Book Reviews

Flore de la Belgique, du Nord de la France et des régions voisines. Edited by W. Mullenders. Pp. xliv + 756, with 1 table, 1 folding map, 25 sets of line drawings and 14 text-figures. Ed, Desoer, Liège. 1967 Price 420 B.Frs.

This new Flora of Belgium and northern France embraces a traditionally accepted phytogeographical territory. In many respects it reads like a modern edition of Themistocle Lestiboudois's *Botanographie Belgique, ou Flore du nord de la France, et de la Belgique proprement dite* (1827). However, the new Flora confines itself to the vascular plants, and works from the family to the species by means of simple, but adequate keys. In the case of critical taxa, these are accompanied by clear line drawings illustrating important diagnostic characters. In addition to the taxonomic description of each genus, the Flora includes detailed floristic and geographical observations on most species. Particular emphasis is laid on the vernacular names of species, their season of flowering, life-form, ecology and geographical distribution. Subspecies and hybrids receive rather arbitrary treatment.

An introductory analysis of the phytogeographical regions involved in the territory covered is less than adequate, and the folding map is too complicated and poorly reproduced. At the end of the Flora there is a well-illustrated glossary. The index is satisfactory, and there are some blank pages for personal notes.

I am less than happy with the section on the collection and preservation of specimens. I should have preferred one on the conservation of the flora. In my experience, the herbarium botanist in France and Belgium has little enough regard already for the preservation of the flora. I have too often seen the careless collection of rarities, such as *Osmunda regalis* and the micro-endemic *Biscutella neustriaca*. A cautionary note should be appended with rare species.

In some instances, the geographical notes on species may be found wanting. For example, *Globularia vulgaris* is recorded as 'doubtful' for the district 'Picardo-Brabançon'. I know it at a number of sites in the Somme valley east of Amiens. *Eriophorum gracile* is recorded for three districts, but not for 'Maritime', where it grows near St Aubin (Pas-de-Calais). *Aceras anthropophorum*, *Carex diandra*, *C. appropinquata* and *Carex lasiocarpa* should also be recorded in 'Maritime'. Unfortunately, these minor errors are too frequent.

The Flora will probably find a niche alongside the herbarium and in the study. It is not quite an excursion Flora and is far from being a great reference work; but for general reference purposes it may prove useful. I would recommend it as an introduction to the flora of Belgium and Northern France. The phytogeographical information is of particular value in this respect. However, with the publication of the *Flora Europaea*, some of the nomenclature and taxonomy will become obsolete very soon.

PHILIP A. STOTT

A List of the Flowering Plants and Ferns of Carmarthenshire. R. F. May. Pp. 88. West Wales Naturalists' Trust Ltd. Obtainable from the Hon. Gen. Sec., West Wales Naturalists' Trust, 4 Victoria Place, Haverfordwest, Pembs. Price 50p. post free.

This booklet admirably fulfils its aim of collating the published records for this Flora-less county, and many previously unpublished records seem also to have been included. It lists all native and many alien species, brief ecological notes are given for each, and localities, with references to the recorders, are given for the less common species. The total number of species covered is given as 1117. Short introductory chapters on

topography, plant distribution and the history of botanical exploration give practical and detailed information, and Appendices 1 and 2, with details of records of over 70 unlocalised, lost or extinct species, should prove an irresistible inducement to further activity. There is a useful list of the localities referred to, with grid references, and a geological map which is unfortunately poorly reproduced.

The older records seem to have been thoroughly covered, with the exception of those of Evans (1804), who mentioned 10 species of interest. Evans's record of *Asplenium septentrionale* is the only one for the county, for example, and his record of *Spergularia rubra* from Ferryside pre-dates the cited Barker record by nearly a century. In other cases old records known to the author (for example, Ray's *Juncus acutus* from Kidwelly, mentioned in the introduction) are omitted in favour of more recent ones from the same locality; both together would have been more useful. Of more recent records, that of *Epilobium nerterioides* is a notable omission (*cf.* Hyde & Wade 1957).

The author's concept of nativeness is at the other extreme from that of Benoit & Richards (1963), and a comparative reading of the lists for Merioneth and Carmarthen from this angle is a puzzling experience. May unfortunately does not define 'introduced' as precisely as Benoit & Richards; he seems to follow Clapham, Tutin & Warburg (1962), whose statement that a species is native implies that it is so in some part of Britain, but not necessarily throughout its whole range, and in cases of doubt, such as *Mercurialis annua* and *Myrrhis*, credits them with native status. Since it is to local Floras that one turns for evidence on the nativeness or otherwise of a species, and since this evidence may be only temporarily observable, a more independent and reasoned approach would have been welcome.

The author modestly hopes that his list 'will save much time if at any future date a more scientific flora is ever contemplated.' It must be added that it is just such lists as his that become one's inseparable field companion and are most likely to lead to increased interest in a local Flora.

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A. O. CHATER

The Victorian Fern Craze, a history of pteridomania. David Elliston Allen. Pp. 85, illustrated in black-and-white. Hutchinson, London. 1969. Price £1·05.

For over 30 years I have lived close to ferns and fern men – and to fern books. The books have a great fascination, with their wealth of information and the enthusiasm of the many authors who churned them out in vast numbers during the latter half of the 19th century and gave a very vivid picture of the 'fern craze'. I thought I knew a lot about its history until I read this book by David Elliston Allen who has skilfully captured the picture of the period and made it live in his pages. We feel the excitement of the hunt for new fern varieties, bad ones and good ones, and their subsequent development in garden and greenhouse, and above all we feel the excited urge for more and more information and the avid seizing of each new book as it poured from the presses. The author is to be congratulated on the very successful outcome of the large amount of labour and research which has gone into this production, bringing into small compass so much new and interesting information.

The subject matter would not seem to lend itself to the making of an interesting and successful book and we would expect it to be a dry recital of many facts. The first stimulus to the fern cult was the discovery of reliable spore-raising methods, which

encouraged the growing of many exotic ferns and launched the fern trade. Next came the Wardian Case, which provided the growing conditions for easy culture, and this was followed by an awakening interest in our British ferns and their varieties. Then came the books in ever-increasing numbers until the end of the century, when the 'craze' was fast declining. The story is written by Mr Allen in a graphic manner which holds our interest, and sums up the whole period, bringing its fevered craziness into true perspective.

To the present-day pteridologist the book is a revelation – and a warning! The wind of commonsense blows through it. Ferns are still an absorbing subject with the power to obsess, and with today's revival of interest in them we need the antidote provided by Mr Allen, who signposts the dangers and the absurdities which can still beset us, and helps us to preserve a balanced outlook on ferns.

This delightful small book should be read by everyone interested in ferns. It is excellently produced by Hutchinson, and has several fine black-and-white illustrations taken from the literature of the period. It is certainly very good value for 21s.

J. W. DYCE

Flowering Plants, Origin and Dispersal. Armen Takhtajan. Pp. x + 310. Oliver & Boyd, Edinburgh. 1969. Price £2·50.

Although this book is basically an English translation of *The origin of Angiospermous plants*, 2nd ed. (Moscow, 1961, in Russian), the text has been revised to such an extent that it is in fact a new work. As such it is particularly useful, as it provides a key (both by text and bibliography) to works in Russian on the topics under consideration – topics that seem to have provoked as much discussion in that language as they have in other European ones. Those of us who do not have a fluent reading knowledge of Russian must therefore be grateful to Mr Charles Jeffrey for his most readable English translation.

Takhtajan approaches his subject from many different angles and succeeds in forming a picture – orthodox in many respects, but none the less fascinating – of a group of plants originating at some time well before the Cretaceous from some as yet unknown Pteridosperm with primitive secondary xylem and bisexual strobili. He explains the 'gap' in the fossil record in terms of population genetics, i.e. of small transitional populations in which evolution could operate at an accelerated rate, and repeatedly emphasises the evolutionary importance of neoteny (e.g. the concept that the flower is a neotenic form of the ancestral Gymnosperm strobilus).

The first flowering plants are depicted as woody, evergreen and possibly pachycaul. As each character is examined in detail and the evidence considered, a picture is gradually formed of a plant with many Magnolialean characters but more primitive in some respects (e.g. with a perianth of bracts). The viewpoint is very similar to that given by Cronquist in *The evolution and classification of flowering plants*, which was recently reviewed in this Journal, i.e. it is based on the ideas of Bessey and Arber & Parkin that the *Magnolia* type of flower is primitive and basic to the whole of the Angiospermae. Little consideration, if any, is given to more recent theories that cast doubt on the validity of the orthodox view, although these can often provide more convincing explanations than can the classical theory. Thus, while Takhtajan finds it difficult to account for the occurrence of both extrorse and introrse anther dehiscence in primitive families, and therefore thinks lateral dehiscence to be primitive, Melville's Gonophyll Theory provides a simple explanation where the 'foliar' stamens are not regarded as primitive but as derived from a 'typical' stamen with its subtending foliar organ. If this is so, the 'typical' stamen with filament and anther has not gone through a 'foliar' stage, and the differences in dehiscence were fixed before the foliar type evolved.

After an interesting and illuminating discussion of primitive families containing 'living fossils', the author indicates (i) how the various apetalous Dicotyledons are

thought to have been derived from different families in which petals are present and then (ii) how the Monocotyledons, in his view, are derived monophyletically from the Nymphaeales (without discussing the serious difficulties involved in this theory). Chapters then follow on the time and place of origin of the Angiosperms and their sudden apparent evolutionary radiation, in which a tropical, possibly S.E. Asian origin, well pre-Cretaceous in time and a subsequent radiation into temperate regions are suggested. This radiation is thought to have involved migration by means of land bridges, and the words 'Continental Drift' are not even mentioned.

To the main text are added two appendices, of which the first is a useful synopsis of Takhtajan's own classification of flowering plants, published in Russian in 1967, and the second gives the floristic regions of the world with the endemic and otherwise prominent families and genera of each.

All in all this is a book that will fascinate anyone interested in the evolution and distribution of the Angiosperms. With due allowance for the author's occasional dogmatic tendencies, it should also be a useful university text-book.

N. K. B. ROBSON

Wild Flowers of Greece. C. N. Goulimis. Edited by W. T. Stearn. Pp. 212, with 104 colour plates by N. A. Goulandris. The Goulandris Botanical Museum, Kifissia, Greece. 1968. Price £26.

This handsome volume is a worthy and fitting memorial to one of Greece's outstanding amateur botanists of the last two decades, Constantine N. Goulimis, who died in 1963. Like his British predecessor, the amateur botanist Shirley Clifford Atchley, he left an uncompleted manuscript of his work, which in this instance has been edited and completed by William T. Stearn of the British Museum. Both Atchley's *Wild Flowers of Attica*, and Goulimis's *Wild Flowers of Greece* have therefore benefited from the hand of a professional botanist before publication.

Dr Goulimis was by profession a lawyer, and one of the leading lawyers of Greece, and at the same time he was for 44 years the legal adviser to the British Embassy in Athens. It was comparatively late in life – in his 60th year – that his interest in the Greek flora suddenly flourished, and from 1946 until his death in 1963 he made numerous journeys into remote parts of Greece and to the Islands, adding not only 230 new species to the Greek list, but discovering a number of species new to science, including *Anthyllis serpentinicola*, *Campanula goulimyi*, *Inula serpentinica*, *Linaria hellenica*, *Linum goulimyi*, *Crocus goulimyi*, *Silene goulimyi* and *Tulipa goulimyi*. This is surely unprecedented in the twentieth century: a self-trained amateur starting his botanical life at sixty and discovering in Europe so many species new to science, particularly when his terrain had been worked botanically by such great European botanists as Tournefort, Sibthorp, Boissier, Halacsy, Hayek, Turrill and K. H. Rechinger, to mention but a few.

The richness of the Greek flora compares only with that of the Iberian Peninsula in Europe. Greece, though a quarter the size, has probably one and a third as many species of flowering plants again as France, for example. Goulimis estimated that when the more remote areas had been fully explored 'the number of 6,000 will be considerably exceeded'. He must have known the Greek flora better than anyone of his time. He describes how he has made more than 220 expeditions, great and small, in search of flowers, and has climbed more than 70 Greek mountains, often on more than one occasion, on his explorations. In his fascinating introduction to the book he describes some of his favourite hunting grounds and the plants he has discovered. For my own part, I wish that this section were many times longer and more detailed, for here lies the heart of the matter, and Dr Goulimis's real contribution to our knowledge of probably the most interesting flora in Europe.

In 1954 Dr Goulimis began to plan a series of illustrated volumes on the Greek flora

in collaboration with Mrs Niki Goulandris, who painted the plants as he brought them in from the field, sometimes illustrating new, unnamed species. Her fine water-colours of these plants, so ably reproduced in Athens, give a great distinction to this volume. There is a total of 110 species reproduced in full colour plates, selected from a wide range of families.

Widespread and familar lowland species, such as *Epilobium angustifolium*, *Rosa canina*, *Globularia alypum* and *Euphorbia characias* subsp. *wulfenii*, stand page to page with such new and rare species as *Crocus goulimyi*, *Fritillaria davisii*, *Staehelina arborea*, *Centaurea lactucifolia* and *Campanula formanekiana*. With each species there are short notes on its distribution in Greece, in particular listing those localities where they have been discovered by Dr Goulimis. Notes on their medicinal and other 'uses', both ancient and modern, are included, as well as their habitats and vernacular names. Only new species are described in detail. It is with the selection of species that my main criticism lies; there seems no reason for the odd assembly of rare and common plants, unless as I suspect, they have been chosen to supplement the ten volumes of Sibthorp and Smith's *Flora Graeca* and the magnificent paintings of Ferdinand Bauer.

Few, alas, will be fortunate enough to use *Wild Flowers of Greece* in conjunction with the senior volumes. Be that as it may, Dr Goulimis's volume is indeed a landmark in Greek botany – the first book of any stature from the pen of a Greek botanist to be published in recent years. It may well prove to be more than this, for it is also the first publication of the Goulandris Botanical Museum, founded in 1963 by Mr and Mrs Angelos Goulandris as a centre for the study of the Greek flora. It has set a fine example of both scholarship and production, and it is a worthy beginning to what we all hope will be a long series of works by contemporary Greek botanists.

O. POLUNIN

Plant Anatomy. A. Fahn. Pp. viii + 534. Pergamon Press, London. 1967. Price £3·75.

During the last 20 or 30 years British students have had to rely on a number of American text books of plant anatomy. However excellent such works are, it is a pleasure to welcome this new book which presents the student with a somewhat different approach and outlook. Professor Fahn's book was written originally in Hebrew and has been revised during translation for this English edition.

The first half of the book deals with the various kinds of cells and tissues which are to be found in the vascular plants (Tracheophyta). A clear and concise chapter on the cell is followed by a chapter on meristems and apices, which is an attractive presentation of histological and dynamic aspects including an evaluation of recent research and citing about 100 references.

Seven chapters – Parenchyma, Collenchyma, Sclerenchyma, Xylem, Phloem, Lacticifers, Epidermis – make up the section on Mature Tissues. They contain a great amount of detailed information, clearly presented and well illustrated on structure and development with considerable emphasis on economic and evolutionary considerations. There is, for example, a valuable discussion on the evolutionary trends in the development of tracheary elements in various angiosperm groups. The chapter on the epidermis, with its detailed consideration of stomatal types, trichomes and other surface appendages, is of special interest to taxonomists.

The next two sections are entitled 'Primary Vegetative Body of the Plant' (three chapters) and 'Secondary Body of the Plant' (five chapters). Here again there are various features worth drawing attention to such as the account of adaptation to desert and saline habitats shown by stems, and an example of a key for the identification of trees and shrubs using features of the secondary xylem.

The last section of the main text, which is concerned with the reproductive organs, comprises a long and detailed chapter on the flower and two shorter chapters on the fruit and the seed. That on the flower covers such topics as ontogeny, vascularization

(which is particularly well treated), phylogeny, structure and development of the stamen, pollen grain development, phylogeny and histology of the carpel, sporogenesis, an extensive survey and classification of nectaries, and the formation of endosperm and the embryo. It contains a great amount of information, most of it up to date, although the section on pollen grains, especially with regard to the pollen wall, is somewhat superficial, and makes no references to research published during the last 10–15 years.

In the chapter on the fruits it is good to see a distinction made between the achene (e.g. *Ranunculus*) and the cypsela (of Compositae). Most recent anatomical texts treat the fruits of Compositae as achenes although, as Fahn points out, they are formed from an inferior ovary and surrounded by other floral tissues in addition to the ovary wall and are therefore false fruits (pseudocarps).

There is a glossary of some 400 terms, as well as indices to authors and subjects.

Professor Fahn has written a valuable and enjoyable book which should be widely used by undergraduates in British Universities. Many of the examples and illustrations are different from those they will normally encounter in American texts, making a refreshing change. The translation by Mrs Sybil Broido-Altman reads very well. The book is well produced and printed on coated paper, the printing having been done in Hungary. It is good value at 75s.

V. H. HEYWOOD

Die Farnpflanzen Zentraleuropas. K. and H. Rasbach (photographs) and O. Wilmanns (text). Pp. 295. Quelle & Meyer, Heidelberg. 1968. Price DM 38.

This is one of the most beautiful botanical books I have ever had the pleasure of reviewing. A comprehensive introduction covers the life-cycle and evolution of ferns and 'fern-allies'. There is also a section on hybridisation and the biogeography of the group. However, valuable as Dr Wilmanns' account is, it is the systematic section, which comprises about three-quarters of the book, which will undoubtedly prove the major attraction of the work. Seventy-seven of the ninety Pteridophytes of Central Europe are illustrated by superb black and white full-page photographs, taken in such a way that the essential characteristics of each species are caught. That they can be compared to pictures taken in this country by Michael Proctor ought to be a sufficient indication of their standard. By paying particular attention to lighting and backgrounds the Rasbachs have produced some startling effects: you can almost feel the rigid texture of *Asplenium fissum* (p. 137), whilst the picture of *Ophioglossum vulgatum* (p. 165) suddenly makes the resemblance to a snake remarkably plain. The three moonworts, *Botrychium lunaria*, *B. matricariifolium* and *B. virginianum*, are so lifelike that they seem to be growing on the page. Probably most successful of all are the species of *Lycopodium sensu lato*. The clear distinction between the sporophylls of *Diphasium complanatum* and *D. issleri* is vividly brought out, which makes the absence of mature sporophytes of this complex in Britain even more frustrating.

The plants are arranged according to a broad habitat classification: cliffs, scree, alder woods, beech woods, open water and so on, and each habitat is introduced by a typical landscape including one or more of the species to be illustrated later in detail. Whilst this does help to relate species to habitat in a telling way, it does detract from the book as a work of reference. It is aggravating to have the genus *Equisetum* scattered in at least three places. The habitats and the systematic material could have been separated without in any way reducing the value of the former.

There is a synopsis of classification which closely follows *Flora Europaea* in its treatment, but analysis shows that the thirteen species for which there are no illustrations are not mentioned elsewhere. It is unfortunate that lack of a picture should also mean lack of a description, as it tempts the term 'Kaffee-tisch,' which would be a gross underestimate of the full value of this book.

F. H. PERRING

A Guide to the Naming of Plants: with special reference to heathers. David McClintock. Pp. 38. The Heather Society. 1969. Price 32½p.

Mr McClintock is one of the few botanists to have successfully bridged the gap that exists between botanical theory and horticultural practice. His knowledge of both spheres and of the problems and misunderstandings which have long prevented their complete agreement is succinctly but sympathetically demonstrated in this little booklet.

It is 17 years since the first edition of the *International Code of Nomenclature for Cultivated Plants* was published and today, with the fourth revised edition now available, I doubt that many copies are to be found on the bookshelves of gardeners. Certainly few nurserymen possess a copy, and of those that do only a handful have attempted to put its rules and regulations into practice.

Nurserymen and gardeners are normally much too busy growing plants to be bothered with codes of nomenclature and the likes, but it is these people, the producers of new cultivars, the hybridists and the mysterious men with an eye for a 'good 'un' who must benefit from the *Code* in the long run. As far as practising gardeners are concerned the *Code* fails in that it assumes too much, and this is where Mr McClintock's question and answer method of explaining the basic facts is so very much more digestible. He succeeds in putting across in a simple yet accurate manner important aspects of what is to many people a most confusing subject.

The booklet is divided into three parts. The first sets out the chief principles on which the correct naming of plants is based; the second exemplifies these in the naming of hardy heathers (which include *Calluna*, *Erica*, *Daboecia*, etc.); and the third lists recommendations of the Heather Society on certain cultivar names.

The type is clear and the sections arranged in a simple, uncluttered manner; this, plus an excellent index, makes the booklet easy to refer to and enjoyable to read.

I have only one minor criticism. I do not agree with the coining of new English names for plants which have no available established one. Our friends the Americans are particularly fond of this unfortunate albeit amusing pastime. Established English names have been with us a long time and their origins are often part of a rich heritage of folk-lore and history, but to invent a new English name for a species perhaps already well known by its botanical name seems pointless. It gives the idle gardeners amongst us an unnecessary alternative. Examples of these names in the booklet are thankfully few but include 'Balkan Heath' (*Bruckenthalia spiculifolia*), 'Winter Heath' (*Erica carnea*), 'Williams' Heath' (*Erica* × *williamsii*) and 'Menziesia' (*Phyllodoce caerulea*). The last is particularly unfortunate in view of the existence of the genus *Menziesia*, several species of which are cultivated in British gardens. I must emphasise that this is only a personal criticism and in no way detracts from the value of the booklet to the user, be he botanist, gardener or layman.

The Heather Society is to be congratulated on its foresight in commissioning the work and in choosing such a 'natural' author.

ROY LANCASTER

The Oxford Book of Food Plants. S. G. Harrison, G. B. Masefield & Michael Wallis. Pp. viii + 206. Oxford University Press, London. 1969. Price £2·75.

This is another volume of the successful series of Oxford books on plants and animals. Like its companion volumes on *Wild Flowers*, *Garden Flowers* and *Flowerless Plants* it is an exceptionally fine book, and there is certainly a need for it. In an age of technological advancement where people become, to an alarming degree, ignorant of the natural resources on which their lives depend, books of this kind serve as educational tools of great importance.

The main purpose of this work is to depict and describe the plants which provide food for the human race. On 87 colour plates about 420 useful plants (species, varieties or cultivars) have been magnificently illustrated by B. E. Nicholson. (Incidentally,

here is one more proof that even today the artist's rendering of plants is far superior to anything which colour photography has to offer.) Special emphasis has been given to the organs of plants which are actually consumed as food, but in many instances the whole plant has been illustrated. There are not many books on the market in which the same high degree of colour fidelity has been achieved. Each description is printed facing the relevant illustration, which is convenient for the reader.

For each plant, information is given about its geographical distribution, origin, morphology and value as a nutrient. Also the most important particulars about both cultivation and processing methods are given. The length of the description and the amount of information it contains varies according to the importance of the plant.

Although one does not expect a cookery book, in some instances the reader may expect to be told more about the usefulness of certain plants. The reviewer was very unhappy that even this book did not enlighten him on why *Monstera deliciosa* deserves its specific epithet. For goodness' sake, how is it eaten? To stay with this plant, is the statement that it is 'the only genus of plants which has natural holes in the leaves' really correct?

The arrangement follows a classification of foods rather than a botanical one, beginning with cereal crops and followed by oil-producing plants, nuts and legumes; spices, salad plants, leaf vegetables and root crops form the final sections. General topics of interest are treated in three concluding chapters (the domestication, spread and uses of food plants).

An illustrated glossary of botanical terms at the beginning of the book will assist the less initiated user of the work. The figure given for the term *bipinnate* is not quite correct since the pinnae are not completely divided, but it would be pedantic to argue about such minor mistakes in a book of this nature.

In conclusion, this delightful book can be thoroughly recommended to anybody, be he just curious, a lover of plants or, like the reviewer, interested in all possible aspects of 'gastrosophy'.

EDMUND LAUNERT

Nightshades. The paradoxical plants. Charles B. Heiser, Jr. Pp. 200. W. H. Freeman & Co., San Francisco. Price $5.95.

Too scarce are those who both know their subject expertly and can, or do, write or broadcast well about it. Consequently much that is published or heard is by those who can talk or write (or the publishers think they can), and know enough to get by. Perhaps this is the lesser evil, when we see how heavily and obscurely some specialists express themselves. But in this book we have a specialist who can, and does, write well. Professor Heiser, we are told, has published over 50 scientific papers (although I am never sure at what stage any given piece of writing qualifies for this designation) and the bibliography includes some of his on Solanums. Internal evidence too shows his first-hand knowledge and investigations into their family.

There are nine chapters, each devoted to one or a group of Solanaceous plants, such as Peppers (*Capsicum* spp.), Potatoes, Egg Plants, Tomatoes, the Wonderberry, Mandrakes, Jimsonweed (*anglice* Thorn Apple, for this is an all-American book), Henbane, Tobacco, Lulos and Pepinos (know what they are?), and some garden annuals. The author discusses their history, uses, composition, variation, even their nomenclature, and covers widely each plant in a way to be understood by the general reader. Even the more expert might well learn from what he relates, sometimes with dry humour – 'The superior ovary – this refers to the position of the ovary, not its quality'. Most of the taxa discussed are American, in origin at any rate. But this is no drawback to the lessons to be learnt from this book, perhaps particularly in the story of the Wonderberry; and 'certain principles first delineated in *Datura* and other 'worthless' plants have been of tremendous importance in the understanding of all plants, including those of great direct importance to Man'. Not all is botanical, for example the history of cigarettes, but this fairly broadens the interest. I regret only that

the author did not discuss some plants (e.g. Jerusalem Cherry) more, or include others such as *Nicandra*, or Woody Nightshade (the origin of the name Nightshade remains a mystery); and that it should be out-priced, at any rate to sell well in the British market – but would it not make an excellent paper-back?

DAVID MCCLINTOCK

The Lowland Grasslands of Co. Limerick. A. M. O'Sullivan. Pp. 57 + 6 plates and 3 maps. An Foras Talúntais, Irish Vegetation Studies 2, Dublin. 1968. Price 25p.

This is a detailed analysis of grassland communities based upon 110 semi-random samplings made over a wide area of lowland County Limerick, and conducted according to the methods of the Zürich-Montpellier system of phytosociology.

All the communities enumerated are considered to belong to the major class of European lowland grasslands, the *Molinio-Arrhenatheretea*, within which two orders, three alliances, four associations (*Lolio-Cynosuretum, Centaureo-Cynosuretum, Senecioni-Juncetum acutiflori, Junco acutiflori-Molinietum*) and three sub-associations of *Centaureo-Cynosuretum* are recognised. The associations and sub-associations are in turn surveyed from the point of view of floristic composition and variation, phenology, distribution and ecology, management and improvement, and the findings are set out briefly in a final summary.

The job is very competently done, and the conclusions may be very useful in grassland research, but I cannot help feeling that Mr O'Sullivan would have done better had he been freed from the intolerable restrictions of the phytosociological straitjacket, and allowed to roam the verdant acres of Limerick guided by his own eyes and native commonsense.

Plant societies are of absorbing interest, and phytosociology will one day engage the sedulous attention of our best botanical intellects; but the Zürich-Montpellier line went astray when it hitched its wagons to that grand old puffer we call formal taxonomy.

R. D. MEIKLE

Flowers of Europe. Oleg Polunin. Pp. 662, 192 pp. colour photographs, 50 plates of line drawings, and text figures. Oxford University Press, London. 1969. £4·20.

It is easy to be unkind about this book, and to point out that 2,600 descriptions, however judiciously supplemented by line drawings and colour photographs, cannot conceivably provide fully informative guidance to the vast, varied and intricate flora of Europe. Five large volumes, without illustrations, are not likely to accomplish this to everyone's satisfaction. Mr Polunin's book is not intended for the expert, but for that much-appealed-to class of person, the intelligent tourist, who will find in these pages as much botanical information as, or possibly more than, he is likely to be willing to digest.

From the viewpoint of book-production, author, publisher and printer are alike to be congratulated. The colour photographs are mostly of the highest quality and well reproduced, though I am still not convinced that photography is a satisfactory substitute for line drawings. Photographs, however good, too often fail to reveal those very features which are essential for accurate determination, and which an accomplished botanical artist will take care to stress. Some of the 'close-ups' in this volume (e.g. 70 *Osyris alba*, 363 *Eruca vesicaria*, 1215 *Scrophularia scorodonia*, 1216 *S. hoppii*, 1282 *Plantago media*) afford virtually no indication of the general appearance of the plant, while others (e.g. 669 *Euphorbia dendroides*, 1193 *Verbascum thapsiforme*) are taken at a distance which lends enchantment to the view, but precious little in the way of taxonomic data. The text figures are, on the other hand, uniformly lucid, accurate and helpful.

The text, in a book of this kind, might almost be said to be a minor consideration. The

author has made few concessions to the novice. Descriptions are terse and technical, with the odd appended note of economic, medical or general interest to assuage the general aridity. I have not tested the keys to families and genera, but they look practical enough, though, again, an entry such as 'Valves rounded at the back; median nectaries absent; lateral nectaries prismatic' may test the patience of the tourist, whatever his I.Q., to somewhere near breaking-point. The species are not individually keyed, probably not a serious omission where there are group headings and abundant illustrations as well as descriptions. So many species have had to be passed over in silence that a key, at this level, might be more misleading than helpful.

In brief, it is a handsome book, at a very reasonable price, but it tries to cram too much into one nutshell; and the nutshell may well have become too heavy for those who travel light in permanent fear of the excess baggage exactions inexorably demanded by the grim-faced servants of the aircraft corporations.

R. D. MEIKLE

Photosynthesis. Isaac Asimov. Pp. 193. George Allen & Unwin, London. 1970. Price £1·75.

This book is a popular but by no means superficial account of the process upon which virtually all life at the present day ultimately depends. In fact, '*Photosynthesis*' is too narrow a title, because the authors consider the whole of the carbon cycle – both the energy-fixing process of photosynthesis and the energy-releasing process of respiration. Dr Asimov, a chemist by training, is well known within his own field as a biochemist, as well as enjoying a considerable reputation as a scientific populariser and science-fiction writer. The present book, written in a readable and uninhibited style, is evidently aimed at the intelligent layman. The essential facts and concepts are lucidly set out, at a pace, and with a degree of background explanation, which seem nicely judged for a reader who may have only limited scientific knowledge – though it would be idle to pretend that a completely non-scientific reader is likely to find this an easy book. The author has achieved more than merely a sound elementary exposition of our present understanding of the biochemistry of the carbon cycle. He has written with a sense of the wider relevance of the mechanisms and processes he describes, and of the human and social origins and ends of science. Only a few points left me a little uneasy. I am sure the author could have contrived to explain more lucidly and specifically why the heat of combustion of glucose (673 kcal/mole, p. 61) is different from the standard free-energy change for the same reaction (686 kcal/mole, p. 67). Also, I know that I (as a non-biochemist) am not alone in finding the molecular changes of the Krebs and Calvin cycles peculiarly fascinating, and I should have liked rather more detail here. However, these are small criticisms of an admirable piece of popular scientific writing, and the reader whose interest is aroused will be able to pursue these and other questions elsewhere.

M. C. F. PROCTOR

Index Kewensis Plantarum Phanerogamarum. Supplementum XIV (1961–1965). Compiled at the Herbarium of the Royal Botanic Gardens, Kew, under the direction of Sir George Taylor. Pp. 149. Clarendon Press Oxford: University Press, London. 1970. Price £6·50.

The latest supplement of *Index Kewensis* makes this invaluable work complete as far as the end of 1965. 'Complete' is possibly an over-statement because, like its predecessors, this part includes some names that were omitted from previous supplements. It is nevertheless to all intents and purposes a complete index to the descriptions of all Phanerogamous species published from 1961 to 1965 (inclusive). Would that the same information were available for subspecies and varieties.

N. K. B. ROBSON