

## BOOK REVIEWS

*The Diversity of Green Plants*. P. R. Bell and C. L. F. Woodcock. Pp. ix + 374. Edward Arnold. London. 1968. Price £4 (board), £2 (paper).

This is a new morphology text-book intended for undergraduates. It aims by means of a selected series of examples to cover the range of organization shown by autotrophs: algae, bryophytes and trachaeophytes. This it does in some 340 pages of which over half carry an illustration. There is also a 17 page glossary and a brief bibliography of 86 references. The text-figures (there are some 230) are a special feature. They are mostly clear simplified outline diagrams and about two-thirds are original. To the undergraduate picking up the book for the first time this feature will give it an instant appeal. The selection of examples, which is probably similar to those cited in most undergraduate courses in British Universities, is an additional selling point.

The usefulness of this book is difficult to assess: it is in no sense a work of reference for in so short a text it can go no further than, if as far as, many lectures would on any part of the field covered. It could be useful in an introductory first year course which includes a broad survey of systematics and morphology. The diagrams include much that is seen in practical classes and it is perhaps in the laboratory that the book may be of most value. It will be useful to teachers in sixth forms and to their students who may require a concise one-volume guide to plant form.

This is not a work for more advanced students. The authors give a too condensed and often oversimplified account of the subject matter. There is no morphological theorizing, names like Lam, Meeuse, Melville and Zimmermann never crop up and Eames, *Morphology of Angiosperms* (1961) does not occur among the references. The authors are uncommitted to the extent of using neutral terms like micro- and mega-sporangiophores for stamens and carpels but without any explanation or discussion of homology. There are some brief passages on evolution and two interesting ideas were introduced here. One (p. 7) concerns the rate of production of carbohydrate and the role this may have had in the evolution of cell walls in early land plants. The other (p. 341) speculates on the ecological effect induced by differential rates of decay of angiosperm and gymnosperm leaves (surely only those of some conifers). The evolution of Osmundaceous ferns and of the female cone in conifers, for which there is ample palaeobotanical evidence, are passed over so summarily that the student is unlikely to be even awakened to their existence, although Florin (1951) is at least mentioned.

There are a number of minor errors in both the text and figures which will irritate the specialist teacher though they are probably not very dangerous to the student: the size of the capsule and involucre in *Lophocolea* (fig. 4.9) in proportion to the rest of the leaves; the shape of the antheridial branch in *Sphagnum* (4.17) and the somewhat irregular arrangement of leaves, not in clear vertical ranks as is typical. The perspective in the drawing of the dehiscent capsule of *Andreaea* (4.19b) makes interpretation difficult. The leaf-bases of *Lepidodendron* (5.23) lack an outline delimiting the leaf scar. There is no primary xylem in the transverse section of *Lyginopteris* (7.1). The fibrous layer (endothecium) has been separated from the epidermis in the *Lilium* anther (8.22). The diagram (8.43b) showing a transverse section of a host stem with a haustorium of *Cuscuta* does not very satisfactorily define the limit of penetration achieved by the parasite. In the text Cycads (p. 239) are said to have trilete pollen. It is, in fact, sulcate or anacolpate; however, as these terms are not used, it might possibly have been described as monolete. The statement (pp. 250, 258 and fig. 7.26) that the 'air bladder' in the Cordaitales and *Pinus* is developed between the exine and the intine is an oversimplification (cf. Erdtman 1957): but the exine is defined in the singular (p. 348) 'as the outer layer [not layers] of the wall of a spore or pollen grain'. *Ligustrum* pollen as figured (8.24) is colpate (it is, strictly, colporate) but not porate as labelled.

The authors have missed the opportunity to present an exciting account of the diversification of autotrophic plants and instead have produced another pedestrian and somewhat superficial text-book.

P. D. W. BARNARD

*Flora of Iraq*, Volume 9. N. L. Bor, with economic and distributional notes by Evan Guest. Edited by C. C. Townsend, Evan Guest and Ali Al-Rawi. Pp. vi + 588, with 216 plates (1 in colour). Ministry of Agriculture, Baghdad, Iraq. 1968. Obtainable from R. Maclehorse & Co., Glasgow. Price £3 10s.

This volume of the *Flora of Iraq* is a most remarkable achievement for a man who has long passed the age of retirement, and this is especially noteworthy in an era of youth-worship. Norman Loftus Bor hardly needs any introduction: as one of our leading agrostologists he has gained renown with his work on the Gramineae of India, Pakistan and Ceylon as well as with his participation in Rechinger's *Flora of the*

*Lowlands of Iraq*, not to mention his numerous contributions towards our knowledge of this family in various scientific journals all over the world.

The first two volumes of the *Flora of Iraq* (all that had previously appeared) have already been thoroughly reviewed in *Watsonia* 6, 390–391. Either the importance of the Gramineae or Dr. Bor's immense drive may be the reason for the appearance of this volume (No. 9) many years ahead of schedule.

The systematic treatment of the volume is preceded by an introduction to the morphology of the Gramineae, which is a welcome help to those less experienced who try to find their way through the keys. This part is followed by a key to the Tribes, which may pose some problems to the non-specialist since it is based on the proverbially tedious spikelet characters. Within each Tribe a key to the genera is provided. More important than this, however, and of greater value as far as practical use is concerned, is the artificial key to the genera (pp. 21–40), where basically more conspicuous characters such as type of inflorescence, arrangement and shape of spikelets etc. are used to break down the large number of genera into recognizable groups. The inflorescence types are magnificently illustrated on eleven interleaved plates. A random trial proved the workability of this key; but the reviewer alas, was, irritated very much by its inconvenient lay-out (this criticism applies to all the keys in the book). For this, of course, the author cannot be blamed. One really wonders why in A.D. 1968 planners of taxonomic works can still advocate the use of un-numbered indented keys which can sometimes only properly be used with the help of a measuring device. Within the key to the Tribes (stretching over several pages), for example, there are not less than 15 lines beginning with 'spikelets'! How will the inexperienced user ever find his way through such a maze when even the trained taxonomist finds it difficult? I should point out that most modern taxonomic works have introduced numbered keys, most notably *Flora Europaea*, *Flore du Gabon*, *Flora of the British Isles*, *Flora Iranica*, etc. etc.

The descriptions both generic and specific are adequate. Bibliographic references are confined to the Middle East, and only the most important synonymy is given. Most praiseworthy are the notes dealing with economic aspects of species as well as the fact that most of the local plant names have been translated from the Arabic. Nomenclaturally the work is up-to-date. Not without sadness does one note that the Common Reed now bears the name *Phragmites australis*, but this is not the place to lament either the absence of a list of 'nomina specifica conservanda' from the *International Code of Botanical Nomenclature*, or the eagerness of some colleagues who just cannot let sleeping dogs lie.

The most outstanding feature of this volume is its almost luxurious amount of illustration. Besides the really attractive coloured frontispiece of *Bromus danthoniae* by Mary Grierson, there are 215 (not 212 as stated on p. vi) plates of line drawings, mainly executed by Derrick Erasmus. Most of these plates are excellent, and indeed a few of these, e.g. Plate 215 (*Zea mays* L.), show that he is not just another plant illustrator but an artist at work.

Both the author and the authorities of the Royal Botanic Gardens, Kew, are to be congratulated on this volume.

EDMUND LAUNERT

*The Natural Geography of Plants*. H. A. Gleason and A. Cronquist. Pp. viii + 208 illustrations (mostly photographs). Columbia University Press, New York & London. 1964. Price £4 10s.

Although this book has been available for over 4 years, no review has yet appeared in these pages. As it is a remarkable book, in several ways, I feel that no apology is required for bringing it to the notice of readers of *Watsonia* after this time. A word of explanation is necessary, however, on account of the somewhat misleading title. A more informative one would be 'The Natural Geography of Plants of North America'; even this would not be a strictly accurate summary of the contents. It is true that the North American flora figures largely in this work and that the authors have addressed their remarks principally to those inhabitants of the United States and Puerto Rico who are anxious to look with an intelligent eye on the natural vegetation around them; but the plants of these regions are used to illustrate principles of plant geography that are applicable to all parts of the world, particularly, of course, to the North Temperate region, in which the British Isles are situated.

The main part of the work, as Cronquist explains in the preface, was written by Gleason. This comprises 21 out of 22 chapters and deals with various aspects of the theory of plant geography such as distribution, migration and dispersal at the present day and in past time (both historical and geological), joint migration and floristic groups and provinces. Cronquist's main contribution is the last and largest chapter in the book (pp. 275–414), which gives a very full analysis of the vegetation of North America, north of Mexico.

One of the most valuable and interesting features of *The Natural Geography of Plants* is the way that the authors appeal to the reader to go out and look around him, point out aspects of plant distribution that he will observe, and then provide reasoned answers to the questions raised by the consideration of these aspects. The very large number of black-and-white photographs, of a uniformly high quality although obtained from various sources, must also be noted.

One of the factors governing plant distribution that is given great emphasis is *time*. The authors return continually to this topic, stressing that: 'Plants have had, not decades or centuries, but thousands or even tens of thousands of years to carry on their migrations, and even short steps become wonderfully effective if continued long enough' (p. 44); '... we must never forget the importance of time in phytogeography' (p. 49); 'time is the important factor' (p. 264); and that one should 'never forget the importance of past vegetational history in explaining the present distribution of plants' (p. 269). Indeed they seem to imply that migration over long periods, either by short stages with extinction in the middle of the range or by long-distance dispersal, can be invoked as a cause of most of the widely discontinuous distributions that exist today; but they admit that there are some for which they can give not even the vaguest explanation. The possibility of causes such as continental drift (for which more and more favourable evidence seems to be accumulating) is not even mentioned. It is pointed out that almost all distributions are discontinuous to the extent that a species does not occupy all suitable ecological niches (owing to incomplete migration, migratory barriers or competition), so that the more obvious discontinuities often differ only in degrees from those that are familiar in the small-scale plant community.

After dealing with these mainly autecological topics, the authors turn to consider species in relation to one another. The concepts of 'joint migration' and 'joint ranges' are used to introduce the plant community, and a large section of the book treats this subject in a fair amount of detail, first in general ('Floristic groups and Provinces') and then with reference to North America.

Although this book is addressed to the 'interested layman', it contains an abundance of information and ideas that will prove useful and stimulating to anyone, professional or amateur, who wishes to consider questions involving the distribution of plants, in both space and time.

The format is pleasing and the price not excessive for today. I should, however, have liked the index to include the Latin names in their alphabetical sequence, not merely in parenthesis after the common 'English' (*i.e.* American) name. For that matter, the practice of using 'English' names in the text, with the Latin one in parenthesis only when first mentioned, is rather confusing to an English-speaking non-American, let alone a reader whose native tongue is not English.

N. K. B. ROBSON

*Mountain Flowers in Colour*. A. Huxley. Pp. 428 incl. 112 colour and 36 black and white full-page plates. Blandford, London. 1967. Price £1 10s.

This attractive volume is designed to cater for the English-speaking visitor to any of the main European mountain areas who has a little knowledge of botany and a strong desire to identify what he can of the rich mountain flora of Europe. The market for such a book is greatly stimulated by the spread of tourism in recent years, and it is remarkable that, as the author says, there was, in English, no single volume that could be said to give any moderately comprehensive selection of the mountain plants of Europe since H. S. Thompson's *Alpine Plants of Europe*, published in 1911 and long out of print.

The book 'is based unashamedly on its illustrations', which are generally of a high quality, and would certainly enable any user with no technical knowledge of plants to identify such distinctive species as the Lady's Slipper Orchid, *Cypripedium calceolus* or the Mountain Avens, *Dryas octopetala*. It would also be true that the illustrations on the whole distinguish well between the rather numerous species of the famous mountain genera like *Saxifraga* and *Gentiana*. Nevertheless one feels some doubt about the complete absence of *any* keys for identification; there is no method of using the book at all to arrive, for example, at the fact that the small white-flowered cushion alpine is a *Saxifraga* and not, perhaps, a *Draba* or an *Arenaria*. Some compromise between the arid dichotomous keys of a technical Flora and a complete reliance on illustrations would surely have been preferable?

The selection of species to include is, of course, easy to criticise—no selection can satisfy everyone, and it would be unreasonable to condemn the exclusion of, for example, most alpine grasses and sedges, because, clearly, these are not what the layman calls 'mountain flowers'. It would, however, be less easy to defend the somewhat cavalier treatment of the *Cruciferae*; familiar alpinists such as *Kernera saxatilis* or *Cochlearia* spp. surely deserved inclusion? The treatment of critical genera is unsatisfactorily variable; for example, a more rigorous policy of including only the two aggregate Linnaean species *Alchemilla alpina* and *Alchemilla vulgaris* would have prevented the error of including twice (once as *A. hybrida* and once—correctly—as *A. glaucescens*) what is in fact the same plant!

A final, more serious criticism. Nowhere in the otherwise excellent, lucid introductory material can I find any reference to the urgent problems of protection of the mountain flora of Europe. It is emphatically not good enough, in the modern age, to provide people with a stimulus to admire the rare and the beautiful without administering a warning. Tourism can so easily destroy what it thrives on. Surely all authors of popular works on natural history must at the very least face their readers with the challenge of the conservation of nature. To mention, for example, that *Eritrichium nanum* is 'rare' in the Alps without saying it is

legally protected seems like a betrayal of trust. A paragraph on conservation could so easily have been included on p. 11 of the Introduction where rarity is discussed. May I commend the idea to the author if, as he deserves, his otherwise admirable book quickly reaches a second edition?

S. M. WALTERS

*B-P-II: Botanico-Periodicum-Huntianum*. Edited by George H. M. Lawrence, A. F. Gunther Büchheim, Gilbert S. Daniels and Helmut Dolezal. Pp. 1063. Hunt Botanical Library, Pittsburgh, Pa., U.S.A. 1968. Price \$30.00.

Abbreviations of botanical periodicals have long posed a problem both for authors and for editors, and while the data given in the *World List of Scientific Periodicals* have been accepted as a standard by some they have been rejected by others. A major difficulty in using that work is that one must know the full title of a periodical in order to trace its relevant abbreviation, and a further complication is that details of periodicals which ceased publication prior to 1900 are omitted.

Prior to the appearance of *Botanico-Periodicum-Huntianum* no adequate reference book devoted entirely to botanical periodical literature existed. This work, the compilation of which was undoubtedly a herculean task involving much international cooperation, is a vast compendium of some 12,000 titles comprising much of the world's periodical literature relating to all branches of botany. Under the title of each periodical cited, the editors have attempted to provide the following information: (a) an internationally acceptable unambiguous abbreviation; (b) title, as given on the title-page of the first volume; (c) place of publication of first volume; (d) volumation and pertinent publication dates; (e) index reference for the title in the Union List of Periodicals.

The selection of periodicals covers a very wide field indeed, and is particularly comprehensive on central European literature, providing references to many important early, but obscure or overlooked, series. There are, however, some surprising omissions, and among those which readily come to mind, so far as current periodicals are concerned, are the botanical series of the Finnish journal *Aquilo*, and of the *Revue Roumaine de Biologie*. *The Annals of the Natal Museum*, Pietermaritzburg, which has been in existence since 1906, and which contains several important revisions of genera of South African Gramineae, is omitted, and the *Israel Journey of Botany* is excluded, although it may be found under its pre-1963 title as *Bulletin of the Research Council of Israel. Section D Botany*.

The abbreviations adopted are not always entirely satisfactory—could they ever be so? Our own publication, *Proceedings of the Botanical Society of the British Isles*, is provided with the abbreviation *Bot. Soc. Brit. Isles Proc.*, though cross references, a most valuable feature of the book, show that it has also been cited as *Proc. bot. Soc. Br. Isl.* and *Proc. Bot. Soc. Brit. Isles*, the latter being the abbreviation in most common use in European literature, and which, I suspect, is likely to be retained as standard.

The volumation and pertinent publication dates are of considerable interest, and it is possible to trace many of the great historical periodicals such as *Acta physico-medica academiae caesareae leopoldino-carolinae naturae curiosorum exhibentia ephemerides sive observationes historiarum et experimentia . . .*, first published in Nuremberg in 1727, through their many changes of titles and numerous series. The accumulation of such data is, I know from personal experience, time-consuming and needs much careful checking and rechecking. Despite the excellence of this section of the book there are a number of incomplete or inadequate references which I feel could have been improved upon, e.g. the reference to *Contributions du laboratoire de botanique de l'université de Montréal* gives vols. 1-?, 1922-38. An examination of the run of the periodical at the Library of the Royal Botanic Gardens, Kew, revealed that the entry should read nos. 1-30, 1922-38, and that the superseding periodical, *Contributions de l'institut botanique de l'université de Montréal* commenced at no. 31, 1938, and not as vol. 1 as given in B-P-H. The East German periodical *Drudea: Mitteilungen des Geobotanischen Arbeitskreises Sachsen-Thüringen*. Jena, is cited as Vols. 1-4, 1961-64, whereas, so far as I am aware the publication is still current. *Deutsche botanisch Monatsschrift*. Sonderhausen, Germany. Vols. 1-23, 1883-1912, appears as a bare statement, whereas the serial had at least four different subtitles during the course of its existence.

The blemishes referred to are, however, of minor importance in a work of such vast proportions and the editors are more than justified in closing with Alexander Pope's words:

*Whoever thinks a faultless piece to see  
Thinks that ne'er was, nor is, nor ne'er will be.*

Professor Lawrence and his colleagues are to be congratulated on the production of a volume of a very high standard, reasonably priced in view of its bulk and content, which will serve as an invaluable reference book for many years to come.

D. H. KENT

*Essays on Form in Plants.* C. W. Wardlaw. Pp. xiv + 399. Manchester University Press, 1968. Price £2 15s.

The essays in this book have been selected by Professor Wardlaw from his published work on aspects of form in plants. They are presented in chronological order, the earliest being dated 1944 and the latest 1966. The kernel of the book is provided by the development of the author's thoughts on plant morphogenesis but at each stage he has made a wider application of his point of view. Thus the complementary aspects of the various botanical disciplines, of phylogeny and ontogeny, and of levels of organization within the organism are all examined. Indeed, their immanence can be sensed throughout the book. Wardlaw's treatment of these issues is an important contribution to theoretical botany and anyone who is struggling for a comprehensive view of plants must be grateful for the groundwork accomplished by him. In his earlier books, the amount of factual information is immense; for students of morphogenesis, therefore, his recent *Morphogenesis in Plants* will continue to be the most useful work to have at hand. The present volume, which gives access to the ideas without a heavy load of fact, may be preferred by the non-specialist wishing to extend or clarify his thinking. It also makes available to the individual and small library a number of articles which otherwise are difficult to obtain.

Wardlaw's studies of the shoot apex of ferns are represented mainly by summary papers reprinted from *Nature*. From these early studies came the elaboration of the concept of the growth centre as a site of special metabolism that induces a physiological field within which no new growth centre can originate. The nature of the organ to be formed by a growth centre becomes fixed after a (sometimes) perceptible interval, the factors which evoke development along a particular path being a subject for further investigation.

The anatomist looks for signs of differentiation in the immediate derivatives of the apical meristem; but still the visible pattern appears 'out of the blue'. Wardlaw, while stressing that this pattern must earlier be present at the invisible, chemical level, was intrigued by the problem of how chemical pattern could arise: how heterogeneity can come from homogeneity. By a coincidence, this problem was also exciting interest at Manchester in the neighbouring Mathematics Department where the late A. M. Turing was providing an answer in his 'Chemical Basis of Morphogenesis'. The two papers in which Wardlaw comments on and applies Turing's theory of diffusion-reaction systems are included in this volume. In his later work, Wardlaw, taking into account the interactions between different levels of organization, between the whole and its parts, formulates his hypothesis of the *organismal reaction system*.

Of especial interest to readers of this journal is the entertaining article 'A surfeit of species'. Wardlaw is concerned not so much with the documenting of species as with knowing the host that have been documented. He commends an effort to find out whether morphological parallelism is matched by morphogenetic parallelism. If the same means have been used in different taxa to reach similar structural ends, the comprehension of the labyrinth of speciation is made easier.

A remarkable feature of Wardlaw's gift is his capacity to cherish the past whilst looking forward irrepressibly to the future. In the introductory and concluding chapters there can also be detected a hint of his warm and chivalrous approach to science and life.

F. CUSICK

*British Mosses and Liverworts.* E. Vernon Watson. Pp. xvi + 495, 18 plates, 8 + 242 text figures. 2nd Edition. Cambridge University Press, London, 1968. Price £4.

During the last twenty-five years there has been a greater interest taken in British bryology, especially in the field, than ever before. The stimulus has come mainly from the staff of the Universities, often members of our Society, and the British Bryological Society. As the standard works by H. N. Dixon and S. M. Macvicar were becoming scarce and out of date, a pressing need was felt for a work that would cover at least the commoner species likely to be encountered by the student. This need was most ably filled by Dr. Watson's work, which by his method of description, illustration, and remarks on habitat and ecology, has brought many students on to a more comprehensive study of the subject.

Those of our members who have an interest in plant communities will need to be able to name, and recognize again, the bryophytes found in the various habitats that they may be studying or mapping for conservation or other purposes. The illustrated introduction and glossary, followed by keys to all the species mentioned in the book—over 300, will guide the novice along the right methods of approach. Well over 200 taxa are illustrated and described, with valuable helpful remarks on their habitats and associates. Less common species receive adequate mention including aids to recognition.

At the end of the descriptive part is a series of habitat lists, 24 in all, with the species commonly or constantly found in each enumerated. The taxonomy and nomenclature is, of course, in accordance with the latest research. There really is far more pertinent information about the taxa which are illustrated than is to be found in any other work currently available. This book is an essential aid to the ecologist as well as a beginner at bryology and is strongly recommended as good value for the price.

E. C. WALLACE