

BOOK REVIEWS

R. KNAPP: *Einführung in die Pflanzensoziologie. Pflanzengesellschaften, Vegetationskunde, Vegetationskartierung und deren Anwendung in Land- und Forstwirtschaft, Landschaftspflege, Natur- und Umweltschutz, Unterricht und anderen Gebieten*. Completely revised third edition; 388 pages, 253 figures, and 41 tables. Publ. Eugen Ulmer, Stuttgart, 1971. Price DM 48.—.

The present book was first published in 1948 and 1949; it consisted of three separate parts ("Arbeitsmethoden der Pflanzensoziologie", "Die Pflanzengesellschaften Mitteleuropas", and "Angewandte Pflanzensoziologie"). In 1958 a revision of the first part was published. The first/second edition contains 338 pages, so this second/third edition has been somewhat enlarged.

According to the preface the book is intended on the one hand as an introduction for those who want to specialize in vegetation study, on the other hand as a source of information on plant communities for those who are engaged in investigations in the fields of agriculture, forestry, control of the environment, nature conservancy, and in the study or the teaching of biology in general.

The book is divided into seven chapters. The first chapter contains a brief introduction to some general concepts in vegetation study, its aims and its task. In the second chapter the fundamentals of the investigation and classification of plant communities are discussed. The sample plot analysis, the composing of tables, and the taxonomy of plant communities are treated in detail. Besides, the terms boundary, gradient, and continuum are briefly mentioned. The third chapter deals with synecology. The (abiotic) properties of the environment in relation to the vegetation are treated, and there are explanations of ecological species groups, life forms, diaspores, polyploidy, and the science of formations. In the fourth chapter the study of succession (synchronism) and its applications, the synchronology, and, rather detailed, the zoological including human influences are discussed. In the fifth chapter attention is paid to vegetation-mapping, the science of plant areas, and further aspects of synchronology (which term is not used, however). The sixth chapter contains a survey of the higher vegetation units (classes, orders, and alliances) in Central Europe. A short description of the physiognomy, the synecology, and the distribution, as well as an enumeration of the main characteristic species (in the sense of faithful taxa) have been added to each unit. This chapter takes up about one third of the book. The seventh chapter gives brief instructions (7 pages) for the teaching of vegetation study at universities and secondary schools. The list of references contains about 800 titles.

"Einführung in die Pflanzensoziologie" is a solid book, well got-up. It gives a more or less complete review, illustrated with many examples, of all aspects of vegetation study as practised according to the French-Swiss School, without being, however, so detailed as to get the size and the character of a handbook.

However, in my opinion the book shows in some points more or less serious shortcomings. First, it is to be regretted that the obsolete term plant sociology has been maintained; it would have been more correct to use phytocoenology (mentioned by the author merely as a synonym) or vegetation study ("Vegetationskunde", "vegetatiekunde"), nowadays commonly used in Central and Western Europe. The author obviously interprets vegetation study only as a part of plant sociology, though he nowhere clearly states this. Besides, the place of plant sociology within geobotany is not clearly stated. This vagueness and inaccuracy concerning the terminology and the definition of concepts occur in more places in the book; for instance, a definition of the object proper, the vegetation, is lacking, while indications like "Plant Ecology", "Plant Community", "soziologische Gruppen", and "pflanzensoziologische Arealkunde" need a more accurate explanation. In a book meant to be an introduction to vegetation study I think such imperfections the more annoying.

The distribution of the subject-matter over the chapters and the subdivision of the latter

are sometimes not very clear, which presents again difficulties to beginners and to those who have to do with vegetation study only indirectly. To give an example, the explanation of life forms and the science of formations in the third chapter (synecology) would have been more in place in the second chapter. On the other hand, the human and animal influences on the vegetation (fourth chapter: syndynamics) in my opinion form part of synecology.

It is to be regretted that the mutual relations between plants are not discussed at all; the reader is referred to KNAPP's book "Experimentelle Pflanzensoziologie und gegenseitige Beeinflussung der Pflanzen" (1967).

Actually, an extensive survey of the Central European plant communities, as given in the sixth chapter, is not in place in an introduction to vegetation study. An introduction ought to deal with the aims and methods of the investigation of vegetation; an enumeration of vegetation units is a result of this. On the other hand, however, this survey greatly enhances the utility of the book.

Finally, the book is focused on Central Europe, which is a drawback to the Dutch reader. Vegetation types that are prominent in the Netherlands, like vegetations of broads and ditches, salt marshes, etc., are little involved in the discussion of the various methods and concepts. Moreover, the frequent use of German names of plants and plant communities makes the book less easily understandable. It is to be regretted that this concentration on Central Europe is not restricted to the text, but can also be found in the list of references. Apart from some general syntaxonomic surveys, the representation of literature from outside this region is rather scanty.

A. J. DEN HELD

A. A. IMSHENETSKI (editor): *Mycotrophy in plants*. Israel Program for Scientific Translations, Jerusalem, 1967. Translated from "Trudy Konferentsii po Miko-trofii Rastenii"; Moskva, 1955. 362 pp.

The book contains 22 reports, 7 undelivered papers, and discussions by Russian workers contributed to a conference held in 1953. The majority of the contributions (15 reports and 7 undelivered papers) – reflecting general trends of Russian work – deal with ectotrophic tree (mainly oak) mycorrhiza.

At that time research was concerned with morphology and mainly with establishing beneficial effects of the symbiotic association and the conditions leading to it. The practical application of introducing mycorrhizal fungi (mycorrhization) had its first great successes in Russia in the course of afforestation of shelterbelts in steppe regions. Work on this line is critically reviewed by Zerova, Chastukhin, and Runov. Several workers report experiments of mycorrhiza synthesis with pure cultures of different fungus species.

The present volume is outdated by two further Russian books on mycorrhiza: Lobanow, Translated into German, 1960, and Shemakhanova, translated into English, 1967 (also in Jerusalem). Its main value is the comprehensive documentation of Russian work until 1953. The text is carefully translated.

W. GAMS

P. BELL and C. WOODCOCK: *The Diversity of Green Plants*. 2nd edition, 374 p., 276 figures and photographs. Edward Arnold, London 1971. £ 5.— (paperback £ 2.50).

This book was first published in 1968 as part of the series of student texts in Contemporary Biology. It is an introduction to the evolution in autotrophic plants. In the second edition there are a number of additional illustrations and the sections on the algae (Cyanophyta and Chlorophyta), mosses and liverworts (Bryophyta), conifers (Gymnospermae) and flowering plants (Angiospermae) have been substantially revised.

The first chapter deals with the principles governing the evolution of autotrophic plants: evolution in structure, nutrition, life cycle, mobility and sexual reproduction. The following chapters contain definitions and summaries of characteristics of divisions and classes, and short descriptions of orders. Relationships between various species of the Plant Kingdom are mentioned and discussed. Contemporary and fossil records are compared.

Two chapters are devoted to the algae and end with a description of the evolutionary trends within the algae. They trace the algae from unicellular to parenchymatous organization, from simple to elaborate life cycles and from isogamy to oogamy to show a number of progressions, which can be regarded as representing channels of evolution.

There is a chapter on the mosses and liverworts (Bryophyta) with a discussion of the many similarities between algae and bryophytes.

All the vascular plants (i.e. those possessing the lignified conducting tissue, xylem) are placed in a single division: Tracheophyta. Discussion of the many and diverse orders and their inter-relationships occupy the remaining three chapters and include more than half of the book. The book ends with a glossary of terms, a reference list of about 90 references and an index.

This is a very useful book for students. It contains much information, but detailed considerations of paleobotanical and recent information on evolution have been omitted. It is well-printed and the price is reasonable. The glossary of terms is an important part of this book.

The drawings are too schematic and it is a pity that some references like Cryptogamic Botany by G. M. Smith are missing.

We must remember, however, that a book of this size cannot be more than an introduction to the subject of evolution in autotrophic plants.

A. J. MUNTING

HANS MOHR und PETER SITTE: *Molekulare Grundlagen der Entwicklung*. BLV Verlagsgesellschaft, München, 1971; 230 pp.; DM 22,—.

The discipline of "developmental biology" is in a period of rapid progress. The Jacob-Monod theory of enzyme synthesis by gene activation and repression has been, and still is, a powerful inductor of research and synthesis in the field of developmental biology. It opened the possibility to consider developmental processes in the various groups of plants, animals and viruses on the basis of one integrated view.

In succession there appeared among others the books by Sussman: Growth and development (1960, 1964), Bullough: The evolution of differentiation (1967) and by Mohr & Sitte (1971), treating development of microorganisms, plants and animals. The first book is a textbook for undergraduates, the second an inspiring book for researchers, and the third has qualities of both. The last-mentioned book is divided into two major parts. The first part consists of introductory chapters on complexity, the Jacob-Monod model, the cell model, and the analysis of factors in development. The second part treats an array of subjects, more or less

specially: morphogenesis in viruses, differentiation, hormonal regulation, the influence of light on development, the development of special structures and organelles, enzymatic regulation and interactions between the nucleus and the cytoplasm.

The choice of the subjects of the individual chapters and the way in which they are treated seem rather arbitrary. For this, however, the authors can hardly be blamed, as they had to choose out of a "*mer à boire*".

The book should be read and re-read by those who are merely interested in the subject, as well as by researchers in the field, as it gives many openings to related problems in other organisms and is thereby another plea for an integrated approach to the problem of development.

R. SOEKARJO

L. B. MOORE and E. EDGAR. *Flora of New Zealand volume II.*

Indigenous Tracheophyta, Monocotyledones exopt Gramineae. I—XL + 354 pp., 43 figs., 4 maps, 1970. A. R. Shearer. Government Printer, Wellington, New Zealand. Price \$ 4.50.

This flora with its attractive cover gives in fact much more than is expected from the title. The descriptive flora treatment is preceded by a bibliographic section entitled "Annals of taxonomic research on New Zealand Tracheophyta 1965–1968" and by a synopsis of classes and orders which mainly follows Hutchinson's system.

The descriptive section fills of course the greater part of the book. It begins with a key to the families and a key to the genera. As far as I can judge from the groups with which I am acquainted, the descriptions are extremely accurate. In addition to the descriptions also notes on the distribution (in New Zealand as well as abroad), ecology, flowering and fruiting time, type material and type locality are given, curiously all under the heading "Dist." Other particulars, which may have bearing on the taxonomy of the described taxa, e.g. arguments for making taxonomic decisions, notes on typification, relationships, etc. are printed in a smaller letter-type. The descriptive part is concluded by a useful, 13 pages long glossary.

A few corrections have to be made. *Zostera novazelandica* Setchell is recorded as being a synonym of *Z. muelleri* Irmisch ex Aschers.; it is, however, a valid species restricted to New Zealand. *Z. muelleri* does not occur in New Zealand, but is endemic to Victoria, Tasmania and the South-eastern part of South Australia, in spite of many records in literature which state otherwise.

The correct name of *Spirodela oligorrhiza* (Kurz) Hegelm, is *S. punctata* (G. F. W. Meyer) Thompson. The description and drawing of *Wolffia arrhiza* (L.) Horkel ex Wimmer relates in fact to an undescribed species from S. E. Australia, known as *W. arrhiza* var. *australiana* Benth.

The last part of the book consists of a well documented list of chromosome numbers of the New Zealand Gymnospermae, Dicotyledones and Monocotyledones (incl. Gramineae) (28 pages) and the "Corrigenda to volume I" (14 pages). The general index relates only to the descriptive part of the book.

The fact that this flora gives only the indigenous plants, renders it an academic document. The question which springs immediately to mind is which species are indigenous and which not. There will always be some doubt about the indigenous character of the occurrence of some of the species. For example, the late discovery of some *Lemnaceae* (*Spirodela oligorrhiza* in 1930; *Wolffia arrhiza* in 1950) can be ascribed to the fact they were overlooked or that there was a lack of interest in them, but is it just as well possible that they appeared very recently in New Zealand. If the identification is correct, *Lemna minor* L. is certainly introduced. Anyway, it is a fact that nowadays many alien species occur in New Zealand and that several of them play a conspicuous role in the vegetation. To completely neglect naturalized species of common occurrence restricts the utility of the flora to a limited group of professional botanists. As an example I refer to three water plants of the family *Hydrocharitaceae*, viz. *Lagaro-*

siphon major (Ridl.) Moss ex Wager, *Elodea canadensis* Michx., and *Egeria densa* Planch., which are so common in some lakes on North Island that they are regarded as pests which need to be controlled (See e.g. V. J. Chapman & C. A. Bell, Rotorua and Waikato water weeds: problems and the search for a solution, Auckland, 1967). These three species are not given in the flora, nor is the family mentioned. In my opinion such common naturalized species should have been incorporated in the flora, e.g. in a smaller letter type or in a note. However, in the case of introduced species the authors have not been entirely consistent, as a few introduced species are recorded, e.g. *Potamogeton crispus* L. in a note under *P. ochreatus* Raoul and *Cordyline terminalis* (L.) Kunth in a general note under the description of the genus *Cordyline*. When seen in the light of what the two authors have achieved, however, my remark is of minor importance. This volume is truly an excellent piece work.

C. den Hartog.