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EDITORIAL

OUR CONTRIBUTORS

THE LIFE BLOOD OF ANY JOURNAL is the constant flow of material through the pages and we must pay tribute to the many outstanding contributions made by our members and outside authors over the years. A publication such as this has to maintain relatively high standards and to speak with authority. It does not cater to the same audience as the popular gardening press who over the years have done such wonderful work in taking expert horticultural knowledge into the gardens and living rooms of the family man. Yes we say living rooms, for all those devoted to the home garden know how much planning goes on before a cosy fire on dark, dank winter evenings. We may also include the T.V. and the Radio with their fine gardening sessions in the above category. Our R.N.Z.I.H. members have played their part nobly in these activities for not only have they conducted a major proportion of these sessions but they have contributed liberally with fine articles in popular garden magazines and in the columns of the daily and weekly newspapers.

This Journal is a closed publication circulating to the members of the R.N.Z.I.H. only though there is certainly no objection to outsiders reading it. Our members are very much dedicated to horticulture and are mainly professional horticulturists and highly skilled amateurs. If the popular garden press imparts primary school knowledge to the gardening public we may be presumed to be working at the secondary and tertiary levels.

In these circumstances we need articles at a higher level of scholarship than the popular garden press; articles that cater for a knowledgeable and a critical audience; authoritative articles often of a considerable length that will advance the horticultural knowledge of the members; theses and learned papers on horticultural research all come within our orbit and within the scope of the Institute's objectives as an educational body.

This brings your Editor to the crux of the matter. It has never been easy to obtain suitable contributions at this level but lately the situation seems to have become far more acute. Advancing years have taken toll of many of our former steady contributors whilst increased executive responsibilities have prevented others from carrying on with their writing. Normally they would be replaced by younger members moving up in the horticultural field but we have had few contributions from our up-and-coming horticultural authorities and executives in the last few years.

Horticultural specialisation seems to have taken its toll, too, and articles that would once have come to this Journal for publication now go to the journals of specialist societies. As you all know your Editor is not opposed to specialist societies, and in fact is deeply involved that way himself, but he does feel that it is important for specialists to realise that by contributing authoritative articles to this Journal they will be rendering a fine service to their specialty, their specialist society, to horticulture in general and to this Journal.

Finally returning to a more mundane level we draw your attention to the bold type at the foot of the inside front cover which states that articles published will be paid for at customary rates.

THIS JOURNAL HAS BEEN SUPPORTED NOBLY BY THE CONTRIBUTIONS OF THE MEMBERS IN THE PAST AND *WE LOOK TO YOU* FOR A CONTINUANCE OF THAT SUPPORT.

HELP US TO HELP YOU.

1971 ANNUAL DOMINION CONFERENCE
of the
ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.)
FORTY-EIGHTH ANNUAL MEETING & CONFERENCE OF DELEGATES

NOTICE is hereby given that the forty-eighth Annual Meeting and Conference of Delegates of the Royal New Zealand Institute of Horticulture (Inc.) will be held in Auckland on February 12, 1971, commencing at 9.00 a.m.

The Annual Banks Commemorative Lecture will be delivered at 8 p.m. on the same date.

Members of the Institute and Delegates from affiliated organisations are especially invited to attend the Dominion Conference and the Banks Lecture.

K. J. LEMMON, Dominion Secretary.

A QUARTET OF PINES

By W. R. SYKES, B.Sc. (Hons.)

Botany Division,
Department of Scientific and Industrial Research, Christchurch

Among pine specimens that I have recently assembled at the Herbarium of Botany Division are many of the rarer species which are in cultivation in this country. Of the four discussed here only *Pinus canariensis* can be described as other than rare at present but the closely related *P. roxburghii* (syn. *P. longifolia*) is currently being offered for sale by a few nurseries. The other two species, *P. bungeana* and *P. gerardiana*, are also closely related to each other but are very different from the first two. Although all four are 3-needle pines, two form a small group of their own in one subgenus of *Pinus* and the others do the same in the second subgenus (Mirov, 1967, 521-522). They are ornamental species which should be cultivated more in New Zealand and seem to be reasonably hardy, although two are from sub-tropical regions.

Pinus bungeana and Pinus gerardiana

These species have an interesting discontinuous distribution. *Pinus bungeana*, Chinese lacebark pine, occurs naturally in the mountains of central China and *P. gerardiana*, Himalayan lacebark pine, is from the north-west Himalaya and neighbouring areas of West Pakistan and Afghanistan. The latter grows in temperate regions between 6,000-12,000 ft. The timber is of little use in either species. The Chinese tree has been extensively planted around temples and cemeteries whereas the Himalayan tree is mainly valued for its edible seeds which are very rich in oil (Dallimore and Jackson 1966, pp. 409 to 429).

Pinus bungeana and *P. gerardiana* can form large trees in their homelands but I have only seen small ones in New Zealand. However, they are so rare that their potentialities in this respect are probably unknown. The distinctive smooth bark, which is shed in large irregular plates or scales reminiscent of a plane tree, was present in trees of both species seen. This character is unknown elsewhere in the genus and has given rise to the common name of lacebark pine. The trunk is thus patterned with different shades of grey and silver owing to the varying length of time that each plate of bark has been exposed. The shoots are green, or nearly so, in both species, and the rather small winter buds are also similar with reddish brown scales which are free towards the apex and not covered with resin. The needles are very aromatic when crushed and, in both, the sheaths at the base are deciduous by the second year. The last character is rare among 3-needle pines and helps

to link the lacebark pines with the 5 needle pines of the *P. strobus* and *P. cembra* groups. The needle length seems to differ between the Chinese and Himalayan lacebark pines and measurements on a very limited number of specimens are 5-9 cm. for *P. bungeana* and 8-12 *cm.* for *P. gerardiana.* The foliage on the latter does not appear to be so sparse as in the former.

The cones are obviously different in these lacebark pines (Fig. 1 a. and b.). As well as the big disparity in size and shape, the scales of *P. bungeana* cones are rather thin and flexible as opposed to the thick woody ones of *P. gerardiana.* As illustrated, the apophyses, or terminal part of the scales, in the latter are strongly reflexed. However, cones of both are deciduous and have a recurved spine although this may be lost if they have been lying on the ground for long. A short wing is present on the seed in both species.

Pinus canariensis and Pinus roxburghii

The second couplet of pines has even more interesting discontinuous distribution to-day but fossils similar to them have been reported from south Europe (Mirov, 1967, p. 73). *Pinus canariensis* is the Canary Island pine and is endemic to the Canary Islands, and *P. roxburghii* is the chir pine (pronounced cheer) from the subtropical Himalaya where it is especially abundant in the western and central regions. Both species occur to about 7,500ft naturally and neither generally grows much below 3,000ft. They form extensive forests but the natural area of the Canary Island pine has been greatly reduced by man. However, reafforestation there has, to some extent, restored the picture. They are valuable timber trees and, in addition, the chir pine is an important source of resin whilst the soft needles of the Canary Island pine were used for lining banana cases (Dallimore and Jackson, 1966, p.p. 411 and 482).

Both form fairly large trees eventually in New Zealand and, in the vegetative state, are very difficult to distinguish. The glaucous white juvenile foliage of *P. canariensis* is very attractive and from the few young plants of the other species seen here, it seems that they also have this character. The trunks are rough with thick fissured reddish bark which flakes off in large scales. The young shoots of the Canary Island pine are yellow or light yellowish brown, whereas in the chir pine they are a deeper yellowish brown or brown. This is not a very good character, for trees of the former in rather diverse climates where growth is poor, tend to have darker shoots. Unfortunately the key in the leading work in conifer taxonomy, Dallimore and Jackson (1966, p. 396) uses shoot colour to separate the two species. The winter buds of the Canary Island pine are prominent and apart from the chir pine, cannot be mistaken for any other pine that I know in New Zealand.

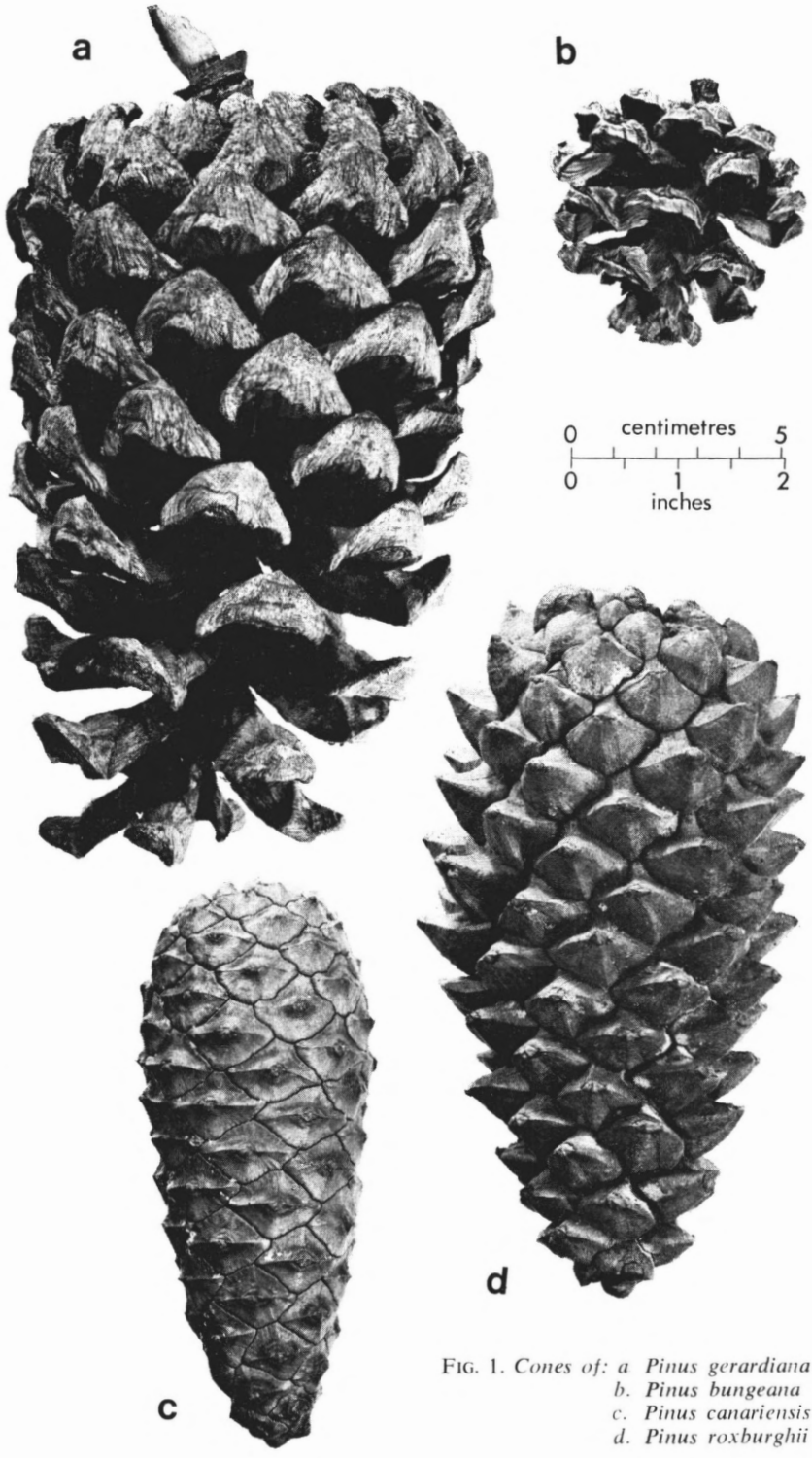

FIG. 1. *Cones of: a Pinus gerardiana*
b. Pinus bungeana
c. Pinus canariensis
d. Pinus roxburghii

The terminal buds can grow to 9 cm. or more long, although they are often much shorter. They are always free of resin and have prominent white-fringed scales which are recurved to some degree, particularly towards the base. In the chir pine, at least in the few New Zealand trees seen, the buds are 1-2 cm. long and have less prominent fringed scales which usually appear browner than those of the other, owing to the narrower white margin. Thus again, the species cannot be satisfactorily separated by this character. They both have dense terminal tufts of grass-green foliage on the shoots and the long slender needles have sheaths 1-2 cm. long.

The cones provide the best diagnostic characters (Fig. 1 c. and d.). Those of *P. canariensis* have a relatively smooth surface with flattened and rounded apophyses (the terminal exposed part of the scales) whereas in *P. roxburghii* the apophyses are strongly elongated with a marked tendency for the tip to curve towards the base of the cone, like a blunt hook. The scales in the Himalayan species are thicker and much more woody than those in the Canary Island species. There is considerable variation in the cone size of both and I have collected mature *P. canariensis* cones only about 9 cm. long whereas the minimum length is given as 15 cm. by Dallimore and Jackson (1966, p. 411).

It may be of interest that three of the pines described here can be seen in the comprehensive New Zealand Electricity Department Pinetum at Lake Coleridge, Canterbury. The only place where I know *Pinus gerardiana* grows is on the estate of the late Mr T. W. Adams, Greendale, Canterbury. Otherwise one or two of these species may be seen in the Botanic Gardens, Christchurch, and in a very few private collections in the North Island, notably Eastwoodhill near Gisborne. I should be very grateful for information concerning the cultivation of these or any other rare pines in New Zealand.

ACKNOWLEDGMENTS

I am grateful for permission from the New Zealand Electricity Department to visit the Lake Coleridge Pinetum and from the Forestry School of the University of Canterbury to visit the Adams Estate at Greendale.

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MIGHTY MIDGETS

or

'CÉCILE BRUNNER' TYPE ROSES

By THE EDITOR

Probably the most popular of the Victorian roses extant to-day is 'Cécile Brunner' also known as the Sweetheart Rose, 'Mignon' and 'Mme. Cécile Brunner'. It is still widely grown and there are few flower lovers who do not know of it under one of the above names and here is the catch for another similar rose is often mistaken for 'Cécile Brunner' at all levels of horticulture. We refer to 'Bloomfield Abundance', an equally fine rose but lacking the romantic and nostalgic associations of 'Cecile Brunner'.

The dispute as to the ancestry of 'Bloomfield Abundance' seems to have been satisfactorily resolved and we may well include it in this class of roses on the score of heredity as well as because of its physical attributes.

The 'Cécile Brunner' type of rose certainly does not fall within the miniature class or the *Miniature China Roses* as they should be called. The Royal National Rose Society defines the latter in "ROSES—A Selected List of Varieties" as "very dwarf recurrent-flowering bushes from six to twelve inches or so in height with tiny flowers, often perfectly formed. They are mostly hybrids of *Rosa chinensis mimima* (*R. rouletti*)." You will not note that the class is not rigidly confined to cultivars with *R. chinensis mimima* in their ancestry but they should conform to the other specifications. Briefly they should be of miniature habit, have miniature leaves, canes and flowers perfectly proportioned and certainly should not be taller than eighteen inches when grown on their own roots. If budded on to a vigorous stock they may grow considerably taller. For this reason they should be propagated by cuttings except for those few cultivars that do not root readily, such as 'Estrellita de Oro' (syn. 'Baby Gold Star') and 'Rosina' ('Josephine Wheatcroft'). Unless specifically included in a class of miniature roses or the schedule calls for blooms of miniature-flowered roses 'Cécile Brunner' type roses should not be exhibited in classes for miniature roses. They may be exhibited as floribundas and the R.N.R.S. "Selected List of Varieties" does include them under *Hybrid China Floribundas*. Despite their ineffable charm it is doubtful if under modern judging standards they would take any prizes against the more formal types of floribundas and a class for this class of roses seems desirable under the heading of dwarf polyantha or 'Cécile Brunner' type roses. Roy E. Shepherd in "The History of the Rose" places them among the

polyantha roses and though genetically they are not always of polyantha origin they exhibit polyantha characteristics. True polyantha roses are descendants of *R. multiflora* crossed with *R. chinensis* but it has been horticulturally convenient to include in the class cultivars of different origins displaying similar characteristics. They take the name Polyantha from their cluster flowering habit but the word which is the Greek for "many flowered" was first applied by Siebold and Zuccarini erroneously in 1843 to *R. multiflora* (the Latin for many flowered) which had been previously named by Thunberg in 1784. Carrière, a French horticulturist, applied the name Polyantha to the original type in 1876. In Britain they are called Polyantha Pompons (Poly.-poms.).

The first recognised Polyantha rose introduced was 'Paquerette' in 1875 by Guillot Fils, Lyon-Monplaisir, France. It has double, scentless, pure white flowers about an inch in diameter twenty to thirty in a cluster on a dwarf plant of slender growth. The leaves have five to seven leaflets similar to those of *R. multiflora.* The parentage is given as *R. multiflora x R. chinensis.*

'Mignonette' introduced by Guillot Fils in 1881 is considered to be a second generation seedling of *R. chinensis* x *R. multiflora* and is described as very small, double, soft rosy pink to white flowers in clusters of thirty to forty on a dwarf very free blooming bush.

In all nineteen varieties of named Polyanthas were released between 1875-1900 by eleven hybridists and of these only six could be considered as having lasting merit, being 'Cécile Brunner' (from Pernet-Ducher, the famous hybridist who later introduced the first Pernetiana, 'Soleil d'Or, 1881), 'Clotilde Soupert' (Soupert and Notting, 1889), 'Eugénie Lamesch' (Lambert, 1899), 'Leonie Lamesch' (Lambert, 1899), 'Marie Pavie' (Guillot, 1888), and 'Perle d'Or' (Dubreuil, 1883).

The others were 'Anna Marie de Montravel' (Rambeaux and Dubreuil, 1879), 'Mignonette' (Guillot, 1881), 'Miniature' (Alégatière, 1884), 'George Pernet' (Pernet-Ducher, 1887), 'Gloire des Polyantha' (Guillot, 1887), 'Golden Fairy' (Bennett, 1888), 'Red Pet' and 'Little Pet' (Paul, 1888), 'Blanche Rebatel' (Bernaix, 1889), 'Étoile d'Or' (Dubreuil, 1889), 'Petit Constant' (Soupert and Notting, 1890), 'Mme. E. A. Nolte' (Bernaix, 1893) and 'Perle des Rouges' (Dubreuil, 1896). They mostly showed the Tea Rose influence in blossom form and colour, retaining the growing and flowering habit of the Polyanthas (Shepherd, "The History of the Rose"). The colour ranged from the pure white of 'Anna Marie de Montravel' to the maroon-crimson of 'Red Pet'.

It is interesting to note here that 'Baby Baccara' released by Meillands in 1965 and an orange-scarlet cluster-flowered rose of low stature had 'Perle des Rouges' in its ancestry through its pollen parent,

the miniature rose 'Perla de Alcanada' and it is to be hoped that the success of this cultivar leads to more of this type of Polyantha rose being raised.

Probably the greatest significance of the original Polyanthas was the introduction of additional outside blood, notably H.T., leading to the development of the hybrid Polyanthas largely by D. T. Poulsen of Denmark and later his sons Nils and Svend. These are often called the Poulsen Roses and further infusions of H.T. genes led to the evolution of the Floribunda rose. Other species and hybrids have all been used, notably those of *R. eglanteria,* the Sweet Briar, and *R. moschata,* the Musk Rose. This movement continues and in the result we are now seeing a gradual merging of the H.T. and Floribunda roses. When this occurs we shall probably see more crossing back to the old Dwarf Polyanthas. Generally the dwarf polyanthas are diploid with fourteen chromosomes, the hybrid polyanthas triploid with twenty-one chromosomes and the floribundas tetraploid, having twenty-eight chromosomes. The latter cross far more easily than the hybrid polyanthas.

The Miniature Rose has been developed greatly in the last thirty years, some noted hybridists such as Pedro Dot, of Spain, John de Vink, of Holland, and Ralph S. Moore, of California, specialising in raising new Miniatures. This specialisation is resulting in very great advances in this type of roses and many outside types of roses have been used in their efforts to improve this class, notably the floribundas and their predecessors. The genetic potential of such roses as 'Cécile Brunner' has been realised and examples of their use are 'Perle de Monserrat' ('Cécile Bruner' x *R. roulettti*) and 'Perla Rosa' (Pedro Dot, 'Perle des Rouges' x *R. rouletti*).

Pernet-Ducher raised the famous Pernetiana rose, 'Soleil d'Or', and thus introduced the Persian Yellow, *R. foetida,* genes into our modern H.Ts. This has produced the deep yellows and flame shades so prominent in our modern roses and most of our modern roses, H.T. and Floribundas show this influence. Pernet-Ducher has been given full credit for this but when we realise that he also raised 'Cécile Brunner' many years before we have surely undervalued his contribution to our modern roses. 'Cécile Brunner' and 'Perle d'Or' were a great step forward for they were the first dwarf polyanthas in which the influence of the Tea rose was apparent.

The investigation of even the recent ancestry of present day introductions involves many difficulties. Roses have been garden plants for many thousands of years and many garden hybrids have occurred naturally over the years, and furthermore man has assisted nature in this task by raising new cultivars by open pollination. Not only that roses have hybridised freely in the wild and many roses introduced as

newly discovered species have later turned out to be natural hybrids. Later man has taken over the task of pollinating agent but it was not until the rediscovery and study of the theories of Mendel that the necessity of keeping accurate records was realised. To-day we are very conscious of the parentage of our garden plants, particularly the specialist flowers, and the newcomer views with astonishment official lists of fifty years ago that make no pretence of giving the parentage of the cultivars listed. The problem is not confined to roses, occurring in many other ornamental and food plants, but is probably at its worst here because of the antiquity of the garden rose, its consistent popularity and the fact that a seedling rose will flower in about six months from germination. This latter, of course, helps the hybridist who may be using back-crossing and other hybridising patterns but the end result of all these factors is a genetic mix-up that makes the evolution of a hybridising policy far from simple. It should not escape notice that most of the world's great rose hybridists belong to families and firms whose hybridising efforts may be measured in generations. At the same time this should not deter the amateur who will find hybridising a fascinating and enjoyable hobby that will add vastly to his knowledge of his chosen flower and all the time there is a chance that he will strike a bonanza. Many of the world's great flowers have been bred by amateurs dabbling in hybridising.

Another result of this tangle is that the genetical classification of roses is often an impossible task and for horticultural purposes roses are classified according to their characteristics. This does involve difficulties with cultivars on the borderline and it is not unusual to find a cultivar such as 'Blue Diamond' among the H.Ts. in one catalogue whilst another grower lists it among the floribundas. Often the deciding consideration in naming and classifying a new rose may be economic.

Thus many cultivars appearing in the Polyanthas, Hyb. Polyanthas and Floribundas are not descended from *R. multiflora* and examples are 'Baby Chateau' and 'Pinnochio' (Shepherd, "The History of the Rose"). Often in these cases another species may be found a generation or two back. For instance 'Florence Mary Morse' has *R. eglanteria* in its ancestry and *R. moschata* is a forbear of 'Pinnochio' and 'Fashion'. 'Schneewittchen' (Syn. 'Iceberg') is classified as a floribunda though genetically it appears to be either H.T. or a Hyb. Musk depending whether the seed parent was the 'Robin Hood' of the E. C. Hill Co. or that of Pemberton, a Hyb. Musk; probably the latter. This sort of situation is not made any easier by there being another 'Schneewittchen' from the Lambert stable in 1901 with the parentage 'Aglaia' (*R. multiflora* x Rêve d'Or) x 'Pâquerette' (the first named Polyantha) x 'Souvenir de Mme. Levet.' This rose may still exist.

The problem of borderline varieties between the H.Ts. and Floribundas will increase for a time and then disappear as these two classes gradually merge.

Having outlined difficulties of classification we shall now describe the most significant of those varieties that have been placed in the Polyantha class, as distinguished from the succeeding Hybrid Polyantha and Floribunda classes.

CÉCILE BRUNNER (a polyantha, thought to be an unintroduced sister of 'Pâquerette' x 'Mme. de Tartas, a Tea rose) was introduced by Pernet-Ducher in 1881; bud long pointed, flower small, double, open, fragrant, clear light pink with yellow base shades in centre, borne in clusters; foliage sparse, dark green; bushy, compact and free blooming.

It is easily propagated by cuttings and is slow growing on its own roots. Though Graham Thomas in "Shrub Roses of To-day" speaks of it growing up to four feet most overseas writers imply that anything over 2-3 feet is probably 'Bloomfield Abundance'. There are many bushes that are indisputably 'Cécile Brunner' in New Zealand that are about five feet tall and three to four feet through. They may be distinguished not only by the flower and its sepals but by the characteristic compact, fairly dense, bushy growth. Quite possibly these strong growing 'Cécile Brunner' are budded plants on *multiflora* stock. It would be an interesting exercise to bud the dwarf form on to rootstocks of "Climbing Cécile Brunner'.

In view of the exceptional vigour of the climbing sport (Cl. pol. Hosp., 1894 and Ardagh, 1904) it is not improbable that intermediate strains have arisen in the course of ninety years. This writer has copied Mrs Nancy Steen ("The Charm of Old Roses," page 72) in taking a short flowering basal growth from the climbing sport and rooting it. To date this has been even slower growing than cuttings taken from a bush variety at the same time but conclusions cannot be drawn from this isolated case.

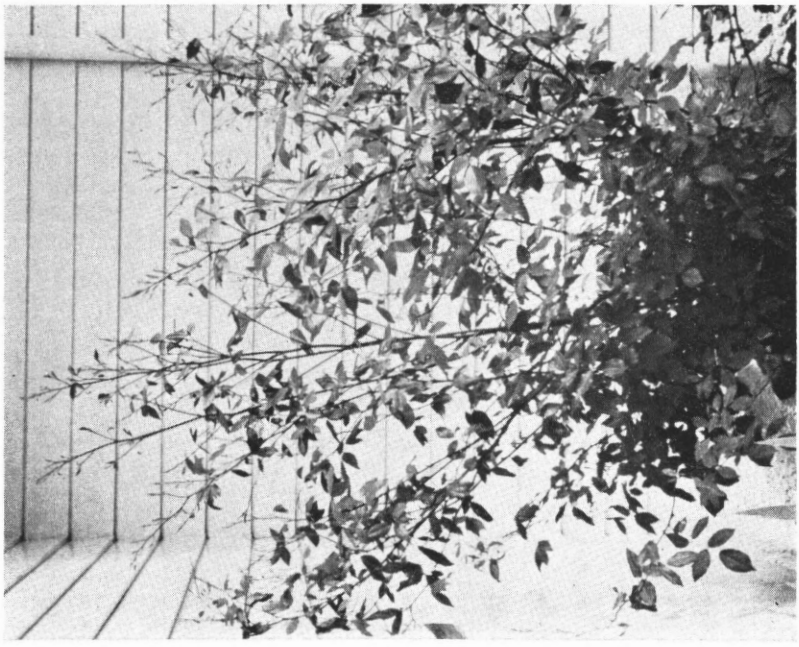
YELLOW CÉCILE BRUNNER:'Perle d'Or', and described later.

WHITE CÉCILE BRUNNER: This sport of 'Cécile Brunner' was introduced by Fauque, Fauque et Fils, Orleans, France, in 1909 and has white petals shaded yellow and buff. Graham Thomas ("Shrub Roses of To-day") refers to a lemon-white sport that has apparently been lost.

RED CÉCILE BRUNNER:

PASADENA TOURNAMENT: The latter is the correct name of this variety raised by Alfred Krebs of California and introduced in 1942. The parentage is 'Cécile Brunner' x an unnamed seedling, and "Modern Roses 6" describes it thus, "bud long pointed; flower small, double (36

Bush of 'Cécile Brunner'. Compact but vigorous.



'Bloomfield Abundance'. Showing tall but lax habit.

petals), cupped, fragrant, velvety red; long stem, foliage bronzy, very vigorous. This sounds a most interesting descendant of 'Cécile Brunner' and it is classed as a floribunda.

OPAL BRUNNER: This was introduced by Dr. O. C. Marshall, California, about 1948 and is classed as a climbing floribunda, parentage unknown. It is said to have slightly richer colour than the Hyb. Musk 'Cornelia', but has smaller flowers and very small buds with a slight musk fragrance; free blooming and suitable as pillar rose to ten feet. Graham Thomas considers it an insult to link it by name with 'Cécile Brunner'.

IMPROVED CÉCILE BRUNNER: Introduced by Carl G. Duerhaem, California, in 1948, previously being called 'Rosy Morn'. There were already three previous cultivars with the latter name and the unfortunate change was made as above. The parentage is 'Dainty Bess' x *R. gigantea* and it is placed in the floribundas. Walter Duncan, Vice-President, The Rose Society of South Australia, in the "Australian Rose Annual, 1970" says "Flowers are three inches across, and totally lacking in the simplicity which has stood through time. Why destroy an image to replace it with an inferiority? Was it recognition of greatness, or an admission that 'Cécile Brunner' is a rose that has never been surpassed"? Graham Thomas on page 149 of "Shrub Roses of To-day" dismisses it summarily.

MADAME JULES THIBAUD: Is a peach coloured sport of 'Cécile Brunner' whose origin is not known.

CLIMBING CÉCILE BRUNNER is the veritable giant of the tribe, indeed one of the great giants of rosedom for its vigour rivals that of the Hyb. Bracteata, 'Mermaid'. It has a superior habit and fortunately is does not have those vicious claws of 'Mermaid', the thorns being sparse. If you were limited to one rose this would be the one to grow. The growth is rather stiffer and more upright than we associate with most climbing roses of this stature and vigorous in the extreme. It is generous in flowering and the flower trusses are mainly borne on six to nine-inch spurs along the previous year's lateral growths. Some say it does not repeat freely but we have not found it so; it could hardly be expected to repeat on the scale of the first flowering. Pruning is best limited to cutting out wood older than four years, some thinning out and keeping it within bounds. It may be tied in and trained but be warned. The support must be really solid and firmly anchored for in a gale 'Climbing Cécile Brunner' will act like a sail and take any ordinary support with it. A magnificent specimen is said to adorn a building at the University Botanic Garden, Oxford.

Easily rooted cuttings may make canes twelve feet long in a year.

The comparatively thornless bark lifts easily and it makes quite a good alternative budding stock if you have none of your favourite rootstock available. Buds may be inserted in the young canes which may be cut off and rooted later when the bud has taken or the conventional routine of rooting cuttings and then budding may be followed.

'Clg. Cécile Brunner' does not seem to set seed easily and though we have grown it for fifteen years and it is impossible to dehead completely we have never seen heps on the climber yet.

PERLE D'OR (Dubreuil, 1883, *R. multiflora* x 'Mme. Falcot', a yellow Tea rose). Though Graham Thomas says this is a more vigorous and leafy plant than 'Cécile Brunner', mentioning plants four feet high and through, we have not seen one in this category. The many narrow-petalled flower is similar to that of 'Cécile Brunner' but tends to a bullet-nosed centre. It is not a pure yellow but inclined more to apricot and buff shades. "Modern Roses 6" says golden pink, whatever that might be. It is an excellent companion rose for 'Cécile Brunner'.

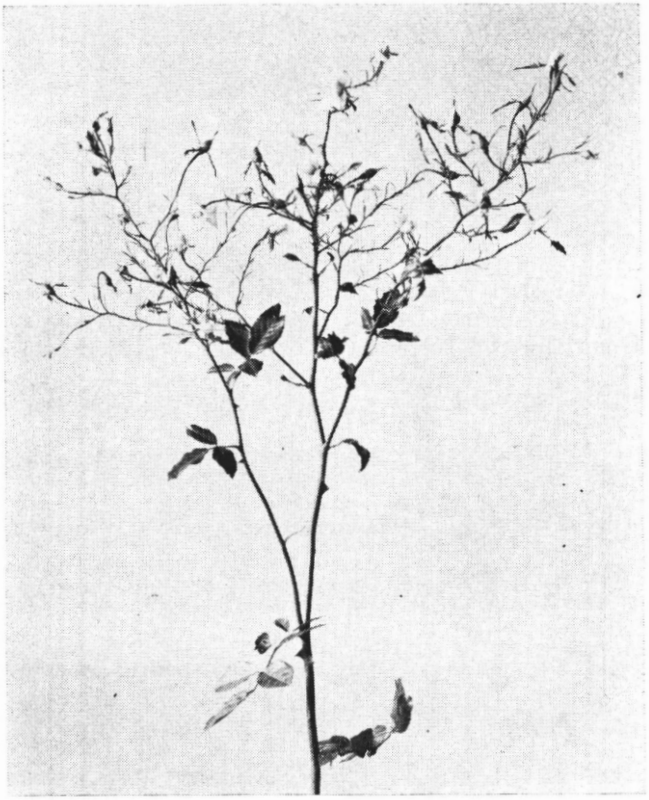
ÉTOILE D'OR (Dubreuil, 1889): Brief mention of this is made in "The History of the Rose" and the only other reference we know of is in Mrs Steen's "The Charm of Old Roses" as being seldom seen but growing in an old garden in Hawke's Bay. It is described as sulphur yellow in colour. A small rose in the Woodlands, Hagley Park, Christchurch, is labelled 'Etoile d'Or' but appears to be 'Perle d'Or'. A namesake, a H.T., is listed in "Modern Roses".

BLOOMFIELD ABUNDANCE (G. C. Thomas, Calif., 1920: 'Sylvia,' a Hybrid Wichuraiana, x 'Dorothy Page Roberts,' a H.T.). This rose has unfortunately been confused with 'Cécile Brunner' world wide and New Zealand is no exception. This is a good rose and perhaps it is a tribute to the merit of 'Bloomfield Abundance' that it is still being taken for 'Cécile Brunner' for if it had been just a brazen impostor it would have disappeared long ago.

Concerning the parentage British authorities, with the exception of Graham S. Thomas, long maintained that 'Bloomfield Abundance' was a sport of 'Cécile Brunner' but this rose originated in the U.S.A. and the American Rose Society and other authorities have given the parentage as above. This has now been accepted in Britain. Actually there are several significant differences between them and this fact makes the view that the cultivar is a sport most unlikely if not completely untenable. Perhaps the easiest means of identification is by the green toothed calyx-lobes that project almost an inch beyond the buds before they open and reflex when open; the flower stems show bracts instead of leaves. The airy-fairy appearance of the rather irregular flowering panicles say two foot long by nearly one foot wide at the base with up to two dozen flowers on separate side stems, gives a

'Cécile Brunner'

'Bloomfield Abundance'. Note long toothed sepals contrasting with plain sepals of 'Cécile Brunner'.



Spray of 'Bloomfield Abundance' showing the airy-fairy panicles unlike floral structure of any other rose cultivar.

delightful effect that is otherwise unknown in the rose world. The contrast with the solitary blooms on leafy side shoots and the sturdy pseudo-cymes of 'Cécile Brunner' of about twelve blooms, is most striking.

Another most important difference is in the flowering time, 'Bloomfield Abundance' being considerably later than the bush 'Cécile Brunner' and much later than the climbing sport. If you grow all three you can almost guarantee a continuous succession of dainty blooms for at least seven months.

Concerning the actual flower this cultivar is definitely a deeper pink than 'Cécile Brunner' and lacks the yellow tints at the centre. We have noticed considerable differences in the pink of different bushes of

'Cécile Brunner'. This could be due to soil and other environmental differences but it is not unlikely that several strains of 'Cécile Brunner' have evolved over the ninety years of its existence. It has displayed a sporting propensity, so this is to be expected. When comparing shapes we could perhaps term a 'Bloomfield Abundance' bloom as a miniature decorative and that of 'Cécile Brunner' as a miniature exhibition rose. Bushes of 'Cécile Brunner' and 'Bloomfield Abundance' are growing together at Bishopscourt, Christchurch. Seen this way no one can have any doubts about their being quite distinct cultivars rather than one being a mutation of the other.

This cultivar may be propagated by cuttings, too, and makes a sizeable bush in a short time. It grows to seven feet or so and can be as much across but owing to its more lax habit it is doubtful if such a bush would contain any more wood than a five foot 'Cécile Brunner'.

CLIMBING BLOOMFIELD ABUNDANCE: Despite the vigour of the bush these always turn out to be 'Clg. Cécile Brunner' which also is known under the synonym of 'Fitesi's Rose'.

BABY BACCARA (Meilland, 1965, 'Callisto' x 'Perla de Alcanada'): This is the most recent addition to the class and fits in well for the pollen parent is a miniature obtained by pollinating 'Perle des Rouges', a nineteenth century dwarf polyantha raised by Dubreuil (1896) with *R. rouletti*. The seed parent is a Hybrid Musk from 'William Allen Richardson' selfed.

Included in this class are seven cultivars introduced in the fifties by de Ruiter of Holland and known as the Seven Dwarfs. They are 'Happy', 'Sneezy', 'Dopey', 'Sleepy', 'Bashful', 'Doc' ('Degenhard') and 'Grumpy' and the latter lives up to its name, being inclined to sulk and difficult to propagate. The parentage of some is unknown but 'Robin Hood' figures prominently and also seedling polyanthas in their ancestry. Though not as refined in bloom as the polyanthas mentioned previously they are not without interest.

There is little doubt that 'Cécile Brunner', though small in flower, is one of the all-time greats of rosedom. The type did not appeal to Victorian rosarians dedicated to the massive and heady charms of exhibition blooms from the Hybrid Perpetuals and the comparatively new Hybrid Teas. 'Cécile Brunner' and its cohorts have outlasted the former, being in general cultivation still.

Nowadays miniature roses are becoming more and more popular and with the realisation that size is not everything in flowers we may expect more roses similar to 'Baby Baccara' to appear as an intermediate between the miniature and the ever-popular floribundas which appear to be about to merge into the Hybrid Teas.

NEWS FROM DOMINION COUNCIL

From the June Meeting

Despoiling of Lake Shores:

Mr R. Syme related information published in connection with the enquiry into the raising of the level of Lake Manapouri. He felt that both sides of the case would be adequately presented before the Commission appointed by the Government.

Historic Trees Sub-committee:

Mr Burstall reported by letter that Forest Service reports on the Poverty Bay and Hawke's Bay areas were ready and copies would be circulated shortly. Other regions were being completed as the reports came in. Reprints of the official reports, which are in typed form, will be available to District Councils.

Reigstration of Judges—Conditions of Registration:

These are currently being reviewed in association with the interested bodies. Those for Floral Art Section have been reviewed in association with the Floral Art Society of New Zealand and other sections were still under review. The relevant minute is rather long and interested members should ask their District Council to allow them to study the Minute.

Role of the R.N.Z.I.H.:

The Dominion President reported that two meetings had been held by the Sub-Committee and local working committees in Palmerston North, Hamilton, Wellington and Christchurch had also met.

Plants Act and Plant Quarantine Regulations:

The Sub-committee reported that they had considered the Draft Act and the Revised Regulations and recommended their support by the Institute as fair and satisfactory.

Dominion Conference 1971:

Venue and Date: Auckland, 12th February, 1971.

Official Opening: Minister of Agriculture to be invited.

Banks Lecturer: Still under consideration.

Afternoon Discussion: Time to be provided for a discussion to be held on the future role of the Institute.

Meeting Hall and Saturday Programme: Arrangements left in the hands of the Auckland District Council.

"Flowers for Shows":

Stocks are low at 217 and interested persons should buy theirs now.

Election of Fellows:

Messrs G. J. Bradborne and R. J. Manson (nominated by Wellington District Council).

Honorary Life Membership:

Mr T. R. Rodda, Miss N. D. Horneman, Mrs W. Tudhope, Mrs A. J. Stark, Mrs E. I. Gudex (all nominated by Waikato District Council), Mr W. Pettigrew (nominated by North Taranaki District Council).

Planting of Trees at Otara, Auckland:

Mr I. A. Frost, New Zealand Forest Service, reported that the Lions Clubs of Auckland proposed to undertake an extensive tree planting in the suburb

of Otara and had approached the Forest Service in connection with the supply of trees. The scheme was commendable and Mr Frost is to confer with the Auckland District Council.

Trees on Land for Development in Palmerston North:

Mr Bolton reported that a system was being developed in Palmerston North whereby trees on land intended for development within the city were scheduled. The developers then consulted with the City Council before the trees were removed. City Council policy was oriented to retaining trees where possible.

Trees in Lower Hutt:

In a recent subdivision the City Council had taken steps to preserve historic trees.

BOOK REVIEWS

Publishing houses may submit horticultural books by New Zealand authors for review and the Institute will endeavour to have such books reviewed by a suitable authority.

The Editor may also accept reviews of suitable books submitted by the reviewer over his own name.

There is no undertaking to review every book submitted.

"FLOWERING VINES OF THE WORLD"

For the past eight years there has been on my bookshelf and possibly on yours, too, a big black-backed book with the white-printed title "Flowering Trees of the World" by Edwin A. Menninger. It is an excellent book about trees for the tropics and warm climates and is well illustrated by hundreds of colour photographs and some line drawings.

Now a companion volume has come from the same publisher, Hearthside Press, New York. It is called "Flowering Vines of the World" and is by the same author together with fifty collaborators from all over the world.

The new book is a fascinating source of information. Though it is not too technical for the home gardener, it contains much of great interest to the specialist.

New Zealand readers will notice that several of our native plants are described and illustrated, including *Freycinetia banksii* (kiekie), various *Metrosideros, Tetrapathaea tetrandra* (New Zealand Passionfruit), *Rhipogonum scandens* (Supple-jack), and *Clematis*.

One native you might not expect to see in a book on vines is *Clianthus puniceus* (Kaka Beak). Like other plants included, this is a shrub that English and American gardeners treat as a climber just as you might train an apple or pear on a wall or fence.

Metrosideros carminea (Akakura) is listed among "the most beautiful vines in the world."

Leading up to the main part of the book, which describes the vines in

detail, are several interesting chapters with intriguing headings such as "The mechanics of how vines climb," which tells of the leaners, the thorn clingers, the weavers, the graspers, and the rooters.

A helpful chapter suggests various ways of supporting vines for the best display of flowers. One novel method is to plant the climber in the centre of a level wire-topped table about 12ft square and at work-bench height (3½ to 4ft). The work of training the branches is made easy and the flowers can be looked down on.

Vines that produce flowers on pendent racemes or on hanging stems (like some of the passionflowers and the lapagerias) should be trained over pergolas so that they can be easily seen from below.

A supplement with the amusing title of "Vines Left Out of This Book" gives a brief description of plants that for some reason or other did not qualify for the main section. For instance, there are vines of excessive size and here is our native Rata (*Mestrosideros robusta*).

Then there are vines that are weeds, vines with inconspicuous flowers (our Supple-jack), and even a place for the kumara among the vines that yield fruits or other crops.

There are 196 illustrations in colour and 375 in black and white, which help greatly in identification.

A book like this cannot be produced cheaply; the American price is $25 and in New Zealand it will no doubt be a little more. But for any gardener who wants a reference book that is good to look at and good to read this is a fine investment. DOUGLAS ELLIOTT.

"PLANTS FOR GROUND COVER"

By Graham Stuart Thomas, 273 p.p. Illustrated in colour and black and white. (Dent.) $7.95.

The English writer and Gardens Adviser to the National Trust, Mr G. S. Thomas, must be very well known by now in New Zealand—especially to rose lovers; but his books have a great appeal to all garden lovers because of his wide and sound horticultural knowledge. "Colour in the Winter Garden," his first break from a rose book was widely acclaimed; and now he has followed it up with "Plants for Ground-Cover". This work will appeal to many who are endeavouring to simplify garden work, and yet, at the same time, retain easy yet attractive plants. As a very busy man with wide interests, Mr Thomas, has for years practised what he preaches—and most successfully too. For the small garden, he widely advises only such plants as do not travel rapidly from underground roots—a valuable hint, especially in some warm New Zealand areas. He shows, also, how suitable ground cover can conserve moisture, shade roots, provide extra humus, and, as well, cut down the weed problem. He gives a lengthy list of suitable plants—their height, spread, soil requirements, and whether they favour sun or shade. In fact, the veriest amateur, if he follows the sound advice so clearly given, could quickly learn the technique of using ground cover for his plants. The illustrations, both in colour and in black and white, give a clear and wonderful picture of what can be achieved by the thoughtful use of "Plants for Ground-Cover". Mr Thomas is a firm advocate of the lasting effect of beautiful foliage, both in form and colour; and this aspect of gardening has been wonderfully illustrated in this extremely worthwhile work. NANCY STEEN.

THE POTATO'S NEAR RELATIONS

Some of the Species Growing in New Zealand

By DOUGLAS ELLIOTT, F.R.I.H. (N.Z.), New Plymouth

The common potato, *Solanum tuberosum,* is but one in an enormous genus of over 900 species.

Among the shrubby solanums growing in New Zealand some have attractive flowers, two are grown for their edible fruit, and two are weeds.

Let's start with our own native *Solanum aviculare* or Poroporo. This is a leafy soft-wooded shrub growing 4 to 10ft high, which throughout most of the year bears pretty purplish flowers about an inch wide in clusters among the leaves.

Of the oval yellow berries, which are about an inch long, Cheeseman says: "The fruit is edible, and was made into jam by the early colonists." Apparently it is not only humans who eat it; for "aviculare" means "sought by birds."

This common shrub is found also in parts of Australia and Tasmania and in Norfolk Island. Cheeseman refers to a variety, 'Albiflora,' which has white flowers.

Rather like Poroporo is *S. rantonnetii,* a native of Paraguay. It is a tender shrub growing 4 to 6ft high and bearing yellow-centred violet-blue flowers in summer. At least one nursery still stocks this plant, which does well in Auckland. (There used to be and probably still is a good specimen in the Parnell Rose Garden.)

Practically a weed (definitely so in my garden at one time) is the Jersualem Cherry, *S. pseudocapsicum.* It is neither a native of Jerusalem (it comes from Madeira) nor a cherry.

The common name is unfortunate as it gives the impression that the fruit, which is bright orange like a ripe cape gooseberry, is edible, whereas it is in fact poisonous.

Though Jerusalem Cherry is very ornamental and a popular pot plant in England, it is too common to have much appeal for New Zealand gardeners. It grows quickly to a final height of about 4ft.

A similar Brazilian species, *S. capsicastrum,* has shorter leaves, the fruit are orange-red to scarlet, and the plant grows only 1 to 2ft high.

One of the species with definitely edible fruit is *S. muricatum,* known by the common name of Pepino in this country. Its other common names of Melon Pear and Melon Shrub refer to the flesh of the fruit, which looks and tastes like rock melon. In size and shape the fruit resembles the Tamarillo; the skin is pale green streaked with purple.

The leaves are smooth and almost fleshly. The stems are prickly.

Considering it comes from the tropics, you won't be surprised to find the plant is frost-tender; but in a sunny sheltered position it survives light frosts. Like other tender shrubs such as luculia, poinsettia, and hibiscus, it is best pruned in spring so that you can then cut off any damaged shoots. Tie the remaining shoots to their support.

S. jasminoides, the Potato Vine, is a native of Brazil and is more hardy than *S. wendlandii*. In summer and autumn it bears masses of small pale blue flowers in loose clusters.

The variety, 'Album,' which has pure white flowers, is commoner in this country and grows like a weed in some mild districts.

S. crispum is a more or less evergreen climber from Chile. It has clusters of fragrant flowers, which are a delicate bluish-purple. Each flower is about 1in wide and has a bunch of yellow anthers in the centre. It flowers in summer. It can be grown as a shrub.

The only place I ever saw it in this country was at Eastwoodhill, where I took the accompanying photograph. It is such an attractive plant, I wonder it has not become popular. Perhaps like many other good plants, it is neglected because we have so much to choose from.

And now for the two weeds.

S. nigrum is the notorious Black Nightshade, a common shrubby weed with white flowers and small round black berries. It is said to be poisonous but there is some doubt about this.

Bailey's "'Standard Cyclopedia of Horticulture" lists it among the species grown for edible fruits and says:

"In the Dakotas, according to Hansen, the plant is often called 'stubbleberry,' as it volunteers freely in wheat-stubble, and the fruit is used there for pies and preserves. . . . In warm countries, according to Vilmorin, the leaves are sometimes eaten as spinach is, 'and apparently without injurious result, although the plant belongs to the dangerous family of the Solanaceae.'

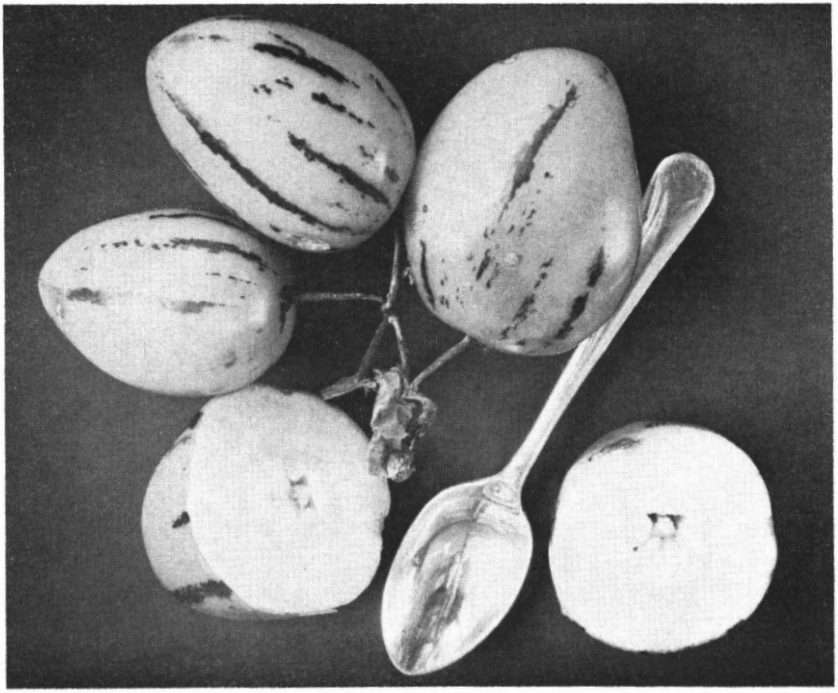
"The species is extremely variable, and much difference of opinion exists in regard to the poisonous qualities of the berries."

Bailey also lists a variety called 'Guineense," which has a bigger fruit and is called Garden Huckleberry. This is probably the fruit that was sold in New Zealand as huckleberry a few years back. If it always tastes like the sample I tried, I'm not surprised that it didn't become popular. But at least it wasn't poisonous.

Cheeseman lists Black Nightshade as a native of New Zealand and adds: "A common weed in almost all parts of the world."

Solanum wendlandii *Photograph—Douglas Elliott*

Solanum jaminoides album *Photograph—Douglas Elliott*



The fruit of the pepino, *Solanum muricatum*
Photograph—Douglas Elliott

A native of Chile and Peru, the Pepino is a quick-growing shrub about 4ft high. As it is brittle and frost-tender it needs shelter. It grows easily from cuttings, which is just as well because I have never seen it set seed. Where you would expect seed, in the middle of the fruit, there is a small empty space.

I have not seen this delicious fruit for many years. I used to grow it but lost it one cold winter.

Another edible species is *S. melongena* 'Esculentum,' commonly known as Egg Plant or Aubergine. It also bears the intriguing names of Bringall, Jew's Apple, and Mad Apple.

This plant comes from Africa and South Asia and is a tender annual that is tricky to grow except in very warm gardens or under glass. The big shiny fruits are deep violet.

I've made the acquaintance of three climbing solanums. By far the most spectacular is *S. wendlandii*, which comes from Costa Rica. Throughout the summer it bears masses of lilac-blue flowers, which are about 2in wide and are borne in heavy clusters about 8in wide.

Solanum wendlandii
Photograph—Douglas Elliott

Solanum crispum
Photograph—Douglas Elliott

GROUND COVER IN THE CHRISTCHURCH AREA
(Continued)

By N. W. DRAIN, N.D.H.(N.Z.), Christchurch
(Being a thesis submitted for the National Diploma in Horticulture)

In New Zealand, Christchurch in particular, a number of *Erica* species and varieties have been planted as ground cover on traffic islands and median strips and some of these are proving to be quite successful under these conditions. For general ground cover planting such as on open sunny banks, not too steep, the various lower growing Ericas and Callunas are an excellent choice, and better use could be made of these for such situations.

Erica Carnea — 6″ – 12″ Spring Heath.

HABITAT — Central and Southern Europe.

This is probably the best of the heaths for ground cover purposes, possessing a more prostrate habit of growth than other species. As a ground cover it is not as resistant to traffic or as reliable as some other plants, but this is compensated to some extent by the attractive rosy red flowers which are a notable feature during the winter months. There are a number of varieties, some of which extend the flowering period well into the spring. 'Springwood White', with white flowers is perhaps the best variety as a ground cover—strong growing and very prostrate. Other varieties are 'Prince of Wales', a fine dwarf crimson, 'Queen Mary', bright pink and 'Vivellii' with crimson red flowers. As with all members of the heath family, soil for planting should be acid with a liberal amount of humus, preferably peat or leaf mould. Spacing of plants is satisfactory at 18″-2′ for ground cover purposes.

PROPAGATION — Small late autumn cuttings or from self rooted layers.

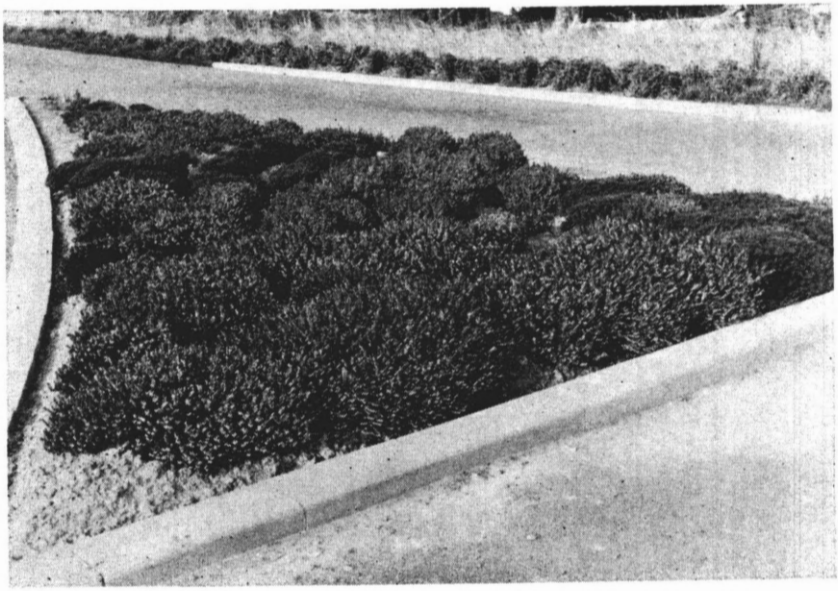
PLANTING — From pots or open ground 18″-30″ apart.

Erica darleyensis — 2′

Blooming from May until September, this species has the longest flowering season and in addition is probably the toughest and hardiest of all the heaths. Once established, is tolerant of poor soil and dry conditions and is more suitable than most other species and varieties for large scale planting. Unfortunately its flower colour lacks warmth in comparison with the selected forms of *Erica carnea* but its greater hardiness would favour it for many situations. For this reason it appears to be a satisfactory heather for traffic islands and median strips. Planted at 2′ apart, *Erica darleyensis* will soon spread and meet up to form a really dense cover.

PROPAGATION — Autumn cuttings.

PLANTING — From pots or open ground 2′ – 3′ apart.



Erica mediterranea 'Rosslare'

Photograph—N. W. Drain

Erica vagans 2′ – 3′ Cornish Heath.

This is a hardy heath and fairly reliable as a ground cover. Planted amongst the winter flowering varieties it provides colour at a time when colour interest is lacking. Two varieties of *Erica vagans, alba* with white flowers and 'Mrs Maxwell', a bright pink, are both very attractive though they do not appear as hardy as the parent plant for exposed situations such as traffic islands.

PROPAGATION AND PLANTING as for *Erica darleyensis.*

Erica mediterranea 'Rosslare'

This variety together with *Erica mediterranea* 'W. T. Rackliff' are widely used for general planting and trials so far indicate their suitability as ground cover where plants of this form and habit are required. Forming dense bushes 24″ high and as much across, the flowers are rose pink and white respectively.

PROPAGATION AND PLANTING as for Erica darleyensis.

Hebes

These New Zealand shrubs have gained considerably in popularity during the past few years and this is no doubt due to the increasing awareness of the unique qualities of form texture and colour, possessed

by this genus. For general landscape work, where small shrubs are required, the Hebes are almost unsurpassed in their general usefulness and amongst the numerous species and varieties are several valuable ground cover plants. Though many species may in fact be used as ground cover, a few have shown particular merit in this respect. Worthwhile attributes of most of the Hebes include their climatic hardiness, ease of propagation, ease of establishment, rapidity of growth and tolerance of a wide range of soils.

Hebe chathamica

This species has prostrate stems and small ovate leaves of a soft green colour. It forms a dense prostrate bush and once established is fairly effective in smothering weed growth. Plant 2′ apart.

Hebe hartii

This is another prostrate species which forms a low dense ground cover. It has quite an attractive habit of growth with narrow ovate, shiny, green leaves. Plant 2′ apart.

Hebe obtusata

A much more vigorous species than the previous two listed, it has a prostrate habit and forms itself into a solid mound, making a dense cover. The leaves are much larger than most of the low growing species. Flowers are pale lavender. Plant 3′-4′ apart.

Hebe youngii

Its neat compact and prostrate habit of growth makes this Hebe very useful for areas where a plant of this nature is required. Leaves are very small, dark green, with stems of a blackish colour. It has been used in Christchurch on narrow median strips and appears to be an ideal plant for such areas. Plant 18″ apart.

Hebe pinguafolia

A particularly attractive species with small blue grey leaves and compact habit of growth. Though the stems are not prostrate, the plant soon forms a solid clump and the leaf colour provides interesting contrast when planted amongst other species. Plant 2′ apart.

Hebe 'Inspiration'

Not as compact as some species, but it does make an attractive rounded and tidy bush with pretty purplish-mauve flowers in spring. If planted fairly close together, bushes soon link up to form quite an effective cover and one virtue of this species is its apparent ability to withstand the adverse effects of motor traffic pollution when planted in traffic islands. Plant 2′ apart.

Hebe decumbens

Another prostrate species having bright green leaves with a reddish tinge.

Hebe albicans

This is a tidy plant making a dense bush with distinctive pale blue-green leaves and it provides excellent colour contrast amongst darker foliage. Plant 2′ apart.

PROPAGATION	of all Hebes is generally by semi-ripe cuttings.
PLANTING	From pots or open ground.

Senecio greyii	4′
HABITAT	New Zealand.

Though rather taller than most ground covers *Senecio greyii* may be regarded as a first rate plant for many situations. Of rapid growth, it soon forms a dense bush when planted in mass, is effective in smothering most weeds, while its grey and green stems and leaves never fail to attract attention. It is particularly useful for traffic islands and city planting generally being tolerant of the adverse factors encountered in these areas.

PROPAGATION	Hard or semi-ripe cuttings.
PLANTING	From pots or open ground 3′ apart.

Nepeta mussini	2′ Cat mint.
HABITAT	Persia, Caucasus.

This perennial has been grown as a border and rock garden plant for many years, but its potential value as a ground cover for large areas has not yet been realised in New Zealand. Wyman in his book "Ground Cover Plants" includes *Nepeta mussini* in his main descriptive list of plants which have been "used as ground covers in the central and northern parts of North America". In sunny situations either on banks or on flat areas *Nepeta mussini* should prove to be an excellent cover plant, its grey-green foliage and lavender blue flowers both being very attractive. An annual cutting back of flower spikes is necessary to keep these plants tidy.

PROPAGATION	Division, cuttings and seed.
PLANTING	From pots or open ground.

Rosmarinus officinalis protratus	1′ Creeping Rosemary.
HABITAT	Southern Europe.

This plant is common enough in rock gardens and is often seen draping over a wall. As a ground cover, it is ideal for dry sunny banks, though perhaps not as reliable as some cover plants. Though one plant

will eventually cover a considerable area it is fairly slow of growth during the first year or two and for this reason is not to be recommended where a quick cover is desired.

PROPAGATION	Semi-ripe cuttings.
PLANTING	From pots 18″ apart.

While the plants that have already been described are representative of most of the better plants for general use, a considerable number of other shrubs and perennials are excellent subjects for specific situations.

Amongst the perennials are a number of first rate cover plants for sun and shade. With some of these the foliage dies down for the winter months, but they generally form such thick clumps that no weeds can penetrate. In this category are the hosta, e.g. *Hosta lancifolia* and *Hosta plantaginea,* the hellebores, e.g. *Helleborus corsicus* and *Helleborus foetidus, Convallaria majalis* (Lily of the Valley), and the astibles, all of which are shade lovers. Other perennials useful as ground covers include *Bergenia cordifolia, Brunnera macrophylla* and a number of *Geranium* species including what is reputed to be a really excellent cover plant, *Geranium macrorrhizun.* A number of the evergreen saxifrages also make useful ground cover, including some in the "London Pride" group. Among the *Polygonium* species are *Polygonium affine* and *Polygonium vaccinifolium,* both vigorous mat forming perennials and best planted where they will not be a nuisance by growing into other plants. The same applies to some of the *Campanula* species which nevertheless are worth growing on account of their attractive flowers. *Campanula glomerata* with heads of purple flowers is well known but is a very invasive plant. *Cerastium tomentosum* is useful on account of its greyish woolly foliage and white flowers.

There are several prostrate forms of ceanothus which can serve as ground cover plants for hot, dry situations, but their relatively short life would place them behind many other plants. One variety *Ceanothus thrysiflorus repens* has been propagated at the Municipal Nurseries, Christchurch. It has quite an attractive form of growth with very pretty mid-blue flowers in spring. Amongst the hypericums are a number of species with a semi-herbaceous habit, which would be useful as ground cover in smaller areas. The ones in question form solid clumps of foliage and from this the flower stems arise, these requiring cutting back after flowering. Species at present under trial at the Municipal Nurseries, Christchurch include *Hypericum aegyptiacum, Hypericum fragile* and *Hypericum tetrapterum.*

CHAPTER 5

DESIGN IN GROUND COVER

No study of plants used in ornamental horticulture, no matter how high their functional value, would be complete without some reference to design elements such as form, texture and colour. Detailed study and observation of individual species reveals the presence of these qualities, common factors with all plants including ground cover.

In any prosposed scheme, consideration should be given to these various qualities with a view to obtaining maximum value in terms of visual satisfaction and enjoyment together with efficient function also.

Traditional landscaping invariably uses and emphasises such features as trees, shrubberies, flower plots and lawn and these still remain valid and valuable elements in landscape planning and design.

However landscape design for today's architectural and engineering forms require a somewhat different approach and treatment from that given to the more traditional forms of earlier times. The materials now used in these newer structural forms, including new textures and colours, have created a demand for different landscape materials including plants, in the treatment of the outdoor environment. Some of these materials include rocks (as elements of design), pebbles and crushed rock as ground cover and a large percentage of lower growing shrubs and perennials, in the nature of ground cover plants.

The development of this branch of landscaping has no doubt focused attention on the design aspect of ground cover and ground surface treatment generally, including advancement towards a more imaginative use of plants in what may be termed the floor of outdoor living spaces.

It is not proposed here to provide detailed plans and designs to demonstrate what may be achieved through the intelligent use of materials, but rather to direct attention to the basic qualities of these materials for the purpose of stimulating more thought in their use.

The landscape architect is concerned not only with the functional aspects of general landscape planning but is conscious of the need for good design in the employment of his materials. It has been said that whatever is done in the landscape, affects the landscape and while this is generally thought of as applying to taller elements such as trees and buildings, the formation of ground patterns should be considered also.

Design with hard surfacing is briefly covered in Chapter 6, though mention here is made of the interesting patterns that can result from the use of these materials in conjunction with ground cover plants.

Mention has already been made of design elements relating to plants, namely form, texture and colour. Both form and texture are

Juniperus sabina tamariscifolia and *Hebe albicans* at Ferry Road and the Tunnel Road junction

Photograph—N. W. Drain

concerned with individual character of the plant e.g., its general growth habit, arrangement of branches etc. while colour may refer to that of flowers, fruit, leaves or stems, one or all of which may be notable features of an individual species of plant.

Another important aspect of design is scale. This may relate either to the total size of any given area or size of other elements such as buildings, around which planting is to be carried out. As a general guide, large expanses are better served by plants with bold foliage, while those with smaller leaves and neat compact growth habits are more suitable for smaller areas, and the good designer will be conscious of these broad aspects when planning a particular area.

In regard to colour, there is no lack of worthwhile material which, when skilfully chosen and applied provides stimulus and contrast either with plants used alone, or these in combination with other material such as hard surfacing, walls of buildings, etc. Light coloured foliage for example, is useful in brightening dark areas.

Awareness of colour and an appreciation of colour harmony can be developed from study and constant observation, though individual ability to accomplish this varies from person to person. Some knowledge however, of colour features of plants, can be fairly readily obtained from detailed descriptions such as are provided in the lists in Chapter 2.

As already stated, form and texture relate to a plant's individual character and this is a vital aspect to consider, and one by which a strong design may be introduced into a scheme. A knowledge and understanding of this aspect can only partly be gained by descriptions, and is really dependent upon personal observation over a long period. A comparison, for example, of the general character of the pfitzer juniper, English ivy and *Hebe pinguifolia,* to mention only three different plants reveals that there is diverse material with which to work.

Design qualities of a few ground cover plants will now be considered.

The interesting leaf patterns of the English ivy (*Hedera helix*) and its varieties provide relief and strong contrast when used in areas containing large expanses of smooth surfacing such as concrete or asphalt. Another plant useful for such areas is *Euonymus radicans variegata,* its cream and sometimes pink variegations providing interest, particularly in the winter months. Because of its light coloured foliage, *Hedera canariensis variegata* is particularly useful and attractive under trees and on shady banks. *Hypericum calycinum* is another attractive plant, its bright yellow flowers providing excellent colour for much of the summer. *Mahonia aquifolium* also has yellow flowers, blooming in spring and followed by light blue berries, though the leaf pattern of this plant is perhaps more interesting as a design element. The heath family contains some attractive colours both in foliage and flower and these with their fairly compact growth habits are particularly suited to smaller areas. They can of course be mass planted in large areas and by careful planning, flowers in various colours can be had for most of the year. *Calluna vulgaris aurea* is well known for its pale gold foliage when grown in full sun, and is especially useful amongst the dark green foliage of various ericas. Many of the low growing *Hebes* are interesting in both form of plants and colour of foliage, and some species have rather attractive flowers also. Some of the more outstanding include *Hebe armstrongii* with bronze gold foliage, *Hebe albicans* and *Hebe pinguifolia* with glaucus foliage, and other species with similar colourings as well as various shades of green. The striking character and colourings found in the prostrate junipers, never fail to arouse interest. The blue foliage of *Juniperus horizontalis glauca* and soft green and gold of *Juniperus chinensis pfitzeriana aurea* to mention two examples make these plants very valuable in any scheme where foliage colour is desired. The distinctive growth characteristics of the junipers also sets them apart from other plants and there are many situations where they can be used to advantage. They are particularly attractive when used in association with rocks and pebbles.

Other plants of particular interest and value include *Senecio greyii* with grey and white leaves, *Nepeta mussini* with sage green foliage and

mauve flowers, *Thuja occidentalis rheingold* with beautiful gold and bronze foliage and valuable as a dot plant to give striking contrast amongst other foliage colours, and *Ajuga reptans purpurea* and the variety *variegata*, both providing contrasting colours amongst the green foliage of other plants.

Paving and Cover Plants

Brief mention has already been made of combining ground cover plants with paving and many interesting patterns can be designed from random stepping stones surrounded with plants, to large public walks and squares containing planting plots which may be of any shape or size. These plots should always be raised to a minimum height of 6″-9″ to prevent damage from pedestrians. Cover plants should be selected according to the size of plots and colour and texture of paving.

Lawn and Cover Plants

Some ground cover plants are seen at their best when mass plantings are combined with lawn, particularly with areas adjacent to buildings. The fine texture of a first rate lawn contrasts sharply, for example, with the strong form and texture of such plants as the English Ivy, and where space and general design of an area permits, such combinations can be very attractive indeed.

Trees and Cover Plants

Trees are generally regarded as an integral part of the landscape and are almost always included in the planning and design of today's living spaces. Plantings of trees either singly or in groups are often considerably enhanced by an under planting of a suitable ground cover plant. This is especially true where trees are planted in formal beds close to buildings.

CHAPTER 6

HARD SURFACING

Hard surfacing in the form of asphalt and concrete has for so long been an integral part of the outdoor environment that its importance as an element of landscape design is often overlooked.

This chapter is concerned with the broader aspects of paving materials for pedestrian traffic with emphasis on their place within the total concept of landscape planning. It is obvious that modern forms of hard surfacing contribute substantially to the comfort, convenience and efficient function of everyday living, but it is important that when these materials are used, they are considered in relation to all other elements of the landscape.

As a ground cover, hard materials are sometimes to be preferred to cover plants or lawn, for example, those areas surrounding public and private buildings which are subject to a heavy concentration of pedestrian traffic. It is surprising to find at times, the continuing use of

Cashel Street-High Street triangle

Photograph—N. W. Drain

lawn as a surfacing material in these areas, when the need is obviously for hard material. This is especially true of private gardens where the traditional pattern so often followed does not provide for the maximum comfort, convenience and durability.

Some of the most successful examples of hard surfacing include provision for the planting of trees and other plants, either in plots within the area, or in borders adjacent. This integration of plants and hard paving is extremely satisfying visually, providing design and implementation are of a high standard.

Bricks and unit concrete pavings laid without mortar are particularly suited for use with trees and enless variations of pattern and arrangements of materials are possible. In smaller public areas where people congregate, it is possible to have the beauty and function of trees combined with durable and maintenance free ground surfaces and resting places are easily provided in such areas as well. An example in Christchurch is the triangle at the corner of Cashel and High Streets. This area, originally containing a pool lawn and flower border, was redesigned by the Parks and Reserves Department of the Christchurch City Council, to provide free movement and resting points for pedestrians. The area was surfaced with large concrete paving slabs and several raised beds of differing shapes were constructed, these being planted in a variety of low growing shrubs. Seats were provided and a tree (*Platanus orientalis*) sited to provide shade, welcome in the heat of summer. (The

value of this tree however, as a landscape element amongst tall buildings is no doubt its most important function.)

There are several such areas in Christchurch which at present are made up of lawn and flower plots, and it is intended to redevelop these also to a similar pattern, thus providing more adequately for the needs of present day living.

Having decided to use paving for a particular area, it is important that the materials chosen blend or harmonise with other elements, such as walls of buildings, fences, etc. Factors such as colour, texture and also the size of individual units, must all be carefully considered; this latter aspect being concerned with scale or proportion.

Particular reference will now be made to some of the paving materials commonly used and factors of a practical nature to consider in their choice.

Hard paving may be done with poured concrete, but unit materials are commonly used. These include pre-cast concrete blocks, natural stone, bricks and tiles. Log sections and wooden decking may also be added to this list. Special aggregates may be used to surface concrete including selected pebbles, crushed brick or rock in various colours. They can be mixed in the top inch of concrete or sprinkled over the surface after pouring; but to perform these operations successfully requires a considerable degree of skill.

Factors governing the choice of pavings are as follows:—

Cost and Availability

Some materials have a high initial cost matched by low maintenance costs, and vice versa. Durability such as freedom from cracking should be matched to the life expectation of the project.

Appearance, Weathering, Cleaning

Texture, colour suitability for plain or patterned work should be considered. Natural materials tend to weather unevenly, but this may improve their appearance. It may be necessary to select materials which can be cleaned by washing and hosing. In large areas where cleaning may need to be done by machine, the design must be of sufficient structural strength to carry the necessary weight.

Safety, Noise, Light Reflectivity

The use of non-slip materials may be important, particularly in public areas. Softer and coarser textures may lessen impact noise. Light reflection causing glare may be a consideration, particularly where vehicular traffic is in close proximity.

Subsoil, Drainage Services

Subsoil conditions may decide the use of an impervious paving or otherwise, depending on general drainage requirements. In the case of

specimen trees in paving, provision must be made for water to penetrate to the root zone. If underground surfaces are to be accommodated, ready access to these may be an important consideration. Unit paving materials laid so they can be easily removed would be desirable in such cases.

Comparative Cost of Surfacing Materials

Apart from the cost of the materials themselves, factors such as labour and transport costs, soil structure and the availability of materials (including wastes) are important. It is sometimes difficult for example, to obtain labour that is sufficiently skilled for the efficient laying of natural paving stone. Detailed information on laying the various types of paving is readily obtained and will not be considered here. However, brief mention is made of foundations, and if hard paving is to be successful, certain fundamental knowledge and rules must be understood and applied as necessary. They include:—

(a) **Subsoil:** Its physical nature (clay, peat, sand, etc.). Water table, previous disturbance, if any.

(b) **Preparation:** Excavation of organic topsoil and sub-soil if necessary and the provision of a suitable base material, well compacted.

SCREE GARDENS

What may generally be regarded as a new form of landscaping, involving the use of pebbles, crushed rock, etc., as a surfacing material, has arisen in certain parts of the world during the past number of years. These materials have long been used as a medium to assist in the growing of certain plants, particularly alpines, but their value as a landscape element has largely been overlooked.

Scree gardens strictly speaking, are gardens constructed to provide a home for the true alpines—that is, plants that are found growing on mountain slopes covered with loose stones, and where the melting snows during the summer provide them with plenty of ice cold water. However, it may be said that in the Canterbury district at least, the term scree garden has come to be used for any garden where the principle feature is a covering over the soil of pebbles or crushed rock of some form or another. These gardens are probably better referred to as Contemporary Scree Gardens and the true scree as Traditional.

These gardens also sometimes feature rocks, either singly or in groups, but cannot rightly be termed rock gardens. The rocks are used, not to provide a home for the wellbeing of the plants (though they may serve this function in some cases) but are carefully selected and so placed, to be viewed as an added attraction to the garden.

Water also has a place in this form of landscaping and some of the most beautiful designs feature either a pool or a stream or both; the sound and sight of moving water creating a most satisfying experience for the user.

The inspiration for this type of landscaping has no doubt come from the traditional gardens of Japan and perhaps indicates something of Japanese influence on Western thought and culture. It is the writer's opinion, however, that traditional Japanese landscaping in its entirety has little place in the New Zealand way of life, but there are elements which may be used and ideas that can be borrowed to bring enrichment and fresh interest into our homes and environment.

Quite apart from the added interest the Contemporary Scree Gardens are able to provide, when skillfully designed and constructed, and properly blended with other landscape elements, there are certain obvious practical advantages, particularly for those areas exposed to the public view. The main one of course, is that the covering of scree dispenses with the need for any cultivation of the soil, and coupled with this is the fact that such gardens maintain an attractive and tidy appearance over the whole of the year, the only work necessary being an occasional pruning of some plants, and the removal of any weeds which may appear from time to time. (The question of weeds is dealt with under general preparation and construction.)

This landscaping does appear to have first been applied to the private garden, and from this, extended to landscaping of commercial and industrial concerns. Public bodies generally appear to have applied this scree landscaping to a limited extent only, though its value in areas surrounding public buildings is being recognised, some interesting work having already been carried out. With private homes, these scree gardens have either been developed as a feature within an existing garden, or in the case of some of the newer homes in the Christchurch area, the whole of the area from the house to the street has been so treated. A critical survey of these gardens, however, makes it apparent that some attempts at these do not really measure up to good standard in terms of general design and choice of materials. Perhaps the strongest criticism should be directed at the types of rocks often chosen and also the placing of these rocks in gardens where they are intended to be a feature. These are often completely lacking in individual character, and, in addition, often scattered throughout the garden with no indication of there being a coherent plan or design. Another common fault is the use of crushed rock as the soil covering, of a colour, size, or texture, which does not harmonise with other elements such as rocks, plants, or the house itself. Strong colours are definitely for small areas and neutral tonings are to be preferred in most instances. The range of materials available in Christchurch and the surrounding district is not great, difficult access and/or

high transport costs often being a limiting factor for the use of materials on large scale projects particularly. Materials that have been used to date include rocks and crushed rock (in various grades), from the Halswell Quarries, rocks and boulders from various parts of Banks Peninsula, smaller stones and pebbles from river beds in Canterbury, crushed marble mainly from North Canterbury areas and schist from the lake areas of Otago and from the West Coast of the South Island.

There are no really difficult techniques involved in constructing a contemporary screen garden, but it is important that a few basic and commonsense rules are understood and followed.

What is important initially, is an appreciation of what represents good design and considerable thought should be applied to the initial concept of a scree garden, and the question of harmonising with other elements in the landscape, through to the actual elements to be used, including rocks, plants and surfacing materials.

The general preparation of the soil for planting follows the same principles as that for cover plants generally, this being dealt with in Chapter 7. All perennial weeds must be eradicated and some time should elapse between initial cultivations and planting, to allow for the emergence of all such weeds. As a general rule for these scree gardens, the laying of black polythene over the ground at the time of planting is desirable, to prevent the growth of further weeds. The polythene must be generously overlapped and cutting, to enable it to be fitted around each plant, is necessary. The surfacing material (pebbles, crushed rock, etc.) is then laid on this to a depth sufficient to cover the polythene completely, usually 1″-2″. The use of polythene as a sealing agent may not always be practicable or worthwhile: such as on rocky slopes, where weeds will find their way through at the point where the polythene meets the rocks. A similar problem can arise at the juncture of the polythene with the plant, and some hand weeding is usually necessary, particularly in the early stages of growth. Some of the scree gardens in Christchurch have been constructed without using polythene at all. A fairly thick layer of surfacing material has been applied over the ground and this has had the effect of at least checking weed growth. Modern weed killers carefully applied between the plants, destroy weed growth and after several applications, only occasional hand weeding to remove the odd weed is all that is required.

A point apparently in favour of not using polythene is that the plants receive the benefits of natural rain and air more readily, though actual tests over a considerable period would need to be carried out before definite conclusions could be arrived at, on this point.

(to be concluded)

REGISTER OF JUDGES

I wish to draw your attention to the service now being offered by this Institute in keeping a Register of Judges. When approved for entry in this Register the judge is given a small certificate in a plastic case—suitable for carrying in purse or pocket—and signed by the Dominion President and Dominion Secretary of the Institute. The Register is kept in the office of the Dominion Secretary and lists judges in Floral Art, Roses, Camellias and other specialist Societies.

Nominating bodies take full responsibility that the conditions under which the judge is granted a Certificate are as stated in the application form, which may be obtained from the Dominion Secretary or District Council Secretaries.

DISTRICT COUNCIL NOTES

WAIKATO

Much of the success achieved by the Waikato District Council has been due to the work done by our Honorary Secretary, Mrs D. M. Yendell, over the many years she has held this arduous position. The amount of work attached to being Secretary has been considerable, a fact that may not always have been fully appreciated because of the efficient manner in which it was done. It was with very sincere regret that her resignation was accepted, but the reason was one for congratulation as she will be leaving to live in Canberra, where her husband, Mr J. Yendell, has been appointed New Zealand High Commissioner to the Australian Commonwealth. It would seem that many Waikato horticulturists will be calling on Mrs Yendell in her new home where there is a large garden which will no doubt receive the same skilled attention as did her former delightful one in Hamilton.

We are most fortunate that Mrs L. M. Nicholson, a member of the District Council has agreed to become our new Honorary Secretary. At the May meeting a most interesting and entertaining talk was given by Mr James Stirling about the way in which he gathered together and escorted to Japan a collection of plants which were used in the New Zealand Pavilion at Expo 70

The conservation of our country is a matter of great importance to us all, and in June we were fortunate to have a talk on this by Professor F. J. Newhook of Auckland University. The problems of the conflicting requirements of developing, whilst at the same time preserving the New Zealand countryside, were discussed by one who is playing a major part in this difficult task. Some excellent slides, including some of Manapouri, illustrated this talk. Whilst soil is a basic requirement in gardens it is often not realised how this has developed, and in July Professor J. D. McCraw, of Waikato University, gave a talk on the story of the Hamilton Basin and its soils. The way in which the complex deposits of soils took place was traced from the earliest times to to-day, and Professor McCraw's presentation of this talk was obviously appreciated by his audience.

With container-grown plants available throughout the year the former traditional autumn and winter planting season is not now so clearly defined, but local nurseries and garden centres have been very busy. The Waikato is now well served by several garden centres and there is a keen demand for plants for the many new gardens being made in the rapidly growing suburbs of Hamilton and other towns. It is gratifying that a greater range of plants is being offered, for in a climate such as the Waikato the opportunity exists to grow many plants of both temperate and sub-tropical origin. It is to be hoped that desirable plants, some still difficult to obtain, will be grown by nurserymen for the eventual benefit of our gardens.

WELLINGTON

THE SHAPE OF THINGS TO COME

An evening meeting arranged by Wellington District Council in collaboration with the organizers of Conservation Week in Wellington, took place on Wednesday, August 5—Arbor Day. The idea originated from Wellington District Council Chairman, Mr I. D. Galloway, and the success of this function is felt worthy of recording in the notes of this Journal.

The subject of the evening's activities was "Improving Our Surroundings",

the main speaker being Mr Perry Martin Hill, A.A.Dipl., A.R.I.B.A., A.N.Z.I.A., who dealt with "The Impact of New Techniques in Urban Development". Using two screens simultaneously Mr Hill was able to compare different treatment given to similar situations in landscape design or development. Various aspects of the latest urban development schemes in many overseas cities, including Los Angeles, New York, Montreal, London, Moscow, and Japan, were shown and described in detail, followed by a similar topic, but on the local scene. Mr Hill stressed the importance of suitable planting schemes in urban development and gave his views how plants should be incorporated for optimum ultilitarian and aesthetic purposes.

Following the address an open discussion was centred around the ways and means in which Wellington might develop its natural resources and resolve its complexities in urban development. The panel which handled this lively discussion, consisted of the Chairman for the evening, Professor John Roberts, Professor Public Administration, University of Wellington; Mr I. D. Galloway, Director of Wellington's Parks and Reserves; Mr K. V. Clarke, Wellington's City Planner; Mr J. W. Fowles, Assistant City Architect; and Mr Hill.

Through the auspices of the Institute and the willingness of the "professional men" comprising the panel, representatives of many other organisations were able to take an active part in matters likely to affect their own environment. This opportunity for members of the public to express their views to the men whose job it is to plan, and execute, urban development augurs well for a better understanding of the problems involved and a broader agreement, perhaps, of the schemes best suited to Wellington's needs.

The appeal of the meeting can be measured from the fact that about ninety people attended, and its success could well set a future trend in matters of a similar nature to be organised by local executive committees of the Institute.

WHANGAREI

MAY.—Our meeting scheduled for 28th April had to be delayed for a week in order to secure the services of our speaker, Mr R. H. Mole, Director of the Otari Open Air Plant Museum at Wellington, who briefly outlined the history of Otari, which began in 1908, when 150 acres of land, partly open grassland, part bush and some in scrub and gorse was part gifted, part purchased by the Wellington City Council and set aside as a reserve. In 1927, largely influenced by the late Dr Leonard Cockayne, F.R.S., a sympathetic City Council approved a plan to use it for a museum, devoted entirely to native plants, to contain, as far as practicable all the plants of New Zealand Botanic Region, whether herbaceous plants, shrubs or trees. They were to be planted, as far as possible, in the same associations as they occur in nature, and to illustrate by their arrangement their uses in the home garden, whether for lawns, hedges, shelter belts, rockeries or for purely ornamental purposes. The topography of Otari with its steep hillsides, sloping banks, bush clad or bare, well watered with numerous streams, but mostly wind-swept, presented many challenges to the gardener who learned to meet them in various ways. Very little virgin bush remained, but some tall rimu, up to 100 ft. high, still existed, also kahikatea, kohekohe and hinau. Tawa was, however, the dominant tree, but in areas burnt 100 years ago, and now in second growth, rewa-rewa had become the dominant tree.

Mr Mole then showed colour slides of the Otari area, which enabled us to appreciate its size, as well as its contours and vegetation, and to realise the transformation from natural to cultivated areas. In the quarter-acre Rock

Garden, Wellington's greywacke stone was used in large masses and contrasted well with the feathery plumes of *Cortaderia fulvida,* and making a carpet below them the lemon yellow, dark-eyed blooms of the native *Hibiscus trionum.* This plant seeds itself and so provides for future needs. Hebes were among the most useful plants on dry, exposed slopes, as they stood up to wind and provided shelter for more tender subjects. Four species were shown, all a mass of flowers. *H. traversii,* a white-flowered South Islander, *H. decumbens,* also a southerner, rather a spreading plant with bright green red-edged leaves, good in the rock garden. *H. albicans,* only 1 ft. high, from Mt. Arthur in Nelson and our well-known *H. diosmaefolia,* easily grown and coming in two colours, a white and a good mauve. Another hebe, and perhaps the most striking of all shown, was *H. ochracea,* with golden tinted foliage. Hebes need careful pruning.

We were on more familiar ground when shown splendid examples of golden tainui and puka, the latter a good plant for wind and salt resistance. The red fruits of *Corokia macrocarpa* made a fine picture and the plants of its sister *C. cheesemanii,* make a good hedge 5-6 ft. high and must be pruned.

Mr Mole considers that the common cabbage tree should receive an award of garden excellence, since it will flourish in so many different situations, dry, wet or exposed The kaka beak *Clianthus puniceus* is effective against a wall or fence and is easily reproduced from seed or soft-wood cuttings. Prune old flowering wood and watch for red spider. Of all the beautiful plants shown the Marlborough broom *Chordospartium stevensonii* proved the most enchanting, with its long, thin, pendulous branches closely studded with lavender blossom. The plants are rare in nature but can be grown from seed.

Unusual forms of well-known plants which do well in many areas, were the amazing dwarf kowhai, 5 ft. high, and massed with bloom from tip to ground level, the prostrate manuka sprawling over rocks and the better-known scarlet-flowered rata *O. Metrosideros carminea,* which likes to grow on rock and flowers in 4 to 5 years.

Another rock plant which does well at Otari is the giant rock daisy from Marlborough, *Pachystegia insignis,* with silver-edged leaves, and silver stemmed buds to 3 inch flowers, snow white with a large boss of golden stamens. In Otari it seeds itself on the stone mulch beneath the plants. Marlborough is a much drier area than Northland and it is necessary to provide extra good drainage and sunny positions for its native plants.

From Campbell Island south of New Zealand, comes one of the really spectacular plants of our Flora, the giant aster *Pleurophyllum speciosum* with mauve flowers, deep purple in the centres. These are borne on stems up to 3 ft. high with many-flowered racemes, each head up to 3½ inches across. From the same place comes the really giant plant of the carrot family *Anisotome latifolia* 6 feet or more in height, with flowers from purple to red in colour, unfortunately almost extinct through the ravages of stock.

A splendid picture of our own Poor Knights plant, *Xeronema callistemon,* should encourage our local enthusiasts to grow this plant with its brilliant red flowers. Mr Mole told of a plant grown at Seatoun, Wellington, which produced 32 spikes of flowers. For success, very dry sunny conditions with perfect drainage are necessary.

For ground covers Mr Mole has found the renga renga, Rock Lily, a very useful as well as an attractive plant, also the little *Fuchsia procumbens* with its lovely cherry-coloured fruits. Both these plants are Northlanders and grow readily here.

Worthwhile orchids were the two species of *Earina* and some of the *Thelymitra* species. For scent it was difficult to excel the *Alseuosmia,* for leaf colour

our Para para, the bird-catcher tree, in its variegated form and easily procurable. For flower colour, a Hebe from the far North is extremely desirable for its bright red coloured flowers.

Plants of the South Island mountains from the extraordinary Vegetable Sheep, the tree *Dracophyllum*, huge spear grass and handsome plants of the carrot family as well as mountain daisies (Celmisia spp.) gave us a picture of plants quite new to many.

Mr Mole predicted that our flaxes would become more and more used in gardens, as they were tolerant of so many positions, and were now obtainable in many colour forms. As a sample he showed a picture of the new *Phormium*, 'Smiling Morn', bred by his predecessor at Otari, with pink leaves striped with green and cream. Plants grown from its seed were so lacking in chlorophyll that hardly any could survive.

The final picture was of *Ranunculus lyallii*, often miscalled the Mt. Cook Lily, but in reality a buttercup—the largest in the world, snow white waxy flowers up to 30 on a head and 3 ft. tall. The leaves are large saucer shaped, like polished greenstone, and invariably hold some rain or dew.

The large audience of over one hundred people gave an appreciative and attentive hearing to this outstanding account in words and colour pictures of some of our native plants.

DISPLAY TABLE

In spite of drought and coming winter, the table was well filled with many interesting and first-class subjects for the garden. Sasanqua Camellias as well as early Japonicas, were well represented. Among the former 'Cotton Candy' and 'Sparkling Burgundy' were favourites, and of the early Japonicas 'Debutante' and 'Ballet Dancer'. The white scented flowers of *Lucullia grandiflora* are outstanding and this shrub, which blooms for seven months, should be in every Whangarei garden where shelter and warmth can be given. It must receive plenty of water from November onwards and if well cared for will flower from late December until July—a good return for anyone's money. A really good plant for the rock garden is the Australian *Grevillea fasciculata*, a prostrate shrub with orange flowers in quantity. It must have an open sunny situation with good drainage—a good plant for scoria gardens.

A new-to-New Zealand plant recently brought in by Mrs Connell, was a bright scarlet Capsicum, 'Fiesta', and well named.

Hibiscus are still blooming and some of the more tender sorts from Hawaii are proving successful if suitably situated, with warmth and shelter provided. Staking is essential.

Most interesting and seldom seen were the large oval fruits of *Stephanotis*. The masses of yellow berries of *Duranta* are most decorative, as also its flowers which come at Christmas time and are beautifully scented. *Petrea volubilis*, a climbing shrub from Mexico, now in its autumn blooming, is a good "doer" here, and outstanding for colour.

A perfect bloom of the Orchid *Oncidium* 'H. Jenson' came from Mr Waterhouse's collection—a truly exquisite flower.

QUESTION SESSION

Q: How are Feijoas pruned? A: Thin out rather than cut heavily, which could force too much growth.

Q: Can Jacarandas be pruned? A: Jacarandas can be heavily pruned and come away quickly, but new growth generally more vertical.

Q: How can I get rid of a Waikato wasp's nest in a Camellia without damage to the plant? A: Spray with Malathion.

Q: I have a Wax Plant (*Hoya carnoa*) which is eight years old, looks sick and does not bloom. A: Wax plants have a limited life and yours is evidently on the decline. Start a new plant.

MAY.—Members were rewarded with a most informative and interesting address by Professor Newhook of Auckland University. His subject, "Rootrots in Ornamental and Native Shrubs" might at first thought seemed rather difficult and even dull, but the Professor's undoubted ability and knowledge, together with his colour slides, made it one of absorbing interest and easy understanding.

Rootrots were not confined to New Zealand, but were of world-wide distribution. Some, such as that which causes "damping off" of seedlings, were familiar to all gardeners, and were usually associated with wet conditions which favoured the growth of fungi. Two others which cause great damage to a wide range of plants, both here and abroad, are *Pythium spp.* and *Phytophthora cinnamomi*. To prevent these fungi from destroying crops, soil should be sterilised before planting seeds or cuttings. Hygiene was then important as disease could be brought in from other sources. Captan could be used for "damping off"; Verticillium wilt was transmitted by potatoes. Tomatoes were susceptible and these need systemic sprays which travel through the tissues. Another fungus Sclerotinia causes great damage to zinnias: it likes, and thrives, on young, soft tissues.

Plants lined out in rows as in nurseries are easily infected, and the infestation is carried on by plants grown on after one season. Container grown plants are preferable and prevent re-infestation. This is important as some diseases take several seasons to show their effects—the case with *Verticillium* and *Phytophthera cinnamomum*.

The latter, often called Glenbervie fungus, was originally observed locally, but is prevalent right down to Motueka in the South Island. It is one of the most destructive of the rootrots and has a wide range of hosts, both native and exotic. It is responsible for collar rot in apples and disease in strawberries evidenced by purple colour in the leaves. It also attacks camellias, ericas, proteas. Our kauri is not immune, and many conifers, especially in plantations, shelter belts and nurseries, are infected.

In spite of these infections there are many remedial factors which are able to modify, control, cure or prevent the damage and loss they cause. After much observation and experiment it was found that, although *P. cinnamomi* was fairly widespread in many places, rainfall damage and temperature were important factors in favouring or limiting its activities. The presence of soil Mycorrhiza in quantity tended to limit its effects.

An open, well-drained soil was essential in preventing damage, as it has been proved that a high water table plus high temperature favours the growth of rootrots which feed on the tender rootlets and so deprive the tree of nourishment, causing stunting, or in extreme cases, death. In a year when the rainfall was very heavy in early Autumn, and the temperature high, rootrots were prevalent, but the winter temperatures which usually came at the high rainfall times, did not favour their growth.

Topdressing with superphosphate has been most effective in restoring damaged conifers in plantations, especially on clay soils in Northland. This improves growth conditions for the host and limits infestation by the fungi. By increasing the growth of the tree tops the ground is kept drier as transpiration is greater, there is more litter on the soil surface which, in turn, tends to promote Mycorrhizas and assist in the restoration of root growth. It is, therefore, important to promote healthy crowns which intercept considerable amounts of rain whilst the litter beneath absorbs a further amount.

Phytophthora cinnamomi is not only a danger to plants of exotic conifers,

but is also a danger to shelter belts, farm lots and in nurseries to a wide range of plants. In our native forests a number of species have been infected, including leptospernum, coprosma, rimu, Southern rata and kauri, but except where specially bad soil conditions prevail, it has caused little damage. This may be due to some immunity developed by our natives.

DISPLAY TABLE

Notable were the white *Luculia grandiflora,* the yellow *Reinwardtia,* various Hibiscus, many camellias, Gordonia and *Alberta magna.* All too often space, time, labour and money are spent on annuals which have a brief life and must be taken out, or on perennials, which need constant care to give good results. With long blooming shrubs, such as listed less labour is involved, and if planted in the positions as required, give months of colour and years of enjoyment.

The new hibiscus hybrids from Hawaii tend to bloom later than the older, hardier sorts. They should be given the warmest and most sheltered positions, covered at night if it seems frosty, and carefully staked. Wind is the prime enemy of hibiscus, until a good root system is made. Among the newer ones shown were 'Full Moon,' 'Californian Gold' and 'Joan Lunn'.

Among the many camellias from a number of growers, those that a beginner should try were 'Donation', 'Wabasuke', 'Lauri Bary', 'Mrs Tinsley' and 'Elsie Jury'. Among others I liked were the large white flowers with a big boss of yellow stamens of *C. granthamiana,* and its lovely pink hybrid with 'Pagoda' called 'Diamond Head'. Most camellias like some light shade, good soil, adequate moisture, and some sulphate of potash, but no lime. A good selection will give flowers in April and right through to October.

Among more uncommon specimens, were white nerines, the rather new *Coprosma repens,* 'Marble Queen', its creamy parts sprinkled with little green dots, a very attractive plant.

Gardenia florida, which is a variety of *G. jasminoides,* comes from China and is one of the most useful for florists, having numerous blooms beautifully scented. A small shrub, it requires a warm situation, good soil, plus compost, but no lime.

The beautiful dark crimson salvia shown is a variety of the more commonly grown *S. splendens* called *atropuperea.* It is a lovely plant and should be grown more often. It grows easily from cuttings and needs to be renewed every year or so. It likes a warm, well-drained place, as it comes from Brazil.

QUESTION SESSION

Q: Why should a Rhododendron suddenly die back? A: Drought may have caused this, or a root rot to which some are subject. Overwatering in high temperatures could be an added cause. Q: Does the chlorine in the city water have an adverse effect on azaleas? A: It has always been contended that chlorinated water does not harm plants—or people, but it is not impossible that ericas, which have a special root association with soil mycorrhiza should be adversely affected, especially when the water is as strongly impregnated as at present. The D.S.I.R. could perhaps give more information.

JUNE.—The June lecture on Fuchsias by Mr Barton of the Fuchsia Nurseries, Glen Eden, Auckland, was well attended.

When buying a Fuchsia the grower should find out its type, whether for basket, pot or standard culture, its requirements as to sun or shade, as well as soil textures and conditions. Proper pruning was most essential if good returns

in flowers were to be obtained. When planting, whether in pot, basket or open ground, it was essential to set at the exact depth it had been grown previously, and the hole should be made accordingly and of good width to give a free root spread. Soil should be of good, but open texture, and the plant staked and tied.

Mr Barton then gave directions for feeding and warned against heaping lawn clippings around the plant. Alaska or fish manure emulsion at the rate of one tablespoon to the gallon of water could be poured over the leaves to feed the plant. Old ensilage was a valuable manure, especially for basket plants. It was better to keep to organic fertilisers and natural foods such as sheep and cow manures.

To control thrips or mite, a spray of Malathion every five days was recommended, with special attention to underleaf cover. A combination of Tedion and Malathion was even more effective, as both eggs and adults were destroyed.

Watering was most important, especially for baskets, which should never be allowed to dry out. Rainwater was better than tapwater. In summer plants should be heavily hosed.

Soil must be kept open and a good mix was ensured with 7 parts loam, 2 parts ensilage, and 2 parts coarse river sand—Waikato No. 4 or 5. If ensilage was unobtainable, use 2 parts peat. Mr Barton thought Cambridge peat better than Hauraki.

Pruning: Established plants could have two-thirds removed after frost danger was over. When growth was renewed tips of branches should be kept pinched out to promote side growths and increase the number of flowers.

Old mossy plants should be replaced, but fuchsias were useful for about 15 years. Pruning of woody plants could be done in April when rain starts, but spring is better. Root prune with a sharp spade older plants, and for pot plants cut out the big heavy roots.

When planting in baskets line with spagnum or even bush moss, but if polythene were used, coarse scoria not fine must be used. When plants get tired and flowers small they need rest and renewal. This can be achieved by gradual pruning, one branch at a time, so that enough leaf is left for transpiration. When the cut branch has formed shoots then cut another and so on. If soil is infested with bacteria water with Malathion. Old poultry manure as well as cow and sheep manure was valuable. In general pink and blue flowered fuchsias need shade in the morning, but not in the afternoon. Red shades are more tolerant of sun.

DISPLAY TABLE

Camellias were in full force on the June table, with some good blooms from two of our most enterprising growers, Mr Blumhardt and Mr Finlay. Among the many attractive varieties shown were 'Bonnie Marie', 'K. Sawada', 'Dianella', 'Judge Ragland" and "Betty Sheffield Supreme'.

An unusual and most attractive specimen was a Clematis from the Himalayas, *Clematis puberula,* its stems, leaves and buds coated with golden bronze, silky hairs. This is a plant for a sunny, warm position, but the rather cold nights of early June did not affect it adversely.

Prunus mume, 'The Geisha' and *Magnolia stellata* with *Chimonanthus praecox* gave promise of an early Spring. Of special interest were two forms of *Protea neriifolia* grown from seed.

Hebes are specially useful garden plants, as they tolerate a variety of conditions and in the North we have a number of handsome species blooming in Winter, including several variants of *H. speciosa.* Two very reliable plants on the table were *H. macrocarpa* and *H. acutiflora,* the latter from the base of the Kerikeri Falls, a most attractive and profuse bloomer if well supplied with water in the dry months.

Lastly a very late rose, 'Maria Callas', and a fine specimen of *Aloe ciliaris* lent colour to a fine collection.

NEW MEMBER OF NATIONAL PARKS AUTHORITY

Dr C. A. Fleming, a leading Wellington scientist and conservationist, has been appointed to the National Parks Authority, the Minister of Lands, Mr Duncan MacIntyre, announced to-day. Dr Fleming has been appointed under the National Parks Act 1952 on the recommendation of the Royal Society of New Zealand. Dr Fleming replaces Mr F. R. Callaghan, who retired from the authority on which he has ably represented the society during the last 13 years.

Dr Fleming is well qualified for appointment to the authority, holding a B.A., D.Sc. and Hon. D.Sc. (Victoria, N.Z.) and being a past president of the Royal Society of New Zealand. He was awarded the O.B.E. in 1964 and made a Fellow of the Royal Society in 1967. He is also a Fellow of the Royal Society of New Zealand, Museums Association of New Zealand and Geological Society. Dr Fleming has also been president of the Ornithological Society, is chief palaeontologist, N.Z. Geological Survey, and is at present a member of the Board of Trustees of the National Art Gallery and Dominion Museum and the N.Z. National Commission on U.N.E.S.C.O.

"With the authority entering a new period when park affairs are assuming greater national significance brought about mainly by their increased popularity and public concern to preserve a natural environment of quality, there is a growing need to establish a balance between park preservation and public use. Dr Fleming's services should be of particular value to the authority in this field," said Mr MacIntyre.

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