Book Reviews

Flowers of Greece and the Balkans. A field guide. Oleg Polunin. Pp. xv+592 including 62 pages of line drawings and 21 maps, with 80 colour plates. Oxford University Press, Oxford. 1980. Price £40.00 (ISBN 0–19–217–6269).

This latest of Oleg Polunin's *Field guides* to the European flora presents a concise, but by no means superficial, picture of the flowering plants and conifers of the Balkan peninsula. The area that is covers takes in the whole of Greece (including the East Aegean Islands, excluded from *Flora Europaea*), Turkey-in-Europe, Albania, Bulgaria, Jugoslavia as far north as the River Sava, and the small portion of Romania that lies south and east of the River Danube. The author has condensed his account of the rich and varied flora of the region, together with the associated mass of published material, into a form that is attractive, comprehensible and useful to the amateur botanist.

A book of this type has been badly needed, as the available floristic texts on the Balkans tend to be over 50 years old, scarce, extremely expensive and written in a foreign language, often Latin. However, the most significant attribute of this book is not that it gives access to diffuse and obscure information, but that it provides a radical alternative to popular botanical accounts of Greece which emphasize the lowland spring flora, notably the orchids and other petaloid monocots. Based on the author's many years of botanical experience and extensive travel in the region, *Flowers of Greece and the Balkans* demonstrates the wide range of flora and vegetation that the amateur botanist can expect to see in the Balkan peninsula.

The general layout of the book is similar to that of the author's previous field guides, *Flowers of Europe* (1969) and *Flowers of South-West Europe* (1973). It is set out in three principal sections, each treated as a chapter. The first chapter considers salient features of the geology, topography, climate, vegetation and floristic affinities of the Balkan peninsula. The second chapter describes twelve 'plant-hunting regions', and the third chapter, just over half of the text, gives descriptions of the species of plants that are likely to be encountered in the field, with keys to separate species in the same genus. This chapter is followed by an index section that includes a table of popular plant names in English, Jugoslav (Serbo-Croat), Bulgarian and Modern Greek: and concludes with a detailed bibliography. At the end of the book there are 64 colour plates illustrating over 400 species.

The two introductory chapters are clearly written and full of information. Chapter 1 emphasizes the interaction between the geological history, climatic variation and human influence that has created the diversity of flora (over 6500 species) that occurs in the region. Obviously the author has had to simplify his material to a considerable extent, but there is plenty of detail, as for instance in his straightforward and flexible treatment of the classification of the main types of vegetation in the Balkans. Here, as elsewhere in the book, the reader who wishes to know more is directed to a more specialized text. The section on the climate – which dispels the popular misconception that Greece has an overall regime of 'hot, dry summers / warm, wet winters' – may contain a few surprises for many readers, such as the fact that Crkvice in southern Dalmatia is the wettest place in Europe with up to 4622 mm of rain in a year!

The plant-hunting regions in Chapter 2, covering a wide range of geographical and ecological variation, include Crete, the Peloponnesos, the Pindhos mountains and Mt Olympos in Greece; the Rhodope mountains, the Black Sea coast and the Stara Planina in Bulgaria; and the mountains of Macedonia, Dalmatia and Durmitor in Jugoslavia. This section of the book is stamped with Oleg Polunin's enthusiasm for the Balkan flora and should certainly encourage the reader to follow in his footsteps. Although it is all too easy to bemoan the omission of one's own favourite area, I was disappointed that there was little more than mention of the mountains of Greek Macedonia, which are appended rather awkwardly to the account of the north Pindhos. Many are inaccessible, as the author points out, but at least one, Mt Pangeon near Kavalla, has both a rich flora that is representative of the region and a road up to the summit area.

Chapter 2 is enriched by half, full and double page colour plates of the areas described, and also by double page spreads of line drawings by Miss P. Halliday, illustrating the facies of a number of distinctive species. I was particularly pleased to see the double page of drawings of Macedonian

roadside weeds. The common weeds of the wayside, especially the bigger thistles, often catch the eye of the traveller and lend much character to the landscape. Some are of remarkable beauty – *Alcea pallida*, *Cirsium candelabrum* and *Xeranthemum annuum* spring to mind immediately. These are illustrated here. Some of the species represented in the line drawings are only depicted by fragments, which in a few cases causes individual drawings to lack clarity, a problem compounded by the small scale. Another minor criticism of the line drawings is that they bear no indication of scale, nor are they paginated. (This also applies to the line drawings in Chapter 3).

In view of the immensity of his task, I feel that it would be unfair to criticize too harshly the author's selection of species in Chapter 3. In general he has achieved an adequate balance of mundane and esoteric species, as well as including representatives of large and taxonomically difficult genera such as *Campanula*, *Centaurea* and *Orobanche*. However, apomicts such as *Alchemilla*, *Rubus* and *Taraxacum* are given only brief mention. The author deserves credit for not overdoing the orchids, although there are a lot of these in the Balkans and they are popular with many botanists.

It is a great pity that a book that presents so much specialized information to the general reader has avoided the inclusion of grasses, rushes and sedges and has only 'bare bones' accounts of families (e.g. Chenopodiaceae) of limited aesthetic appeal. These are serious omissions indeed.

There is no family key and no descriptions of families; nor is there a key to genera. For these the reader is referred to *Flowers of Europe*, the 'mother volume'. There are no generic descriptions other than comments on some diagnostic features – again one must refer to the mother volume. On balance I regard this as a sensible system that leaves room for more descriptions of Balkan species, even if it does necessitate having the other volume always to hand. Now that there are three volumes of the author's field guide series available it seems reasonable to regard them as a unit, as one does the volumes of any Flora.

Readers who are in any way unfamiliar with the Balkan flora will probably be largely dependent on the illustrations in order to identify plants. The excellent line drawings in Chapter 3, by Barbara Everard and Ann Davies, should greatly aid identification. They also serve to break up the text of this solid Flora section. The colour plates of individual species that follow the text are of high standard and will contribute enormously to the appeal of this book. Since they will be used extensively for identification, it is unfortunate that a few of them are not as sharp or as correctly exposed as they might be. One or two, such as those of *Saxifraga juniperifolia* and *Anthemis rigida*, are so fuzzy as to be of little value.

Particularly helpful are the photographs of plants of distinctive growth habit, for example the compact, rounded cushions of *Minuartia stellata*, which suitably complement morphological details given in the text. As in his other field guides, the author has included several photographs in which the subject is set against a spectacular, panoramic view of seaside or mountains (or even just a dusty roadside). These photographs spice the plates with a strong local flavour and are guaranteed to induce nostalgia in those who have already visited the Balkans!

It is probably these colour plates that have pushed up the price of this book to what it is. Money is a sad and sordid subject to be raised in a review of a book, but here it *is* necessary to raise it. The high price of *Flowers of Greece and the Balkans* will undoubtedly deter many potential buyers, and it is most unlikely that those with only a passing interest in botany will be prepared to pay so much. This is ironic in that Greek holidays are extremely popular at present and there is, to judge from television programmes and the contents of bookshops, much public interest in natural history. I feel that the publishers have thrown away an opportunity to tap a larger market.

The publication of this book is timely, because the Balkan flora is increasingly threatened, particularly some of the rarer endemic species. In Greece, for example, expanding tourism has destroyed many coastal habitats and bauxite mining threatens montane habitats on Mt Giona (described under southern Pindhos mountains in Chapter 2) and elsewhere. Chapter 2 has a section on national parks, and in his preface the author lists organizations in Balkan countries that are concerned with conservation. Species listed under plant-hunting regions are marked if thought to be endangered or potentially endangered.

I hope that this book will introduce the Balkan flora to a wider public. The flowers of the region deserve to be as familiar to the visitor as are the antiquities and I therefore welcome this handsome contribution to Balkan floristic literature.

J. AKEROYD

The back garden wildlife sanctuary book. Ron Wilson. Pp. viii+152, with numerous line drawings. Penguin Books, London. 1981. Price £2.95 (ISBN 0–14–046915–X).

All of us can help to conserve wildlife in the one area over which we have complete control, our back gardens. This is the admirable theme of this stimulating and informative book, first published in 1979 and now re-issued as a Penguin Handbook.

From the first section of the book the author stresses the 'natural' approach to a wildlife garden, from the construction of a compost heap to the avoidance of pesticides. The chapter on birds contains all the usual details of nest-box and bird-table construction: an unusual addition is the provision of a list of plants which are attractive to birds, either for their berries or their seed-heads. These detailed lists of suitable plants for a wildlife garden occur in all the chapters of the book, and are among its most useful features. Unfortunately, in this same section on birds, one of the irritations of the book first appears. Interspersed with the excellent line drawings produced especially for this book are many old illustrations of all kinds of wild creatures, their historical quaintness being more than offset by their inaccuracy of representation and their irrelevance to the text of the book. Perhaps the most irrelevant of all is the picture of an eider duck, an unlikely candidate for the garden pond!

The mammal chapter is perhaps rather hopeful in describing the construction of a hedgehog-house and a bat roosting-box, but the next chapter, on insects, is rather more successful. As well as lists of food-plants of the commoner caterpillars, and flowers attractive to butterflies and bees, there are interesting sections on breeding butterflies and bee-keeping, with ideas for encouraging the less well-known solitary bees and wasps. The chapter on the garden pond is again excellent for its plant-list but rather vague on the invertebrate inhabitants of the pond. However, the advice on encouraging frogs to breed is very welcome, as this once common creature has sadly decreased in numbers. The final chapter gives advice on suitable trees and hedges, with notes on propagation, and a useful section on plants to grow on or against walls.

One or two irritating errors in the book are perhaps as much the fault of the editor as of the author. We are twice referred to the enigmatic 'p. 00', and some of the metric equivalents of measurements are wrong: a 12 in. square bird-table is given as 15 cm square. An illustration of three British bats includes two little-used common names (the common bat and the great bat): a few pages later they appear under their more usual names (the pipistrelle and the noctule) with no cross-referencing.

After each chapter is an excellent list of references, of both a specialized and a general nature, and this feature (together with the detailed plant lists) makes the book almost more useful as a reference work than as a 'how-to-do-it' manual. It is a pity that the author makes no comments on the lists of recommended books, as the layman is likely to be bewildered by their sheer numbers, and would perhaps prefer a more selective list with critical notes on each.

Despite these criticisms, this is an ideal book to stimulate someone who has never considered the potential of his garden as a wildlife refuge, without sacrificing the conventional picture of an English garden; and even the experienced naturalist will undoubtedly gain some useful ideas from some of the chapters.

P. C. Barnard

The flowering of Britain. R. Mabey & T. Evans. Pp. 173, with 45 colour plates. Hutchinson Publishing Group, London, etc. 1980. Price £9.95 (ISBN 0–09–142690–1).

Text and illustrations in this book are closely interwoven, and together they present a picture of Britain's native flora in words and colour photographs. Richard Mabey tells us that, during seven years of research and photography in the preparation of the book, the authors ranged over the British Isles. While recounting these botanical travels and considering the historical impact of the vegetation, they found themselves continually drawn to the more personal associations of our plants with people. Beginning with some famous "botanical monuments" and ending with "the last resorts" for some native plants, the authors describe the book as "variations on a theme"; and their concern that the wild plants which for so long have been "human familiars" are now "not just dwindling in numbers but passing out of our lives" is emphasized by many particular examples and

interesting quotations from earlier writers. The flowing text encompasses the culture of flowers linked with history through the centuries, with medicinal and herbal associations also. With lucid description, the history of our vegetation from prehistoric times to the present and the changing patterns of plant distribution are discussed in general and in particular, as in the reference to the discovery of former ancient woodland by E. Milne-Redhead (B.S.B.I. Past-President) in 1977 in Suffolk through field recording there of woodland plants in a hedgerow.

The book is generously illustrated with 45 evocative colour photographs; in most of these the plants are set into a landscape scene and clearly shown as an integral part of the habitat. In many of the pictures Tony Evans shows a particularly sensitive use of lighting. It could be that northern readers will be sad to see the beautiful picture of *Campanula rotundifolia* (to Richard Mabey "the most perfect of all British wild plants") captioned "Harebell", with no alternative of "Bluebell" for those who consider these as the true "Bluebells of Scotland".

The book is divided into four main parts: Introduction, Wood, Fields and The Wastelands, with an index and a section entitled "Guide" which lists a careful selection of recommended books, and also notes on conservation legislation and a reference to the B.S.B.I. which has already brought us many enquiries and new members.

The design and colouring of the dust jacket is disappointing for a book intended to capture the attention of those who have not yet looked closely at the flowering countryside; but in content there is a freshness of approach, and this well collated gathering of detailed plant knowledge and observation (rest harrow leaves "curiously smelling of vaseline") will give pleasure also to the experienced botanist.

M. Briggs

The wild flower key. Francis Rose. Pp. 480, with 125 colour plates, 2 black & white plates and numerous text-figures. Frederick Warne (Publishers) Ltd, London. 1981. Prices £8.95 (cased; ISBN 0–7232–2418–8); £5.95 (limp; ISBN 0–7232–2419–6).

This book is essentially a field guide to the flowering plants of the British Isles and the adjacent parts of the Continent from Denmark to the mouth of the Loire, illustrated in colour, with brief descriptions and a generous number of keys. The chief novelty of the book is the inclusion of some 45 pages of vegetative keys to the commoner plants of eight major habitats. Two of these keys, for woodlands and for chalk grasslands, should be very useful as they cover a high proportion of the species likely to be met with. They are ingeniously constructed and work well. Others, however, are less adequate. The key for shingle beaches and sand dunes covers only 15 species, a fraction of what one is likely to find on such sites even in winter. The key for aquatic habitats includes no species of *Callitriche*, in my experience perhaps the commonest of all aquatics. (This genus is altogether poorly treated in the book as in the main text it is placed in the monocots.) In spite of a warning on p. 11 that the "dichotomous" keys can contain up to five choices at a stage, the key for fens begins with a daunting set of 12 choices.

The keys to families, genera and species in the main text are the best feature of the book and work quite well, though in spite of the title of the book by no means all of the species included can be reached by means of them. In both keys and descriptions technical terms are kept to a minimum, but the appeal of this to the beginner may be offset by a forbidding use of abbreviations that leads, especially in summaries of distribution and habitat, to such phrases as "widespread but l and r on gslds, mds". The descriptions are mostly pithy and diagnostic, with important characters in bold type. However, a great many species are given only in the keys, for example eight of the upland willows, or five of the roses; and as they are not illustrated the reader has no opportunity to confirm identifications he makes with the keys.

The illustrations are variable in quality. Some, such as the orchids and broomrapes, are good; some are bad, while the *Galium uliginosum* is alarming enough to deter the faint hearted from ever venturing into a calcareous fen. About two thirds of the 1400 species in the book are illustrated, not enough to enable the book to be used, like some other field guides, by its illustrations alone – and this is no bad thing. Some omissions are particularly annoying, for example in *Orobanche*, where

inflorescences of only seven of the ten species in the key are shown, though there is clearly room for three more on the plate.

Subspecies are mostly not included, *Dactylorhiza* being the chief exception. The author explains on p. 10 that a few "critical" groups, i.e. *Alchemilla*, *Rubus*, *Sorbus*, *Saxifraga hypnoides* agg., *Euphrasia*, *Taraxacum* and *Hieracium*, are only partially covered. Yet many more genera are treated more summarily than one would expect, e.g. *Rosa*, *Arctium*, *Atriplex*. Grasses, sedges and rushes are discussed but only a token selection of species of each group is given; this is disappointing in a book whose vegetative keys give it some claim to be of use to ecologists. A number of these plants do appear, however, in the vegetative keys, but in most cases the reader has no means of checking them. (Dr Rose has a healthy disrespect for another readily available vegetative key when, after keying out three species of *Carex* in his heathlands key, he says that the remainder are unidentifiable without fruits.)

The inclusion of part of the Continent in the area covered means that the book includes 84 species not in the British Isles and not in CTW. These 84 include most of the commoner species, but there are at a conservative estimate about 180 species excluded which do occur in that part of the Continent and which would fulfil the author's criteria for inclusion if they were in Britain. These 180 include widespread or conspicuous species like *Alyssum alyssoides* or *Orlaya grandiflora*, as well as species like *Epilobium collinum* that it would be useful for British botanists to be aware of.

The nomenclature of Latin names is mostly that of CTW ed. 2, and so is almost 20 years out of date and very different from, for example, that of the new edition of the *Excursion flora*. The author says that where names in *Flora Europaea* differ from those he uses, he gives them in brackets, but in fact in at least half the cases he does not; in the Compositae, for example, 15 such *Flora Europaea* names are not given. To confuse matters further, he mentions *Pilosella* as an example of one of the few *Flora Europaea* names he does adopt; but this genus is one that *Flora Europaea* signally failed to recognize. More concern with nomenclature might have led at times to more satisfactory taxonomy; for example, it is unhelpful today to give only one species of *Lycium* and to call it *L. halimifolium*.

The concise and informative preliminary chapters include a good glossary. They give valuable emphasis to conservation, and the reader is urged to take the book to the plant whenever possible. He is also sensibly urged to use a lens regularly, and never to pick any plant that might possibly be rare, even if it is locally abundant.

This book though entirely suitable neither for the beginner nor for the advanced student, should be of considerable interest, especially to those who botanize in S. England and who visit N. France and the Low Countries. It is a pleasure to say that for 480 mostly closely packed pages the paperback price seems very reasonable. It would greatly increase the usefulness of any second edition if grasses, sedges and rushes were fully treated, if some of the vegetative keys were made more comprehensive, and if the layout of the main text was altered so that the keys were made more complete and more often placed closer to the relevant descriptive sections.

A. O. CHATER

Süsswasserflora von Mitteleuropa, Volume 23. Pteridophyta und Anthophyta. Part 1. Lycopodiaceae bis Orchidaceae. S. J. Caspar & H.-D. Krausch. Pp. 403, with 109 plates and 1 map. Gustav Fischer Verlag, Stuttgart & New York. 1980. Price DM 86 (ISBN 3–437–30309–0).

This volume, in spite of its title, is not simply an updated version of Glück's first edition, published in 1936, but a completely new work. The authors have extended over the strict borders of "Mitteleuropa" and include plants such as *Eriocaulon aquaticum*, *Isoetes azorica*, *Pilularia minuta* and others which could never be considered to be Central European species; in fact, about a quarter of the described species carry the tag "Im Gebiet fehlend" (outside C. Europe). This book is almost but not quite a Flora of the aquatic ferns and monocots of Europe (the second part dealing with the dicots is already in press).

There are many keys: direct to family based on reproductive structures; direct to genus based mostly on easily seen vegetative characters; from family to genus; from genus to species; from species to subspecies. The key to families and the key that leads directly to the genera also include the

dicots. I have used these keys with students in the northern Italian ricefields and have found them simple to use and satisfactory. Each family, genus, species and subspecies is fully described and includes a selected bibliography (the full references will be printed in part 2). All the genera and nearly all the species are illustrated with well-designed line drawings. After each species description there is a precise autecological account including a code to life-form and phytosociological information; the geographical distribution is fully described (world-wide and within Europe) and references are given to published distribution maps; phenological information, chromosome numbers and assorted information such as taxonomic difficulties, variation, tolerance to drying, strange growth states, etc., are also mentioned. The dreadful "Glücksche Formen"–*submersus*, *terrestris*, *fluitans*, *semimersus* etc., have disappeared.

The amount of information packed into this volume is indeed impressive and valuable. However, I am not able to give this work unqualified praise as there are, unfortunately, some blemishes. There are a rather large number of minor and silly misprints and mistakes. British botanists might not like to see Frank Perring's name spelt "Perrier", although other misprints such as "Schleuchzeriaceae" and "*japolica*" do have a certain charm. The nomenclature and the taxonomy are not always in accordance with *Flora Europaea*. One cannot say it is wrong; but it will lead to some confusion, particularly among the fine-leaved species of *Potamogeton* and the genera of the Cyperaceae. On the other hand, many adventive species are included that are missing from *Flora Europaea*, and there are also species such as *Ottelia cordata* included that have not (yet?) been found in Europe.

On the whole this book is good and a very valuable Flora and reference work. It can be recommended to all people seriously interested in the aquatic plants of Europe. The binding, paper and printing are of excellent quality; the book will fit into a large pocket and the cover is waterproof!

C. D. K. Cook

Three-dimensional structure of wood. An ultrastructural approach. B. G. Butterfield & B. A. Meylan. 2nd Edition, Pp. 103, with 226 black & white photos. Chapman & Hall, London & New York, 1980. Price £17.50 (ISBN 0–412–16320–9).

This new edition bears very little resemblance to the first, but will undoubtedly be received as enthusiastically. It contains 226 high-quality scanning electron micrographs of wood structure. The much expanded text will enable many users to obtain an adequate impression of wood anatomy without recourse to standard texts. Each photograph has an explanatory caption, and the relevant text is usually close to the illustrations.

The SEM is now regarded as an important tool to aid a proper understanding of some aspects of wood anatomy. Even in those areas where it is not essential, the photographs produced enable the student, teacher and research worker to comprehend structures far more readily than they could with the light microscope alone.

Those interested in design should also see this book!

D. F. Cutler

Historical plant geography. An introduction. Philip Stott. Pp. xiv+151, with 58 text-figures and 10 tables. George Allen & Unwin, London. 1981. Prices £12.00 (hardback; ISBN 004–580010–3); £5.95 (paperback; ISBN 004–580011–1).

In the preface to *Historical plant geography* (the title page, though not the cover, adds the qualification *An introduction*) Philip Stott explains ". . . this book is neither about the study of vegetation nor the concept of the ecosystem. In writing it I have had in mind a very different tradition, one which above all concerns itself with the study of the geographical distribution of individual plant species and natural plant groups over the surface of the globe. This is the subject which has long been known as historical plant geography." In an introductory work to a wide, and in

places conjectural, field of enquiry the author's stated aim is to "... provide an easily understood guide to some of the more important theories and problems." The author is conscious of the erosion of geographical traditions in the study of plant geography by ecologically based ones and sets his book squarely within a geographical, or historical, framework; hence the title. The book comprises 9 chapters, a glossary, a bibliography, and botanical and subject indices.

In a brief though adequate historical introduction the aims and methods of plant geography are presented as four related stages: i–Collection, identification and recording of plants in the field; ii–Mapping plant distributions using information gathered in stage i; iii–Classification of plant distributions that have been mapped into patterns or groups; iv–The generation and testing of theories to explain the types of distribution discovered and described in stages i–iii. The first three stages (each given a separate chapter) form the practical kernel of the book, what Stott calls *Establishing patterns of distribution.* The taxonomic basis on which theories of plant geography are ultimately built (Chapter 2) is carefully and rightly stressed and could be read with benefit by any botanist. A good chapter on plant mapping (3) continues the initial high standard of content and interest. In comparison the chapter on plant distribution patterns (4) seems less satisfactory.

The second part of the book, designated *Interpreting patterns of distribution*, is at once on more conjectural ground, and one here misses the flavour of controversy and debate which surrounds some of the topics discussed. For example the chapter on Origins, boundaries and disruptions (5) neglects entirely the seminal paper of Croizat, Nelson & Rosen (1974) on "Centres of origin and related concepts", and the theories of vicariance biogeography. The discussion of plate tectonics is rather thin and the treatment therein of Australasian palaeobiogeography outlined by Raven & Axelrod (1972) could have been updated with advantage. Chapters on palaeobotanical evidence (6), disjunct distributions (7), the problem of endemism (8) and the genetic basis of variation and the conservation of the genetic diversity in the plant kingdom (9) are all carefully treated, but in none are cryptogamic plants mentioned. This is not so much a criticism of the author's choice of subject matter as an indication of the failure of modern cryptogamists to promote their plant groups in a wider context, as well as an admission of the paucity (relatively speaking) of acceptable taxonomic information which might allow cryptogams to be used successfully in phytogeographical studies. A wide field is here ripe for exploration, and this book could well help aspiring cryptogamists to place their studies in a wider perspective.

Throughout the text, key words or concepts are printed in bold type at their first appearance and are explained in a succinct glossary at the end. Each chapter is provided with a list of references to pertinent books and papers for further study, with useful introductory works marked. The bibliography is extensive and apparently well chosen and varied, and it *does* illustrate the historical traditions of the subject, though I missed the names of Du Rietz and of Skottsberg. The fact that not one biogeographical paper from *Systematic Zoology* (in recent years a stimulating repository of challenging new ideas) is listed is a curious and critical omission. The book reads well in sum and in part, and is attractively and cleanly laid out and well bound (opened pages stay open), and illustrations are mainly clear and apt (the scale to Fig. 8.2 is clumsy). Despite these few reservations, I feel that the author *has* provided an easily understood guide to some of the important theories and problems of plant geography, and it can be warmly recommended to students and other needing a concise and accessible entrée to this stimulating subject.

REFERENCES

CROIZAT, L., NELSON, G. & ROSEN, D. E. (1974). Centres of origin and related concepts. *Syst. Zool.*, **23**: 265–287.

RAVEN, P. H. & AXELROD, D. I. (1972). Plate tectonics and Australasian palaeobiogeography. *Science*, **176**: 1379–1386.

D. J. GALLOWAY

A common green: Duleek–the botany and history of a Meath Commonage. Donal Synnott. Pp. 28, with 11 line drawings by Simon Coleman and a historical account by Michael Ward. Duleek Historical Society, Duleek. 1980. Price £1.00.

This booklet sees the happy marriage between local history and local botany – an association which many botanists would wish to applaud. It is to be hoped that more examples of this kind of union will follow, and result in similar publications from other localities.

Duleek lies in County Meath in the Republic of Ireland, about 40 km north of Dublin. After the historical introduction, the author gives a description of the natural habitats and characteristic plants of this area of unenclosed commonland. Except for perhaps two of the landscapes, the drawings, including all those of the plants, are too woolly to appeal; but the most valued feature of the booklet is its five-and-a-quarter-page scientific list of species so far recorded on the common, with their Irish and English equivalent vernacular names. Any botanist visiting this part of Ireland should have this booklet, which is certainly worth the price asked.

E. W. GROVES

A taxonomic revision of the genus Origanum*(Labiatae)*. J. H. Ietswaart. Pp. ix+153, with 36 figures and 6 tables. Leiden Botanical Series, volume 4. Leiden University Press, Leiden. 1980. Price Dfl. 60 (ISBN 90–6021–463–3).

The genus *Origanum* has been a delight not only to naturalists, but also to those with culinary or horticultural interests, while the dittany, which can still be bought in Cretan markets, was credited with medical virtues by Theophrastus. Nevertheless, the identification of the species has for so long been a problem, partly due to conflicting treatments and partly because until now nobody has attempted to revise the group as a whole.

The author of the present work has wisely chosen to take a broad view of the genus, so that *Amaracus*, which includes many of the horticulturally most attractive species, and *Majorana*, which includes culinary herbs such as Pot Marjoram, now disappear into synonymy, though I was surprised to see no attempt to recognize these at an infrageneric level. Instead the author recognizes 10 sections, a treatment which seems excessively 'splitty', obscuring some of the relationships rather than highlighting them. However, it must be said that the group is very competently treated, and the author has a clear view of the delimitation of the species.

Of the 38 species, apart from *O. vulgare* (Mild Marjoram), which is native across N. Africa, Eurasia from the Azores and Britain to Taiwan, most have rather limited ranges in dry calcareous habitats in the Mediterranean region, and some are extremely local there.

The author suggests that hybridization is the chief factor in speciation in the genus. While it is clearly an important factor, following migrations due to climatic and vegetational changes from the Pleistocene onwards, insufficient account seems to have been taken of morphological trends due to selection pressure acting on natural variation. The variation in corolla morphology, for example, strongly suggests the agency of pollinators in selection.

There is an interesting chapter comparing possibly related genera, which indicates links with *Thymus* and *Micromeria*; but this also highlights our overall ignorance of intergeneric relationships in the family. Other subjects discussed include gynodioecy, chromosome numbers, chemical characters, hybrids, and species in cultivation.

Various name changes should be noted: the plant known as *Amaracus* or *Origanum tournefortii*, occasionally cultivated as an alpine, should now be called *O. calcaratum* Juss.; the plant known (incorrectly) as *O. heracleoticum* in *Flora Europaea* is now *O. vulgare* subsp. *hirtum* (Link) Ietswaart.

Occasionally the author's typification seems open to question. For example, both *O. syriacum* L. and *O. maru* L. have been typified by the same specimen in the Linnaean Herbarium. While the sheet indicated is unquestionably the type of *O. maru*, it can hardly be the type of *O. syriacum*, which apparently does not occur among the sheets in Linnaeus's herbarium in London, and must be looked for elsewhere.

The author has apparently overlooked *O. vulgare* subsp. *viridulum* (Martr. Don.) Nyman, which is an earlier name for *O. vulgare* subsp. *viride*.

The plant known as *O. dubium* Boiss. in Cyprus, which is represented by many sheets in the Kew herbarium, seems readily separable from *O. majorana*, which also occurs there as a native plant.

Ietswaart considers the two to be indistinguishable, but he may perhaps have seen insufficient material of these.

I would be wrong to finish on a critical note in reviewing this excellent work. The keys and the very clear line drawings are particularly praiseworthy; and the account will be of great value as a reliable means of identifying this attractive but puzzling group of plants.

R. M. HARLEY

Biochemical evolution. Edited by H. Gutfreund. Pp. vii+368. Cambridge University Press, London, etc. 1981. Prices £30.00 (boards; ISBN 0–521–23549–9); £12.50 (paper; ISBN 0–521–28025–7).

The 1970s have witnessed a massive increase in the literature on biochemical evolution. It has been a critical period, with profound changes in philosophy and method application and with the accumulation of new information. Today, there seems to be no consensus on the evolution of chemical systems, or on the use of evolutionary theory to understand metabolism at the molecular level. Instead, there is a burgeoning data base and a plethora of new ideas and techniques. However, despite the numerous problems that have arisen, there are some answers, and this book is an attempt to assess the issues and redress the balance.

There are nine chapters in the book, all written by acknowledged experts in their respective fields. At first sight the subjects of each chapter seem to have little connection with one another, ranging from a treatise on "Prebiotic evolution" to an account of "The vertebrate visual pigments", but we are assured that they deal with the main problems in each particular arena. Perhaps only Chapters 1, 2, 3 and 5 will be of particular interest to *Watsonia* readers, since the other five deal strictly with animal and bacterial systems.

The first chapter, by the editor, entitled "Some problems in molecular evolution", sets the scene. A committed Darwinian, Dr Gutfreund believes that population polymorphism, evolution of oligomers, random genetic drift and evolutionary clocks represent the big problems in biochemical evolution today. Expecting some insight into these matters, I was disappointed, since this chapter only pinpoints a few ideas, and answers are nowhere to be found in the book.

However, the botanical contributions are interesting for different reasons. Dr Schuster's chapter on "Prebiotic evolution" is a speculative, but detailed, appraisal of the 'origin of life' literature. He outlines three areas of research bearing on this problem: simulation modelling mimicking supposedly prebiotic conditions, a search for fossils, and the study of self-replicating mechanisms in DNA and RNA. That the search for fossils is fruitless is indicated by its brief coverage in the introduction and the absence of further comment. The rest of the chapter is about the other two subjects. The section on "Prebiotic chemistry" is so full of speculation that I wonder whether this represents twentieth century alchemy. By far the most fascinating sections are those on self-replicating systems, wherein a detailed account of replication dynamics and compartmentalization of complex chemical systems can be found.

Perhaps the most interesting chapter for the systematist is that by Dr Derek Peacock on "Data handling for phylogenetic trees". Three cheers for empiricism! I often wonder why molecular phylogenists should be the most analytical of systematists, but maybe the answer lies in the fact that the comparative biology of macromolecules is a very new field by comparison with studies on gross morphology. Dr Peacock gives three good reasons for optimism in the use of protein data in phylogenetic studies: proteins are a direct translation of genetic messages; homologies are relatively easy to establish; and the data lend themselves to computer manipulation. He gives a good account of the problems associated with establishing homology and illuminates the differences of technique in reconstructing phylogenies from distance measures, parsimony procedures and compatibility studies. He overstates the case for clique analysis, but this is not so surprising when one realizes that he favours this method in the analysis of his own plastocyanin data. Nevertheless, this is a useful review, and everybody who has contributed to the field at least gets a mention.

The chapter by Drs Rao, Hall & Cammack brings together a range of topical and controversial notions on the evolution of "The photosynthetic apparatus". It is divided into two main parts dealing

separately with bacterial and eukaryotic energy-fixing systems, and the emphasis is clearly on biochemistry and energetics. The sections dealing with the evolution of chloroplasts and associated proteins are fascinating, but I do get depressed when the higher plants are considered to be triphyletic and, in one diagram, the sister group to mammals on two separate occasions!

To conclude, *Biochemical evolution* is a patchy book with mixed themes. However, it is beautifully produced and well edited. The fact that most people won't read more than one or two chapters means that it will tend to be a library volume rather than a personal purchase.

C. J. HUMPHRIES

Name that succulent. G. D. Rowley. Pp. 288, with numerous text illustrations. Stanley Thornes (Publishers) Ltd, Cheltenham. 1980. Price £8.75 (ISBN 0–85950–447–6).

It is no mean achievement to include within a fairly slim volume a very readable account of the principles and practice of nomenclature with special reference to succulents, together with keys for the identification of all the major genera of succulents, and a brief synopsis of each genus.

The opening chapters give, in the authors's inimitable style, one of the best accounts of nomenclatural practice that I have yet read. Without going too deeply into the morass which is called taxonomy, it sets out clearly how plants acquire their names, how they should acquire them and how some have acquired names to which they are not entitled. My only criticism of this section is that, under the title of this book, it will not be read by nearly as wide an audience as it deserves. I have not had a chance to try out the keys in more than an incidental fashion, but they would appear to work satisfactorily. No doubt, users will be quick to point out any failures in this respect. The keys have been made much easier to use by adopting the relatively broad concept of many genera which is now fashionable, e.g. *Neoporteria* or *Borzicactus* in the Cactaceae. Although references are given to keys to species where these exist, many of these books could be difficult to obtain and I think it is a pity that keys to species could not have been included, though I am well aware that this would have made both the book and the task substantially larger.

The book is well produced and illustrated, and gives, I feel, good value for money; I imagine it will be a 'must' for all succulent enthusiasts, and it would not be out of place on the shelves of some botanists as well.

R. B. IVIMEY-COOK

Origin of Species. Anonymous. Pp. 120, with numerous illustrations. British Museum (Natural History), London, and Cambridge University Press, Cambridge. 1981. Prices £10.00 (hard covers; ISBN 0–521–23878–1); £3.95 (paperback; ISBN 0–521–28276–4).

This volume coincides with, and is a companion to, the Natural History Museum's major new exhibition "Origin of Species", staged as part of the Museum's centenary celebrations. Like the Museum's publications in general, it is very lively and attractively presented and shares the bulk of its illustrations with the exhibition; it can be regarded as an extended synopsis of it. What does it intend to do?

It would seem to be directed at the 12-year-old who may have enquired about natural variation but who has received little or no instruction on its cause and destiny and who has not previously considered the definition of species of which he would have instinctively been aware. Such an innocent is led gently and superficially along the path of comprehension – the identity of species, their morphological traits and breeding behaviour, the competition for survival, the interaction of heredity and environment. To ensure understanding, the book is replete with vivid diagrams, cartoons and photographs.

In attempting to define a species there is a hint that neither appearance nor breeding behaviour is an infallible criterion. It is as well that the authors have not revealed the surprising lack of agreement

on the definition even amongst systematists and evolutionists, except perhaps amongst some of those whose sole interest lies in the preserved specimen.

The mechanics of evolution consistute the second part of this book. Genetics is introduced without mention of Mendel; the word chromosome is used for the first, and almost the last, time. There is no need for mention of dominance or recessiveness when talking of coat-colour inheritance in cattle or of short-leggedness in sheep (depicted as a dominant mutation); the only point to be made is that there is such a thing as heredity and mutation. Some of the importance and complexity of inheritance is demonstrated with Queen Victoria's haemophilic descendants – the best-known case of sex-linked inheritance but one that is difficult to comprehend without any mention of sex-chromosomes.

Natural selection is convincingly demonstrated with the aid of mice and pepper moths. The selective value of phenotypes is well shown by mimicry in butterflies, but the difficulties in assessing the significance of phenotypic variation are pointed out in the case of banded snails.

The mechanism of speciation is introduced by discussion of spatial barriers to interbreeding, which can in some way cause divergence that may or may not produce a permanent failure to interbreed if recontact takes place. This introduces again the difficulty of the species definition, except in the case of the so-called 'instant' species which result from chromosome divergence coupled with hybridization and polyploidy.

Finally, there is a fishy ending in Lake Victoria and a quite plausible correlation between evolution in isolated lakes and rivers and eventual co-habitation, in the strictly non-sexual sense it seems, in the vastness of the modern lake.

And so the matter is concluded without a glimmer of a clade or a hint of creationism – at least not one which would be noticed by a young reader. He will have been introduced to evolution in a stimulating way and in a Darwinian way. Like Darwin, he will not have the benefit of genetic understanding or knowledge of the importance of chromosomes in inheritance; but perhaps the mind will have been alerted sufficiently to pursue these matters in the bibliography, which, it should be noted, does not include the Old Testament.

This book is clearly the result of collaboration between a number of very thoughtful people who have spent a great deal of time finding ways of conveying the essence of a difficult subject in a compact volume. Despite the omissions which have been mentioned, it will probably succeed in its aim of making the young – and some not so young – aware of species and their evolution. It is an excellent reminder of the exhibit, which preferably should have prior view since it can explain rather more. It should find its place amongst the more junior at school and can be highly recommended for any shelf reserved for an introduction to biology.

I believe that this book has achieved its limited objectives in a novel, attractive and stimulating way. It is a fitting contribution to the centenary celebrations of the Museum and congratulations must be given to its anonymous compilers and its publishers, the British Museum (Natural History) and the Press Syndicate of the University of Cambridge.

K. JONES

Gardening with children. Alison Ross. Pp. 176 with 32 text-figures. Faber & Faber, London, 1980. Price £5.25 (ISBN 0–571–11564–0).

This is a delightful book which has been written "to help other parents, grandparents, teachers and friends to introduce young people to the pleasures and interests of gardening." It is full of ideas and suggestions for growing and studying plants in a wide range of conditions from gardens, backyards and window boxes to indoors, where there is special emphasis on the needs of housebound and handicapped children.

Plant biology, soils, tools and techniques and propagation and cultivation are dealt with simply and lucidly, and there is a chapter on how to encourage and conserve wildlife in the garden. Each chapter ends with suggestions of interesting projects for children to undertake.

There are some mistakes – the statement "Double flowers have an increased number of petals which have taken the place of pollen-producing anthers and nectaries" is illustrated by drawings of single and double forms of *Dahlia* and Michaelmas Daisy (*Aster*). The glossary, which is generally

good, does contain inaccuracies such as the definitions of *fruit*, *seed* and *variety*; *inorganic* is said to mean composed of man-made materials, *photosynthesis* to be the manufacture of food by the green parts of the plant using air, light and water. Such errors are regrettable because the book's intended readers will be likely to accept such statements as completely true.

In general, however, this inspiring and pleasantly illustrated book succeeds in its aims and is to be warmly recommended.

A. LEE

The Oxford encyclopedia of trees of the world. Edited by Graham Bateman (Consultant Editor: Bayard Hora). Pp. 288, with numerous coloured illustrations. Elsevier Publishing Projects (U.K.) Ltd, Oxford. 1980. Price £12.50 (ISBN 0–19–217712–5).

Can there be an excuse for another colourful catalogue of trees? Yes, if you get the right people – and they have (p. 5) – and if those authors use the opportunity freshly, in this case to write a scientific book for everyman. Without pretence, they deal with the "Main species", often arranged in systematic subdivisions, of almost 150 genera of wild and cultivated trees, in a wide area of the world. Despite the title, the trees of the tropics feature in summary on only seven pages.

In the preface, Professor Brenan recognizes the size of the authors' task and welcomes the diversity covered, as do I. The first 60 pages nod respectfully to the generalities: morphology, forestry and diseases. The main text follows with its run of genera, which incidentally includes almost all the Conifers. The treatments of these relies heavily on Harrison's revision of Dallimore & Jackson, *A Handbook of Coniferae and Ginkgoaceae* (1966), which means that the nomenclature of *Widdringtonia*, for example, is out of date. Scattered through you find attractive full-page pictures; but the close-knit text and good, if small, illustrations of distribution and structure are what matter. The colour printing is rather too dark in the copy I have, which gives a sombre effect. Identification keys, bibliography and indexes complete the volume. Users of common names will welcome the tables giving their relationship to scientific ones.

Check the survey of *Prunus* (pp. 198–9) and of *Eucalyptus* (pp. 216–7): they are examples of the range of scientific information you can have in your hands. A pedagogic flavour is evident, perhaps, but the book is attractively produced and fully illustrated: the small coloured habit sketches are especially useful. See if you don't think this book is actually worth the price – I do.

J. LEWIS

Guide to the identification of some difficult plant groups. M. J. Wigginton & G. G. Graham. Pp. 145. England Field Unit Occasional Paper No. 1. Nature Conservancy Council, Banbury. 1981. Available from Interpretative Branch, N.C.C., Attingham Park, Shrewsbury, Shropshire. Price £4.25 (p.&p. included) (ISBN 0–86139–133–0).

Those who are dedicated CTW-users like myself will find this praiseworthy publication indispensable. It really amounts to a supplement to the standard Flora of the British Isles, bringing into one place much of the additional material published elsewhere since 1962, e.g. in *Euphrasia* and *Ranunculus* subgenus *Batrachium*, to name but two groups. Not only that, there is a good deal of material from personal communications or documents of limited circulation which most readers will never have seen before, as well as sound advice on naming familiar but tricky species. There are numerous very helpful line drawings. Although the guide was compiled with northern England in mind, and is evidently an expansion of an earlier guide (1976) issued for use only in Durham (vice-county 66), nearly all of it applies to Great Britain as a whole.

R. J. PANKHURST

Atlas de la flore belge et luxembourgeoise – Commentaires. E. van Rompaey & L. Delvosalle. Pp. 116, with 19 text-figures. Jardin botanique national de Belgique, Meise, Belgium, 1978. Price BFr? (D–B–1978–0325–15). *Atlas de la flore belge et luxembourgeoise.* 2nd edition. E. van Rompaey & L. Delvosalle. Pp. 288, with 1542 distribution maps. Jardin botanique national de Belgique, Meise, Belgium. 1979. Price BFr 450 (D–1979–0325–6). *Atlas of the Netherlands flora, Volume 1.* J. Mennema, A. J. Quené-Boterenbrood & C. L. Plate. Pp. 226, with 16 text-figures and 332 distribution maps. Junk, The Hague. 1980. Price Dfl. 125, US $65 (ISBN 90–6193–605–5).

These major works of scholarship extend into new fields the concept of an atlas of plant distribution as we know it from the *Atlas of the British flora* and extend it in a way which would be of benefit to British botany if the example could soon be followed here.

The 'inspiration' for both the Belgium and the Netherlands plant mapping schemes was the work of two Dutch botanists, Goethart and Jongmans, who began publishing distribution maps of Holland in 1902 based on the presence or absence of species in rectangles of 5 ×4.2 km: the so-called 'hour squares' because the sides provided about one hour's walking in either direction. Sadly, the inspiration took slightly different forms in the two countries, so that today Belgium botanists map on 4 × 4 km squares, whereas the Dutch use 5 × 5 km units. Moreover, as the Belgians have followed the example of the Shropshire Flora Committee and mapped 'greater' Belgium, including large tracts of Holland, Germany and Northern France, as well as the whole of Luxemburg, these two atlases overlap in area, but the records do not coincide.

This failure to co-ordinate in space is followed also in time: the Belgian maps distinguish between records made before and after 1930, whereas those of the Netherlands show records before and after 1950.

In this latter respect and in many other ways the Belgian work is much closer to the *Atlas of the British flora* than the Dutch work. This is especially true of the *Atlas* sensu stricto, which gives distribution maps of 1542 taxa, updating the maps published in the first edition of 1972 and adding 12 new maps. New ground is broken in the second volume – the "Commentaires". Not only does this contain a history of plant-mapping in Belgium, but it also includes a series of 19 maps on an 'hour square' basis of the factors affecting distribution: these are comprehensive, dealing with climate, topography, soils and even woodlands and heavily populated areas. With each of these maps are listed examples of species with distribution closely correlated with the factor concerned, both positively and negatively.

The flora is then divided into 54 distribution types, each named from a typical example, from the ubiquitous *Plantago major* type (in all but 40 of the 2950 squares) to the *Ononis natrix* type of four species restricted to W. Lorraine. There still remained 179 taxa which defied definition, which points perhaps to the weakness of an analysis that looked at distribution within Belgium alone (howbeit 'greater').

The final section, "Remarques concernant des espèces et des genres" or "Opmerkingen bij sommige soorten en genera" (there is a choice of language throughout), is a series of 'one-liners' which amplify the maps published in the first edition of the *Atlas*. This information is often only a list of additional squares or deletions, which is superfluous to those possessing the second edition, in which they have been incorporated. As this section occupies about half the book, it is an expensive way of acquiring the really useful material in the first 46 pages. It is unfortunate that the editors and publishers could not have combined the two parts into one single volume. This is what the Dutch have done in their work, which is the first of three volumes intended eventually to cover the whole flora. Obviously appreciating that the *Atlas* will be of wide interest beyond their shores, the Netherlands Flora Department of the Rijksherbarium, where it has been compiled, have prepared two separate versions – one in Dutch and the other partially translated into English, including the extensive 41–page introduction and a précis of the commentary on each of the maps.

The first volume of the Dutch *Atlas* deals with 332 species which are extinct or very rare in the Netherlands – very rare being defined as species which have occurred since 1950 in ten or fewer of their 5 × 5 km hour-squares. It is thus in effect a very comprehensive 'Red Data Book' and is remarkably similar in coverage to the British equivalent, which included 321 species which have occurred since 1930 in 15 or fewer 10 × 10 km squares. It is therefore fascinating to compare the contents of books covering floras on opposite sides of the North Sea, separated by only 120 miles – a process made easy by the sensible arrangement of the Dutch work in alphabetical order of genera.

The result of this comparison is surprising: only 40 species are extinct or very rare in both countries and only 9 of these are amongst the 60 species now protected in Britain, viz. *Cephalanthera rubra*, *Himantoglossum hircinum*, *Lactuca saligna*, *Melampyrum arvense*, *Ophrys sphegodes*, *Polygonatum verticillatum*, *Polygonum maritimum*, *Teucrium scordium* and *Viola persicifolia*.

In contrast, many species which are in no sense threatened or rare in Britain are endangered in Holland, including a large number of orchids, such as *Aceras*, *Anacamptis*, *Coeloglossum* and *Spiranthes spiralis*. Doubtless we shall discover in Volumes 2 and 3 that many of our very rare species are abundant and widespread in Holland. If this does emerge, then it will re-emphasize the need for European botanists to work much more closely together on species-conservation problems, identifying species threatened throughout their range as well as those which, through in danger in some regions, are well established and thriving elsewhere.

Both these Belgian and Dutch publications are to be welcomed for providing essential information for the better understanding of the European flora and for its conservation. It is to be hoped that they will be kept in print and be frequently updated and that they will soon be joined by a similar volume for northern France, where French and Belgian botanists have recently been extending the notion of 'greater' Belgium at least as far as the Seine!

F. H. PERRING

Thonner's analytical key to the families of flowering plants. R. Geesink, A. J. M. Leeuwenberg, C. E. Ridsdale & J. F. Veldkamp. Centre for Agricultural Publishing and Documentation, Wageningen, The Netherlands. 1981. Prices Dfl. 69,00 (cloth; ISBN 90–220–0744–8); Dfl. 38,50 (paper; ISBN 90–220–0730–8).

When faced with the identification of a completely unknown flowering plant, the botanist (professional or amateur) must needs have recourse to a family key – but which one? All seem to have their difficulties. The one most widely used in the British Isles is probably that by Hutchinson (1973), but it involves the user in detailed observations of ovary structure right at the beginning of the Dicotyledon section; whereas that by Davis & Cullen (1979), which in some ways is easier to use, deals only with North Temperate families and those commonly cultivated in that region. If the material is incomplete, then one can use a multi-entry key, Hansen & Rahn's punched-card system (1969 et seq.) being the only one that covers all flowering plants. Several generations of herbarium workers, however, have found the key published by Franz Thonner (1917) to be among the most accessible, partly because decisions involving detailed observation are not reached until relatively late, and partly because so many aberrant taxa are keyed out separately. But it has two main drawbacks: it is in German and it is out of date. Now, four botanists from Leiden and Wageningen have remedied these defects, translating the key into English and modifying it to take account of recent work on angiosperm families. In addition, they have provided an account of Thonner's life and work, a valuable introduction to, and notes on, the use of the key (which should be read by everyone who requires to consult a botanical key), and a concise key to the major groupings.

Having given a general welcome to this book, I should draw attention to two minor imperfections. Firstly, the English betrays its Dutch origins from time to time, e.g. "loculicid" and "septicid" capsules (p. 71) "septifragous" and "loculicide" capsules (p. 153), "capitules" (p. 180), corollas "imbricate or apert" (p. 180). Secondly, in use, several misprints have come to light (e.g. Calcycanthaceae (p. 6), Lilliaceae (p. 11), "lower" for "flower" (p. 23); and in lead 775 the lead numbers 776 and 777 appear to have been transposed). Neither of these short-comings should mislead the user, at least not for long; and so this key must be thoroughly recommended for use with reasonably complete material, particularly where the provenance of the specimen is unknown.

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N. K. B. ROBSON

100 families of flowering plants. M. Hickey & C. J. King. Pp. xx+567 with 142 line illustrations. Cambridge University Press, Cambridge. 1981. Prices £27.50 (boards; ISBN 0–521–23283–X); £8.95 (paper; ISBN 0–521–29891–1).

All too often a student's idea of a plant family is based on a series of 'family characters' learned from a text-book. Believing that this is not a desirable state of affairs, the authors of this attractive book have selected, out of a total of 300–400 flowering-plant families, 100 of which living material is readily available in the British Isles, either from the native flora or in cultivation. Each family is described under the headings of Distribution, General characteristics, Economic and ornamental plants, and Classification; then one example (or occasionally more) is described and illustrated by drawings of the inflorescence, flower and fruit, whole and appropriately dissected. In the descriptions of the chosen species, emphasis is also placed on floral characters, especially those involved in pollination. The work is completed by an introduction and glossary, both well illustrated, data on flowering times of the chosen species, and comparative tables showing characters of certain families that are likely to be confused by the student.

From this summary of its contents it will be evident that *100 flowering plant families* is an elaborate classroom manual, which should prove to be very useful in conjunction with elementary courses in plant taxonomy, giving clear and detailed drawings 'from life' of flowers and fruits that the student may have in front of him. (Alternative examples are frequently given.) As such, it is to be welcomed warmly. It is not a treatise on flowering-plant families (such as Heywood (1978)), and consequently theory is reduced to a minimum. The overall classification adopted is that used in Davis & Cullen (1979), i.e. the modification of Cronquist's system published by Stebbins (1974); and the individual family classifications have been obtained mostly from general works (e.g. Engler & Prantl, Hutchinson).

Taken on its own terms, this is a most successful book. It will not help you to identify an unknown specimen, or to discover the current view of a given family's relationships (except in very general terms). It will, however, give you a clear idea of how the floral and fruit characters of that family are exemplified by one (or a few) species, which may or may not be typical of the family as a whole, but which should be easily obtainable in the British Isles.

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N. K. B. ROBSON

Chemosystematics: principles and practice. Edited by F. A. Bisby, J. G. Vaughan & C. A. Wright. Pp. xii+449, with 106 text-figures and 30 tables. Systematics Association Special Volume No. 16. Academic Press, London. 1980. Price £38.80 (ISBN 0–12–101550–5).

This handsome, well-produced book of 21 chapters covers a diversity of methods of chemosystematic research in a wide range of organisms. Its strengths lie in the inclusion of results

and thoughts from several disciplines and several kinds of worker. There are chapters by chemosystematists, by numerical taxonomists, zoologists, botanists, chemists, geneticists, microbiologists and "working taxonomists" (an intriguing phrase used by the editors). All seem to have got along very well at the International Symposium of the Systematics Association (at the University of Southampton, July 1979), where they read the papers now published in this book.

An excellent feature is the inclusion of various summary or review papers, which lend useful perspective to the book as a whole. Too often in edited proceedings of wide-ranging conferences the reader, swept along on waves of euphoria from one remarkable new flush of evidence or ingenious technical advance to another, can be forgiven for thinking that the millenium is at hand. Though there is plenty of new information here, the editors, and authors too in general, have presented it in a sober, critical fashion. Twentieth-century taxonomists are well used to proclamations of the new era and the new way. The trumpets loudly bray, but the walls of The System do not fall. Isozymes have not solved all the problems any more than chromosome numbers did, or DNA analyses will.

Difficulties facing taxonomists are outlined in several contributions: the search for new taxonomic evidence in order to make classifications ever more natural; the storage and retrieval of the data; the correlation and weighting of characters; the integration of new kinds of data into the processes of taxonomic revision; communication between different kinds of workers; the number of taxa which exist, sampling requirements and the shortness of human life; the interpretation of chemical results in taxonomic terms; the presentation of chemical data in digestible form; the assessment of primitive and advanced features. These problems receive more general emphasis than at the previous Systematics Association conference on chemotaxonomy (1968) or in other compendia. Taxonomy is very much more than generating new evidence. Making a general purpose classification is a greater intellectual challenge than is even now allowed by the generality of biologists, though they may concede that it has practical value and an interesting evolutionary penumbra.

This is a sensible review which suggests that chemosystematics may have come of age. Not many of the philosophical insights are new, but it is valuable and encouraging to see both the opportunities and limitations in the methods evaluated realistically, widely and often. The editors have compiled a volume in which it is easy to find one's way about and where all the contributions are relatively easy to follow, whatever one's own field of taxonomic interest may be. Students and researchers will find it helpful, though at nearly £40 it is clearly priced for library reference.

P. M. SMITH

Flora of Iraq, Volume 4. Edited by C. C. Townsend & Evan Guest. Pp. ix+1199 in 2 parts (pp. ix, 1–628 in part 1; pp. 629–1199 in part 2), with 194 plates, 1 coloured frontispiece, 1 regional map and 12 distribution maps. Ministry of Agriculture & Agrarian Reform, Republic of Iraq, Baghdad. 1980. Price £10.00.

The long-awaited fourth volume of this *Flora* (see *Watsonia,* **6**: 390–391 (1968) for a review of Vols. 1 & 2; *Watsonia,* **11**: 86 (1976) for a review of Vol. 3) is a fine example of international collaboration, with contributions from 23 botanists representing 10 countries. Part 1 contains most of the orders of Hutchinson's Lignosae, from Araliales to Rubiales. Part 2 completes the Lignosae and commences the Herbaceae, which is covered from Ranales to Rhoeadales. The latter order includes Cruciferae, the largest family treatment in this volume. Unfortunately, the choice of the Hutchinson system instead of the more familiar Engler-Melchior (1964) system means that, while Bignoniaceae are included, Scrophulariaceae are not; while Verbenaceae are included, Labiatae are not. The *Flora* has a surprisingly wide coverage of species which are not native to Iraq, including garden plants, crop plants and even those which have apparently failed in experimental plots (p. 220). Additional comments on related plants not found in Iraq, foreign folk-names and usage make fascinating reading, but the value of their inclusion in this book is questionable. For example, does the usage of *Hedera helix* in Medieval Britain have any bearing on the current flora of Iraq, where the species is commonest as a garden ornamental? Perhaps the answer lies in the wide scope of this *Flora*, referred to by Agnew (1968); but then, does this book succeed in its function as a school text?

The inclusion of the map of physiographic regions and districts is an improvement over Volume 3,

enabling the distributions to be interpreted without recourse to Volume 1. Numerous illustrations greatly increase the value of this volume; but there seems to have been a breakdown in communications during the preparation of the artwork, since the captions and illustrations do not always match. For example, Plate 13:1 shows a long shoot of *Ulmus densa* bearing many short shoots, while the caption reads "leafy short shoot". The two captions for Plate 13: 3 & 4 read "young flower" and "developing flower", while the three illustrations appear to be a young hermaphrodite flower, an older hermaphrodite flower and male flower. The descriptions are generally of good quality except for small inconsistencies in format (there are at least three different ways of citing length times breadth measurements) and a fortunately small number of errors.

Volume 4 of the *Flora of Iraq* is a valuable contribution to the literature of this interesting area, and I sincerely hope that the remaining volumes will follow as rapidly as possible.

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D. A. SUTTON

Hedgerow. Eric Thomas & John T. White. Pp. 46, with numerous coloured illustrations. Ash & Grant, London 1980. Price £4.95 (ISBN 0–904069–39–7).

This unusual and attractive book traces the history of an imaginary hedge from Saxon times to the present. John White's enthusiastic, almost reverent, text covers the origins, growth, resources and wild life of the hedgerow, and is complemented by Eric Thomas's equally exuberant illustrations. Apart from the hedgerow's importance as a habitat for a wide variety of wild life, the author also stresses its importance to the human community. Hedges were originally constructed to define boundaries and prevent cattle from straying; later they became important as sources of food, fuel and medicinal herbs, and provided cover for game. When so much has been crammed into so small a space, perhaps it is inevitable that the book should show some species in rather peculiar habitats, and contain some rather unfortunate phrases, and folklore of a sentimental and picturesque kind. Whilst it is pleasing to imagine Tudor villagers making hawthorn garlands to bedeck their Jack-in-the-Green, the truth is grim. Jack evolved towards the end of the eighteenth century in urban communities, where he formed the centre piece for the May Day celebrations of chimney sweeps and climbing-boys. One day of frolic in a year of unremitting toil.

The historical survey ends on a gloomy note. One fifth of Britain's hedges have been removed since 1946, and the present-day farmer is depicted as having no understanding for the environment from which he obtains his living, and, ultimately, our food. However, perhaps this is too pessimistic, for there are signs of a renewed appreciation of the importance of hedges. As the price of oil and electricity continues to soar, many country people are returning to the hedgerow as a reliable source of cheap fuel. The final pages explain how a hedge can be dated by counting the number of species which it contains, and provide brief summaries of how three types of hedges may be made.

The writer and artist successfully convey their enthusiasm, and despite occasional flaws the final pattern is pleasing.

A. R. VICKERY

A handbook for naturalists. Edited by Mark R. D. Seward. Pp. 202, with 42 figures and black & white photographs. Constable Guides. Constable & Co. Ltd. in association with the Council for Environmental Conservation, London 1981. Price £4.95 (ISBN 009–462390–2).

At first this book looks like one of the field guides (size 12 cm by 18.5 cm), but this is strictly a reference work for the home or library. The book is intended as a reference source for books and organizations connected with natural history and wildlife.

Each chapter has a different author, and it is here that the weakness of the book lies – in the differing degrees of thoroughness with which the topics are dealt. Some of the authors seem to lack enthusiasm for their chosen subjects, and this is reflected in the text.

Bruce Campbell's chapter, on the historical background of natural history in Britain, is a splendidly concise summary, although it stops short of the formation of Wildlife Link, the successor to the now defunct Council for Nature.

Tim Sands's "Wildlife and the Law" is a well balanced chapter with a good coverage of a complex subject. Susan Joy and John Stidworthy give an interesting account of nature trails and describe how they are set up. Henry Disney's study on the Field Centres is a useful source of information on these popular places. In the chapter on Fieldwork and Equipment, apart from giving details about binoculars and other apparatus, the authors (Martin Spray and Peter J. Prosser) suggest projects which will certainly find favour with teachers. Each chapter gives a general account of the topic while indicating how you can progress further or where you can obtain further information.

The photographs are disappointing. There is no excuse for the dull, poorly reproduced pictures, even in black and white. They do not add to or enhance the useful information in the text; in fact they give the impression of a book of the 1950s, not the 1980s. Although the publication date is given as 1981, I looked in vain for any reference to the new Wildlife Bill at present (July 1981) before Parliament. It can be argued, too, that some of the organizations listed have only marginal terms of reference as far as wildlife is concerned; but, on principle, I preferred to see them included. However, while the omission of the Royal Entomological Society may be excusable (although the Linnean Society and the Institute of Biology are included), the British Entomological and Natural History Society, an active and thriving society, should certainly have been included.

This book will be very useful to those starting to develop an interest in natural history; and those already involved in any aspect of wildlife who have ever tried to find a particular society's address or source of information will certainly find this book useful. It is by present-day standards inexpensive.

P. E. S. WHALLEY

Ancient woodland. Oliver Rackham. Pp. xii+402, with 152 figures and 33 tables. Edward Arnold, London. 1980. Price £50.00 (ISBN 0–7131–27236).

One of the phenomena of recent revolutions in scientific thought is the development of areas of study that are inherently 'interdisciplinary'; ideas, methods and subject matter of established disciplines are found to illuminate an individual research problem. A curious feature of such development (Kuhn 1970) is that separate workers often find, contemporaneously, that the *same* set of ideas, methods and information contributes to their particular studies. Nevertheless, it is usually possible to point to one person who has lead the field in such an integrating discipline.

Historical ecology is such a new discipline; it is concerned with the ecological changes which have occurred since man's culture evolved from hunter-gatherer communities to those societies which have had a significant effect on the landscape. In north-western Europe the beginning of this change is usually identified as the end of the Mesolithic and the beginning of the Neolithic 'agricultural revolution'. Historical ecology uses material from archaeology, palynology, historical records, field botany and many other sources to add to ecological interpretation of extant communities. The rapid development of interest in historical ecology is witnessed by very full attendance at conferences such as 'Botanical studies in landscape history' and 'Medieval parks and forests', both held at Oxford University in 1980, within a few months of each other, and attended by scholars from many disciplines.

The first landmark for a new discipline (at least since Caxton!) is the publication of it's first definitive text. We now have this for historical ecology in the shape of *Ancient woodland*, by Oliver Rackham, who must qualify as the founder of the discipline.

When examining this monumental text I was immediately reminded of *The history of the British*

flora, by Professor Godwin (1956), which established palaeoecology as a discipline within British science. Structurally, Dr Rackham's book has many of the features of the first edition of Godwin – a mixture of *very* specific information (often in the form of extremely detailed investigations of particular sites) and broad conclusions pertaining to the British Isles as a whole (with the occasional injection of information from continental Europe). Sometimes the swing from generalities to extreme detail leads to a sense of imbalance. For example, I do not think that we need a description of *methods* of mechanical analysis of soil (Chapter 4) – a reference to a text on soil analysis would be sufficient. However, the *results* of such analysis are undoubtedly important, and Dr Rackham is correct to present them in detail. Similarly, I did not find the brief discussion of ordination methods in Chapter 3 particularly helpful; but the results of ordination of ground vegetation from the Bradfied Woods are informative. Also it is undoubtedly correct to give detail of structures not previously described in the literature, such as the sand lenses found by Dr Rackham in the soils of some woodlands (Chapter 4). Despite the range of Dr Rackham's presentation, he has a clear and delightfully 'familiar' approach to writing; and he is not afraid to express strong opinions, as on p. 170 (Chapter 11):

> "This brings us to the mad world of the 1970s, in which the price of ordinary oak-*trees* is as low, in relation to the value of money, as at any time since the fifteenth century; the price of oak *timber* is higher, again in relative terms, than at any time in history; and prices paid for underwood, provided the seller knows where to find the buyer, seems to be roughly equal to the previous all-time maximum in the eighteenth century."

One is also always fully aware of Dr Rackham's wealth of personal observation of woods and woodland features, such as the unique form of coppice growth of limes described on pp. 242–243 (Chapter 15).

Another feature reminiscent of Godwin (1956) is the inevitable bias to East Anglia (clearly established in fig. 0.1 in the Preface), which, of course, is the region in which Dr Rackham has carried out most of his work. However, not *all* his work was done there, as is amply revealed by his detailed descriptions of certain sites outside of East Anglia, and by his general comments on other regions. The emphasis on East Anglia is clearly acknowledged by Dr Rackham, and the reader always knows when first-hand information is being presented and when the author is extrapolating ideas to woodlands that were not subject to his most thorough investigations.

Of course, historical ecology is not concerned just with woodlands; there have been studies on, for example, grassland and heathland, but woodlands have a special significance in the historical ecology of the British landscape since many represent a continuity with the original woodland that developed after the last glaciation, which Dr Rackham calls *wildwood*. Terms such as 'wildwood', when first introduced in the text, are printed in bold italics, and defined in the text and/or the glossary included in the index. I found this a particularly useful feature of the book and one that is ideal for student reference. I believe that many of these terms are correctly and definitively defined for the first time in any text on woodlands.

The chapters of the book effectively fall into two sections – Chapters 1–12 describe woodland prehistory and history, woodland properties such as soil, plant communities, and the economic and social history of the management of woods and the use of wood products. Chapters 13–24 describe in detail particular woodland types; some are, to my knowledge, the first detailed evaluations of their vegetation, such as the chapters on hornbeam-woods (Chapter 14) and limewoods (Chapter 15).

In the first section some chapters are amplifications of previous studies by Dr Rackham and other workers, whereas others probably provide the first definitive presentation of their subject matter. Examples of the former are those on 'Flowering plants and ferns in ancient woods' (Chapter 5) and 'Ground vegetation' (Chapter 7). The distinction between floras and vegetation is clearly made, and topics such as indicator species, minimal area, and the response of ground vegetation to coppice cycles, are thoroughly discussed. Chapter 6 on 'Tree communities' describes approaches to handling data on underwood species that Dr Rackham has himself devised, such as *mosaic size* (the average area occupied by each element in the mosaic of tree communities in a wood) and *contiguity* (how often one community abuts on or intermingles with another). The classification of woodland types of eastern England is a model for workers in other regions to produce similar analyses.

Chapter 8, on 'The prehistory of woodland', fully develops the concept of wildwood, and makes the important point that, with the exception of the elm-decline, woodland management is not sufficiently taken into account in the interpretation of pollen diagrams. The paucity of evidence and

work on woodlands during the Roman period is clearly revealed, and there is much room here for further research.

Chapter 9, on 'The making of the woods', clearly establishes the wide nature of evidence and sources for the historical ecologist, including archives and place names. Those already familiar with Dr Rackham's work know him to be a leading scholar of Domesday Book. I have long laboured under the misconception that Domesday says little about woods. This is because I have not read Domesday, but only the analyses of the Book by other authors; it is they who say little about woods. The lesson for the historical ecologist is that he must always go to primary sources for the interpretation of historical records of woodland management. Dr Rackham sets the Domesday record straight by a masterly analysis and presentation of the woodland aspects of William I's

> "... great survey of his kingdom. Census techniques were more efficient then than now and the work was done within a year."

Historical geographers should be compelled to read this chapter; perhaps we would then be spared much of the romantic nonsense written about the extent and nature of woodlands in medieval and Tudor England. This condition should also apply to economic historians for Chapter 10, on 'Woodland management, products, and uses since 1250'. This very informative chapter establishes the importance of the correct interpretation of terms such as *wood*, *timber*, *clear*, *plashing*, etc.

Chapter 11, on 'The economic and social history of woods', is probably unique in style and subject matter. I believe that other features of our landscape such as heathland and grassland should receive similar treatment. The lesson is that to understand the scientific ecology of our vegetation types is no longer sufficient – we must also know their role in the economy and social development of the cultures which exploit, manage and shape them (for better or for worse).

The first section of the book is completed by an illuminating discussion of 'Wood-pasture systems and products'. As with 'Chapter 10, we can see how the work of the historical ecologist can complement the work of the historical geographer, and many extant misunderstandings about the nature and growth of Forest systems (in the medieval, not the modern sense, of *forests*) are resolved. Again, there is a most useful and clearly presented terminology, which will serve as a standard reference for any student of medieval parks and forests. The detailed examples (such as Sotterly Park, N.E. Suffolk) described by Dr Rackham show how to conduct research on the many parks and forests of the British Isles which have not yet been thoroughly investigated. In addition, advice is given on how parks should be currently managed for the conservation of their most important features – old trees, scrub, long and short grass (and the interfaces between them) – which are particularly important for bird and insect populations. There is a discussion of the modern proliferation of deer. Dr Rackham advocates a positive attitude to deer management:

> "... the medieval arts of living with deer need to be revived. ... Deer are a resource that should be used: it is a pity that so much excellent meat should be running around the countryside and often nobody is using it, the numbers being limited only by starvation and poaching."

The second section of the book presents chapters analysing distribution, taxonomic status, prehistory and historical record, modern ecology, and conservation of the main woodland types (described in terms of the *tree communities* approach of Chapter 6). These chapters are a major contribution to British vegetation ecology, complementing and adding to the now classic descriptions by Tansley (1953) and Ratcliffe (1977). In some cases (e.g. Chapter 17, on oakwoods) there have been previous detailed descriptions, but Dr Rackham adds the perspective of historical ecology to our perception of the vegetation, as well as incorporating the most recent work on their ecology and taxonomy (*vide* his discussion of elms as a critical genus in Chapter 16). Some woodland types receive their first full description in this book; I was particularly fascinated by Chapter 15, on limewoods 'currently neglected in scientific literature.' Convincing evidence is presented for an anthropogenic lime decline, but not as synchronous in western European pollen diagrams as the well-known elm decline.

For a scientist working on *any* aspect (ecological, botanical, zoological, pedological, geographical, etc.) of the woodland types described in Chapters 13–24, I have no doubt that Dr Rackham's accounts will come to be regarded as the standard reference.

The bibliography and references are most thorough (some 919 entries – many on work carried out after 1970) and are sensibly divided into three sections: I, Bibliography and author index on ancient woodland and wood pasture, II. Primary historical sources, III. Other references. The combined index and glossary of terms is excellently cross-referenced with the main text, using bold italics. The

printing of the text and diagrams is good, and in such a monumental work is amazingly free of typographical errors. I have two criticisms. First, the quality of the photographic figures is appalling; as an example look at Figures 10.5 and 10.6 on page 143–I learn nothing from these about the structure and harvesting of faggot products. Similarly, contrast the printed information of Figure 0.3 with the corresponding photograph (Fig. 0.2) of a completed record card for woodland survey; the latter is quite indecipherable. I doubt whether the poor quality is in the original negatives. As a regular attender at Dr Rackham's lectures, I know him to have an excellent collection of photographs from ancient woodlands; and he is too meticulous a scholar to consistently select poor quality pictures! The publishers and/or printers must feel guilty about these photographs marring an otherwise superb volume.

Second, the price; having said that this work is a landmark in the development of historical ecology, and appreciating its size and full coverage of the subject, I could not expect the book to be cheap; but I would still want it to be as freely available as possible. I shall certainly refer my own students to it. At £50 it is not likely to be widely purchased outside college and public libraries. A great pity. Can such a high price be justified? I really do not know–perhaps 'the mad world of the 1970s' is not restricted to the timber trade.

These two criticisms aside, Dr Rackham's *Ancient woodlands* is a text that historical ecologists and botanists have eagerly awaited for some time; it will undoubtedly be used by them as a standard text for many years to come.

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D. L. WIGSTON

Orchids of Greece. J. D. Lepper. Pp. 59, with 8 colour plates. Arthur H. Stockwell Ltd, Elms Court, Ilfracombe, Devon, 1981. Price £2.50 (ISBN 0–7223–1450–7).

Greece remains an ever popular area for tourists, many of whom are becoming increasingly interested in the wild flowers of the Mediterranean. This is the first simply-written, pocket-sized paperback volume to appear dealing exclusively with the majority of orchids native to Greece and the Aegean.

The seven chapters deal with: 1. Floral morphology and pollination, 2. Geographical regions within Greece (i.e. the mainland, Aegean Islands, Corfu, Rhodes and Crete), 3. Hints on orchid hunting, 4 *Ophrys*, 5. *Orchis*, 6. *Serapias* and other genera, and 7. Conservation. Chapter 2 lists some of the species to be found in the different parts of Greece. A rough guide to the typical flowering period in each of the areas described, together with notes on suitable habitat and hints on photography, is provided in Chapter 3. The following three chapters provide simply written descriptions of 53 species in 16 genera. Each species is placed in one of three habitat types termed A, B, and C, e.g. C is open maquis scrub. The term 'maquis' is used throughout without reference to the lower, more open 'garigue' (Greek: *phrygana*) scrub which provides the habitat for the majority of these orchids. Descriptions are too brief and omit important characters, such as leaf-spotting in *Orchis anatolica* and *Neotinea maculata*, the deflexed side lobes of the lip in *Ophrys sphegodes* subsp. *spruneri*, and the presence of only one keel on the lip hypochile in *Serapias lingua*.

Nomenclature is, in general, up to date, although later synonyms are occasionally used, e.g. *Orchis saccata* for *O. collina* and *Ophrys fuciflora* for *O. holosericea*. Many currently accepted subspecies are given only varietal status, e.g. *Ophrys scolopax* subsp. *cornuta* and *O. sphegodes* subsp. *mammosa*. The latter is in fact locally common, not rare as stated on p. 33. Two widespread taxa, viz. *Orchis morio* subsp. *picta* and *Serapias vomeracea* subsp. *laxiflora*, although figured, are

not recognized in the text. Simplified keys to *Ophrys*, *Orchis* and *Serapias*, together with details of distribution within Greece, would have been useful.

The eight colour plates, each depicting six orchids, would have gained from a better standard of reproduction. Of these, four are incorrectly named, viz. Plate 5, nos. 3 and 4 are *Orchis morio* subsp. *picta*, Plate 6, no. 6 is *O. lactea*, and plate 7, no. 4 is *Serapias vomeracea* subsp. *laxiflora*.

Despite these criticisms, Mr Lepper has produced an inexpensive and quite useful guide to orchid identification for the layman visiting the eastern Mediterranean.

J. J. Wood