THE CANBERRA BOTANIC GARDENS

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The Canberra Botanic Garden.

Introduction.

A site for the development of extensive Botanic Gardens was proposed in the original Griffin plan for Canberra. In 1935 Dr. B.T. Dickson, Chief of the Division of Plant Industry of the Council for Scientific and Industrial Research, made a report to the Department of the Interior on "Botanical Gardens in Canberra", in which he dealt with site, scope of work, maintenance, and other factors. The site under consideration at that time was approximately that of the present garden. But World War II intervened, and it was not until 1950 that development was begun by the Parks and Gardens Section of the Department of the Interior. The lower part of the site was divided into roughly contoured planting sections, and in the spring of 1950 a number of shrubs and trees were planted; these included Eucalyptus and Acacia species and various genera of Myrtaceae and Proteaceae, and a number of our surviving specimens date from that time. A similar planting was carried out in 1951 but after this the rate of development became slower and for some years other garden needs of the city had to be put before those of the Botanic Garden.

In 1960 the rate of development of the Garden was accelerated and in particular the rate and range of collecting in the field were increased. In the autumn of 1961 a start was made in developing the upper part of the Garden, and since then 2000-3000 plants have been put in each year.

The Site.

The Canberra Botanic Garden is situated on the east facing slope of Black Mountain, with an altitudinal range of about 300 ft. (c. 1900-2200 ft.), and occupies about 80 acres. In common with the rest of the district, the Garden experiences a winter with low night temperatures and severe frosts followed by daily thaws; however, there is a marked frost gradient, with the lowest temperatures recorded at the bottom of the garden, so that the climate at the top of the area is less severe. The Garden is sheltered from strong westerly winds, and even in winter sunny days are frequent. The summer is hot and dry with much lower humidity than in coastal districts. Rainfall is slightly above 24 inches per annum, but very heavy rainstorms, usually associated with thunder, often occur.

The natural soil of the site is mainly a poor sandy loam developed from the metamorphic rock of the mountain; it is very stony in patches. Considerable soil erosion has taken place since human occupation of the site and much of the natural topsoil has now been replaced by topsoil taken from the bed of Lake Burley Griffin.

Plan of the Garden.

The plant collection is to be composed entirely of Australian natives; it is hoped to exhibit all members of the flora which can be induced to grow in Canberra. The central part of the Garden, and especially the older contoured area, will have a largely taxonomic arrangement. This implies that any section may contain a single genus (e.g., Acacia, Grevillea), a single family (e.g. Papilionaceae, Labiatae), or a group of small families. No attempt will be made to arrange the Garden according to any particular taxonomic system; the position of each group is determined by horticultural requirements, the size of the group, and the need for variety in the design of the Garden.

In suitable areas, but especially towards the northern and southern boundaries of the Garden, "ecological" or "locality" groups are planned; planting has begun in the first of these in the deep gully to the south of the contoured area, where rainforest species and ferns have been planted and show a surprisingly high degree of survival. Other groups planned for the near future include species of the West Australian sand plains, the Grampians, the Blue Mountains, moist coastal heaths, and alpines.

The third type of planting is purely ornamental; examples are to be seen at the southern end of the Acacia plantation, where a colourful mixture

of native species has been planted at the junction of two important tracks, and at the view point above the Eucalyptus section, where low growing species have been planted to create a patch of colour without blocking the view.

The design of the Garden will remain informal; much use is to be made of the native eucalypts, especially the handsome species E. mannifera ssp. maculosa (formerly known as E. maculosa) the Red Spotted Gum, and E. rossii, a Scribbly Bark, and native grasses will be encouraged rather than formal lawn sowings. An example of this is the use of the rhizomatous species Festuca asperula for erosion control along lawn edges.

On this sloping site landscaping does not depend on the creation of vistas so much as on the preservation of those which naturally exist. There are three main points from which splendid and different views of the city may be obtained, and planting must be designed to preserve these. Other minor view points are to be developed, for example, by the removal of one or two trees at a strategic point. Another consideration in landscaping is to provide an interesting view to the Botanic Garden from points outside it; for example, the view of one of the main uphill tracks from the neighbourhood of University House clearly calls for the planting of groups of shrubs with brightly coloured flowers in the cleared areas beside the track; to give interesting glimpses of the Garden to passers-by on the future highway at the lower boundary, small Eucalyptus groves and a colourful plantation of Myrtaceae have been designed.

To provide diversity in the garden layout, types of development may include contoured beds, less formal sections separated by winding tracks, small ornamental beds, gullies, and natural lawns in which are planted groups of trees and shrubs. The "Diuris Lawn", on which numerous native orchids are to be found in spring, is an open space at the centre of the Garden, beside which Acacia beds and an ornamental section will form a colour contrast in the spring.

Species grown in the Garden.

There seems to be a widespread idea in Australia that the climate of Canberra is an almost impossible one for plant growth, and that the majority of Australian species not native to the district must be killed by severe frost. This is far from true; certainly, the frosty winter requires certain precautions in the care of plants, as does the hot, dry summer; but, provided these are taken, surprising range of plants can be grown, and members of the Gardens staff have enjoyed many surprises in finding that species expected to be frost-tender survived the winter without damage.

It is a popular fallacy that, to grow native plants, the exact conditions of the natural habitat must be reproduced, and that in particular soil conditions must be imitated and extremes of temperature, especially low temperature, must not exceed what the species has already encountered. These two assumptions are implied in many of the questions put to the Gardens staff. However, it must be pointed out that a species in nature has not necessarily occupied the whole of the range of conditions to which it is suited; it may be prevented from achieving this by topographic conditions, lack of time, etc. Near the limits of its tolerance, a species may be more readily eliminated by competition than at its optimum. Consequently, the Canberra Botanic Garden may be regarded as a large-scale experiment on the conversion of potential to actual range, and on the effects of removing competition.

Such are the exaggerated ideas about the severity of the Canberra climate, that visitors from Sydney and Melbourne sometimes seem to think that we can grow little beside alpines!... but, as a matter of fact, the climate has much in common with that of a vast area of the interior, from the coast of Western Australia to central Queensland. Throughout this dry area humidity is low, temperatures in summer are high, and frosts are by no means unknown in winter. Canberra has a higher rainfall than most of this area and hence sufficient moisture to ensure that frosts will be "white"; but it is probable that few species of the interior will refuse to tolerate an increase in moisture provided this is accompanied by good drainage.

There is, of course, some affinity between this climate and that of the tablelands and mountains of eastern Australia, and some of the species of subalpine areas of the Snowy Mountains, the Victorian Alps, and the mountains of Tasmania are doing well in the Garden. True alpines have proved rather difficult subjects, as conditions at the highest altitudes are very different, with perhaps a blanket of snow for several months. Some coastal species have been found to do quite well, others evidently refuse to tolerate either frost or low humidity.

Aims of the Botanic Garden.

Canberra is developing rapidly as a centre of administrative and scientific activity; it has a rapidly increasing population and a thriving tourist industry. It is already famed as a garden city. It is most appropriate that the national capital should incorporate a native Botanic Garden as fully representative as possible of the flora of all parts of Australia.

There are three principal aims in the development of the Garden. Firstly, it must be a place of public interest. It is not designed as a picnic spot or a family playground, for other areas in Canberra will be developed to fulfil these functions; but it will certainly be of interest to the residents of the city, and, it is hoped, will eventually become a tourist attraction. Although the Garden is not as yet open to the public, many people have, at their own request, been shown round it by members of the staff and have expressed a wish to come again; some are frequent and privileged visitors. Public interest should be increased by the fact that this will be the only large public garden in Eastern Australia entirely devoted to the native flora. (King's Park, Perth, is developing a Botanic Garden which is largely native, and smaller collections, such as Maranoa Gardens in Melbourne, are well known; the Botanic Gardens of the State capitals have native sections.)

Secondly, the Garden will be a place of horticultural interest. During the last few years interest in the growing of native plants has greatly increased, and they are now included in many public and private gardens. But many potential garden subjects are as yet untried, and the Canberra Botanic Garden will function as an experimental area for some of these. It will also display plants which are suitable for growing in the city, including those which are issued by Parks and Gardens Section to new householders. Species suitable for issue to the public or for use in planting streets and public gardens must be of known frost hardiness so that they will grow in the lowest and frostiest parts of Canberra, and they must be easily available and able to be propagated in quantity. But many other beautiful species which do not fulfil these requirements can be grown by keen gardeners, and trials in the Botanic Gardens may well add to the numbers of these. In addition, interesting horticultural forms and spontaneous hybrid can be preserved and studied.

Thirdly, the Garden must be a place of scientific interest. It will become an obvious place for convenient study of the native flora; for example, an overseas visitor may be able to study a species which he would have to travel many miles to see in the field, and material for scientific studies of various kinds may be made available. Already some material has been grown in the Garden for research workers in different branches of Botany, and material has been obtained on collection trips for Universities and Herbaria in different States.

Finally, the Garden will be a source of propagating material. Species obtained from localities difficult of access may be propagated vegetatively, and in some cases cuttings may be passed on to Yarralumla Nursery (also an establishment within Parks & Gardens Section) for use in the city. This applies also to interesting horticultural forms and hybrids which may be obtained from time to time. Seed is also being collected for exchange with other Botanic Gardens and with private collectors.

Records.

If the Botanic Garden is to fulfil the functions outlined above, keeping of very detailed records is essential. On the horticultural side, it is necessary that records be kept of the origin of various forms, method and ease of propagation, hardiness, and response to any special treatment. Requirements for material to be used for scientific purposes are very exacting; for example, material of unknown origin supplied by a commercial nursery would not be suitable for cytological experiments, whereas material collected in the field might give vital information.

A record keeping system has been instituted in the Canberra Botanic Garden; and it is hoped that by its means the origin and complete history of each plant will eventually be known, from its collection in the field or arrival from another source, through the processes of propagation, to establishment and subsequent behaviour in the Garden. Already a body of data has been collected which, when finally analysed, should add considerably to our knowledge of Australian plants in cultivation.

Collection and Propagation of Plants.

Some plants for the Garden are still obtained from commercial nurseries, and seed comes through exchange with Botanic Gardens and other organizations. However, for reasons given above, the most valuable plants are those obtained from the field, or others of which the origin is known with certainty.

Extensive collecting trips are made by officers of the Canberra Botanic Gardens and other members of Parks & Gardens Section. Western Australia, Queensland and Tasmania have all been visited in recent years and trips in Victoria and New South Wales have been numerous. Seed is collected, and small plants are carried home in tins; with modern air transport even cuttings are successful, and these are sent home by air freight at intervals. Herbarium specimens are collected to match all propagating material. Propagation of cuttings and seed is carried out at Yarralumla Nursery.

Care is taken to observe the quarantine regulations of the various States, and where necessary advice is sought from the Plant Quarantine Section of the Commonwealth Department of Health, from the State Departments of Agriculture, and from organisations such as the Tick Control Board. Officers of these bodies have always proved helpful and co-operative.

Likewise, we have sought the co-operation of State bodies responsible for National Parks, Forest Reserves, and flora conservation, and permits have been obtained for collecting where these are necessary. In most cases we have been made very welcome in National Parks and other protected areas.

The Herbarium.

It is clear that the work of the Botanic Garden cannot be carried out successfully without a reference collection of herbarium specimens continually available. Voucher specimens for propagating material are collected, and general collecting to illustrate the flora of various States as far as possible is also carried out. Specimens are taken from the garden and nursery to illustrate variations in horticultural material.

The collection at present contains approximately 24,000 specimens, and is being increased at the rate of some 3000 a year. A system of cross-indexing herbarium and living specimens has been developed.

Annexe Garden.

A small annexe garden is in process of development at Jervis Bay, within the Australian Capital Territory. Here are grown species which are too frost sensitive for Canberra, or which have been shown to do very much better on the coast. It is hoped to develop this establishment into a small Botanic Garden plus a Native Flora Reserve.