plant. Included are recognition phenomena, the induction of susceptibility, the role of toxins, hormones, and other substances in the disease process, natural regulators of fungal development and other factors that contribute to susceptibility of the plant to infection. In part II, on host incompatibility, four chapters deal with those responses of the host, which are thought to contribute to resistance, such as ultra-structural changes, production of phytoalexins and non phytoalexin host responses in vascular wilt diseases. In separate chapters attention is paid to non host resistance and to so called "field resistance", which limits attack of plant populations, although individual plants are not resistant. Part III, entitled "New directions in the development of plants, resistant to disease", deals with future possibilities to use the basic information presented in the first two parts, to developing promising new methods of disease control. After considering the conceptual and practical aspects of breeding for resistance, attention is paid to the ecological aspects of disease resistance and the best possible agriculturally stable strategies to reduce crop losses, to the exploitation of disease tolerance by modifying the vulnerability of the plant, to the possibility of inducing resistance and even immunizing plants as a practical means for disease control, and finally to the role of cell cultures in plant disease research and the possibilities of protoplast techniques for the transfer of genes for resistance.

This book is not meant as a handbook, which covers the whole field of physiological plant pathology. Little attention, for example, has been devoted to the enzymes which the pathogen uses when infecting the plant. The merits of the book lie primarily in the fact that it focuses on topics where research makes rapid progress, and where new possibilities for disease control may emerge in the future. It seems to me a pity, however, that hardly any attention has been paid to the fascinating results obtained recently in the study of the crown gall disease, where the inciting agent, *Agrobacterium tumefaciens*, transfers genetic information to the genome of the host plant cells.

The contributions have been written in a critical and thought stimulating way. They have been put together in a logical framework, so that the book by far exceeds the level of just conference proceedings. The editing has been carried out in a careful way, so that there is hardly any reason for criticism (e.g. *Agrobacterium tumefaciens* is written correctly on p. 145, but as *A. tumefaciens* on p. 23 and p. 114, and as *A. tumefaciens* on p. 319).

This book can be highly recommended to research workers in the field of physiological plant pathology and further to all others who want to be kept abreast of recent development in this field and the possibilities they offer for new ways in future plant disease control.

J. DEKKER

J. RŮŽIČKA: *Die Desmidiaceen Mitteleuropas*. Band 1, 2. Lieferung. IX + 444 pages, 73 plates. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart 1981. Price (clothbound) DM 196.-. ISBN 3-510-65103-0.

Four years after the publication of Růžicka's Central-European desmid flora the second part, dealing with the genera *Actinotaenium*, *Tetmemorus*, *Euastrum* and *Micrasterias* has now come off the press. The two parts together constitute the first volume of a monograph to be issued in three volumes. Although the time-lapse between the first two parts is appreciably greater than previously announced, it cannot be considered as excessive in view of the bulk of the last part.

It is highly satisfactory that the author has succeeded to maintain the high scientific standard of the first part. The specific advantages of Růžicka's monograph over other desmid floras, among which the excellent quality of the hand-drawn illustrations, the painstaking taxonomic disquisitions, and the consequent applications of the International Code of Botanical Nomenclature (see also *Acta Bot. Neerl.* 27: 247) are again manifest. The introduction to the part under discussion consists mainly of a tirade against that same Code, for that matter. Růžicka, to whom the frequent violation of the Rules by desmidiologists is a thorn in the flesh on the one hand, must admit on the other that with every new version of the Code it becomes increasingly difficult to find one's way out of the maze of nomenclatural rules, and he concludes that nomenclature is becoming a separate discipline only to be practised by specialists in that field.

A pleasant surprise when making the acquaintance of the second part is that apart from the anticipated treatment of the genera *Tetmemorus*, *Euastrum* and *Micrasterias* also some space is devoted to the genus *Actinotaenium*. It is in fact the first thorough systematic overview of this genus, which was segregated from *Cosmarium* by Teiling in 1954. Its distinguishing characters within *Cosmarium* sensu lato are its omniradiate cell shape, the only faint isthmus-furrow and the basically stellate chloroplast. *Actinotaenium* was well-defined by Teiling it is true, but the taxonomy of the various species was only poorly set forth by this author, and these taxa were subsequently again classified under *Cosmarium* in the well-known monograph of Krieger & Gerloff (1969).

It is striking that it took a considerable time before such a well-defined genus as *Actinotaenium* became recognised in the desmid nomenclature, in spite of the fact that such of old accepted and universally known genera as *Euastrum* and *Micrasterias* are so much more difficult to separate from one another and from *Cosmarium*. The last three genera in fact exhibit a gradual transition, with as an inevitable consequence a number of border-line cases which can – also by Růžicka – only be classified in a rather arbitrary fashion. Among his illustrations of *Euastrum insulare* (Witttr.) Roy, *E. binale* (Turo.) Ehrenb. ex Ralfs, and *E. montanum* W. & G. S. West, for instance, we encounter some which are suspiciously similar to, respectively, *Cosmarium trilobulatum* Reinsch, *C. quadratum* (Gay) De Toni and *C. subreinschii* Schmidle.

The last-mentioned species of *Cosmarium* may be expected to be treated in the next volume of Růžicka's monograph to which one may look forward with great expectations. For the time being the part under discussion (which also includes the literature references pertaining to the first two parts issued) completes the first volume, which can be characterised as an impressive and exemplary study that is an absolute must for everyone who has dealings with desmids professionally or as a hobby.

P. COESEL

I. ROTH. *Handbuch der Pflanzenanatomie*, Band IX, Teil 3: *Structural patterns of tropical barks*. Gebrüder Borntraeger, Berlin-Stuttgart, 1981. 609 pp., 282 figures. Price clothbound DM 288.-, US \$ 128.-.

This important book on tropical bark structure consists of a general part, a special part in which a description is given of the studied families, a part on the taxonomic importance of bark structure together with ecological and phylogenetic aspects, and finally a small chapter on economic bark utilization.

The main portion of the material studied (280 species) came from the humid forest of Venezuelan Guyana. Scientific plant names are given without names of authors.

The language problem plays a role in definitions of for instance cortex and bark. The term bark had to come from the Spanish expression "corteza" (from latin "cortex") with the subdivision in "corteza primaria" and "corteza secundaria". Properly speaking the whole concept of bark, cortex, soft and hard bast used by the author is rather confusing and probably unnecessary complicated. For instance, sentences like "furthermore, the crushed thin-walled cells of the primary phloem as well as some fibres of the protophloem remain on the inside of the primary cortex", or "hard bast comprises fibres and sclereids of the secondary phloem, but excludes all secondarily formed sclereids" are difficult to understand.

For the characterization of the families in the special part usually only a few species are used, so the indication "description of the studied families" is somewhat misleading. Unfortunately a description of the sieve elements is lacking. Since these data are missing an arrangement of the investigated material into evolutionary types according to a method indicated by ZAHUR (1959), or according to a system used by BRAUN for the secondary xylem (Band IX, Teil 1 of the same series of Handbuch der Pflanzenanatomie, 1970) is impossible or very difficult. The statement that regular bark arrangement of tissues is more advanced than an irregular one, because regular arrangement is almost entirely associated with the occurrence of highly specialized sieve tubes, is questionable and in contrast with observations of several other investigators.

Roth's book gives a more general view of bark structure almost without mentioning sieve elements. In combination with the work of authors dealing with more detailed investigations of especially sieve elements, the present book is of great value and a welcome supplement to the literature.

R. W. DEN OUTER

J. GUERN and C. PÉAUD-LENOËL (eds.): *Metabolism and molecular activities of cytokinins*. Springer-Verlag, Berlin, Heidelberg, New York, 1981. Proceedings in life science XII, 353 pages, 170 figs. Price DM 98.-; approx. US \$ 44.60. ISBN 3-540-10711-8.

The book consists of the main papers presented by a number of research workers at the International colloquium of the Centre National de la Recherche Scientifique held at Gif sur Yvette in France from 2-6 September 1980. The comprehensive chapters of a specialized field of research include in section 1, cytokinin biosynthesis in microorganisms and higher plants. Section 2 deals with the metabolism of cytokinins and their physiological responses in plant and bacterial systems. Section 1 and 2 give up to date information on the synthesis of cytokinins and their metabolic fate in microorganisms and higher plants. Sections 3 and 4 discuss the mode of action of cytokinins on the molecular level. Much attention is paid to the hormone receptor concept and to the effect of cytokinins on transcription, translation and on protein synthesis. Section 5 describes the role of cytokinins in the development of chloroplasts, whereas in section 6 attention is paid to the responses of animal systems to cytokinins.

Some chapters give extensive data about experimental results, whereas others present a more general view of the results which have been published in the last years. The book contains a wealth of information about recent progress on cytokinins. It can especially be recommended to those plant physiologists who are interested in the biosynthetic pathways of hormones and to those who are interested in the role of cytokinins in plant growth and development.

H. M. DEKHUIZEN

L. BRAUNER und F. BUKATSCH: *Das kleine pflanzenphysiologische Praktikum; Anleitung zu bodenkundlichen und pflanzenphysiologischen Versuchen*. 9th revised edition, in German. VEB G.Fischer Verlag, Jena, DDR, 1980. G. Fischer Verlag, Stuttgart, BRD, 1980. ISBN 3-437-20237-5. 335 pp., 149 figs., chemical synonym-table, some additional figs. and tables in text. Size: 17 × 24 × 2 cm. Price 26,60 M (hardback, DDR) or DM 32,00 (soft cover, BRD).

The first edition of this book has been written in 1903 by W. DETTMER, who was clearly inspired by his own "Das pflanzenphysiologische Praktikum" (G. Fischer, Jena 1888). The present 9th edition can best be compared with the 6th completely revised or later editions. (The 7th edition was reviewed in 1964: *Acta Bot. Neerl.* 13: 438.) Especially the parts on photosynthesis and on soil properties, and some minor parts are modernized. The trivial chemical names are changed according to the IUPAC nomenclature rules and a conversion list is added.

Experiments are available on water and mineral economy (including soil analysis), on metabolism (respiration and photosyntheses, primary and secondary metabolism), on development (germination, growth and movements) and on survival (propagation and dispersal), numbering 265 items. Still in accordance with the original plan of Dettmer, most experiments can be done with very simple equipment.

Those who want to use this book when designing their own courses, will have to check local conditions and available plant races for their utility in some experiments. They will be expert enough to declare e.g. a traumatic acid test (according to WEHNELD, 1929; exp. no.: 184) essential for the insight in (modern) plant physiology or not. Some experiments may be too far simple for instance when the presence of anti-bacterial substances in leaves is demonstrated by the resistance of fresh leaves against decay in water (exp. no.: 210), without analysing killed leaves or an extract of those leaves as well. The effect of ethene on plant development is demonstrated by the use of an apple as gas generator (exp. no.: 181), but the possible effects of other gases, like carbon dioxide, are neither mentioned, nor excluded.

The book has simple but effective illustrations. There are some irritating printing errors, unwanted black spots and damaged characters. This, however, will not limit the use of the information, available for a reasonable price. The revised edition, with old and rather new experiments, is a useful tool in the planning of methodically simple, high school or undergraduate courses in plant physiology.

H. H. VAN GENDEREN

Just out:

FLORA NEERLANDICA – Flora van Nederland, published by the Royal Botanical Society of The Netherlands.

Part IV (6). RUBIACEAE TO VALERIANACEAE; 80 pages with 13 text-figures; dutch guilders 22.50.

Prijzen voor leden van de KNBV in Nederland f 17.50.

Orders to: The Librarian of the Koninklijke Nederlandse Botanische Vereniging, P.O. Box 9614, 2300 RA Leiden, The Netherlands.