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BOOK REVIEWS

J. BURGESS: *An introduction to plant cell development.* Cambridge University Press, London, New York, New Rochelle, Melbourne, Sydney 1985. viii + 246 pp., 158 ill. Hard cover (ISBN 0-521-30273-0) £ 27.50, $ 54.50; paperback (ISBN 0-521-31611-1) £ 9.95, $ 19.95.

In his preface the author states that this book is written from the standpoint of cell structure with deliberate emphasis, where possible, on spatial considerations. Indeed the whole book is amply illustrated with many photographs, mostly obtained by electron microscopy. These illustrations are rather classical ones, produced mainly from thin-sectioning. There are no freeze-etched surface views on nuclear membranes, Milles spreads of chromatin or immuno-stained microtubules. This might be considered as a drawback but essentially it does not detract from the main topic of the book: the elucidation of whole plant development, starting from the cellular environment. The author has explicitly chosen this concept and avoids the discussion of all cell organelles in detail. Only two of the most striking plant cell components, the plastids and the excreted cell walls, are dealt with in separate chapters. The ensuing chapters describe developmental strategies, cell differentiation, pattern formation, polarity and whole plant development.

The book is particularly suited as an introductory text for students starting courses on general botany, developmental biology or plant cell biology. It is well edited, although personally I would prefer a more glossy paper quality for the reproduction of the micrographs. The text is concise and easily read. Also the price will be no hindrance in the wide-spread use of this book. It comes right in time to give a broader scope on how plants are built up from cells, especially after the boost of narrowly focussed texts based on ground plants parts and isolated organelles. More experienced readers and researchers will also be pleasantly surprised.

J. H. N. SCHEL

R. I. B. FRANCKI (Ed.): *The plant viruses.* Vol. 1. *Polyhedral virions with tripartite genomes.* Plenum Press, New York and London, 1985. XV + 309 pp., ill. Cloth. US $ 59.40; in US and Canada $ 49.50. ISBN 0-306-41958-0.

The book is a first volume of a series designed to provide a comprehensive review of the new information available up to 1984 concerning the molecular biology of different virusgroups. Volume 1 deals with four groups of viruses, all with tripartite genomes: the Bromoviruses, Cucumoviruses, Ilarviruses and Alfalfa mosaic virus. A number of these viruses are widespread causing very destructive plant diseases.

Chapter 1 (R.I.B. Francki) concerns the taxonomy of these viruses. He suggests to place them in a single virus family: the Tricornaviridae.

Chapter 2 (J. E. Johnson and P. Argos) deals with virus particle stability and structure of the Tricornaviridae. A wealth of information elucidated with drawings is available to inform us about the nature of coat proteins and its interaction with nucleic acid.

Chapter 3 (R. H. Symons) on viral genome structure shows the impressive information gained in the last 10 years. The technique of hybridization analysis using c DNA is a powerful method for estimating the extent of sequence homology between viral nucleic acids.

Chapter 4 (R. Hull and A. J. Maule) describes the multiplication of viruses with tripartite genomes covering data from 1979. There are still stages in the multiplication cycle about which little is known; not surprising since a plant cell is such a very complex structure and viruses only multiply in a living cell.

An important Chapter (L. van Vloten-Doting) has been written on virus genetics. The enormous increase of knowledge about the organization and expression of RNA plant viruses was mainly possible by the study of conditional lethal mutants. Analysis of pseudorecombinants has taken place for the last 15 years. The use of protoplasts was very helpful. The prospects for future research of the genetics of virusses are good and these will pave the way to study the genetics of the host.

Chapter 6 (G. P. Martelli and M. Russo) concerns the symptomatological and ultrastructural aspects of virus-host relationships. The symptoms caused by the viruses of the Tricornaviridae are very different depending on the virus genome, the host genome and the environment. Many members of the groups were reinvestigated in the laboratory of the authors. The quality of the photographs could have been better.

Chapter 7 (E. P. Rybicki and M. B. von Wechmar) deals with serology and immunochemistry of the Tricornaviridae. Since recent reviews have been published this chapter is concentrated on general conclusions and includes suggestions for the most appropriate use of the techniques in the comparative serology of the viruses. As antigenic similarity between virus particles depends on coat protein sequence and structure, serological studies may still be the simplest reliable means of determining virus relationships in the absence of sophisticated facilities and molecular biological expertise.

Chapter 8 (R. I. Hamilton) concerns virus transmission. The modes of transmission which occur in the four virus groups were compared and their importance to the survival of the respective viruses were assesed. As a specialist in this field he proposes to make a distinction between natural and experimental plant virus transmission. A good idea, especially when dealing with tripartite ss RNA genomes. Although all Tricornaviridae are mechanically transmissible this mode is not particularly suitable for their survival. Many aspects of the virus transmission require further study.

The last Chapter 9 (R. G. Garrett, J. A. Cooper and P. R. Smith) concerns virus epidemiology and control. It is concentrated on the consequences of the transmission mechanisms on the ecology and control of viruses belonging to the four groups. Molecular biology now permeates so much of present research that it will be a great help for a full understanding of the interaction between plant and virus.

Following the present volume, six books are in preparation covering the other virus groups and the viroids. To obtain such a complete and useful review one should start to buy volume 1. The series is not meant for libraries only.

D. H. WIERINGA-BRANTS

K. MÜNTZ: *Stickstoffmetabolismus der Pflanzen.* VEB Gustav Fischer Verlag, Jena 1984. 331 figs., 33 tables. Soft cover. M. 60,–.

This book gives a detailed review on the recent progress in studies on the nitrogen metabolism of plants. The book is devided into three chapters: 1. Assimilation of anorganic nitrogen compounds (123 pages), 2. Transport of nitrogen compounds (15 pages), and 3. Nucleic acid and protein metabolism (111 pages). It reviews ca. 1150 original papers in these three subjects and the list of references comprises of 13% of the total volume. Many papers are referred extensively and a selection of original figures and tables has been used to illustrate the book. Due to the extensive number of references and the detailed information, this book is a useful handbook for advanced students in botany who are familiar with the German language. Contrary to most previous review books on the nitrogen metabolism of plants, it is written by one author. Consequently the book has become a balanced overview of the new lines in modern plant physiology. Special attention is given to biosynthesis of RNA and DNA and the regulation of protein synthesis in plants. Classic subjects in plant physiology, such as transport, have had much less attention. Although the insight in the Molecular Botany is still behind that in Molecular Microbiology, the current handbook demonstrates the rapid progess in the former field. Special attention is given to the nucleic acid and protein metabolisms in seeds and in leaves. And a link is made between histological and biochemical observations.

A. D. L. AKKERMANS

H. BOTHE and A. TREBST (Ed.): *Biology of inorganic nitrogen and sulfur*. Springer Verlag, Berlin, Heidelberg, New York 1981. viii + 384 pp., 144 figs. Cloth. DM 89.–, c. US $ 46.80.

This book contains the proceedings of a conference held in 1980 in Bochum (FRG) and provides the recent progress in nitrogen and sulfur metabolisms in plants and micro organisms. The reason to combine research on conversions of nitrogen and sulfur compounds was the great similarity in the metabolism of both elements.

The book is divided into six chapters. Chapter 1 comprises three contributions on Information on Nitrogen Metabolism in Plants (L. Beevers), Assimilatory Reduction of Nitrate (M. Losada, M. G. Guerrero & J. M. Vega) and Dissimilatory Nitrate Reduction (F. R. Whatley). Chapter 2 is focussed on Dinitrogen Fixation and includes 6 contributions on Genetics of Dinitrogen Fixation (W. J. Brill), Rhizobium Genetics (W. Heumann), Physiology of Dinitrogen Fixation (J. R. Postgate and 8 coworkers), Biochemistry of Dinitrogen Fixation (W. G. Zumft), Ammonium Assimilation (D. Kleiner, S. Phillips and E. Fitzke) and Hydrogenase-Nitrogenase Relationships (H. Bothe & G. Eisbrenner). Chapter 3 gives a review of 6 topics in Sulfur Metabolism: Assimilatory Sulfate Reduction (J. A. Schiff & H. Fankhauser), Ecological and Physiological Aspects of Some Anaerobic Sulfur Bacteria (N. Pfennig & F. Widdel), Mechanistic Aspectes of Dissimilatory Sulfate Reduction (J. M. Akagi), Energetic Aspects of Sulfate Reduction (R. K. Thauer & W. Badziong), Photolithotrophic Sulfur Oxidation (H. G. Truper) and Oxidation of Ammonia by Nitrosomonas and of Inorganic Sulfur by Thiobacilli (I. Suzuki, S. Ch. Kwok, D. C. T. Tsang & R. S. Bhella). The final two chapters are concentrated on more specialized aspects of the nitrogen and sulfur metabolism in plants and microbes.

Although our knowledge of the nitrogen and sulfur metabolism, especially the molecular genetics, has been improved since 1980, the present book is still a useful selection of review and original papers. Since most current scientists are highly specialized, the present proceedings will facilitate interdisciplinary exchange of information in biological sciences: the nitrogen specialist learns about the progress in sulfur metabolisms and visa versa. Moreover, microbiologists and botanists learn about the progress outside their direct own field and realize that regulation of enzymes involved in N and S metabolism is highly dependent on the type of organism! During the last decade review books on nitrogen metabolism, in particular nitrogen fixation, appear almost annually. This has created duplicates in fields with slow progress and too much specialized papers in fields with rapid progress, e.g. molecular genetics. The current book remains its significance because of the clear overview of the subjects and the combination of the topics of N and S metabolism.

A. D. L. AKKERMANS

E. OBERDORFER: *Pflanzensoziologische Exkursionsflora*, 5th Ed. E. Ulmer Verlag, Stuttgart 1983. 1049 pp., 58 figs. Cloth. DM 58,–.

This well-known compendium gives very much information in a very compact way. Since no comparable Dutch book is available, Oberdorfer's flora is a much-consulted reference book in the Netherlands. The most obvious divergences between "German" and "Dutch" phytosociological en ecological positions of plant species may be observed when this flora is applied to the calcareous dunes of the Netherlands. Other types of landscape in this country falling more or less outside the scope of Oberdorfer's flora are the peat-bogs, heathland pools and river valleys, which differ considerably from those in Central Europe. For this reasons a "Dutch Oberdorfer" would be helpful.

An advantage of Oberdorfer's presentation is that almost every species gets its phytosociological definition, not only the selected group of characteristic and differentiating species of syntaxa, as is the case in the Heukels' Flora van Nederland. To what kind of curious outcomes the latter procedure may lead is illustrated by the example of the ubiquitous *Achillea millefolium*, which in the Flora van Nederland is only indicated as a differentiating taxon of grazed *Juniperus* scrub (Squarro-

so-Juniperetum)! The ecologically sensitive *Ajuga reptans* even lacks any syntaxonomic report. On the opposite, Oberdorfer gives the whole phytosociological amplitude in such instances.

Less reliable and critical than these ecological data are the keys in this Exkursionsflora. Too often they appear to fail upon closer examination (e.g. with *Carex, Elymus, Glyceria, Myosotis, Poa*). Another point of criticism that may be brought against the present-day practice of German phytosociology is the steady inflation of syntaxa. With 48 classes and many hundreds of lower units surveyability and applicability are not furthered. Especially ruderal vegetation types, whose composition is always more or less accidental, should not be split up so endlessly as is usual at present. Any new turn in soil use may induce new plant communities, if at least they deserve the qualification "community"!

As to a marginal part of Germany, the Eastfrisian Wadden Isles, the diagnosis of species is not always complete or right. *Carex punctata* is not to be found in the Armerion maritimae, but in the Violion caninae and Caricion davallianae. *Fragaria* × *ananassa* occasionally runs wild in dune dwarf scrub (Salicion arenariae; Spiekeroog, like in the Dutch dunes). *Lepidium heterophyllum* seems to be characteristic of transitions between the Sedo-Scleranthetea and the Sisymbrion (Langeoog, like in the Netherlands). *Thalictrum minus* is rather frequent in low dune scrub (Salicion arenariae) and some other types of dry dune vegetation.

For the rest, the Pflanzensoziologische Exkursionsflora is a convenient guide within its own territory, and this fifth edition is recommended to all vegetation investigators.

E. J. WEEDA

H. F. G. VAN DIJK, B. G. GRAATSMA en J. N. M. VAN ROOY: *Droge stroomdalgraslanden langs de Maas.* Wetenschappelijke mededelingen K.N.N.V. nr. 165. Koninklijke Nederlandse Natuurhistorische Vereniging, Hoogwoud 1984. 146 pp., 58 ill. Df 20.–. Address: Hoogenboomlaan 24, 1718 BJ Hoogwoud.) (Te bestellen door overmaken van het bedrag op girorekening 13028 t.n.v. Bureau K.N.N.V., Hoogwoud. Prijs voor leden K.N.N.V.: *f* 16.60.)

This publication deals with the dry grasslands in the Meuse valley in the southeastern and central parts of the Netherlands. Up to about 30 years ago many of these grasslands were rich in rare species, and variation between them was considerable thanks to diversity in soil properties (acid to basic, poor or rich in calcium, loam and mosit content &c.). Among the chiefly South or East European flora elements of the Meuse valley, wanting in the surrounding Pleistocene area, are (were) i.a. *Campanula glomerata, Euphorbia seguieriana, Trifolium striatum* and *Veronica prostrata.* Nowadays the greater part of the grasslands under consideration have been destroyed by intensification of agriculture, reclamation of sand and gravel, recreation &c. Much of the destruction results from lack of interest or apprehension as to seminatural ecosystems and has no planological or economical justification.

Regrettable as these facts are, I cannot avoid making some objections against their presentation. In my opinon facts should be enunciated fully before evaluation takes the floor. In the present publication pessimistic statements are all-pervading. When in chaper 5 concreter descriptions appear, the text is tough and "opaque" due to the mass of details. These peculiarities are still more obvious in chapter 8. Moreover, the question may be asked if such detailed descriptions of single terrains as constitute this chapter are suited for publication in this way. In general, the underlying investigation report should have undergone a more thorough recasting before being printed.

A less important point of criticism is that the present investigation was executed in only one year with rather exceptional weather conditions (1980). Consequently the inventory of several terrains is not quite complete.

Despite these critical notes, I hope this publication – and possibly more effective offshoots of it – will contribute to conservation and restauration of the remains of the dry grasslands along the Meuse.

E. J. WEEDA

G. GOMEZ-CAMPO (Ed.): *Plant conservation in the Mediterranean area.* (Geobotany 7). Dr. W. Junk, Publishers, Dordrecht, Boston, Lancaster, 1985. XII + 269 pp., ill. Cloth. Dfl. 215.00, US $ 67.50, £ 59.75 ISBN 90-6193-523-7.

Fourteen authors from eight Mediterranean countries, viz. J. Malato-Beliz (Elvas); C. Gómez-Campo, J. Ruiz de la Torre (Madrid); A. Pons, P. Quézel (Marseille); J. Mathez, C. Raynaud (Montpellier); S. Filipello, S. Gardini-Peccenini (Pavia); C. Papanicolaou (Thessaloniki); T. Baytop, H. Demiriz (Istanbul); M. Avishai (Jeruzalem); L. Boulos (Cairo), and five authors from three West-European countries, viz. C. Leon, G. Lucas, H. Synge (Kew); A. Strid (Copenhagen); S. Snogerup (Lund), participated in this Geobotany vol. 7 regarding the various aspects of plant conservation in the Mediterranean. In preparing this book the editor, C. Gómez-Campo, was assisted by V. H. Heywood (Reading).

The book is divided in three sections. The first section (chapters 1–3) gives a general introduction, beginning with the conservation problems of the Mediterranean flora. Moreover it defines the Mediterranean region and describes the historical development of its flora and vegetation, including man's impact on it. In section two (chapters 4–10) a number of case histories are given concerning the flora of different subareas, viz. Iberian Peninsula, Italian Peninsular and alpine regions, Greek Mountains, Anatolian Peninsula, arid (south-)eastern Mediterranean region, Maghreb countries (the North-African countries from Morocco to Tunis) and Mediterranean islands. Section three (chapter 11–14) deals with number of actions and solutions concerning the problems of Mediterranean plant conservation: the value of precise information, conservation of native ecosystems, and the role of botanic gardens and seed banks in conservation.

This book certainly is a fine piece of international cooperation, indirectly one of the fruits of the activities unfolded since 1974 by the Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area (OPTIMA).

The emphasis lies on the protection of plant species, while comparatively little attention is paid to the conservation of populations and ecosystems. The latter should always be the ultimate purpose of nature conservation, as J. Ruiz de la Torre correctly points out (chapter 12). A chapter which discusses problems, projects and possible achievements in the field of reforestation with native coniferous and broadleaved trees in the various countries, however, is lacking.

The publisher, Dr. W. Junk, member of the Kluwer Academic Publishers Group, has done his work well: lay out, typography etc. are as they ought to be. The book is attractively illustrated with black and white figures, but is quite expensive.

Despite this, many people interested in the (conservation of the) Mediterranean flora and vegetation will hopefully read this book, so that it can contribute to the dispersal of the idea that man on earth should be a preserver, and not a ruthless consumer and destroyer.

J. H. IETSWAART

J. H. COOLEY and F. B. GOLLEY (Ed.): *Trends in ecological research in the 1980s.* Plenum Press, New York and London, 1985. Published in cooperation with NATO Scientific Affairs Division. VIII + 344 pp., ill. Cloth. US $ 63.00; in US and Canada $ 52.50. ISBN 0-306-41889-4.

"Trends in ecological research in the 1980s" represents the proceedings of a NATO ARW and Intecol Workshop, it encompassed the Future and Use of Ecology after the Decade of the Environment, held April 7–9, 1983 at Louvain-la-Neuve, Belgium.

Sixteen prominent ecologists have attempted to summarize and consider innovations and advances that have taken place in their field of ecological interest, in the 1980s.

Ecology is a very young science; the first International Congress of Ecology was held in 1974 in The Hague, with proceedings entitled "Unifying concepts in ecology"; it reflected the search for streamlining of this widely diversed branche of science.

The contributions do not sum up and comment upon research progress as in review papers, but generally represent the rather informal, personal and often subjective views of the sixteen authors.

From an introductory paper by Frank Golley, one may conclude that the Netherlands was number eleven out of 105 different countries in a (biased) world survey of the number of ecologists per country, derived from data of published papers. Although some suspicion is necessary regarding the generality of "observed" trends, most of the contributions are very readable and interesting. The chapters cover the field of plant ecology (Plant Physiological Ecology-H. A. Mooney; Investigative Plant Ecology – P. J. Grubb; Vegetation Science – E. van der Maarel); Animal Ecology (Plant-Herbivore Interactions, Insect Ecology – P. W. Price;Arthropods – J. Adis & H. O. R. Schubart), Ecosystems (with chapters by H. Decamps, H. Remmert and one by B. Ulrich) and theoretical-philosophical papers by O. Ravera, N. Chr. Stenseth, M. Godron and R. Margalef.

The cover of the volume says that both ecologists and legislators are provided with a wealth of information. Titles of some of the papers are real eye-catchers: Hermann Remmert: 'And now? Ecosystem Research!', Ramon Margalef: 'Facts about life and the environment not to forget in preparing schoolbooks for our grandchildren".

More papers contain lessons to learn: a plea for the use of mathematical models in evolutionary ecology (Stenseth). In the following and related paper Margalef warns for pseudo- and too theoretical-mathematical developments, justifying the factitious rule of thumb, that any expression in ecological theory more than four inches long is a false one. Authors differ in their opinion (and optimism) on future scientific developments: Remmert propagates the study of (complex) ecosystems, while Mooney and Stenseth propose the study and modelling of single species problems first, since, as Stenseth (p. 275) remarks: "We have to learn to walk before we can run!"

"Trends in ecological research for the 180s" will be difficult to digest for "eco-activitsts and other believers in pop ecology". It will be very useful for students and teachers and ecologists involved in introductory courses of ecology giving a fairly complete survey of all parts and approaches in the science of ecology.

J. ROZEMA.