

AUSTRALASIAN
HERBARIUM NEWS

NO. 11.
DECEMBER 1952.

PUBLISHED HALF-YEARLY BY THE SYSTEMATIC BOTANY COMMITTEE OF
SECTION M (BOTANY) AUSTRALIAN AND NEW ZEALAND ASSOCIATION
FOR THE ADVANCEMENT OF SCIENCE.

ANNUAL SUBSCRIPTION: Seven shillings & Sixpence.
(U.S.A. ONE DOLLAR)

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AUSTRALASIAN HERBARIUM NEWS.

A journal for the interchange of information
among the systematic botanists of Australia
and New Zealand.

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AUSTRALIAN COLLECTIONS
in the
OXFORD UNIVERSITY HERBARIA.

Australian Herbarium News, No.2., March 1948, contained some reference to Australian plants in Oxford collections. It is hoped that the following notes may be helpful to Australian taxonomists in assessing the importance of these collections and deciding whether, when engaged upon the revision of genera, they should consult them, either in person or by loan. Specimens are willingly loaned to responsible herbaria for the use of research workers.

The Department of Botany at Oxford has recently moved to new buildings from the cramped quarters that it occupied at the ancient Physic Garden. The break with a tradition extending over 330 years was not lightly made, but extension on the old site was impossible. In the new building there are two herbarium rooms, each 55 x 22 ft., together with ancillary rooms. One of the rooms is occupied by the Forest Botany Herbarium under the care of Mr. Hoyle. It is largely, but not exclusively, occupied in the study of woody plants, particularly from the tropical colonies. The second room holds the British Herbaria, now incorporating the collections of George Claridge Druce who left his herbarium, library and an endowment of over £30,000 to the University. This herbarium is under the care of Dr. E.F. Warburg. The same room also houses the Fielding Herbarium, in which Australians are likely to be most interested.

This herbarium is based upon the collection of Henry Fielding who died in 1850, but it is also the general herbarium of the Department. While, for various reasons, it cannot be allowed to grow indefinitely, it is of some size, now containing approx. 335,000 specimens. Fielding was a gentleman of independent means living at Lancaster and a friend of Sir William Hooker. With Hooker's advice, he bought some famous herbaria as they came on the market in the first part of the XIXth century: notably the collections of Prescott and Haworth. He also subscribed to various collecting expeditions and consequently received sets from them. Unfortunately herbarium practices of those days did not recognise the importance of keeping such things as collector's original labels. Fielding's desire, in many cases, seems to have been that of wishing to have neatly mounted sheets with a beautifully written label. Specimens that seemed to him to have been scrappy or otherwise indifferent he appears ruthlessly to have thrown away. Thus many of the S.African succulents which must have been in Haworth's collection were destroyed.

For some time past Mrs. H.M. Clokie has been engaged on making a catalogue of the collections and the collectors represented in the Fielding Herbarium. It seems possible that, with the present activity of taxonomic botanists in Australia, it would be helpful if the whereabouts of other classic early Australian collections, besides those at Kew, the British Museum and at Cambridge, were more widely known. Thus A.T. Lee in her revision of the genus Swainsona (Contrib. N.S.W. Nat. Herb.I, No.4.p.240, 1948), has a note on S. canescens which suggests that it might have been

helpful had she seen Drummond's No. 268, (Cyclogyne canescens) of which there are two good sheets at Oxford. There are also half a dozen collections of Swainsona by Fraser before 1838, some vaguely localised as "plains of the Interior", but others stating "banks of the Macquarie River", "the Hastings River" and "the Melville Hills". Incidentally, there is also in my own herbarium a specimen of S. viridis J.M.B., also, I fear, "imperfect", but the specific epithet is in Black's hand-writing. Mr. Black went through the greater part of my collections and always had any duplicates that he wanted for his herbarium.

The principal Australian collections here, the whereabouts of which it might be helpful to Australian taxonomists to know are as follows:-

Leschenault de la Tour - Baudin's Expedition - 1802-1804, about
150 specimens.

Charles Fraser, chiefly N.S.W., but some W.A. and Tasmania. 1816 - 1831,
about 500 specimens.

Allan Cunningham. Many now unlocalised but others labelled N.S.W.,
Queensland, W.A., 1816-1839, over 500 specimens.

Franz Siever, Fl. Novae Holl., 1823, about 400 specimens.

R.C. Gunn, chiefly Tasmania, 1829-81, over 1000 specimens.

J. Milligan, Tasmania, 1830-60, about 150 specimens.

James Anderson, N.S.W., 1835-1842, about 500 specimens.

James Drummond, W.A., 1829-1863, about 1500 specimens.

William W. Spicer, Tasmania, 1870-1871, about 800 specimens.

T.G.B. OSBORN,
Oxford.

MEETING OF HERBARIUM CURATORS, U.S.A.

At Cornell University in September, about 100 herbarium workers met to discuss curatorial problems. In the discussion on recruitment of new personnel, two difficulties emerged, 1. finance, 2. availability of suitable workers. A suggestion to help with the first difficulty was that a definite effort should be made to make herbaria more generally useful and to integrate the activities more closely with those of the institutions (in U.S.A. mostly Universities) of which they are part. In regard to the second problem there seemed to be less difficulty in getting graduates than in recruiting non graduate workers for tasks such as mounting and labelling. This work is generally regarded as too menial for graduates and too skilled for unskilled workers. At the graduate level women are taking over curatorial work in a few American herbaria. They do no teaching but do engage in research. There is division of responsibility, one being responsible for exchanges.

A proposal for photographing all American type specimens was discussed at some length. The general feeling was that there would be two main difficulties, 1. selection of actual types and finding them in herbaria, 2. determination of whether only whole sheets should be taken or whether close-ups of details should also be included. This was thought to be desirable but would introduce the further difficulty of determining what parts of what specimens should be photographed. The Bailey Hortorium already has many type photographs available on an exchange basis.

There was lengthy discussion on loans. Fairly general agreement was reached on the following points:-

1. Loans should be returned in the original packages to reduce danger of damage in transit.
2. Every sheet should be annotated by the borrower; annotation slips should be neatly affixed to the sheets and should not be offensively large; direct annotations on sheets should be kept to a minimum and should be made neatly; surname of annotater should be given in full.
3. Requests for loans of all material from one particular geographical region were frowned on because of the work involved in extracting the specimens from a large herbarium. It was suggested that the borrowing institution should pay a graduate student to sort out such material.
4. Loans should be returned complete; partial returns were not favoured, particularly by the large herbaria, because of the amount of clerical work involved.
5. Except in very special circumstances, loans would be made only to recognised institutions and not to individuals as such.

Curators of some large herbaria mentioned the high cost of preparing loans for shipment. At Berkely for an average loan the cost of preparation and shipment amounts to about 20 cents per sheet.

In a discussion on the exchange of information on special research problems, favourable mention was made of Australian Herbarium News. The opinion was expressed by more than one of the American botanists that a similar unpretentious periodical would meet a real need in the United States.

Fumigation was talked about at some length. Techniques using aerosols, lindane, chlordane, ethyl formate and methyl bromide were mentioned as well as fumigation by heat which is standard procedure in several large American herbaria.

Dr. Keck from New York described a system of mounting using liquid plastic instead of straps. I saw some of the specimens mounted by this method and they appear to be equally as good as those mounted with linen or paper strips. The method is very much faster than strapping. I have the formula and hope soon to have samples of the necessary materials through local agents. For fine aquatics, it was stated that cellulose acetate dissolved in acetone to a watery consistency is satisfactory if painted on.

It was suggested that bulk buying of mounting paper and fragments folders might be considered as a means of reducing the cost of these expensive items.

Dr. Just proposed that an approach should be made to the National Science Foundation for a grant of 1,000,000 dollars to finance a comprehensive treatise on all plants and animals in the world down to generic level. He stated that this work should be carried out by American workers. The response did not seem to be particularly warm.

Apart from the questions discussed and those left unaired the meeting was a splendid opportunity to meet herbarium workers from all over U.S.A.

S. L. EVERIST,
Brisbane.

The Sydney Meeting of the Systematic Botany Committee held during the A.N.Z.A.A.S. Conference, August, 1952.

From the minutes of the above meeting the following items may be of general interest.

Visit of Dr. Melville: From the chair Dr. Patton welcomed Dr. Melville of the Kew Herbarium and expressed the Committee's good wishes for his visit to Australia. Dr. Melville in acknowledging Dr. Patton's remarks stated that he would be glad to co-operate in any way especially with regard to the assembling of information for the proposed Type Register.

Robert Brown Mss: It was proposed that a letter be written to the Secretary of C.S.I.R.O. congratulating the Organisation on the micro-filming of some of the Robert Brown manuscripts and another through A.N.Z. A.A.S. expressing our appreciation and thanks to the Trustees of the British Museum for their co-operation and the loan of the documents for photographing at Australia House. Miss Burbidge's offer to check through the microfilm of the Prodrromus mss. before it leaves England was gratefully accepted.

Resignation of Honorary Secretary: The Committee regretfully accepted the resignation of Miss Burbidge from the post of Honorary Secretary. Miss Burbidge left Australia in October to take up the post of Australian Liaison Officer at Kew. Miss J. Garden and Miss J.W. Vickery, both of the National Herbarium of N.S.W., were elected as Honorary Secretary and Honorary Treasurer respectively.

A.H.N.: It was decided that the subscription rate for Australasian Herbarium News should be raised to 7/6d. for Australian subscribers, 7/6d. (sterling) for overseas subscribers and that it should remain at one dollar for U.S.A. and Canadian subscribers. Also that the Secretary and Treasurer should have the power to charge this rate for two (2) issues rather than as a yearly rate if they consider such action desirable.

J. GARDEN, Hon. Secretary,
Systematic Botany Committee.

NEWS AND NOTES FROM STATE HERBARIA.

Western Australia:

The Herbarium has been attached to the Agricultural Department as part of the Botanical Branch since 1924. This branch has recently been re-organised, the Assistant Government Botanist, two botanists and the Seed Laboratory staff being separated from the Herbarium as a distinct Branch of the Department, leaving the Government Botanist and one Botanist to carry out the duties associated with the Herbarium.

Western Australia Cont'd:

Work on a Monograph of the W.A. species of the genus Eucalyptus is proceeding and about one half of the species have been dealt with. It is hoped that the work will be completed next year. This volume will see the completion of that part of the Flora to be issued in the form of a monograph, and the remainder will be printed in a reduced form. Part 1 of Vol. 1. of the Flora (Gramineae) has recently been published.

Queensland:

Mr. S.L. Everist left Brisbane on July 30th to attend the 6th International Grassland Congress in Pennsylvania and returned on November 4th. He visited a number of American herbaria and attended a meeting of Herbarium Curators at Cornell University. He returned via Europe after visiting the herbaria at Kew, British Museum, Edinburgh, Leiden and Paris and the British Grassland Stations. On December 1st he left for New Caledonia and Fiji and is due back on December 16th.

Mr. S.T. Blake has nearly completed the preliminary work on a revision of the species of Melaleuca allied to M. leucadendra. While on annual leave, he attended the Sydney meeting of A.N.Z.A.A.S. in August, and later took part in the United Nations Eucalypt Study Tour while the party was in Queensland.

The heavy demands on time made by routine enquiries and determinations and weed control work has almost prevented any research work during the past six months.

Mr. R.W. Johnson and Mr. L. Pedley, former cadets, have been appointed to the staff and will take up full time duties in the near future.

Victoria:

Mr. A.W. Jessep and interested colleagues have founded the Australian and New Zealand Camellia Research Council. This body will deal with nomenclatural problems in the genus Camellia.

The botanical staff, Messrs. P.F. Morris, J.H. Willis, P. Bibby, R. Smith, Miss C. Skewes and Librarian Miss K. Kenna have attended to Herbarium routine. Lectures to students and the public have been freely given.

Dr. R. Melville, D.Sc., Ph.D. from the Royal Botanic Gardens, Kew, England is here to study our flora and has already collected in N.S.W., Victoria and Tasmania. Some thousands specimens collected are being prepared and will be forwarded to England for comparison with the type specimens. A duplicate set will be presented to the Melbourne Herbarium. Seeds of native plants suitable for cultivation are being collected for despatch to Kew, England, to grow in the new Australian House there.

Victoria Cont'd:

Among the many visitors welcomed were Sir G. Campbell, Scotland; Mr. G. Herlots, Colonial Office, London; Mr. G. Gilbert, Brussels; Professor de Phillipis, University of Florence; Dr. M.N. Ramashamy, Bangalore and Professor T.G.B. Osborn, Oxford University, who kindly exhibited the specimens collected by William Dampier on the west coast of Australia.

Recent publications include:

A Descriptive Guide to the Melbourne Botanic Gardens (Price 2/-).
Index Seminum; Melbourne Botanic Gardens.

Catalogue of plants growing in the Melbourne Botanic Gardens,
(Ready for Printing).

Work is proceeding on the Handbook of the Victorian Flora.

New South Wales:

A number of interstate botanists visited the Herbarium during the Sydney A.N.Z.A.A.S. meeting. Members of the staff prepared accounts of the vegetation and lists of species occurring in areas traversed on excursions led by botanists from the Herbarium.

Dr. R. Melville spent some days at the herbarium and in the Botanic Gardens. He confirmed the identifications of our material of Populus and Salix, identified material of Ulmus and checked names of coniferous plants cultivated in the gardens. Members of the staff took Dr. Melville on collecting trips to the Blue Mountains and the Hunter River Valley.

Mr. M.G. Gilbert of Brussels, formerly working in the Belgian Congo, spent some time in the Herbarium studying the Australian species of certain genera common to both countries such as Croton, Melia and members of the family Sapotaceae.

Mr. R.H. Anderson visited the Melbourne and Adelaide Botanic Gardens examining various phases of maintenance work in those Gardens and various parks in each city. He arranged for seeds and plants of a number of selected species not well represented in the Sydney Botanic Gardens to be provided in exchange for material grown here.

A library of color transparencies of native species is being prepared and in recent months some fifty sandstone species have been photographed in their natural habitats. It is intended to build up a collection of shots of outstanding species for all seasons of the year.

Miss M.D. Tindale's revision of the Australian members of the Cyatheaceae is almost ready for the printer.

BOOK REVIEWS.THE GENETICS OF GARDEN PLANTS.

By M.B. Crane and W.J.C. Lawrence Pp.301. London:
Macmillan and Co. Ltd., 1952, 4th ed. 20/-sterling.

* * * *

This is a newly revised edition of a valuable standard text first published in 1934; the authors are both on the staff of the John Innes Horticultural Institution in England, which is sufficient guarantee of an enlightened cytological outlook backed by much experimental work.

Garden plants are looked upon as things apart by many systematic botanists who are ready enough to identify native plants and ruderals, but lose all confidence when faced with the heritage of the world's garden plants which are such a universal aspect of every-day life. The reason, of course, lies in the great variability and multiplicity of forms (both natural and induced by man) among cultivated plants; most large groups require the knowledge and experience of a specialist before one can name species or varieties; even the confidence of the specialist may be built upon false foundations -- do we always understand what comprises a species? To take but one example, the conception of species limits has suffered many vicissitudes during the last two centuries in the history of the edible pea, Pisum sativum, a name still credited to Linnaeus, though somewhat changed in application since he gave it.

We have a fairly serviceable criterion of specific limits in the breeding behaviour of organisms; if they will not breed together to produce fertile true-breeding offspring they should be considered distinct species. Well-known exceptions are on record of two admittedly distinct species producing fertile true-breeding hybrids such as Primula kewensis and Aesculus carnea; however, when the cytological mechanism has been exposed it has made the explanation clear; such cases, we repeat, are unusual.

We cannot hope to have a reliable classification of any difficult, polymorphic, cultivated or natural group until we understand something more than its morphology, which may only leave us wondering where to make the species division in a series of graded forms with very distinct extremes. The geneticists, working in the first place on cultivated plants, have achieved considerable understanding of the kinds and causes of variation. There is no doubt that the same mechanisms are to be found among wild plants, where however, the number of variant types is generally less due to the action of natural selection, a process mitigated by man in the case of his cultivated plants. Therefore if the taxonomist is to do justice to his difficult groups - even among wild plants - he must become cognizant of these mechanisms. From this point of view, the origin and relationships of the various garden plants become a most absorbing story and one cannot fail to return to work on wild plants with a host of illuminating ideas gathered from it.

The interspecific F1 hybrid is an important type of individual to be able to recognize in a natural population; obviously we need more than subjective criteria, and they are to be had in the irregular cytological behaviour of the chromosomes at meiosis, in the frequent sterility of a proportion of the products of meiosis, and in the usually varied nature of the progeny of the hybrid. (The F2 generation). Other variants in a natural population may be due to polyploidy or aneuploidy, further phenomena requiring cytological proof. Then of course much variation is due to invisible gene differences which can only be demonstrated by more or less elaborate breeding experiments. The methods of cytology and genetics involve time and techniques which remove them from the province of the taxonomists; however, they are the tools by which his understanding is going to be built up and he cannot afford to ignore them in attempting to construct a sure basis of classification; he had better ally himself with cytologists and geneticists.

To return to the subject matter of "The Genetics of Garden Plants", we have stated the point of view of the taxonomist, which is to find out the kinds of cytological relationships known to prevail in various well-studied plant groups. There is also the point of view of the practical grower or breeder of orchard and garden crops, but it need not be elaborated here. The basis of the book is the chromosome complement of the various species, the principles of heredity and genetics, and those critical stages in the life-cycle of the individual -- meiosis and the events that follow leading to seed formation. Within this framework the authors discuss diploid and polyploid plants, numerous particular species and genera, grouped as ornamentals, vegetables, salads and fruits. Vegetative variation is dealt with, such as chimaeras and bud-sports, also the phenomena of sterility, heterosis, xenia and the artificial production of polyploids by colchicine and other methods. Then there is a chapter on the chemical and genetical basis of flower colour, which gives a glimpse of how genes must act by influencing the direction of chemical syntheses in the cell. The book is concluded with three useful appendices and an index, the appendices contain (1) a list of chromosome numbers of many cultivated plants, (2) a short glossary, and (3) a considerable bibliography, most helpful but inevitably leaving something to be desired in a rapidly advancing field.

The inside story of these garden plants so familiar to us makes this an enthralling and valuable book to the botanist, and we believe the systematist will emerge from reading it with a new feeling of mastery towards cultivated plants.

C. M. EARDLEY,
Adelaide.

FLORA OF THE BRITISH ISLES.

By A.R. Clapham, T.G. Tutin and E.F. Warburg. Cambridge University Press, 1952. - i-li, 1-1591.

* * * *

The authors state that this book "is intended primarily for students and amateur botanists who desire to gain an introduction to British plants and for botanists who are not taxonomic specialists". They may well be proud of their success not only in fulfilling this aim but in producing a model handbook which will be in frequent use by even "taxonomic specialists" and in countries far removed from Britain.

The new handbook is surely without a peer in botanical literature in the lucid presentation of a wealth of information, the provision of practical keys to often critical groups without neglecting essential characters, and above all in its accurate and up-to-date treatment, a rare virtue in Floras. All this is accomplished in a sturdy compact volume, very clearly printed in attractive type on good paper.

It is, of course, possible to produce a work of this standard only in a country with a limited and well-known flora which has been intensively studied, and it must be remembered that the authors' work rests on a firm background of taxonomic, cytogenetic and ecological studies by many botanists. Nothing really comparable can be expected in less-favoured countries for many years. One cannot, as sometimes naively supposed, sit down for a year or two and "write a Flora" of any worthwhile standard, unless the results of preliminary specialist investigations are available. Nevertheless Drs. Clapham, Tutin and Warburg have shown us how to combine the kind of keys descriptions and incidental information that general botanists want with the technical, classificatory and nomenclatural accuracy needed to satisfy taxonomists.

The Flora deals with all the vascular plants which occur native, naturalised, or as frequent adventives, in the British Isles. The arrangement is a modification of that of Bentham and Hooker, which, besides being usual in Britain, is certainly more nearly natural than the Engler and Prantl system more familiar in most of Europe, America and Australia. Orders families, genera and species (and often tribes, subgenera or sections, and infraspecific taxa) are all adequately described. British users, especially beginners, will surely find the artificial key to the families most useful. Artificial keys are provided also in certain "difficult" groups, for instance, the genera of Cruciferae, but are supplemented by synopses of the essential characters and natural arrangements. As is appropriate in a handbook, references are limited to standard works on the British flora and only the best-known synonyms are cited.

Specific epithets are decapitalised, but the traditionalist will find the capitalised form given as a synonym whenever it can be correctly used. The keys are of the dichotomous (rarely, and then obviously,

trichotomous) non-indented (number-reference) kind and those tested appeared practical and as free as possible from ambiguity.

The general distribution and scope of each family and genus is given. The specific descriptions are followed by notes on flowering period, pollination method, chromosome number(s) and breeding behaviour, life-form (elaborated Raunkiaer system) and variation. A second paragraph records the status (native etc.), ecology and distribution in the British Isles and overseas (sometimes incompletely). In a book of this size, illustrations must be few and are wisely limited to "difficult" groups such as Cruciferae (fruits) and Alchemilla (leaves). A companion volume of illustrations is promised, and there are, of course, Miss Ross-Craig's steadily accumulating "Drawings of British Plants" to fill this need.

Derivations of botanical names are not given, but other sources are readily available for the British flora. A wise "common names" policy has been adopted, genuine and widely-used common names, e.g. "Wild Leek", "Lords and Ladies", "Welcome home husband, however drunk you be" are distinguished from such invented abominations as "Triquetrous Garlic" and "Insipid Stonecrop" (given in quotation marks). Botanical and English names are combined in a single index. It is indeed hard to see any virtue in doing otherwise. There is a satisfactory glossary.

So much for the matter, what of the concepts? The authors "have preferred to take the narrower view of family or generic limits when by doing so the groups obtained are more natural and are consequently easier to recognize". In general, the results of this policy have been happy, displeasing though they may be to generic "lumpers". However, it has not been applied as consistently as it might, due no doubt to varying influences of published work as well as to individual differences of outlook and experience. Thus, while Scirpus has been split (perhaps excessively?), Rumex (which divides without ambiguity) has not. Ranunculus and Polygonum are among scores of cases which probably tradition rather than good botanical reason has maintained intact. If the principle of separating whatever is clearly separable is accepted the authors have been over-timid, if it is rejected then it is hardly logical to divide Scirpus, Gentiana or Bromus as they have done. One feels disappointment that the attempt to throw off tradition's heavy hand was not pushed further, since it is such excellent and widely-used works as this which are most effective in this respect.

The families on the whole are natural groups, Saxifragaceae for example being taken in the strict sense and Paeoniaceae being separated from Ranunculaceae. However, the restoration of Allium to the amorphous family Liliaceae is not acceptable. Fumariaceae and Papaveraceae are kept apart, Illecebraceae are not separated from Caryophyllaceae, both probably sound practice. Rosaceae might well have been divided but has not been.

Specific limits appear to have been carefully considered and not to be drawn too narrowly. "Aggregate species" recognised for convenience have "no taxonomic significance" according to the authors. This is well remembered, since an impression exists that the "aggregate species" of European works are comparable with true species. The category of subspecies

is freely used in its traditional European botanical application for major infraspecific units, not necessarily geographic races though no doubt usually ecologically distinct to some extent. Varieties are named in some cases but are clearly felt to be of little taxonomic or biological significance, in strong contrast to the subspecies. "Microspecies" often apomicts, in such genera as Rubus, Alchemilla and Hieracium are usually given full recognition, though the rarer ones are not listed, but provision is made for those botanists who do not find it convenient to identify their plants beyond sections, series or "aggregate species" as the case may be. The keys and general treatment of these rather frightening genera are among the best features in the book.

The new "Cambridge Flora", as it will probably be dubbed, is essential to any botanist's library and its virtues greatly outweigh its few faults. The volume itself is of the high standard one associates with the Cambridge University Press.

L.A.S. JOHNSON,
Sydney.

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FAMILIES OF DICOTYLEDONS.

By Alfred Gundersen. i-xvii, 1-237. Chronica Botanica
Co., Waltham Mass. 1950.

* * *

This is a disappointing book. One is not sure whether it is intended as a textbook, a work of reference, a presentation of a new system of classification, or a critique of existing systems, but it is not satisfactory as any of these. It may be described as a rather uncritically abridged compilation, resulting in an unhappy compromise between the "systems" of Bentham and Hooker, Engler, Hutchinson and some others. Except possibly for the references to recent literature, it is difficult to find a use for the work, since it is not critical, develops no particular theme, is sketchy and unequal in descriptions, lacks keys, and lists few genera. Consequently it in no way replaces the standard reference works of Bentham and Hooker, Engler and collaborators, Dalla Torre and Harms, Rendle, Willis or Hutchinson,

Part I consists of six too brief but stimulating and informative essays by well-known specialists, dealing with Fossil Dicotyledons (Arnold) Wood anatomy (Tippo), Carpels and Ovules (Just), Cytotaxonomy (Taylor), Embryology (Copeland) and Plant Geography (Camp). Parts II and III, the work of the author are a sketchy account of the "Characters of Dicotyledons", and "Historical Notes" on the chief classificatory systems from the seventeenth century to 1940 (Skottsberg). Mr. Gundersen's style is highly condensed in quasi-colloquial, the effect being a synoptic and as irritating to the reader) as a student's "Lecture-notes".

Part IV, making up the bulk of the book (pp.53-218) is the "Systematic Arrangement" of families. Four prefatory pages of discussion being a bare synopsis of the view of previous writers, throw little light on the principles adopted in the arrangement or on any views of his own which the author may possess. A rapid count showed an average of six authors' names cited for each ten lines of text!

The Magnoliales are placed first, as in Hutchinson's system, and the Asterales last. Accounts of the salient and more constant features of each family are given, but scarcely amount to descriptions. The illustrations of genera (not always "representative") provided for a minority of the families are in general clear and helpful. The lists of some of the basic chromosome numbers of genera are useful but would perhaps have been better arranged under families than under orders. The approximate number of genera in each family is given, with the names of a few and the family or subfamily range (not always accurately, for instance, Myrtaceae-Leptospermoideae are said to occur "mostly in Tasmania").

The appended references to more or less critical studies of the families are probably the only substantially useful feature of the work, at least to the professional taxonomist. Unfortunately, in his delimitation of families, Mr. Gundersen seems to have paid little attention to the indications of such studies. For example, though it now seems quite clear that Paeonia is not a true member of the Ranunculaceae, he has included it therein. Some irrelevant information, also, is given, for instance that the "fruits" (sic) of Casuarina equisetifolia (an ecologically atypical species in the family) are transported by ocean currents.

Elucidation of affinities between families and their arrangement in truly natural orders are not simple matters and Mr. Gundersen's orders are on the whole as well-chosen as those in any other current system. The delimitation of families themselves, however, is quite another thing. It is true that in some cases family limits depend largely on personal taste, so that it is of no great consequence whether Leguminosae (for example) are treated as one family or as three (Mr. Gundersen, oddly enough, recognizes two.) This reviewer's view is that it is desirable, where possible, to make a clear-cut division resulting in more homogeneous and readily recognizable (and therefore surely more objective) groups, whether in families or genera. He is consequently not in sympathy with the conservative concept of these taxa. Nevertheless, the Leguminosae or the Rosaceae (excluding Chrysobalanaceae) when taken in the broad sense remain fairly natural and coherent assemblages. On the other hand, a "family" such as the Englerian "Saxifragaceae" is not so, and except for mechanical pigeon-holing, is not even convenient. In putting forward a scheme of classification, a taxonomist should surely aim at some consistency of concept. If he believes in "families of convenience", there is no need to depart from the Bentham and Hooker arrangement. If he believes in natural families as, from his general (usually quoted) remarks, Mr. Gundersen evidently does, he should not allow conservatism to vitiate his system by including "anomalous groups" in what are otherwise coherent families.

This is the chief criticism of Mr. Gundersen's system. To take out a few cases at random, one finds Ulmaceae including Barbeyaceae; Moraceae including Cannabiaceae ("Cannabinaceae"); Hydrangeaceae including

Escalloniaceae; Grossulariaceae, Baurera and some other groups; Passifloraceae including Malesherbiaceae, Achariaceae and Caricaceae; Lauraceae including Hernandiaceae; and Gentianaceae including Menyanthaceae. Often well-marked groups which clearly do not "fit in" are not even mentioned, for instance Trimeniaceae (incl. Piptocalyx) (not part of Monimiaceae, Polyenemum Hemichroa, etc. (not Chenopodiaceae or Amaranthaceae) Davidsonia (not Cunoniaceae). Unlike Hutchinson who, though undoubtedly sometimes wrong, made a great advance in family classification, Mr. Gundersen seems to believe it better to be cautious, conservative and probably wrong in the old way than bold and only possibly wrong in a new way. This outlook is familiar enough and he will not lack sympathisers amongst those whose modesty (or apathy) does not allow them opinions regarding higher categories than species and (rarely) genera, but it is not what one expects of the author of a work on "Families of Dicotyledons". To sum up, the book is an exercise in armchair botany combining mediocrity of ideas with paucity of facts, and can thus hardly be recommended.

The book has the familiar "Chronica Botanica" format, which is not particularly attractive. There are few misprints, but Glochidion appears as "Clochidion" in text and index.

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FLORA OF WESTERN AUSTRALIA, Vol. 1, Part 1.

By C.A. Gardner. Government Printer, Perth - 1952.

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The publication of the first part of a Flora of Western Australia is an important event for all interested in Australian botany. Western Australia occupies nearly a third of the Commonwealth and is the only state for which some kind of a flora has not yet been prepared. The preparation of a flora of nearly a million square miles of country is a big job and nowadays it is a novelty for such a task to be attempted by one man. None is so qualified to write about Western Australian plants as is Mr. C.A. Gardner and he deserves the heartiest congratulations on the appearance of the first part and best wishes for the remainder. The excellence of the author's numerous illustrations and the pleasing format are a joy to behold and whet the appetite for more.

This first part, of 400 pages, is devoted to the family Gramineae, of which 128 genera and about 425 species and varieties are described; 232 species are illustrated by line drawings in 103 plates and 6 diagrams. A departure from the ordinary flora is a useful account of the grasslands of Western Australia. There are three provinces, the Northern, South-West, and Eremaean. The Northern Province is by far the richest in grasses, many of which are widely distributed in Northern Australia and other countries.

The South-West Province is relatively poor in indigenous species but supports a large number of naturalized aliens.

The keys and systematic accounts of genera and species follow the usual style. The general distribution of each genus is given, but for species there is usually only a list of the Western Australian specimens examined (the majority collected by the author) with the localities arranged under the three provinces, and the country of origin of naturalized species. The descriptions are often very full but characteristic generic characters should not have been repeated in the descriptions of each species of the genus, and there is a noticeable inequality of treatment in different genera. There is more space taken up in describing the single species of Tragus, Perotis, Tripogon, etc., than is devoted to each of the numerous species of Panicum, Eriachne, Eragrostis, and some other genera. Both prolixity and ambiguity have resulted from using the term "floret" for "flower" instead of the usually accepted concept of "flower with its accompanying lemma and palea."

Full reference to place of publication appears to be restricted to the accepted names of indigenous species; only the author is quoted for other names. Very few true synonyms are quoted, but misidentifications are treated as such, contrary to Rec. xxxii ter of the International Rules of Nomenclature, and even modified concepts of specific limits where there can be no question of misapplication of names are so treated.

Each tribe and genus is illustrated by figures of at least one species; in the more difficult genera, several or all species are figured. The drawings are excellent: they are clear, accurate, and pleasing to the eye, but without indication of magnification and reduction.

It is perhaps to be expected that, in the task that Mr. Gardner has set himself, there will be some taxonomic problems that he will not resolve to the satisfaction of others, but it is unfortunate that he has sometimes rejected the opinions of specialists and adopted or proposed different arrangements merely because some character "is not readily discernable" or "proves difficult." A very few examples will be noticed in this review. There can be little doubt that the Eragrosteae, as delimited by C.E. Hubbard, is a very natural tribe, and Mr. Gardner's distribution of the genera in his flora between the Festuceae, Chlorideae, and Hordeae cannot be regarded as an improvement in classification. The character "Spikelets sessile or very shortly pedicelled along the rachis of solitary, digitate or scattered spikes or spike-like racemes" leading to Hordeae and Chlorideae in the key on p. 3 is very like "Panicle reduced to a simple axis bearing erect racemes of shortly pedicellate or sessile secund spikelets usually in two rows" in the key to species of Triodia on p. 66 (Festuceae). Diplachne and Leptochloa are placed in the Festuceae and Chlorideae respectively, but they are sufficiently similar to be treated as congeneric by some modern agronomists. Other botanists have pointed out the similarities between Danthonia, Astrebla, and Triodia, their differences from the characteristic genera of the Aveneae, and the similarity between Eriachne and genera of the Festuceae, but Mr. Gardner has made no reference to their work and has also overlooked (p. 232) the publication of the combination Eriochloa pseudoacrotricha (Stapf ex Thell.) C.E. Hubbard ex S.T. Blake in Trans. Roy. Soc. S. Austr. 67: 43 (1943).

No student of the family doubts the difficulty of generic discrimination in the Andropogoneae. Thirty-five years ago, with all his experience, Stapf stated that "The absence of definite dividing lines for the genera of the Andropogoneae and Paniceae has so often been demonstrated that it is unnecessary to insist upon that fact" and much work still remains to be done before a generally accepted classification can be achieved. However, no help in this direction is given by the reasons put forward on pp.325 and 328 for the treatment of Bothriochloa and Dichanthium as congeneric, and it is astonishing that so capable a botanist as Mr. Gardner could have published them. Difficulty in placing three collections -- which are stated to be mixed -- is hardly a sound reason for denying generic status to a group of about thirty species, which, contrary to the statement on p.325, is not confined to the Old World. The distinctions between the groups have been misunderstood and it is clear that Dichanthium annulatum and Bothriochloa intermedia have been confused. The two genera certainly approach one another closely through these species, just as Bothriochloa approaches Capillipedium through B. intermedia and C. specigerum, and perhaps Andropogon (sensu stricto) through B. biloba and B. erianthoides. It would be helpful to botanists in general if Mr. Gardner would publish in detail all the evidence that has led him to adopt the various taxonomic and nomenclatural changes in the family.

The many people interested in the derivation or meaning of the names they use will be pleased to find that derivations of all generic names are given. Some are distinctly novel; Eragrostis, for instance, is stated to be derived from era, earth, instead of the usually accepted eros, love (love grass in English, Liebesgras in German, amourette in French). Many readers would have preferred the transliterations of the Greek words, from which, it may be noted, all breathings have been omitted.

A partly illustrated glossary and indexes to common names and botanical names complete a very useful book that will be a standard work on grasses in Western Australia for many years to come.

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CORRECTIONS TO A.H.N. No.10.

- P.2. "Additions to the Flora of South Australia" No.45 is in Trans. Roy. Soc. S.A., Vol.73. (not Vol.74.)
- P.3. Pt.2 Ed.2 of the "Flora of South Australia" appeared in print in 1948. (not 1949).

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