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Book Reviews

Biosynthesis and Biodegradation of Cellulose

C.H. Haigler and P.J. Weimer (eds)
Marcel Dekker, Inc., New York, 1991. ix+694 pp.
Hardcover. ISBN 0-8247-8387-5.

Cellulose is the most common biopolymer on earth. The first monograph about this raw material, which is so important to man, appeared in Britain as early as 1895. Since then, an immense amount of research work has been done to elucidate the chemical and physical structures of cellulose and other cell wall polymers. The present book discusses in detail the synthesis and biodegradation of cellulose. The latter is a new aspect, but has been justly included, since cellulose biodegradation is of vital importance for man and his environment.

The first section includes 12 chapters on the chemical and physical properties of cellulose and other relevant cell wall polymers, as well as the role of the terminal complexes and rosettes in the synthesis of cellulose, the development of microfibrils, the *in vivo* and *in vitro* synthesis of cellulose in higher plants and in *Acetobacter xylinum*, and the cloning of genes involved in the cellulose synthesis by *Acetobacter xylinum*.

The second part of the book is devoted entirely to the biodegradation of cellulose in nature. Its 12 chapters deal with subjects such as the measuring of cellulose degradation and the structure and influence of the breakdown products on hydrolysis. In addition, the book describes the various organisms which are able to biodegrade cellulose, such as reptiles, ruminants, mesophilic and thermophilic aerobic bacteria and mesophilic and thermophilic anaerobic bacteria. There are chapters on cellulases in fungi, bacteria and higher plants and their role in the development of the higher plant. The final chapter discusses the cloning of cellulase genes into micro-organisms which lack cellulase.

This is the first book to offer such an extensive study on both the biosynthesis and the biodegradation of cellulose. An interest in such an integrated approach has been clearly expressed at scientific meetings on cell walls over the past few years.

The editors are to be congratulated on the selection of researchers they have managed to bring together to write the individual chapters; they are all highly qualified specialists in their own field.

A minor, and almost unavoidable blemish in a book with so many contributors is that of duplications. This is particularly evident in the chapters on terminal complexes and those on the structure of microfibrils. On the other hand, this reviewer would have appreciated the addition of an introductory chapter on the history of cellulose research, which has now been going on for over 100 years. On the whole, however, this book definitely achieves its aims, and it should be recommended to all researchers and students who are in any way involved in cell wall research or the biodegradation of cell walls.

M.M.A. SASSEN

The Leeuwenhoek Legacy

B.J. Ford
Biopress, Bristol and Farrand Press, London, 1991.
xiii+185 pp. Illustrated, hardcover. UK £27.50.
ISBN 0-94873-710-7.

This book not only describes the life and work of Antony van Leeuwenhoek, but also discusses Leeuwenhoek's relationship with Robert Hooke and other contemporary scientists. At the same time it recounts with reverence the work of Clifford Dobell, who wrote the best known biography of Leeuwenhoek.

At times, the book reads like a detective novel as Ford describes how, after 300 years, he discovered specimens prepared by Leeuwenhoek. They were sent by him to the Royal Society, together with three of Leeuwenhoek's letters. He even discovered Leeuwenhoek's own red blood corpuscles and the very bacteria he had coughed on his sections. The last part of Ford's work is devoted to a study of the microscopes constructed by Leeuwenhoek. It deals with the way Ford proved the high magnification and surprisingly good resolution of Leeuwenhoek's lenses, qualities that were questioned until recently. Ford therefore used the Utrecht microscope as well as a modern Leitz Dialux to photograph sections made by Leeuwenhoek. By comparing the photographs he arrived at the conclusion that there was no difference at all.

In addition to an introduction about Leeuwenhoek's significance through history, the book contains six chapters. Chapter 1 describes the life and work of Leeuwenhoek. Chapter 2 gives a detailed account of the discovery of the three letters with the small envelopes containing the specimens. In chapter 3 the author describes how he investigated eight different specimens with Leeuwenhoek's microscopes and with modern light and electron microscopes. Chapter 4 deals with the results of the visualized specimen made by Leeuwenhoek, while chapter 5 informs us about the development of the Leeuwenhoek microscope. The final chapter (6) describes all the Leeuwenhoek microscopes that still exist.

The type area of the book is relatively small, leaving a wide margin for notes and captions. Most

of the many photographs use the text column, while small line drawings are displayed in the margin. The book is very clearly written and well illustrated and should be read not only by those interested in the history of science but by all biologists.

M.M.A. SASSEN

Seed Germination in Desert Plants: Adaptations of Desert Organisms.

Yitzchak Gutterman
J.L. Cloudsley-Thompson, (ed.)
Springer Verlag, Berlin, 1994.
xiii+250 pp. Hardback, DM 198; öS 1.544,40; sFr 198, ISBN 3-540-52562-9.

Israelian botany is well known for its studies on desert plant ecology. Based on 30 years of research in the Negev on desert plant ecology, the author, Yitzchak Gutterman, has compiled his knowledge and that of his students and colleagues in a very useful book. The book deals with the survival mechanisms of plants under unpredictable and extreme desert conditions, describes numerous adaptations of seeds to dispersal and germination, and focuses on mechanisms that enable seeds to predict the best time and place for germination. After an introductory chapter, in which the abiotic factors and the main habitats, life forms and life cycles of the plants are described, there are chapters on the environmental factors influencing seed development, and on dispersal, seed banks, seed imbibition and on germination. The chapters are richly illustrated with 139 figures and 67 tables. Contrasting strategies are described, ranging from low-risk strategies of plants producing small numbers of relatively heavy, well-protected seeds to opportunistic strategies of plants dispersing very small seeds in large numbers, which escape and avoid massive predation. One of the most sophisticated dispersal mechanisms is that of *Blepharis*, where rain triggers the explosive ejection of the seeds from the fruits, mucilaginous hairs anchor the seeds to wet soil and orient the micropylar end at an angle of 45°, the radicle appears after 1 hour, penetrates the soil, and attains a length of about 5 mm within 24 hours from the time of dispersal. The seeds of the Negev flora are characterized by many diplo- or polychorous species, whose seeds can make use of two or more alternative, or successive dispersal agents. A relatively high number of species has heterocarpous or heterospermous seeds which differ in dispersal or germination strategy.

The title of the book is somewhat too ambitious. The book is primarily a review of the seed studies on the flora of the Negev desert of Israel; only occasionally, and more briefly, are data from other desert areas cited, e.g. those of Fritz Went from the North American deserts and South African studies on the Karoo and Namibian deserts. Gutterman's classification of dispersal types (Fig. 53) does not fully correspond with the conventional one of van der Pijl, and sometimes mixes dispersal and seed anchoring as in the cases of boring fruits of *Stipa* and the mucilaginous seeds of *Helianthemum*. The author does not make use of some established terminology such as autochory, diplochory, rain-ballist and tumble weeds. As key reference I missed the extensive review of Meinhard Grubert (*Mucilage or gum in seeds and fruits of angiosperms*. 1981, Minerva Publikation, München) on myxospermous seeds.

In spite of this small criticism, the book is an example of a good integration of ecological, physiological and structural data. It represents a very useful compilation of the knowledge on seed ecology of the flora of the Negev desert. The book is recommended to everyone interested in desert ecology, or in seed ecology more particularly.

F. BOUMAN

Biochemie der Pflanzen, 4. Auflage

Helmut Kindl.
Springer Verlag, Heidelberg, 1994. 360 Abb.,
xii+459 pp. Hardback, DM78; öS608,40; sFR78,
ISBN 3-540-57326-7.

There must be something special about a book being re-edited at an increasing speed during the last decade. And, yes, going through the 4th edition I was impressed by the wealth of knowledge brought together under the term 'biochemistry of plants'. This textbook attempts to bridge the gap between biochemical knowledge and the physiology of the plant cell or, in some cases, the physiology of a plant organ. In many instances, the book has succeeded in doing so, which is an admirable achievement for a one-author book. The knowledge on fundamental genetic processes is often used as a vehicle to link pure biochemistry and biological activity. The book presents a valuable source of information not only for advanced students, but also for all plant biologists trying to keep upright in the storm of new techniques, methods and discoveries revealing the dazzling complexity of the living cell and organism. The book is divided into 10 chapters dealing with, respectively, an overview of organelle ultrastructure and cell compartmentation, biochemistry and structural conformation of enzymes, genetic information and regulation of the information transmission, energy conversions at the membrane, chloroplast metabolism, building-up of macromolecules, mobilization of reserve macromolecules, mitochondrial metabolism, properties of the apoplastic space, and functioning of the nucleus.

The apparent disadvantage for many people will be the language; not everyone is fluent in German.

Yet, one might consider purchasing the book, as it will be a valuable complement to the well-known English cell-biological textbooks, not least by the splendid illustrations. Moreover, the book has the advantage that it is focused on plant biology, while knowledge on plants seems to act as an *appendix vermiformis* in most standard textbooks on cell biology.

Occasionally, the figures are difficult to read, since the legends are sometimes short on information. The cited literature is highly up-to-date, but the author does not seem to have used all recent knowledge in his text. Despite these shortcomings, I have read the book with great respect realizing the formidable effort. Therefore—and this might be a question of personal taste—the content deserves a better, less casual presentation than the inconsistent scribbling on the cover.

AART VAN BEL

Biology of Adventitious Root Formation (Basic Life Sciences Series, Vol. 62)

Tim D. Davis and Bruce E. Haissig (eds)
Plenum, New York, 1994. xiv+343 pp. Hardback, US$89.50; ISBN 0-3-6-44627-8.

Preceded by *New Root Formation in Plants and Cuttings*, edited by Jackson (1986) and *Adventitious Root Formation by Cuttings*, edited by Davis *et al.* (1988), this is the newest overview of the field of adventitious rooting. The book consists of 19 invited papers, covering most of the subjects that were discussed on the First International Symposium on the Biology of Adventitious Root Formation, held at Dallas, Texas, 18–22 April 1993.

The importance of adventitious rooting is enormous, not least for commercial use in agronomy, forestry and horticulture, as is demonstrated in some of the chapters in this book. Great progress has been made in propagating hard-to-root species, mostly by applying growth substances or using explants of the suited life stage. Nonetheless, the regulation of the rooting process itself is relatively poorly understood. One of the reasons is the diversity of model systems and plant species that are used for experiments. Suggestions are made to focus the research on only a few genetically well-characterized species, like *Arabidopsis* or tomato. Traditionally, most of the studies have been performed with a large variety of species that are commercially more interesting than *Arabidopsis*.

Next to some classical papers on the different types of adventitious roots and the role of phytohormones in the rooting process (e.g. a concise review of auxin metabolism in cuttings by David Blakesley), much attention has been paid to the competence of cells and tissues to respond to a stimulus that might induce adventitious root formation. Furthermore, models are discussed that can provide more insight in processes like rooting patterns and distribution in the soil and shoot–root interactions with special respect to carbon allocation.

In conclusion, this book does not extensively discuss separate experimental systems, but should merely be used for a clear overview of the more recent developments in the research of adventitious rooting.

E.J.W. VISSER

Zinc in Soils and Plants

A.D. Robson (ed.)
Kluwer Academic Publishers, Dordrecht, 1993. viii+208 pp. Hardback, Dfl.149; US$80; UK£55. ISBN 0-7923-2631-8.

Zinc is a well-known micronutrient in all organisms, based on its catalytic role in metalloenzymes like superoxide dismutase and carbonic anhydrase, and knowledge of its physiological function is still growing, e.g. its importance in zinc finger proteins (cf. Sluyser *et al.* 1993).

The present book, the result of an international symposium in Western Australia in September 1993, may be expected to cover this progress in 14 chapters, written by 24 authors and reviewed by a further 15 scientists. The chapters cover various aspects from its occurrence in soil via plants up to the human and animal food chain.

After a very short treatment of the chemistry and biochemistry of zinc, including its analysis by modern techniques, the chapter on reaction patterns of Zn with soil and soil components (by N.J. Barrow) already makes it clear that the scope is restricted to agricultural soils. The behaviour of zinc in undisturbed soil profiles and its interaction with humic substances is neglected. Zn fertilizers are obviously only those produced by fertilizer companies: the reader from the industrialized world will seek without success the impacts of the application of sewage sludges to agricultural soils.

With further reading the impression increased that the authors have browsed something here and something there, with a consequent lack of concepts. As an example, Marschner's contribution on Zn uptake from soils starts with Zn bioavailability in soils, switches over to VA mycorrhiza with a table on ectomycorrhiza, and ends up with bioavailability in flooded soils. One glimpse is the review on genotypic variation in zinc uptake and utilization by plants (by R.D. Graham and Z. Reugel).

It is not astonishing that the authors' browsing behaviour results in chapter titles that fail to focus their content: ruminants are only sheep and cattle (chapter 14 by C.L. White); Zn concentration in

plants for human and animal nutrition obviously has impact only on man; recent publication on the impact of metal speciation in food on the toxic load for animals are lacking (cf. McKenna *et al.* 1992).

Before publishing such a book, authors should not browse, but try to discuss scientific progress and new concepts. No reader is interested in a Table (Table 1, p. 83) with a potential of 75 data, when only one-third is consistent, and 50% is empty. Some books from the past (e.g. Nriagu 1980; Shaw 1990) may be more helpful than this one.

This book may be interesting for agriculturalists; the narrow scope means it is not very useful for plant physiologists, ecologists, foresters, etc.

W.H.O. ERNST

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Les stratégies végétales: Essai de morphologie évolutive

R. Schnell
Masson éditeur (Services commerciaux, Paris), 1994. x+128 pp. Paperback, FFr.158.
ISBN 2-225-305.

According to its subtitle, this book (128 pages) is an essay, suggesting that it contains the thoughts of the author rather than a thorough scientific treatment; in this respect the title is certainly well chosen. Schnell discusses parallelism and convergence in plant morphology, and asks how they have evolved. The suggested answer is that lineages with a character in common share an ancestral gene for that character. The position in the plant where this gene is expressed might be influenced by a localization factor, so that the same character may be localized in structurally non-homologous organs in different lineages. An example is the presence of winged dispersal units in the Sterculiaceae: they look very similar, but in one genus it is the fruit that is winged, and in another the seed. The presence of the gene in a lineage thus predetermines the form to be achieved in this lineage, and therefore parallel evolution would be a form of orthogenesis.

The explanation for convergence is based on a genetic argument, but surprisingly little effort is made to substantiate the hypothesis with evidence from genetics. Admittedly, there are many open questions regarding the genetics of morphological character evolution, but there is relevant literature, for example on the localization of trichomes on different plant parts. In fact, Schnell's only specific statement about the genetics of morphological characters is highly questionable. It is the assumption that observed mutations have very small effects on the phenotype, and therefore cannot be responsible for convergent evolution.

The tendencies and parallelisms in plant evolution are discussed in much more detail than the underlying genetic and developmental processes. Some of the examples will be familiar to all botanists, such as the reduction of the gametophyte in vascular plants. More interesting are the descriptions of less well-known forms like the spines on bifurcations of leaf veins in *Mourera fluviatilis* (Podostemaceae). This example is used by Schnell to illustrate a tendency of branching in trichotomies.

The central idea in this book that a common genetic factor in a lineage determines similarity of form among some of its members but remains latent in others, certainly deserves further study. In addition, the book contains several other interesting but speculative suggestions on plant evolution. One of them is even in contradiction with the main hypothesis. It is the idea that in regions where many convergencies occur, they are caused by gene transfer between species. These and other conclusions are poorly argued. The few references in the text are not very helpful either, because a bibliography is lacking. More attention has been paid to the figures. All morphological descriptions are adequately illustrated with line drawings and black and white photographs. What the essay offers to those interested in the evolution of plant form is a collection of anecdotes about plant morphology held together by an original theory, but it is left to the reader to analyse the validity of this theory.

JOHANNES BATTJES

Plant Cell and Tissue Culture

Indra K. Vasil and Trevor A. Thorpe (eds)
Kluwer Academic Publishers, Dordrecht, 1994. x+593 pp. Hardback, Dfl.360; US$215; UK£144.
ISBN 0-7923-2493-5.

The earliest efforts in plant tissue culture were made shortly before the second world war. In the 1950s and 1960s, major progress was achieved in various areas: the regulation of adventitious organogenesis by auxins and cytokinins, somatic embryogenesis, induction of haploids, the role of cytokinins in axillary

branching and the isolation of viable protoplasts. In the 1970s and 1980s, *Agrobacterium*-mediated gene transfer and molecular techniques were developed. Together, these achievements may result in a new revolution in agriculture. The present practical applications include virus elimination by meristem culture, vegetative propagation in tissue culture, haploid induction to obtain isogenic lines and the (recent) release of the transgenic tomatoes. In the near future, these new techniques may yield many crop plants with desirable characteristics, e.g. disease resistance and prolonged storage life, and in large-scale vegetative propagation via somatic embryogenesis.

The book covers the whole area of biotechnology. It is divided into two major parts. The first deals with technological aspects, e.g. the nutritional and environmental requirements of plant cell and tissue cultures, somaclonal variation, cryopreservation, gene transfer techniques and the production of secondary metabolites. The second part is devoted to the application of biotechnological techniques to various plant groups; namely, cereals, grasses, legumes, vegetable crops, potato, root and tuber crops, oilseeds, fruit and forest trees, plantation crops and ornamentals. Most chapters give adequate overviews of the major facts in the area. Unfortunately, mechanisms and backgrounds are dealt with only occasionally, showing that very little progress has been made on the scientific level. Nevertheless, the book is very useful for researchers in the field of plant biotechnology. My major criticism is the long interval between writing the chapters and the time of release: in most chapters the literature is covered up to 1990, whereas the book was released in 1994.

G.J. DE KLERK

Genetic Engineering of Plant Secondary Metabolism: Recent Advances in Phytochemistry, Vol. 28

Brian E. Ellis, Gary W. Kuroki and Helen A. Stafford (eds)
Plenum Publishing Corporation. New York, 1994.
viii+368 pp. Hardback, US$89.50.
ISBN 0-306-44804-1.

In 1993, the Phytochemical Society of North America devoted their annual meeting to the genetic engineering of plant secondary metabolism. The proceedings of this meeting are published as Vol. 28 of the Recent Advances in Phytochemistry series.

The state-of-the-art for some secondary metabolite pathways is presented by different authors. The first chapter deals with the biosynthesis of pyridine and tropane alkaloids. It has been possible to increase the alkaloid production by the introduction of a gene encoding a flux-limiting enzyme in the early parts of the pathways. The authors state that it is probably better to use whatever gene of the pathway is available and see what happens, because unravelling a complete pathway down to the level of the genes is an enormous task. The second chapter gives similar data for isoquinoline, monoterpenoid and tropane alkaloids. The next chapter deals with polyketide biosynthesis in prokaryotic cells and thus, in a strict sense, does not fit in this book. However, as the understanding of regulation of secondary metabolism and the metabolic engineering of micro-organisms is much further developed, it gives an idea about the possible perspectives for plants. Due to the fact that the biosynthetic pathway leading to flavonoids and anthocyanins is the best known secondary pathway, some interesting results have been obtained with altering flower colours (chapter 4). For flower colour modification antisense genes have been used to knock out certain pathways. In chapter 5, another interesting strategy is described. By the introduction of genes coding for enzymes which compete with substrates for a certain secondary pathway, the level of these compounds can be reduced, e.g. lower levels of toxic glucosinolates in canola.

As secondary metabolites play an important role in resistance against micro-organisms (phytoalexins), the manipulation of pathways leading to, e.g. isoflavonoids and lignins are of great interest (chapter 6). The identification of phytoalexin-specific promoters is a major goal, because it avoids the need to clone all genes of a pathway.

In chapter 7 the genetic origin of the chemical defence against UV-light is discussed: although an interesting topic, it does not fit in this book. The next two chapters concern terpenoid pathways, the early steps in monoterpenoid biosynthesis in mints, and sesquiterpenoid phytoalexins in *Gossypium*.

Of course no book on plant molecular biology is complete without a mention of *Arabidopsis*. The secondary metabolites found in this plant are discussed in chapter 10. Polyphenol oxidases and the genetic engineering of the loblolly pine are the topics of the last two chapters. At the end of the book there is an index.

Altogether this book gives quite a nice overview of metabolic engineering. Apparently, there are excellent outlooks on interesting applications for this research. All the chapters in the book are produced in the same style: the editors and publishers should be congratulated for this. Probably for reasons of cost there are no coloured illustrations in the book: they would have been useful for the part on flower colours, as the black and white figures presented are not very clear.

In conclusion, this book is highly recommended for all those who are interested in the potential of metabolic engineering in plants and its potential

applications in plant breeding and molecular farming.

R. VERPOORTE

DNA-Based Markers in Plants

R.L. Phillips and I.K. Vasil
Kluwer Academic Publ. Group, Dordrecht, 1994.
x+384 pp. Hardback, Dfl.300; US$177; UK£120.
ISBN 0-792-32714-4.

Volume 1 of the new series 'Advances in Cellular and Molecular Biology of Plants' deals with molecular markers in the nuclear DNA, especially restriction fragment length polymorphisms (RFLPs), and their use in the construction of genetic linkage maps. Markers for taxonomy and phylogeny including organelle markers are mentioned only in one chapter, but with Whitkus, Doebley and Wendel as authors, this chapter is one of the best available summaries of the use of molecular markers in phylogenetic analysis. The emphasis of this volume is on RFLP marker maps of the major crop species and the methods used for obtaining the markers (G. Kochert), constructing a map (N.D. Young), mapping quantitative trait loci (QTLs) (S.J. Knapp) and breeding multigenic traits (C.W. Stuber). The introductory chapters by these authors discuss the various methods step by step. They do not provide laboratory protocols but they do enable the reader to understand the reasoning behind the relevant protocols, describe what has been achieved and what can be done with the various techniques, and indicate where there are problems and limitations. These chapters are excellent for someone wanting to find out what the techniques imply and what they can do. Even someone already working in the area is likely to pick up useful hints. These chapters are followed by reports on the genomic maps (in a curious alphabetical order) of alfalfa, *Arabidopsis thaliana*, barley, *Brassica*, lettuce, maize, peanut, *Phaseolus vulgaris*, potato, rice, *Sorghum bicolor*, soybean, tomato, wheat, and (leading back to A via O) diploid and hexaploid oats (*Avena*). These are mostly the familiar maps, each in its own style, all with many molecular marker loci, some integrating previous traditional map markers or QTLs resolved with the molecular markers. All of these maps will become ever more detailed but, for most of them, the information presented here will be a stable basis for future developments. A more detailed map for *Sorghum* has been published while this book was in press and this is mentioned in an added note. For rice, the map developed at Cornell is shown in a chapter by S.D. Tanksley. The Japanese mapping results have not been available for this volume. In general, though, this book is probably the one place where all the major maps are assembled in one volume with concise but thorough annotations and long literature lists. For most of the species treated here the basic map, including the correspondence of linkage groups to chromosomes, has been worked out and the information presented here is going to remain essential for some time to come. This is a very useful book loaded with relevant information. Anybody feeling temporarily bogged down in the (sometimes dull and repetitive) details of a mapping project need only read the one page of concentrated 'pep talk' by R.L. Phillips and I.K. Vasil introducing molecular marker maps to regain the exciting feeling that, with molecular markers, there is no limit to what we can find out about the workings of a plant and how they are encoded in the genome.

KONRAD BACHMANN

Multilingual Dictionary of Agronomic Plants

S. Rehm (ed.)
Kluwer Academic Publishers, Dordrecht, 1994.
ix+286 pp. Hardback, Dfl.200; US$120; UK£80.
ISBN 0-7923-2970-8.

One of the potential blessings of citing a plant by its scientific name is that every botanist in the world can easily find out exactly what kind of plant is meant by it. Occasionally this is a matter of life and death, increasingly it has far-reaching legal and financial implications, and in general it reduces muddle. It is therefore strongly recommended that scientific names are always used, if only in brackets after the common name, in all technical and scientific publications. Unfortunately, many people who deal professionally with plants are not at all convinced of this argument. Some seem to feel that the use of scientific names is patronizing, some claim that scientific names change more frequently than common names anyway. As a result, common names are regularly encountered in applied botany, and there is a need for this multilingual dictionary. About 2500 plant species are listed in alphabetical order from *Abelmoschus esculentus* (L.) Moench. to *Zoysia tenuifolia* Willd.ex Trin. and their common names are given, usually in English, French, German, Portuguese and Spanish. Common names in other languages are cited where there is a special relevance. Where there are several species in a genus, their common names differ appropriately. If only common names were handled that carefully in practice! Incidentally, not a single Dutch name is given. Assume you are asked about the survival chances in the wild of a genetically modified plant called by its Dutch vernacular name, 'eendekroos'. If a Dutch–German dictionary leads you to 'Entenflott' oder 'Wasserlinse', you have reached a dead end, and justly so, because the register of the *Multilingual Dictionary* lists only the precise species 'kleine Wasserlinse', which nobody

will ever look up. How, after all, without a scientific name, would you know that the German 'kleine' (small) is an essential part of the name! A Dutch–English dictionary will lead you to 'duckweed', and the register of the *Multilingual Dictionary* then points to number 1302, which is *Lemna minor* L., the only species of the genus listed here, and, incidentally, not the one meant in the Dutch document. This is not the fault of the *Multilingual Dictionary*, but it shows that your typical sloppy vernacular name may simply be insufficient for the purpose at hand. In the many cases where there is a standardized common name, more often in vegetables than in horticultural species, the *Dictionary* really helps. Generally accepted scientific names are listed, but many frequently used synonyms are included. This is a useful book. I wish it were superfluous. It is not, but it might have been less expensive.

KONRAD BACHMANN