

BOOK REVIEWS

Plants, Man and Life. Edgar Anderson. Pp. 251. University of California Press, Berkeley & Los Angeles; Cambridge University Press, London. 1967. Price (paperback edition) 19s. 6d.

A warm welcome is sure to be given to this paperback edition of Edgar Anderson's classic work, which first appeared in 1952 and discusses in a very interesting and amusing way various aspects of the interaction between Man and the plants (both wild and cultivated) which occur in close proximity to him. Those who did not read this book when it first appeared now have an opportunity to repair this omission, while those to whom it is already familiar may well wish to have it in its new format. For this edition a short epilogue and some recent references have been added.

N. K. B. ROBSON

Taxonomy. Richard E. Blackwelder. Pp. 698. John Wiley & Sons, New York, London, Sydney. 1967. Price £8 15s. 0d.

At first reading this book seems to have little coherence; it appears to be a series of discussions of different aspects of zoological taxonomy loosely connected and without a clearly defined theme. It is intended as a text and reference book, of course, covering a wide field, so heterogeneity is inevitable. Almost seven hundred pages with very few figures make a large volume, a plethora of facts and ideas which might have been better arranged. The detailed Contents pages at the beginning of each Part are only of limited help.

The introductory matter deals with preliminary definitions and the organization of taxonomy professionally. It includes a reference list predominantly of American institutions and an interesting section giving many examples of the practical value of taxonomy. One is surprised that the author considers such a thorough justification of this value to be necessary, until one realizes that the evidence demonstrates particularly the need for synthetic taxonomic schemes rather than intensive speciation studies. After a rather cursory review of the practical routines of taxonomy, which nevertheless includes some astute observations on collecting and cataloguing, there follows an unusual pair of chapters on the diversity of animal life. Although the matter is familiar here, it is brought together in very readable fashion. The reasons for the different types of diversity are discussed; influences are classified; those of sex, climate, development, reproductive cycles and so on. The author seeks to show how little the museum taxonomist need be constricted by the non-living nature of his specimens.

The heart of the work is Part IV; this mostly concerns the practical aspects of classification and includes lists for reference use, as well as a sophisticated discussion of the formation of groups and advice on the use of literature and even on latinization. An important section deals with the type concept, and its relationship to the lower categories of the taxonomic hierarchy is carefully analysed. Even in this Part, theory comes in: the methodological chapters 10 and 11 are short but interesting and, significantly, their bibliographies (pp. 618-639) are the longest of any. The emphasis is on data and its elucidation, and the overriding theme is the author's concern for comparison rather than mere recognition. The one chapter which all biologists should read is Chap. 11: although not entirely new, the discussion of the nature of species and subspecies may provide the necessary stimulus towards the eventual clarification of their distinction. As Prof. Blackwelder explains, species have a validity which subspecies lack and it is the former with which taxonomists should be primarily concerned.

Methodology proper is dealt with rather shortly in Part V. The two interesting though somewhat didactic chapters present the author's conviction of the primacy of comparative studies in taxonomy, and especially those of structure. He advocates recognition of the biological wholeness of nature, but denies that the search for 'biological species' is the business of the taxonomist. This Part is another presentation of the author's omniscient method: to consider *all* the data and use it selectively and critically to construct a taxonomic scheme (*cf.* Blackwelder 1964). The discussion of the confusion of 'categories' with 'groups' is a very worth-while contribution to the linguistics of taxonomy: one must agree with the author that taxonomists have overlooked the probability of improvement that would follow from semantic refinement of their concepts.

The remaining two-fifths of the book deals with the Code of Zoological Nomenclature, its development and use. There is much critical matter here also, but the text mainly offers practical help to working zoologists. Although this reviewer is a botanist, he judges that the quotations from the 1961 Code together with the author's interpretation and criticism will be of great help to those who wish to present their work appropriately within the complicated framework of zoological nomenclature.

This book is an important contribution on the subject of taxonomy, because Professor Blackwelder speaks from the experience of over thirty years of actual taxonomic practice combined with a real concern

about theoretical principles. This rare combination ensures that a great deal of useful basic information has been brought together and enlivened by higher level criticism. The author has tried to arrange the matter suitably but one feels that the loose organization reduces the book's general utility; scientific philosophy and elementary practice alternate irregularly. It may become a bedside book: a kind of intellectual lucky-dip; there are pearls of wisdom here but the general reader may not enjoy hunting for them.

REFERENCE

- BLACKWELDER, R. E. (1964). Phyletic and Phenetic *versus* Omnispersive Classification. In *Phenetic & Phylogenetic Taxonomy*, ed. by V. H. Heywood & J. McNeill, pp. 17–28. Publication No. 6 of the Systematics Association. London.

JOHN LEWIS

Systematic Embryology of the Angiosperms. Gwenda L. Davis. Pp. viii+528. John Wiley & Sons Ltd., New York and London. 1966. Price £9 4s. 0d.

It is most unusual to find a newly-published biological text wholly lacking in illustrations; this book is such a rarity. Obviously intended for the specialist—there is no attempt to define or explain the technical terms utilized—the work is a *sylloge* of embryological data for all the families of flowering plants.

It has three sections. The first is a succinct introduction, which does not attempt to be a comprehensive review of the subject. A systematic catalogue of features abstracted from the literature makes up a middle portion occupying rather less than half the book. This is followed by an almost equally lengthy bibliography, which lists about 5,000 references. The systematic account is based upon the families as circumscribed by Hutchinson in *Families of Flowering Plants*, ed. 2 (1959), and their order is alphabetical. It is not surprising that some of his small, segregate families are still embryologically unknown, though these are just the families where information on the development of anthers, ovules, embryo-sacs, endosperm and embryos might be of special value to systematists.

The family accounts have a disadvantage in lacking any indication of the genera that have been studied by the authorities cited at the end of each family. The unfortunate effects of this can be readily appreciated by examining a large family such as the Compositae: anyone interested only in agamospermy in *Taraxacum* or *Hieracium* is presented with a list of more than 300 citations of scientific papers for the family. There are no clues to indicate which genera have been examined by the authors cited; each must be looked up separately in the bibliography to yield such relevant information as the title of the paper may (or may not) enshrine—a herculean task.

Though many will undoubtedly share the view of Alice in wondering 'What is the use of a book without pictures or conversations?', for specialists in those fields, the *Systematic Embryology of the Angiosperms* is a valuable compendium.

B. M. G. JONES

Flora of Hertfordshire. J. G. Dony. Pp. 112 with a coloured frontispiece, 16 plates and 56 pages of maps. Hitchin Museum, 1967. Price £2 2s.

Dr. Dony's *Flora of Hertfordshire* is one of the most beautifully produced and most skilfully written county Floras of our time. The firm pages, the clarity of the printing and the excellent frontispiece make a most attractive book, though the small type may be trying to some eyes. Besides the coloured photograph of the Chiltern Gentian, which is the first thing we see when we open the book, there are sixteen pages of black and white photographs in the middle. These are carefully chosen views of the Hertfordshire countryside and will attract not only readers to the book but visitors to the county. There is a short historical introduction and at the end of the book a bibliography and a single comprehensive index, which makes the book easy to use and places the botanists among the flowers where they ought to be.

The body of the Flora is in three parts. First we have a series of 109 habitat studies, a feature with which readers of Dr. Dony's *Flora of Bedfordshire* are familiar. These studies are word pictures of great value. They fix the ever-changing scene for the benefit of future generations. If only botanists a hundred years ago had had the wit or the opportunity to describe the vegetation of their counties in this exact manner, how greatly we should have valued their work now.

The second part of the Flora is a condensed account of the species in their scientific sequence. A good deal could be said about this. At first sight the compression appears to be too drastic. But we must judge a book in the light of its author's intentions. Where information is plotted on a map it is not generally necessary to reproduce it in words and Dr. Dony had to consider also the heavy cost of printing in our day. He decided therefore not to reproduce all the work of his predecessors, especially as this work has been published and is available to students, but to summarize it. The new *Flora of Hertfordshire* is more than a supplement to Pryor's Flora of 1887, but it does not supersede it: both are necessary for a full view of the past and present vegetation of Hertfordshire.

It is evident that Dr. Dony has read Pryor's Flora carefully and checked the geographical references. For example, the apparently simple account of *Potentilla palustris* masks a good deal of work and is an admirable summary of Pryor's longer statement. It is necessary to read both books side by side to appreciate the skill with which the new Flora has been written. There is, of course, a loss of bedside reading for those who like to dream about the past. No summary, for example, however scientifically adequate, can compensate us for the loss of Pryor's record of *Gentiana germanica*, 'About a mile through Tring, on the east of a cart road through ripening barley . . .' We could wish that Dr. Dony had relaxed his rule from time to time to include some of these picturesque statements. For imaginative readers they have the value of coloured illustrations.

But this does not mean that the new Flora is without colour altogether. The observation that *Linum usitatissimum* often sprang up where birdcatchers dropped their seed is reproduced and Dr. Dony tells us that the yellow sap of *Chelidonium majus* is still thought to be a cure for warts. Nor must we overlook the notes of the author himself, as, for example, that the white-flowered form of *Raphanus raphanistrum* is most often seen on arable land and the yellow-flowered form on newly-made roadside verges. Many of Dr. Dony's entries are splendid examples of the Flora-writer's art. What could be better than his accounts of the Juniper and the Box? It is the excellence of such entries as these that whets the appetite. Would not the story of *Euphorbia lathyris* be improved if we were told that the copse near Goldings was once called *Euphorbia* copse and that thousands of plants of Caper Spurge sprang up when the underwood was cut in the winter of 1841-2? Sometimes the addition of a date is all that is needed. For example, the pleasure of the botanist who is fortunate to see the single surviving plant of *Vicia sylvatica* in Wain Wood would be increased, if he knew that it was first found there in 1843.

The value of first records has sometimes been doubted but they are always interesting and many readers will be grateful to Dr. Dony for introducing Isaak Walton to them as a botanist. How fitting it is that he should be the first to record the Bluebell and the Cowslip for Hertfordshire, though he would be surprised to know it. But if first records are to be included in a Flora the author's search into the past should be thorough. In the light of Dr. Dony's work it is surprising how many of Pryor's earliest dates are incorrect. Another pleasing feature of the new Flora is the inclusion of the latest date on which a species presumed to be extinct is known to have been seen. This may often be more reliable than the earliest date, but of the two it is the one we should most like to prove wrong!

The third part of the Flora consists of distribution maps of 696 species. This is a novel and excellent feature. Doubtless the shape of the book was determined by the shape of the county as there are fifteen maps to a page. These are rather small but so clear that nothing is lost. Only the rarest species are without a map, so that for the first time in a county Flora we can see at a glance how each species is distributed. This is a great convenience. The map of *Silene dioica*, for example, which takes the place of a page of records in Pryor's Flora, not only saves much space, but it affords a much clearer view of the peculiar distribution of this species than a long list of place names. It may be said that maps of species like *Bellis perennis*, which has been recorded for every square, and of others, which are known to occur in nearly every square, are unnecessary and that Dr. Dony could have saved six pages by their omission. This is true. But we may be glad he did not prune his book in this way. The full maps are valuable as a contrast to the others and increase the pictorial attraction of the pages. The maps are the cream of the book. They summarize the field work that has been done by Dr. Dony and his helpers and show how thorough that work has been. They offer us a picture of the flora of Hertfordshire as it is at the present day, owing nothing at all to past work in the county. Their simplicity and clarity will do more than many words to popularize the 'tetrad' method of recording.

The maps, however, tell us nothing about the location of the rarest species and the treatment of these species in the textual part of the Flora is uneven. All the recent records are published, but the old records in accordance with the author's general policy are usually summarized. But the old records of species which have diminished during the years are particularly interesting. Dr. Dony gives a full account of *Orchis militaris*. Why should we not have complete accounts also of, say, *Herminium monorchis* and *Drosera rotundifolia*? Where there are too many old records for verbal reproduction, a special series of maps could have been drawn, using hollow circles to indicate unconfirmed records. Maps showing the former distribution of *Parnassia palustris* and *Hottonia palustris* would be instructive.

Dr. Dony's *Flora of Hertfordshire* reflects its author's interest in alien species and garden escapes. They are all there, even *Ligustrum ovalifolium* which 'does not appear as a wild plant'. By contrast the author has little direct interest in the so-called critical species and seems to welcome the opportunity which the *Flora Europaea* gives him of combining the plants we used to distinguish as *Sagina apetala* and *S. ciliata*. This makes recording in the field much easier, but it reduces the value of the book.

The treatment of the genus *Rubus* could hardly be more meagre. Dr. Dony is right to say that a mere list of uncertain names would not be worth printing, but there is a solid nucleus of uncontroversial species

which deserve full recognition. Besides *Rubus ulmifolius*, species like *R. lindleianus*, *R. vestitus* and *R. echinatus* can be recognized at a glance and are widespread. Maps of a dozen or even a score of these could have been made as easily as maps of non-critical species, if anyone who knew the brambles had been willing to spend a fortnight in the county. Perhaps the writer of this review ought not to say more about this. But in his view the poor treatment of the critical species is the one major weakness of Dr. Dony's Flora.

There are those who say that a county Flora is not the place for a detailed account of critical plants, but Dr. Dony's motive was probably to save space and time. To have enlisted sufficient expert help would have delayed the publication of the Flora and the extra pages would have increased its cost. But we can't help asking for more. We are Oliver Twists only because the gruel is so good. Four more pages would probably have been ample for a satisfactory account of the Hertfordshire *Rubi* and if the size of the book could have been increased by thirty pages, not only could all the critical species have been fully recorded, but there would have been room to print longer accounts of the rare species and to include some of the picturesque old records in the summaries of the common ones.

But if we repine for what is not, it must not be supposed that we are ungrateful for what we have. We are very grateful indeed. The new *Flora of Hertfordshire* is a masterpiece of planning and probably contains more information to the page than any other Flora. And as we peruse its pages we feel that what we read is reliable.

E. S. EDEES

Sub-Antarctic Sanctuary: Summertime on Macquarie Island. Mary Gillham. Pp. 223, with 32 photographs and 46 line drawings in the text. 1967. Victor Gollancz Ltd., London. Price £2 5s. 0d.

The author of this book is a botanist with an intimate knowledge of sea-birds. She has pursued this interest on islands around the coasts of Britain, and of Australia and New Zealand. It was therefore appropriate that she should have the distinction of being one of the first four women scientists to visit an Australian National Antarctic Research Expedition's base. The book is an account of this visit, and of the general natural history of Macquarie Island. It is full of observations and information ranging over a wide spectrum of biological interest, from seals and sea birds—albatrosses, cormorants, skuas, gulls, terns, petrels and penguins—to tussock grass, herbfield, feldmark, fen and bog. Naturally in a book of this kind, the animals and birds receive most attention, but the author ensures that a variety of aspects of plant life are represented—indeed, it is no surprise to find that she is often at her most interesting when discussing the impact of animal and bird colonies on the plant cover.

One of the appendices consists of a list of 38 vascular plants recorded on the Island, of which a few such as *Stellaria media* and *Poa annua* are introductions. A previously misidentified fern is named as *Cyclophorus serpens*, but owing to its very dwarf habit the author expresses herself as only 'pretty certain' of the determination. The accompanying list of 42 mosses and 4 hepatics must be a very much less complete indication of the representation of these groups.

A botanical reader familiar with the Antarctic flora may detect some errors. For example, after mentioning the occurrence of *Colobanthus crassifolius* and *Deschampsia antarctica* on the coasts of the Antarctic continent, the author continues '... no flowering plants occur on any Sub-antarctic islands in more favourable latitudes until we get as far north as Macquarie Island . . . and South Georgia . . . The plantless, icebound islands include Balleny . . ., South Shetlands . . ., South Orkneys . . ., South Sandwich and Bouvet Oya . . .' In fact, both of the species mentioned occur in the South Shetlands and South Orkneys, while *Deschampsia antarctica* is recorded from South Sandwich. Furthermore, the implied inclusion of all these islands under the heading 'Sub-antarctic' does not accord with the usual distinction, where vegetation is concerned, between a Sub-antarctic zone (e.g. Macquarie and S. Georgia) and a Maritime Antarctic or Low Antarctic zone (e.g. the other islands named) as discussed by Wace (1965) and Holdgate (1964). Different again is the oceanographers' use of the term, adopted in the map on p. 23, for the region of sea extending from the Antarctic convergence to the Sub-tropical convergence, which excludes even South Georgia.

Apart from these details and some unnecessarily dogmatic statements ('The theory of continental drift is untenable . . .'), the book will appeal to naturalists and will pleasantly recall much that is familiar to any who have visited some part of the Antarctic. It is illustrated by a large number of really excellent photographs and a series of generally pleasing sketches. While the publisher's claim that it is a 'must' for the specialist in several fields is not to be taken very seriously, we can agree that the general reader will find it attractive and interesting.

REFERENCES

- HOLDGATE, M. W. (1964). *Terrestrial ecology in the Maritime Antarctic*: In *Biologie Antarctique*, ed. Carrick, R., Holdgate, M. W. and Prévost, J. Paris.
- WACE, N. (1965). *Vascular plants*. In *Biogeography and Ecology in Antarctica*, ed. van Mieghem, J. and van Oye, P. The Hague.

C. H. GIMINGHAM

Nordisk Kärväxtflora II. Nils Hylander. 4 February 1966. Almqvist and Wiksell, Stockholm. Price Sw.kr. 58.

This second volume of the *Nordisk Kärväxtflora* is long awaited by all who have made use of the first volume and by those who know the value of Dr. Hylander's well-considered and experienced opinions. But the first volume was published in 1953 and there are many younger botanists to whom Volume II will be an introduction to this detailed and all-embracing work. The Flora, then, covers a wide area, namely Sweden, Norway, Denmark, Faeroes, Iceland, Finland and Russian Fennoscandia. It is very unfortunate that the map showing the provinces used in the Flora is not reproduced again in Volume II. There is, however, an additional map, that showing botanical districts in Denmark. The volume contains accounts of Cyperaceae (11 genera, 150 spp.), Orchidaceae (24 genera, 48 spp.), Salicaceae (2 genera, 49 spp.), Polygonaceae (6 genera, 56 spp.), and the smaller families of Myricaceae, Juglandaceae, Corylaceae, Betulaceae, Fagaceae, Ulmaceae, Cannabiaceae, Urticaceae, Santalaceae and Lorantheaceae. The descriptions are detailed and often long and the vital differences may well be lost in a text describing the subtle variation. Detailed distributional data are given and references for literature records are usually given in full. The keys are indented and in many cases short and to the point, requiring only a scanty knowledge of Swedish in order to use them; in other genera, e.g. *Carex*, the many variations of the characters used make heavy going, but on the whole this key to 113 species is commendable. There is at the end of the book a chapter on 'Taxa and nomina nova' validating the new taxa and new combinations mentioned in the body of the work. The volume lacks an index to species (except in the case of *Carex*, on pp. 43-46); a generic index is given on the front inside cover but this does not include all synonyms. There are no page heads to guide the user and the fact that the family headings are in the same 12-point bold typeface as the genera does little to alleviate the situation of quick reference. There is also a sizeable 'Appendix to Volume I' and a list of general literature. The latter is confusing: all references are indexed according to the full title given in the text. Thus 'D. P. Young' is listed along with 'Dandy [J. E.]'; more bewildering, A. Löve is found in the 'A's, whereas 'Löve [A.] and Löve [Doris]' is in its rightful place following 'Lönngqvist'.

Naturally this is a reference book for all who are working on or interested in the flora of Europe. It will be widely used as this and should be in all University and research libraries. But what of its use to the individual botanist who is interested in the Scandinavian flora as a whole but not fully conversant with the Swedish language? In my opinion the keys, descriptions and distributional data make the book a usable handbook. There could have been more illustrations to help clarify the finer points. But as Dr. F. A. Stafleu has said in a review elsewhere, "The treatment is critical to such an extent that if one finds something "different" it is better to hesitate twice and investigate, before one disagrees with the author". To the present reviewer this sums up the reason why this Flora is so valuable: if Hylander has not followed a well-known classification, arrangement or concept, there is a considered reason. In *Carex*, and one may be forgiven in referring so frequently to that genus as it takes up almost one-third of the book, the first thing that is 'different' is the arrangement of the species and the circumscription of the Sections into which they are placed. The relationship of the species to one another is a problem which besets all regional monographers of this large genus; and it will not be solved until the genus is monographed again on a world basis. However, it is interesting to see Hylander's views.

He places *C. lasiocarpa*, *C. hirta*, *C. pseudocyperus*, the *vesicaria* group and *C. riparia* and *acutiformis* in one Section, the *Paludosae*. They are placed at the end of the genus and presumably considered the most advanced, an opinion with which I agree as they all show a specialized inflated utricle to aid water dispersal of the seed. I do not understand on the other hand why *C. dioica* and *C. parallela* (Sect. *Dioicae* Tucker.) are placed in subgenus *Vignea* and not subgenus *Carex*, or why subgenus *Primocarex* is maintained for the *pauciflora*, *capitata*, *pulicaris* and *rupestris* groups.

At the species level the 'differences' are not so outstanding. It is interesting to note that *C. polyphylla* is placed as a subspecies of *C. divulsa* [subsp. *leersii* (Aschers. and Graebn.) W. Koch], and indeed there is much to be said for this. I feel if this policy is taken then perhaps both *C. spicata* and *C. polyphylla* should be subspecies of *C. muricata*. Hylander describes a new subspecies of *C. muricata* (which he calls *C. pairaei* F. W. Schultz), namely subsp. *borealis* Hyl. It is more robust than the type with a wider leaf and larger inflorescence. The most distinguishing difference is the colour of the female glumes which are a darker brown with a green midrib and which show up against the paler green immature utricle. It appears to replace subsp. *pairaei* (i.e. *C. muricata* subsp. *muricata*) in the northern part of the species range.

What has been said for *Carex* could be said similarly for Orchidaceae and the other big genera. Hylander's concept of genera in orchids is not always consistent. *Hammarbya* is recognized as distinct from *Malaxis*, but it is doubtful whether, had the author seen material referable to *Malaxis* from a world-wide range, he would have singled out *M. paludosa* as a distinct genus. Yet on the other hand he includes *Lysiella* and *Limmorchis* in *Platanthera*. Hylander makes several new combinations and new taxa at varietal and

formal level, in *Dactylorhiza*, *Betula* and *Populus* especially; one wonders if all are worthy of taxonomic recognition, especially where nothomorphs of the *Betula* hybrids are concerned.

Hylander follows a Code of Nomenclature which is not always that followed by other botanists and he states his differences in the preface. This is unfortunate but in spite of it the next volume of the *Nordisk Kärleväxtflora* will be awaited eagerly and all must hope that there will not be as long to wait between that and the present volume as between Volumes I and II.

A. C. JERMY

Tropical Plant Types. B. G. M. Jamieson and J. F. Reynolds. The Commonwealth and International Library. Pergamon Press, Oxford 1967. Price in U.K. £2 10s. (hard cover), £2 (paper).

A taxonomist should not be misled into thinking this book deals with type-specimens. It is in fact a traditional type of botany textbook 'to meet the requirements of the Cambridge Overseas Advanced Level Biology Examination', as the Preface states, with many of the examples taken from the tropics. Its qualities need to be judged in relation to this declared aim of providing students in tropical countries with tropical species to study in their own neighbourhood.

The object is achieved to a large extent and it is good to find real attention being paid to the tropics. Even so, one has the feeling that the text is written from a temperate point of view with tropical examples substituted for temperate species. Several temperate types remain; for instance *Fucus*, and not *Sargassum*, is taken as the type of the Phaeophyta, *Psalliota hortensis*, and not *Volvariella volvacea*, as a Basidiomycete; *Ranunculus* is used for the anatomy of the root instead of a typical tropical genus, and the only example of heterostyly given is that of *Primula* even though it is stated that 'heterostyly is remarkably widespread and has been shown to occur in seventeen families'—it would have helped teachers if some of these such as Rubiaceae (e.g. *Mussaenda*, *Psychotria*) had been mentioned.

Several incorrect botanical names have slipped through in the text such as *Bougainvill(a)ea* and *Encephar(c)tos*.

The beautiful illustrations by Miss P. Fawcett are a great asset to the book. They are technically accurate and skilfully drawn but it is unfortunate that some of them have been over-reduced, such as Figs. 54 and 55 of *Dryopteris* where the real beauty is lost, and others where the points of interest are so small as to be hard to see.

It is to be hoped that students will be encouraged to look around and to make their own investigations on the fascinating wealth of morphological adaptations available in tropical plants. Much of this basic work remains to be recorded (as is shown by the recent paper by J. Jenik, in *J. Linn. Soc. (Bot.)* 60, 25–29 (1967), on root adaptations in West African trees) and if Jamieson and Reynolds' text-book stimulates the reader in this way, as well as enabling him to pass examinations, it will have more than succeeded.

F. NIGEL HEPPER

Index to Botanical Monographs. D. H. Kent. Pp. xi+163. Academic Press, London and New York (for B.S.B.I.). Price £2 2s. 0d.

Since Dandy's *List of Vascular Plants* displaced Druce's *British Plant List* as the authoritative check list of British plants, botanists have lacked two sources of information found in the latter work—the lists of casual aliens and the list of critical papers on the British flora. Mr. Kent's publication now replaces the latter and will be very welcome, especially to amateur botanists. Whether it will really be widely used by 'botanists undertaking a taxonomic revision', as claimed by the front flap, is doubtful; most botanists undertaking taxonomic revisions do so either because no previous monograph exists or because they are familiar with such as do exist and have found them to be manifestly inadequate. My own view of this book is that it will be tremendously useful to botanists attempting to name plants which they have collected. I cannot help but feel, incidentally, that the fact that the botanical monographs listed apply to British wild plants should have been made clear on the dust cover as well as on the title page. The word 'wild' has been interpreted in the sense of 'not deliberately cultivated', and thus the publication will be a 'must' for the alien-hunter—a breed obviously well to the fore in Mr. Kent's mind when making his compilation.

It is, of course, always easy to find omissions in such a work, and the compiler is as aware of this fact as anyone. Nevertheless, one has the impression that had Mr. Kent's typescript been circulated a little more widely before going to press, there could have been far fewer of these than there are at present. The omission of some references to well-known and useful papers on British native plants is odd—for example Elliston Wright's *Journal of Botany* papers on *Sagina*. Important papers or revisions very relevant to aliens are missed. For example, Davis' 'Revision of the genus *Calotis*' is included, but not Anderson's 'Revision of the Australian species of *Bassia*' (an equally frequent genus of wool aliens), also in *Proc. Linn. Soc. New South Wales* (Vol. 48, pp. 317–355; 1923). Jaubert and Spach's monograph of *Cicer* is cited but not the much

more recent one of Popov, in *Bull. Appl. Bot., Genetics & Plant Breeding*, Leningrad 21:3-239 (1929). Dudley's very useful paper on *Alyssum* sections *Meniocus* and *Psilonema* in *Journ. Arnold Arboretum* 46:181-217 (1965) differentiates numerous annuals occurring in Britain as casuals, but is omitted; while Nyárády's work on the perennials of section *Odontarrhena* (in papers difficult of access) is included, although rarely if ever likely to be used by British botanists. Other similar examples spring to mind during a casual browse through the book.

Errors are few; however, it might have been as well, in equating *Kohlruschia* with *Petrorhagia*, to add *Tunica* also—for although Dandy transferred *Dianthus saxifragus* L. to *Kohlruschia*, this naturalised species is still perhaps best known to amateur botanists as *Tunica saxifraga* (L.) Scop. Misprints are likewise few and obvious, ranging from the Welsh-sounding 'Pesga llinaceous' on p. 43 to 'Onagearum' on p. 77, which sounds like a group of hybrids between willowherbs and wild donkeys!

Finally, it is a pity that Mr. Kent does not indicate in his Introduction whether in fact he 'closed his books' on 31 December, 1966, so that one might know at what point any future supplement is to begin.

The price will appear high to all still unaccustomed to the blatant excesses of certain continental publishers, but the compiler is presumably not to blame for this, and we can only offer him our thanks for a time-consuming and rather tedious task performed with characteristic diligence.

C. C. TOWNSEND

Deadly Harvest. John M. Kingsbury. Pp. 128. George Allen & Unwin Ltd., London, 1967. Price £1 1s. 0d.

The purpose of this book is summed-up by the author in his introduction: 'To mount a small campaign for better understanding of poisonous plants; to create a better-informed public so that poisonings may occur with less frequency despite the move to suburbia; to make the dimensions of the problem more generally known; to encourage the undertaking of significant research.' This, it should be said at once, was written in the U.S.A.—the book is an English reprint of one published in the States in 1965. To judge from the evidence presented, plant poisoning, of humans no less than animals, is a bigger problem there than here. Nor need we be surprised. We benefit from a few thousand years of tradition based on experience of the plants around us; the Americans are still colonizing into lands where most of the plants have only received names in the past couple of centuries. The mobility of the human population over a vast area with a vast flora must also create problems unknown to us with our cosy little 2,000-odd species.

This having been said, it will be appreciated that parts of this book will be common knowledge to English readers, other parts will be read with no more than general interest or even amused detachment. But it is a good little book and worth reading. It reviews the hazards of plant poisons ('plant' here including fungus) under various headings, with constant reference to particular species, many of which will be familiar to readers in this country. As befits one who has already published a systematic textbook of toxic plants, the author writes in a scholarly and accurate manner, marred by only occasional slipshod terminology—'plant' where he means 'genus', and 'molecule' for 'compound'. His admitted preoccupation with poisoning unfortunately shuts out any reference to the beneficial uses of poisonous plants in medicine. Yet surely it is no accident that these same plants yield valuable drugs: for a compound, or a plant containing it, that is not fairly toxic is, *ipso facto*, bereft of pharmacological activity. The book is attractively illustrated with many small but good plant drawings; the few photographs are almost indecipherable.

D. P. YOUNG

The Elements of Biometry. Kenneth Mather. Pp. x+193. Methuen & Co. Ltd., London, 1967. Price £1 15s. 0d.

The term biometry was introduced some 35 years ago to cover the statistical treatment of measurements on organisms. Since that time, and especially within the last decade, there has been a great increase in the use of mathematical techniques for the evaluation of biological data. Many of these modern applications are concerned not so much with the analysis of experimental data and the testing of hypotheses, as with the use of quantitative data to assess similarities or other functions with a view to improving on an intuitive judgment; what might be termed the quantification of biology.

It could be argued that such aspects properly come within the province of biometry, though there is a substantial body of opinion which still prefers to restrict the use of this term to the statistical or probabilistic approach. Although Professor Mather defines biometry as 'quantitative biology', it is clear that he holds this latter view.

The first half of his book is concerned with the analysis of variance. This is a very readable account which sets out clearly the mechanism of the process. The worked examples should facilitate the interpretation of the procedure for any set of comparable data. A further 30 pages are devoted to the design of experiments

and the methods which can be used to assess the various results obtained from replication, randomization and factorial designs. It is unfortunate that no indication is given of how to deal with missing data, since this is not especially complicated and is one of those problems which an experimenter is likely to meet. The discussion of the relationships between two variables is essentially confined to simple regression and it is surprising that no mention is made of the correlation coefficient; indeed, covariance is hardly mentioned. Although multiple regression is expressly excluded, it is a pity that reference could not have been made to recent works where this and other multivariate techniques are discussed in some detail.

Methods for the analysis of frequency data cover the use of χ^2 where there are several categories for the variable and the author derives the special case of the 2×2 contingency table. The book continues with a chapter on the estimation of parameters. While it is true that in certain aspects of biology this can be an important topic, this section involves by far the most advanced mathematics of the entire text, and its inclusion at the expense of other aspects is rather surprising. One could, for example, have included a brief discussion of ranking methods.

The author draws a considerable number of his examples from genetics, a field in which the statistical applications of biometry are of considerable importance; certain of the terms used may well cause a non-geneticist to reach for his glossary! There are also a number of instances of rather casual phraseology. The paragraph on p. 28 introducing the data on *Primula sinensis* is a case in point, where the words 'pin' and 'thrum' are used where the usual expressions are 'pin-eyed' and 'thrum-eyed'; while 'pin-flower' may be acceptable, surely 'pin-plant' (Fig. 5, legend) is not. Although the word 'family' is used here in its genetical connotation, it would seem that the situation could be explained more clearly if it were stated exactly what groups of plants were being dealt with. It would seem improbable that there is any chance of 'a progeny being pin and thrum'; this type of phrase in a different context appears also on p. 139. One must deprecate the phrases 'more strictly correct' (p. 139) and 'work to be expended' (p. 177). It seems unfortunate that it was not possible to ascertain the specific epithet of *Pharbitis* in the examples on pp. 146 and 162. *Pharbitis*, as the name of a genus, is not a plant (p. 146) and it is difficult to see how it can have a genetic complement.

Typographical errors are few; most are self-evident, though it may take a few minutes to discover that $= 2yB3$ in Table 7 should presumably read $+ 2yB3$. The index is not very efficient, chiefly because of a tendency not to index the paragraph headings. Thus the first reference to 'Normal distribution' is to p. 13, though the paragraph and introductory discussion commence on p. 10. It is surely undesirable to use Σ for summation instead of the conventional Σ ; there is a failure to distinguish between logarithms to base 10 and to base e (especially on p. 132). In a book clearly aimed at beginners, it would surely have been possible to have indicated somewhere the pronunciation of the Greek letters used—how many could read the equations on p. 133?

By taking a restricted view of biometry, Professor Mather has written a book which is in direct competition with a number of texts on the simpler aspects of biological statistics which have appeared in recent years, most of which go rather further into the subject than he does. It may well be that his book will be found sufficient for those biologists, especially in schools and on some undergraduate courses where the concern is chiefly with the experimental aspects of simple populations and a few variables. For many, however, especially those with leanings towards ecology and taxonomy, where it is necessary to consider more elaborate methods adapted to deal with more variables and where comparisons are of more importance than tests of significance, this book will serve as only a very limited introduction to biometry. It is the more unfortunate that there are not even any indications where this additional information may be found.

R. B. IVIMEY-COOK

Vascular Plants: form and function. F. B. Salisbury and R. V. Parke. Pp. 184. Macmillan & Co. Ltd., London. 1964. Price 12s. 6d.

Reproduction, Heredity and Sexuality. S. A. Cook. Pp. 117. Macmillan & Co. Ltd., London. 1964. Price 12s. 6d.

Plants and Civilization. H. G. Baker. Pp. 183. Macmillan & Co. Ltd., London. 1964. Price 12s. 6d.

These books are three volumes out of a series of seven known as the 'Fundamentals of Botany Series' which were originally published in the U.S.A. and which aim, between them, to provide an introduction to all the main aspects of plant science. Each volume is complete in itself, yet there is very little overlap between the volumes as a whole, and it must be said that they achieve a very consistent level of presentation. Each volume is freely illustrated, though in some the photographs could be of a higher standard e.g. the illustrations on pp. 58, 59 in *Vascular Plants*.

American botany books naturally draw their examples from American flora and fauna, and this limits the use of the books in other countries. *Ranunculus adonaeus*, for example, is a buttercup unknown to Great Britain and a genus like *Hymenoxys* is equally unheard of. Similarly words like 'corn' are used which do

not have the same meaning in the U.S.A. and Great Britain, while there are others like 'forb' that are rarely used here. Incidentally, *Drosophila* does not 'rise in clouds from over-ripe fruit left in the kitchen or garbage can' in this country.

The classification of the plant kingdom given in *Vascular Plants* may well be unfamiliar to British readers, and in the accompanying text there is confusion between members of a genus and the generic name itself, as in passages like '*Ephedra* (a shrub . . .)' and '*Araucaria* (the Monkey puzzle tree . . .)'. The possible evolutionary relationships of the angiospermous families are taken from the work of Bessey, and include the lumping of several families into the *Amentiferae*, an arrangement now usually abandoned. But these are minor blemishes on a book which succeeds in relating structure to function exceedingly well and giving, at the same time, an excellent account of many of the most important aspects of plant physiology. There is a good account of the primary and secondary plant bodies, their growth and differentiation, as well as an introduction to cell structure. Chapters follow on the ascent of sap and transpiration, translocation and the activity of the root. The structure of the flower is described together with the physiology of flowering, and there are chapters which deal with the fruit and seed and the physiology of germination. The book also manages to include, here and there, brief mentions of some of the experimental work on which many of the modern views are based.

Reproduction, Heredity and Sexuality commences with a sound introduction to Mendelian principles, and follows it with an account of the gene and its mode of action. The role of recombination in sexual reproduction and its importance in evolution is stressed. The part played by asexual reproduction and apomixis in the life of plants is covered in a further chapter. Finally, the control of recombination and the evolution of genetic systems is briefly outlined. The book draws its examples widely, ranging from the bacteria and fungi to the higher plants. Concisely written, the book covers a wide field yet concentrates on the essentials. More illustrations and some expansion of nature of the evidence for the statements written would have enhanced the value of this book.

Plants and Civilization is a fascinating introduction to the uses of plants by man from prehistoric times down to the present day. It is particularly valuable to the English reader for the frequent mention it gives of early agricultural practices in the Americas. The vast amount of archaeological knowledge of the Old World is, in consequence, a little neglected, but this is well documented elsewhere. There are chapters concerned with major grain crops like wheat and maize. The account of maize is particularly good, for it gives a complete picture, describing its probable origin, genetics and modern development. Wheat genetics are also mentioned, and in this way the book is linked with the others in the series. There is, however, little link with any biochemistry or plant physiology; here an opportunity has been missed. Further chapters give account of the origins of the chief beverages, the uses of trees and the preparation of drugs and dyes. The book ends with a mention of possible future uses of plants and a plea for the conservation and right use of the world's plant resources.

Each book is well indexed and there are good glossaries and lists of books for further reading.

C. T. PRIME

The Biology of Aquatic Vascular Plants. C. D. Sculthorpe, Pp. xviii+610. Edward Arnold. London. 1967. Price £6 6s. 0d.

In 1920 the Cambridge University Press published a book by Agnes Arber entitled *Water Plants, a study of aquatic angiosperms*. This book has become a classic and is often considered to be the best book written on a botanical subject, an opinion borne out by the fact that it was reprinted in 1963 and still continues to sell. Since 1920 an enormous quantity of work on aquatic plants has been published which has sometimes shown parts of Arber's book to be in need of revision. Mr. Sculthorpe has wisely not attempted a revision of Arber's book, but has written on almost the same subject a completely new treatise which in 15 chapters attempts to cover the morphology, physiology, breeding mechanisms, geography, ecology and applied aspects of aquatic vascular plants.

The first chapter, entitled 'The salient features of aquatic vascular plants', is the worst in the whole book, and in many ways it is a pity it was included as it contributes very little to an otherwise very useful book. The first part of this chapter is devoted to avoiding any precise definition of aquatic vascular plants; it is pointed out, however, that emergent plants of saline habitats, such as *Salicornia* and the mangroves, are excluded. The next part of the chapter is an account of the various classifications of vascular hydrophytes according to life forms and growth forms. Hejný's 1960 classification is rejected because only three groups (euhydatophytes, hydatoaerophytes and tenagophytes) were recognized. This, unfortunately, is not correct: Hejný (1960) recognized no less than 10 major and about 50 minor groups and, in my opinion, produced by far the most practical and useful ecological classification of hydrophytes. After dismissing Hejný in one sentence the author then suggests a classification of his own (with 4 major and 3 minor groups) in which

species such as *Eichhornea crassipes* (Mart.) Solms and *Ceratopteris cornuta* (Beauv.) Lepr. could be placed in each of his major groups. The next part of the first chapter is called 'zonation of aquatic vegetation' but is largely a list of names of phytosociologists; page 13, for example, contains 94 reference citations to ecological (phytosociological) work but without any indications as to which of these references are worth reading—no claims are made that this list is complete. The last part of this chapter is on the systematic distribution of vascular hydrophytes and is, perhaps, the least satisfactory part of the whole book. Extracting information on systematics is not difficult, but a critical evaluation is needed and this is just what is not provided; a little time spent looking at herbarium specimens in one of the major herbaria would have enabled the author to avoid many of the more obvious pitfalls. For example, the Elatinaceae and Haloragaceae would never have appeared in the list of exclusively aquatic families. The latter family comes in for an extraordinary circumscription: 'The Haloragaceae *sensu stricto* (i.e. without the gigantic *Gunnera*).' This presumably means that the author chooses to recognize the Gunneraceae Endl. as a separate family (not stated in the text), and not that *Gunnera tinctoria* (Molina) Mirbel (the best candidate for the gigantic *Gunnera*) is to be excluded from the Haloragaceae while the other 32 smaller species of *Gunnera* are to be left in (most species of *Gunnera* are small prostrate herbs).

The second chapter is very much better than the first and deals with the salient features of the aquatic environment. Useful conversion tables are given on pages xi and xii for readers unfamiliar with the metric measurements adopted in the text, some of which, for example metric tons per hectare and cubic metres per minute, are not yet widely accepted in English language publications. The next four chapters discuss the structure and physiology of emergent, floating and submerged plant organs. These are then followed by one chapter on the free-floating habit and another on vegetative polymorphisms. Sexual and asexual reproduction are dealt with in the next two chapters. These nine chapters, the central core of the book, cover a very large amount of information and this has been achieved by adopting a very terse style of writing which requires a considerable amount of concentration by the reader.

The eleventh chapter is on the geography of aquatics. It suffers from some of the same faults as the first chapter, namely, that there are too many statements based on inadequate taxonomy. Perhaps the worst feature is that it is not pointed out to the reader when doubts among taxonomists exist. One must not assume that the latest publication is necessarily the best. A good example is the treatment of the genus *Lemna* where the author has accepted piecemeal the taxonomy of Daubs (1965). As a taxonomist I have no confidence in this work and prefer to follow the much earlier monograph by Hegelmaier; but until taxonomists start criticizing each other's work a little more publicly it is difficult for a newcomer to a particular plant group to know which treatment to adopt.

The last four chapters of this book I found the most interesting and readable. The first of these deals with productivity in hydrophyte communities and the interactions between hydrophytes, their environment and other aquatic organisms. This chapter is followed by two on aquatic weeds and their control. The sections on *Eichhornea crassipes*, *Salvinia auriculata* Aubl. and the problem of sudd obstacles are particularly well presented. The final chapter is a short summary of the aesthetic and economic value of aquatic vascular plants. In many ways I feel that it is a pity the last four chapters were not enlarged and presented as a separate book.

The information in this book is taken almost entirely from published work, with the consequence that many fallacies are reiterated without alteration. For example, on page 131 there is a section on the lack of lacunae in the Podostemaceae; to me this lack seemed unreasonable so I cut some sections of *Apinagia richardiana* (Tul.) van Royen and *Mourera fluviatilis* Aubl. which I have in my own collection and found them both to have well developed lacuna systems. It must, however, be admitted that the much smaller species *Tristicha triflora* (Bory) Spreng. appeared to be without lacunae. Also the generalization that the Podostemaceae have 'minute aerial flowers' (page 283) is not true. *Brasenia* which the author places in the Nymphaeaceae is somewhat misunderstood: firstly, it is apocarpous (page 272), secondly, it is not 'confined to primitive tropical rain-forests and swamps' (page 273) and thirdly, the illustration of its leaf (page 74) is not representative. The condensed style of writing often leads to controversial but unqualified statements; an example is: 'some members of the Pontederiaceae show a trend towards zygomorphy and heterostyly'. This may well be true but I am sure the evidence presented by the genera *Heteranthera* and *Zosterella* is that the trend is away from zygomorphy and heterostyly.

The price is very reasonable for a specialist book of this length and quality. There are many photographs and line drawings which, on the whole, are excellent. The presentation of the book is very good and it is remarkably free from misprints. This does not mean that the book is free from mistakes but most mistakes are not primarily those of the author but of the workers he quotes. Except, perhaps, for the last four chapters the material contained in this book is not really reviewed—it is presented as a collection of summaries and as such it is valuable, but it is rarely stimulating. Very little detailed information can be obtained from the text without recourse to the original references, but the bibliography, which runs to 57 pages, is

absolutely magnificent. To anyone with an interest in aquatic plants this a source-book *par excellence* and in this respect without equal, but I hesitate before recommending it to general biologists or amateur botanists.

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- DAUBS, E. H. (1965). A monograph of Lemnaceae. *Illinois Biol. Monog.* **34**, 1–118.
 HEJNÝ, S. (1960). *Ökologische Charakteristik der Wasser- und Sumpfpflanzen in den slowakischen Tiefebene (Donau- und Theissgebiet)*. Slowak. Akad. Wissen. Bratislava.

C. D. K. COOK

Since writing the above review two highly critical reviews of Daubs's (1965) Monograph of Lemnaceae have come to my notice. They are:

- CLARK, H. L. & THIÉRET, J. W. 1966. *Sida* **2** (6): 437–438.
 DEN HARTOG, C. 1967. *Blumea* **15** (2): 575–576.

Britain's Green Mantle: Past, Present and Future. A. G. Tansley. Second Edition, revised by M. C. F. Proctor. Pp. 327, with 12 line drawings, 72 plates with reproductions of 140 photographs in black and white, and frontispiece in colour. George Allen & Unwin Ltd., London. 1968. Price £2 10s. 0d. (in U.K. only).

Britain's Green Mantle, first published in 1949, was written by the late Sir Arthur Tansley for non-technical readers. He included as much of the material in his classic *The British Islands and their Vegetation* as 'might be of interest to all who love our wilder countryside', and provided a popular account of the more important plant communities in these islands.

The rapid changes during the past twenty years necessitated thorough revision for the second edition, and it is greatly to the credit of the editor that this has been done so skilfully that it still remains essentially the same book, and few readers are likely to detect the additions. The most obvious changes are in the printing and illustrations, and in both respects the new edition is a great improvement. The book first appeared under post-war austerity conditions with 294 pages of crowded print on yellowish paper, but the new volume printed by Jarrolds in 11 point Baskerville type is a first-class production. The photographic illustrations show a comparable advance. Those in the first edition were mainly familiar pictures used to illustrate early ecological works and fell short of modern technical standards. Fortunately it proved impossible to trace copies of the original photographs and a new set of illustrations had to be found; many were provided by the editor himself. These rank amongst the best pictures which have ever been used for an ecological work in this country. Regrettably some of them have been printed so that it is necessary to turn the book sideways, and there is even ambiguity in some captions (*e.g.* page 176), and very few give the scale. To readers unfamiliar with the species portrayed these are serious disadvantages.

In the text the most extensive changes are in the chapter on mountain vegetation (where Dr. Proctor seems more at home than Sir Arthur did), and the new chapter on Conservation and the Future which has replaced one now hopelessly out of date. The first edition appeared in the same year as the Royal Charter establishing the Nature Conservancy, of which Sir Arthur Tansley was the first chairman, and the great progress in conservation since then is a tribute to his pioneer efforts.

It is unfortunate that this book, which is unlikely to be superseded for very many years, should appear at a time when the nomenclature of the flowering plants occurring in Britain is in a more chaotic state than ever before in living memory. Dr. Proctor states that he has used the names in the second edition of the *Flora of the British Isles*, 1962, but he is not consistent, and users of that work will look in vain for such a then well-known name as *Chamaenerion angustifolium*. In any case there have been so many changes in the last six years that many names in that work already seem unfamiliar. At the present time writers are faced with the choice between the *British Plant List* with amendments in the *Proceedings of the B.S.B.I.*, the second edition of the *Excursion Flora, Flora Europaea* so far as it has appeared, the *Critical Supplement to the Atlas of the British Flora* and the innovations in other recent books such as Dony's *Flora of Hertfordshire*. While these conditions prevail it is perhaps wiser for writers on ecology to take their names from a descriptive flora where the meaning will always be clear, rather than to adopt the latest name which may prove to have only a brief currency.

Britain's Green Mantle was written for the benefit of the general public but a considerable knowledge of the British flora is essential if it is to be understood. The work is of the greatest value to field botanists who are not primarily ecologists, and to students of ecology who require a short general account of our main communities. To these readers this well illustrated and up-to-date second edition is to be most warmly recommended.

J. E. LOUSLEY