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CONTENTS:

	Page
The Herbaceous Border: By R. W. Balch, N.D.H. (N.Z.)	1
Review: Lily Year-Book, 1936	23
Bledisloe (Fruit) Cup Competition	25
Classified List of Daffodil Names	26
Institute Notes	27
National Horticultural Week, 1938	27

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THE HERBACEOUS BORDER.

ITS USE, ABUSE AND DIFFICULTIES UNDER NEW ZEALAND CONDITIONS.

By R. W. Balch, N.D.H. (N.Z.), Christchurch.

The Herbaceous Border is essentially part of a garden scheme that is peculiar to a temperate climate. The sphere of its utility is probably confined to that zone between the lines of latitude 36 deg. and 56 deg. of both Northern and Southern Hemispheres. Between those limits lie some 1,400 miles. As would be expected, its characteristics as a garden feature vary considerably from one extreme to the other—its period of interest, the floriferousness and time of blooming of its various individuals, their habit, vigour, the actual plants used—all these differ according to the climatic conditions prevailing. This factor of latitude has the greatest influence in determining the nature of the border in different countries and localities.

Its true home, the land of its birth and greatest popularity, is undoubtedly the British Isles. Its general cheerfulness and pleasing colourfulness are always thought of in conjunction with such typical garden features as spreading lawns, trailing roses, sombre shrubberies and placid water lily ponds. It is as foreign to gardens of more tropical regions as their waving palms, luxuriant growth and gorgeous climbers would be in cooler climates. Most literature I have read on the subject deals exclusively with the border in the British Isles. It is one of my objects to examine the differences that exist between that country and New Zealand, and to show how these differences necessitate modifications in its structure, in some ways to its advantage as a garden feature, in other ways to its disadvantage. My other objects are, as the title suggests, to show its value as a feature of the New Zealand flower garden, its treatment for the most effective result and why failure in obtaining that ideal is so often experienced.

It is not my purpose to elaborate the various cultural operations involved in the formation and maintenance of a border, other than to mention them en passant. It is to be taken for granted that preparation and manuring of the soil, draining, planting, propagation, thinning of shoots, staking and tying, dead-heading, watering, control of pests and diseases are understood. It is the aesthetic side of the subject rather than the cultural that is to be the text of this thesis. Lists of plants under various headings will be found appended.

THE BORDER DEFINED.

A question I have often met with during the course of my training has been—what is an herbaceous plant? Botanically, the term “herbaceous” applies to all plants lacking woody stems and includes annuals and bulbs. Commonly, and the sense in which I shall use it, it signifies a perennial plant which loses its stems annually, while the roots remain alive in the soil. The basal leaves may die away or remain green throughout the winter when the terms “deciduous” and “evergreen” are used. An example of the former is *Phlox decussata* and of the latter *Iris germanica*.

Primarily, the herbaceous border consists of herbaceous perennial plants though, in certain circumstances, other types of plants are used to obtain certain effects. Annuals are very useful for filling unavoidable blank spaces among the permanent subjects during the summer. Climbing plants on pillars, such as *Roses* or *Clematis*, at intervals along a border add height and interest. Suitable shrubs encroaching from the background are often effective during the winter months, besides affording shelter and a foil for the less robust flowering plants in front of them. Occasionally dwarf shrubs, such as *Cytisus* and *Helianthemum*, are used in the border itself.

EVOLUTION OF THE BORDER.

By tracing the gradual development of the English flower garden, I find that, up to about the sixteenth century, its scope was, practically speaking, limited to the use of plant species found growing naturally in Europe. In a border, usually adjacent to the dwelling place of that period, true herbs and medicinal plants were grown. This was the forerunner of the modern flower border. With the discovery of the New World, during the reign of Queen Elizabeth, and the resultant development of commerce, many new and strange plants found their way into Europe and the United Kingdom. Some were introduced for their economic value, e.g. *Potato*. Others were brought home by sailors as souvenirs and curios, e.g. *Fuchsia*. In later years, when Britain was at the height of her colonising period, it was the custom to include scientists and botanists in the complement of warships visiting distant lands. Those men, to name only two, Charles Darwin and Sir Joseph Banks, did much valuable work in studying the flora, fauna and natural features of places they visited and, no doubt, collected seed of many plants. Approaching our own period, plant collecting expeditions, in charge of such well-known men in the horticultural world as George Forrest, Reginald

Farrar, and Kingdom Ward, have and still are combing the world for new plants. The results of these expeditions have combined to introduce to our gardens an enormous number of beautiful, hardy plants hitherto unknown or unobtainable. The production of a tremendous number of new varieties and hybrids of popular perennial plants has been concurrent with and dependent upon these introductions. By means of hybridising, crossbreeding and selection, the plant breeder has caused many of the old-time plants to give rise to offspring that are beyond all comparison with and show very little similarity to their ancestors. Many of the plants, that have formed the backbone of the herbaceous border of the last few decades, come under this category. The Paeony, Delphinium, Phlox and Aster can be said to constitute the big four in this important section of the flower garden. Alike in their indispensability for their own particular period of blooming, they can all, in the forms that we know them to-day, be traced back to humble parentage. Others of slightly less importance, Hollyhock, Lupin, Aquilegia, *Iris germanica* and, of more recent years, *Helenium*, *Kniphofia*, *Tritonia*, have also been vastly improved in respect of range of colour, habit, size of bloom and floriferousness.

From the foregoing facts it can be readily understood why, with such a steadily increasing range of highly desirable plants placed at the disposal of the horticulturalist, the herbaceous border holds the important position in flower garden design that it does to-day.

THE UNITED KINGDOM AND NEW ZEALAND IN COMPARISON.

With herbaceous border work in the locality in which I have had my practical experience—Canterbury, New Zealand—it is impossible to have the border bright with bloom throughout the whole year. There are, approximately, three months, from the middle of May to the middle of August, when it is practically devoid of bloom and is necessarily, owing to cultural operations, viz. digging, dividing and replanting, more or less bare. Even with the most skilful planning, very little can be done to brighten that period. The only plants of any interest, at that time of the year, which can be made use of are winter and early spring flowering perennials, such as *Iris stylosa*, *Crocus*, *Helleborus*, *Galanthus*—evergreen perennials, such as *Iris germanica* and certain *Primula* species—dwarf early spring blooming shrubs such as *Daphne Mezereum* and some *Erica* species. By correct culture, *Violas* can be had blooming intermittently throughout the winter in Christchurch. By striking cuttings in the early summer, they are ready to plant out in late summer and will commence blooming in the autumn. I have not seen them used in the herbaceous border proper at any time of the year, but, given the opportunity, I should certainly use them. In England, they are used extensively in the border during the summer months, but I have seen no mention of them for the winter. In any case, the climate is probably too severe for them to bloom at that time. Other than these plants I have mentioned, there is very little material available for those months.

As climatic conditions necessarily differ in different localities in New Zealand, this period of drabness varies accordingly. That is to say, proceeding northwards, it is lessened by some weeks and southwards it is correspondingly increased.

Comparing Canterbury, New Zealand, Latitude 44 deg. South, with the Midlands of England, Latitude 54 deg. North, I find that that they are alike in one respect and differ in another. An insular climate is common to both but there is a difference of ten degrees of latitude, or some 700 miles, between the two places. This leads me to note the following facts regarding the weather of the various seasons:—

WINTER:—Through reading English horticultural literature and by conversing with skilled gardeners from the Homeland, I gather that winter there differs in several ways from the winter which we experience in this country, particularly in regard to duration and severity. Throughout the British Isles generally, the end of October witnesses a sudden collapse of any plants still in bloom. November, December, January, February and towards the end of March are dormant months. Spring growth does not commence until the beginning of April. Those five months are notorious for the severity of their weather. Continuous hard frosts, frequent falls of snow and fierce storms, together with very little real sunshine, combine to form very rigorous conditions for plant life. Once this cold bleak weather sets in it rarely, if ever, lifts until April ushers in the warmer weather. In some of the more northern and exposed parts of the country, I am led to understand that the soil is frozen solid for a considerable depth for weeks at a time. I also believe that it is the customary practice to afford protection to many plants which are quite hardy in New Zealand. Such plants as Roses and Liliiums, if not covered with branches, straw, leaf-mould, ashes or other protective material, would in all probability suffer frost damage.

In New Zealand, speaking of Canterbury, there is not such a definite time or abrupt change which can be said to mark the limits of the different seasons, when one ceases and the other commences. Winter here does not really set in until the middle of May. June, July, and the first half of August are our bleakest months, the rising of the sap commencing during the latter half of August. Frequent periods of more or less severe frost, one or two light snowfalls and heavy rainstorms, broken by occasional spells of almost warm sunny weather, together with a fair amount of sunshine throughout, make for rather different conditions. The ground does not become so cold and completely dead. A hard frost (Max. 15 degs. F.) is almost invariably followed by a sunny day. Very rarely does the soil remain frozen throughout the whole day, except in shady places of the garden.

Thus the differences between the two countries for this season of the year can easily be discerned. A long cold winter of some five months on the one hand with a shorter sunnier one of three months on the other, naturally means that the latter has a two months longer growing period for the year. It holds the advantage

also of not having that greater state of lifelessness to overcome when growth does commence.

SPRING:—Here again, I notice a sudden change in the British Isles. Growth comes away rapidly with the warmth and sun of April which, with May, constitutes a fairly short spring. April is the month of spring-flowering bulbs—*Narcissus*, *Crocus*, *Chionodoxa*, *Anemone*, and a host of others, as well as such plants as *Primula denticulata*, *Saxifraga* species, *Alyssum saxatile*, *Aubretia* and *Viola*. During May, certain herbaceous perennials commence to bloom—*Lupinus*, *Trollius*, *Aquilegia*, *Doronicum*, *Geum*, *Pyrethrum*, *Incarvillea*, *Aster alpinus*, *Papaver orientalis*.

In New Zealand, I do not notice such a definite line of demarcation. August and September show a gradual merging of winter into spring, with spells of warm weather and cold setbacks. October and November complete the season. The spring bulb blooming is spread over a longer period, while those perennials I have just mentioned for May (United Kingdom), commence here in October, a month earlier. These carry on into November, but here again we have a number of border plants which do not commence until June in England—such essential plants as *Paeony*, *Anchusa*, *Heuchera*, *Iris germanica*, *Thalictrum aquilegifolium*, *Lychnis viscaria*, flower in November in New Zealand. With this fact, I believe we have one of the main differences between herbaceous border work in the two countries viz., that England has a spring of two months whilst New Zealand's spring is practically three and a half months.

SUMMER:—The few weeks about the end of May and the beginning of June (United Kingdom), mark the commencement of the main body of herbaceous perennials. Those I have just named, as blooming in November in New Zealand, are more contemporary, in the United Kingdom, with the June flowering ones; viz. *Delphinium*, *Lilium candidum*, *Campanula persicifolia*, *Lychnis chalconica*, *Verbascum*, etc. Thus, during this month and the following two, July and August, I find a concentrated massed display.

In New Zealand, the same plants are spread over a four monthly flowering period, instead of three, which means that some are getting past their best before others, which, a little later, are in full bloom. This means that with similar borders, in area and grouping in the two countries, that of New Zealand does not have the same massed showing. Through having a more extended season, it is necessarily thinner in the massing of bloom at any particular time. Photographs and illustrations of borders in the United Kingdom bear me out in this statement.

AUTUMN:—September and the greater part of October (United Kingdom) bring the border to a close for the year—a rather brief autumn.

March, April and the first half of May (New Zealand) constitute a little longer autumn season, enabling late flowering plants to linger on until a succession of heavy frosts brings the end. This means that the growing period is protracted at this season also.

THE INFLUENCE OF SUNSHINE.

In seeking to discover another of the principal reasons for this apparent longer growing season in New Zealand, I procured figures from the Christchurch Meteorological Office, pertaining to the average amount of sunshine for both countries and compared them. I quote here a few relevant examples.

NEW ZEALAND:—Yearly average in hours over the four year period from 1929 to 1933:—

Auckland	2065.9	Hokitika	1958.9
Rotorua	2159.2	Ashburton	1867.7
New Plymouth ..	2282.8	Timaru	1927.6
Wellington	2115.2	Dunedin	
Napier	2334.9	(1929 only)	1715.6
Nelson	2616.5	Alexandra	2216.9
Christchurch ..	2006.5	Invercargill ..	1649.9

BRITISH ISLES:—Yearly average in hours over a ten year period ending 1930.

Aberdeen	1330	Blackpool	1521
Edinburgh	1367	Liverpool	1456
Durham	1326	Llandudno (Car-	
Norwich	1581	narvon)	1545
Rothamsted	1550	Cardiff	1603
Nottingham	1276	Bath	1523
Regent's Park ..	1295	Plymouth	1665
Kew Observatory	1465	Torquay	1777
Dover	1753	Penzance	1703
Ramsgate	1753	Armagh	1296
Eastbourne	1826	Dublin	1455
Bournemouth ..	1774	Scilly (Cornwall)	1711
Southampton ..	1663	Jersey	1862

From these figures I deduce that the yearly average for the whole of the British Isles is 1563 hours. This gives a daily average of four hours, twenty minutes. The figures for New Zealand show a yearly average of 2070.6 and a daily one of five hours, ten minutes. This shows that the sunshine of New Zealand exceeds that of the United Kingdom by 507 hours a year or 50 minutes a day.

Another fact regarding the sunshine of the two countries is this: Daylight, in midsummer in Britain, is definitely longer than at the same season in New Zealand. Any person from the Homeland is conversant with the fact that, at that time of the year, it is possible on clear days to read without the aid of artificial light up to 10 p.m. at least. This is a good hour longer than is possible in this country. The same thing is true for the other end of the day. This also is due to the difference in latitude. We have the two extremes, the Equator and the Poles. At the former there is nearly equal day and night throughout the year and, at the latter, six months daylight and six months sunless. The intervening regions vary according to which extreme they are adjacent. Thus, the British Isles being con-

siderably nearer to the North Pole than New Zealand is to the South Pole, the tendency is for the former to have less sunshine in the winter and more in the summer than the latter. This means then that, although the British Isles has, on the average, 507 hours less than New Zealand the amount viz. 1563 hours is experienced to a large extent during the summer months. The latter's 2070 is more evenly distributed throughout the year, there still being, however, a great difference in the amounts received during summer and winter.

By applying this knowledge to the physiology of the plant, we understand more easily how this difference in the length of the growing season affects the plant. Sunlight is necessary for the proper functioning of any plant. Green plants obtain their food in the form of carbohydrates through the medium of the chlorophyll present in their leaves. This action of photosynthesis can take place only in the presence of sunlight. Therefore, the greater the amount of sunlight, the more growth is made, dependent, of course, upon an adequate supply of moisture at the roots to convey the raw materials from the soil to the leaves. The result that would be expected from these conditions is found to be the case. The United Kingdom with the greater percentage of its sunshine experienced during the summer, has its greatest amount of growth and bloom concentrated in those few months. In New Zealand, with its greater distribution of sunshine, the same plants bloom over a more extended season. I showed this previously in discussing the various seasons. By this, I do not mean to convey the impression that individual plants in New Zealand always bloom for a longer time. Whether they do so or not depends on the prevailing weather conditions being to their liking. This is largely determined by that experienced in the native habitats of the species from which they have been evolved and also the manner in which their flowers are produced. In Christchurch (New Zealand), where hot dry winds and long periods of drought during the summer are often the rule, the type of plant which produces its bloom in the form of a definite number of inflorescences, i.e. spikes, umbels, racemes, etc., very often goes out of bloom very quickly. Such plants as *Astilbe*, *Phlox decussata*, *Lilium*, *Iris*, *Galtonia*, which are good examples, are often of comparatively short duration here, unless they are grown in semi-shaded or moist positions. In Dunedin (New Zealand), with a more even-tempered summer, cooler and moister conditions are prevalent, with the result that the same plants last longer in bloom. This means that a plant may have the same number of flowers in each place, but the lasting capacity of the same blooms can vary by some weeks. Other plants produce an indefinite number of inflorescences, that is to say, fresh growths are constantly being made which give rise to fresh blooms. Perennials such as *Viola*, *Coreopsis grandiflora*, *Pentstemon*, *Gaillardia*, *Scabiosa caucasica*, are good examples of this type. Here the number of blooms capable of being produced depends on the length of the growing season. In this instance, Christchurch, which is two or three weeks earlier than Dunedin, due to the difference in latitude, holds the advantage.

The length of the growing season, combined with the distribution of sunshine, has also the following effect on the habit and floriferousness of the plant. With the restrictions of a limited period of growth and concentrated sunshine it is necessary for the plant to hasten maturity and the setting and ripening of seed to ensure the propagation of the species. The tendency is then for stocky growth with a brief flowering period. In the case of a longer growing season with a more even distribution of sunshine, growth is more luxuriant and, lacking the urgent need for the production of seed, blooming is lengthened. It is common knowledge in horticultural circles here, that many plants of all types are more vigorous in growth in this country than the same plants in the United Kingdom.

My interest in horticulture has led me to read of travels in other lands and, in one Scottish Naturalist's account of a trip to Spitzbergen, "Amid Snowy Wastes," by Seton Gordon, reference is made to the suddenness of flowering and seeding in all forms of plant life in that region. Dwarf-growth is also drawn attention to and a suggested explanation is, not only the short growing period but also the angle at which the sun's rays strike the earth's surface there. The herbaceous border in New Zealand will be proportionately affected by the more direct rays of the sun than in the United Kingdom. Plants are drawn up more before flowering commences and the flowering period, when it does start, will be more ragged in the former country than in the latter.

I include the foregoing facts to illustrate further how a warmer climate, by latitude, can lengthen the blooming season of a border, whilst a cooler one can intensify the massing of bloom during the height of the season.

Besides sunshine and latitude, other climatic and geographical factors, which have a great influence on the growth of plants are:—rainfall, altitude, wind and aspect. These, however, are localised considerations which vary tremendously throughout different parts of both countries. They do not enter into this discussion to any extent, as I am dealing with the average conditions pertaining to each country as a whole.

I arrive at the conclusion then, that here it is the differing climatic conditions, which account for the modifications of the herbaceous border from the true English style. The four months, June, July, August, September (United Kingdom), in most instances, constitute the main blooming period of the border there. In other words, that signifies the period embracing the four chief border perennials, Paeony, Delphinium, Phlox and Aster. Planning efforts appear to be concentrated on that relatively brief period, with the object of producing an impressive and continuous display for those summer months, at the expense of the earlier and later ones. This gives good scope for colour scheming, without interfering too much with an even continuity of bloom throughout. Here in New Zealand, with the different conditions prevailing, another method has been followed. Every effort is made to secure an unbroken succession of bloom for the longest possible period. This means that definite colour scheming is rarely attempted, as the difficulty of plan-

ning for both is greatly increased. Providing no glaring clash of colour is evident, the aim is a general bright effect. Beyond separate combinations of two or three different sorts of perennials, attention is concentrated on reducing flowerless gaps to a minimum.

VALUE IN GARDEN DESIGN.

The herbaceous border of to-day is not merely a place for receiving any new plant which may come into a garden by way of gift or purchase, irrespective of its qualifications for inclusion there. Its abuse in this way is, unfortunately, only too often the case in New Zealand. The promising border is altered to a dumping ground for plants that the owner does not know what to do with or where to place. Sometimes they are really fit only for the bonfire. A heterogeneous collection, lacking rhyme or reason, is emphatically not an herbaceous border, though it is often proudly displayed as such.

The true border owes the prominent place which it holds in the modern flower garden, to many good and valid reasons and has doubtless been evolved from that type of border just condemned. In justifying its inclusion as an essential part of a comprehensive garden scheme in New Zealand, I give the following reasons:—

- (a) It is undoubtedly the most suitable place for growing and displaying to the best advantage the hardy herbaceous perennial.
- (b) The ever-present, yet changing, interest that is maintained in the well thought out border for practically nine months of the year.
- (c) The scope for the exercise of artistic taste in the matter of colour harmony and balance.
- (d) The putting to practical use of the knowledge of the habits of various plants and their requirements. This is obviously done better here than in a disjointed manner in other parts of the garden.
- (e) The place it takes in the general architecture of the garden. There are many positions for it in a large garden: (i) a connecting link between the shrubbery and the lawn: (ii) the approach to some special feature, e.g. sundial, fountain, etc. (iii) as a focal point viewed from the residence across an expanse of turf: (iv) a feature in the lawn itself: (v) at the base of a brick wall. In these instances and in many more it is often invaluable.
- (f) The screening of unsightly objects in the form of fences and outhouses, etc.
- (g) It is a constant source of cut flowers for indoor decoration.
- (h) From the economical aspect the relative cheapness and readiness with which it can be stocked, as compared with other garden features, e.g. shrubbery, rose garden, formal beds, make it highly desirable. Another advantage is that the vast majority of herbaceous perennials are readily increased by division or, failing that, by seed. Thus a small outlay is sufficient to stock a nursery border with a few

specimens of each perennial to be used in the border proper. By this means, in a year or two, a large border can soon be planted up.

- (i) The capacity it has to stand up to the vagaries of our climate and still do well.

We thus have many excellent reasons why it is, and always should be, included in a garden design.

ADVANTAGES OVER OTHER GARDEN FEATURES.

In all modern landscape designing, it is usually recognised that naturalness and simplicity are highly desirable, in fact, should be the initial consideration. This fact was not recognised until the latter half of the last century. At that time, garden design had so developed in England as to be almost grotesque in its effect. This seems to have been due to the fact that most garden planning was carried on by those whom William Robinson in "The English Flower Garden" calls, "decorative artists." The result was, that intensive topiary work, masses of ornamental stonework and flower beds of intricate geometrical patterns, were the order of the day. To form these patterns, broken brick, white sand and painted stone were liberally used. Plants were used solely for their compactness and colour, with no regard for their natural beauty of form or habit. Modern landscape gardening did not come into its own until this great gardener, by showing people the enormity of this practice and how it was contrary to Nature, revolutionised garden design. It was only after a bitter struggle between the conflicting schools of thought that it did so.

Although the art of gardening has made great strides since that period, there are still many pitfalls for the unwary and unskilled designer. One fault that is only too common to-day is the habit of using a plan, suitable for a three acre garden, for one of half an acre. In New Zealand, the majority of privately owned gardens, excluding the small suburban and cottage sections, are rarely more than half an acre in extent. By the time a proportion of this area is set aside for the kitchen garden, fruit trees and outhouses, the amount available for the flower garden is considerably reduced. In this remaining area, however, it is often found that a great many distinct features have been attempted, e.g. lawn, shrubbery, rose garden, flower borders, formal beds, rockery, water garden and a tennis court. Something of everything, with nothing worthwhile resulting (except, perhaps, the tennis court), the general effect being a glorious jumble lacking cohesion and reason.

The art of forming a flower garden on this scale lies in limiting the scope to one or two dominant features. The aim should be to choose the most suitable ones for the particular locality or situation under consideration, with due regard to the amount of labour and finance available, both for forming and future maintenance. The rest of the garden is then arranged accordingly.

Having had some experience in the laying out of gardens, I have noticed the following fact, especially with young married couples setting up home in a new house. Very often, carried away

by the enthusiasm of the moment, they agree to an elaborate plan presented to them by a persuasive landscape gardener who is, owing to economic conditions, thinking more of his sales than his clients. The result is that as much as they can really afford, and sometimes a bit more, is spent on the layout. The contractor does his work, leaves all spick and span and departs. The young couple are delighted with the effect and well satisfied. All goes well until growth commences. Then comes disillusion. Young couples are not content with spending all their spare time at home tending the garden. The husband finds that all he can manage is to cut the lawn, let alone trim the edges. The wife is satisfied with cutting blooms for the house. Having spent all they can afford on the constructive work, they are not in a position to employ labour for its maintenance. In consequence, the garden is ruined in its infancy, while the contractor gets the blame and a bad name into the bargain.

In all gardens certain features are usually highly desirable—lawn, shrubbery, cut flower borders. In any plan, these must certainly be included as well as a special feature. The choice of this special one is the next consideration. Among the list or more or less suitable forms for this country the following are outstanding:—

Herbaceous border, rose garden, formal flower beds, rock garden, bog and water garden, fernery, glasshouse, native section, alpine garden, wild garden, wall garden, and borders for a special genus of plants, e.g. Erica, Rhododendron, Iris, Lilium, Hydrangea, Berberis.

For the average garden the advantages of the herbaceous border, in my opinion, place it at the head of the list. Those advantages I have already enumerated. Its chief competitive feature in the average garden is probably formal bedding of half-hardy perennials and annuals. To do this, either propagating houses and frames and skilled labour to run them are necessary, or the plants must be bought in at considerable expense. Another point often lost sight of in formal bedding is that the formal bed has practically the same appearance throughout the season, from the time it is planted until the plants are discarded. Two, or at the most three, changes are possible i.e. spring bedding and summer bedding, with perhaps a catchcrop of pot grown plants in between the two. With the herbaceous border, there is change every week of the growing season. In the words of William Robinson, "The main charm of bedding plants—that of lasting in bloom a long time—is really a drawback. It is the stereotyped kind of garden which we have to fight against; we want beautiful and changeful gardens, and should, therefore, have the flowers of each season. Too short a bloom is a misfortune; but so is too long a bloom, and numbers of hardy plants bloom quite as long as can be desired." In parks and public gardens, where a passing public is catered for, formal beds are permissible and indeed are highly desirable, but in private gardens, where the same few people see them day after day, they do certainly pall.

ITS PLACE IN THE GARDEN.

The correct setting of an herbaceous border in relation to the architecture of the garden as a whole, combined with a position that is favourable for the successful culture of the plants in it, is all important. In my experience of such borders, most failures are caused by disregarding the following two facts:—Ignorance of the different plants' requirements and lack of forethought as to the ultimate effect reached in connection with the immediate surroundings. Unskilled work also produces an unsatisfactory result. Such considerations as background, foreground, shelter, shape and dimensions, require earnest attention before the actual work of forming the border is proceeded with. By taking these points in detail, I shall be able to show how the best properties of the ideal border are usually abused and how these mistakes can be avoided.

BACKGROUND:—I am immediately made aware of the fact that there are two distinct types of border, with regard to this aspect of the subject viz. the single-faced and the double-faced. The former is by far the more simple to handle, the latter calling for great skill in the choice and placing of the plants, as well as in the selection of the site itself. I shall deal with the single-faced type first.

There are several forms of background of which probably the most suitable for New Zealand, owing to the practically universal presence of strong winds, is the well-arranged shrubbery. If strong surface rooting shrubs e.g. *Cupressus* sps., *Ligustrum* sps. etc. are used, they must be kept to the back, leaving the front for those that do not impoverish the soil to any great extent, e.g. Ericaceous shrubs, *Philadelphus*, *Diervilla*, etc. A certain percentage of shrubs, that are of interest during the winter months when the perennial border is drab, must be included. These would include those with flowers, with coloured and variegated foliage and stems and with berries, at that time of the year. Some of these shrubs should project from the main mass at irregular intervals into the flower border, to break any definite line and to convey the impression that the border is a part of the whole garden scheme and not stuck on the edge of the shrubbery as an afterthought. By this irregularity also, bays are formed in which certain tall perennials, needing special attention in the matter of shade and shelter, e.g. *Lilium giganteum*, *Digitalis*, etc., may be planted.

Another form of background is the hedge. If this be of Laurel, Holly, Yew, or other subject, with dark green foliage and unobstructive root system, a grand background is given. The only drawback is that a space of two or three feet must be left for trimming purposes and to allow root room. This space I consider causes trouble by the creation of a ground draught, which has a bad effect on growth. This can be controlled to a certain extent perhaps, by planting every here and there a strong growing bushy perennial close to the hedge so that this wind tunnel may be broken. *Galega officinalis* and *Romneya Coulteri* would be good for this purpose, as well as other similar semi-shrubby plants,

In some cases a brick wall or paling fence is, by force of circumstances, made the background. These may be clothed effectively with climbing and rambling roses, Clematis sps., Hedera Helix, Solanum jasminoides, Vitis sps. and other climbing plants. Here again, however, space must be left for attention, tying and deadheading, except in the case of the self clinging foliage species, with the resultant ground draught. In this case, however, it may be broken by an occasional shrub planted close up, whereas with a hedge it is not advisable, owing to root and foliage competition. An example of a border of this type, I have in mind, is in one of our local parks (Elmwood) and is quite effective. This border, running N.E. and S.W. and facing S.E., is eighteen feet wide, between four and five hundred feet in length, with a seven foot paling fence background. A ten foot pathway runs its full length, which is broken here and there by recesses with seats. It is edged with Hebe pinguifolia, which is trimmed annually in the spring. The fence is clothed with rambling roses whilst dot plants of trees and shrubs, between which the taller perennials are planted, furnish the back of the border. The trees and shrubs consist chiefly of ornamental conifers, Rhododendrons, Camellias, Ilex varieties and Berberis Wilsonae.

The double-faced border presents a different problem. Here, no immediate background is present. It is either surrounded by turf or paths of some description or a combination of the two. The border on which I have worked during the past year, is of this type (Christchurch Botanic Gardens). It is twenty feet in width, four hundred and fifty feet in length and is broken into two equal portions, by a patch of crazy paving with central sundial. It is edged with Buxus sempervirens four inches high, runs East and West and is entirely surrounded by gravel paths, with lawn on one hand and shrubbery on the other. Great difficulty is experienced in planning this border. Something is done each season with colour scheming, but with a double-faced border of these dimensions, apart from localising associations of two or three different plants, little can be achieved. Although the taller plants are kept to the centre, one side cannot be planned regardless of the other, for, viewed from any aspect both are seen together. This manifestly makes it impossible to plan with the objects of both colour scheming and unbroken continuity of bloom. Effort is, therefore, concentrated on an even and continuous flowering period with the avoidance of definite colour clashes e.g. crimson paeony near scarlet Oriental Poppy. Another point is that, although trees and shrubs abound on every side, they are too distant to have any great protective power. Each storm or high wind threshes the taller plants unmercifully, making necessary constant attention to staking. Thus, with the experience I have had of the large double-faced border, I am definitely not in favour of it.

Given full control of a somewhat similar border in another garden, this experience suggests to me that, to produce a really good border, I would have to strike at the cause of the whole trouble. I see several ways of going about this:—

- (a) The border could be completely done away with and a new one formed of a better type in a more suitable position.
- (b) A hedge of *Lonicera nitida*, planted the full length along one side, would convert it into a single-faced border, thus removing the trouble of grouping and, at the same time, supplying the much needed shelter to a certain extent.
- (c) By removing the path on one side, the border could be split down the centre and a straight or winding path formed there. Perennials, reaching a greater height than four or five feet, could not be planted but would not be missed.

Any one of these alternatives would mean a lot of reconstructive work but I believe that it would be more than justified by the results obtained.

Photographs, illustrating the double-faced border in England, give me the impression that it can be made very effective under certain conditions. One I have particularly in mind ("The Flower Garden"—Sanders P. 64) shows a group of these borders, set in a large expanse of lawn and intersected by broad walks of turf. These are but eight or nine feet in width and I specially note that the taller and more rampant perennials are absent, such plants as *Althaea rosea*, *Rudbeckia herbstonne*, *Solidago*, *Kniphofia*, *Helenium autumnale*, and the taller varieties of *Aster* and *Delphinium*. Here, also, individual clumps seem to predominate and not large groups of each perennial. Thus, under conditions such as these, there are definite possibilities of creating good displays with such borders in this country.

N.B.—Unless the double-faced border is definitely stated, all further reference applies to the more usual single-faced type.

FOREGROUND:—Turf is undeniably the ideal approach to any form of bed or border, be it in park or small private garden. In the small garden, plans should be made to allow for an expanse of unbroken lawn, between the residence and the border. In much frequented parks and public gardens, it is perhaps inadvisable to carry the grass right to the edge, owing to excessive wear and tear of the turf. In this case, unless expense makes it out of the question, I would certainly recommend a pathway, three or four feet in width, of large paving stones, laid flush with the grass level. This, as well as making a dry, durable footway, allows dwarf plants at the front to flow over naturally, making a delightful effect of informality. Where there is a grass verge or live edging to maintain, these plants must be kept within bounds and have half their charm sacrificed. Where a gravel path is used to front a border, an edging of some description is necessary. This may be of rock or some compact-growing plant. A live edging, such as dwarf *Buxus*, is neat, but requires constant attention, to keep it undamaged by the smothering effect of the often rampant front occupants of the border. Rock removes this need of the restraining hand. Other live edgings I have seen used are:—*Hebe pinguifolia* and *Hebe buxifolia*, *Nepeta*, *Lavandula*, *Dianthus plumarius*.

SHELTER AND ASPECT:—These depend entirely on the climatic conditions peculiar to a locality. In Canterbury, where we

are subject to fierce hot, dry, north-westerly winds, bleak easterlies, occasional south-west storms, periods of drought and out of season frosts, they are most important. The majority of our hardy herbaceous perennials delight in a warm, sunny, open position with abundant moisture and protection from strong winds. These conditions are usually difficult to obtain here in their entirety in the one position. By skilful planning, however, it is possible, by first selecting the most favourable position available, to so adapt it that these conditions are created. For instance, warmth, sunniness and shelter are often accompanied by dryness. Lack of moisture may be corrected by frequent watering. This, however, is only possible by overhead sprinkling which is detrimental to existing blooms as well as making more work. It is a bad practice in any case. Deep cultivation, combined with the liberal use of well-rotted organic manures, during the preparation of the ground, may do much to make a soil such as this more retentive of moisture. A moist position may possess shelter, but lacks warmth and sunniness. If this is so, the only remedy is to remove the shade-giving object but, if this is done, the shelter and moisture are most probably taken as well. An open position, in my opinion, is the most desirable. This usually has all qualifications with perhaps the exception of shelter, which may readily be provided by thoughtful planting of groups of suitable trees and shrubs or by the use of hedges, fences or walls.

Supposing such an open position has been chosen for a border in Canterbury, the matter of shelter and aspect is now to be decided. I believe our frequent bleak easterlies, fresh from the ocean, to be the winds most harmful to plant life in this district. Therefore, a border running more or less north and south, facing west, with a shrub background, is, perhaps, the best position. The direct force of south-west and north-west winds may be broken, which is preferable to complete stopping, by judicious grouping of some of our more hardy indigenous trees, ornamental conifers or some other suitable exotics. These should be at such a distance that a certain amount of shelter is given without detriment to the border, through shade and impoverishing root action.

A few further points regarding aspect are as follows:—

- (a) The blooms of a number of plants, included among which are *Narcissus*, *Viola*, *Gladiolus*, *Helianthus*, *Paeony*, face in the sunniest direction. Thus, with a border facing south, the effect aimed for by the inclusion of these plants is lost to a great extent.
- (b) In the late spring, when growth is well under way, frosts are still of occasional occurrence. Some plants, *Liliums* especially, with frost on the foliage, may be damaged where the early morning sun has free access to them. This is a further argument in favour of a westerly aspect for, by the time the sun would then reach the border, having first of all to surmount the background, the frost would in all probability have thawed without doing any harm.
- (c) Plants are more hardy and of a constitution better able to withstand the extremes of our changeable weather, when

grown in a position with a southerly aspect, as compared with one facing the north.

A point to illustrate how the climate of a locality can affect the border is this. Most literature which I have read, dealing with herbaceous borders under English conditions, includes, in lists of suitable popular perennials, such plants as:—*Astilbe*, *Primula* sps., *Lo-belia cardinalis*, *Funkia*, *Anemone japonica*, *Trollius*, *Senecio elivorum*. In Canterbury (N.Z.), these plants cannot be included with any success, owing to our hot, dry summers. We grow them here in cool shady spots or by the water's edge. In Dunedin, however, with its cooler and more moist summer weather, these succeed well in the open border.

SHAPE AND DIMENSIONS:—The shape must conform and be in harmony with buildings and other features whilst the dimensions depend entirely on the area of the garden. Dealing with shape, the safest design is undoubtedly the common rectangular one. If it is possible to introduce a curving outline, without violating the principles of landscape gardening, it is quite permissible but it must be very gentle. The shallow S is the usual form. Although I have not seen it worked out, I have it on excellent authority that the outline best described as the falling away curve is most effective. With this type of outline, not only is a view obtained into the border, but also along and through it. Charm is created by the fact that, when close up, it is not all in full view from any one position. There is always the interest of wondering what fresh beauty is just around the bend.

Dimensions, as I have said, depend on the area of the garden. A width of twelve to fifteen feet, exclusive of the background and a length of ~~not~~ less than sixty feet, can be made into a good border. Anything smaller is inclined to be paltry. A greater length, however, gives more scope for good planning.

GROUPING OF PLANTS.

Once the type and size of border has been decided, the next consideration, apart from the preparation of the soil, is the grouping of the plants. This is in every way as important as the other details I have discussed. A promising border, with the best of situations, soils, and surroundings, may be completely ruined, from the aspect of beauty, by unskilful grouping. In a well planned border the factors of height, habit, time of blooming, colour, scent and foliage effect of each plant, determine its position. Familiarity with these points regarding each plant, comes only with years of experience and intelligent observation of the subjects in bloom. It is very easy to plan a border on paper, with the aid of a nurseryman's catalogue, placing the plants according to the descriptions given. A very different result, however, is obtained than was hoped for when that same plan was put into operation. I do not by any means condemn planning on paper. It is much to be desired. I just wish to point out that a border cannot be planned, without a thorough practical working knowledge of each plant to be included. When

putting a plan into practice, it is unwise to be tied to it. As planting proceeds, fresh problems are opened up and so the plan should be modified to suit these. No border can be expected to be perfect in the first season, no matter how experienced the person in charge is. It is only with careful observation during the growing period and the free use of the notebook, for jotting down mistakes as they become apparent and ideas for rectifying them, that perfection can be attained in succeeding years. It is most important that these mistakes and suggested improvements be noted down as they occur. If left to memory, they can easily be entirely overlooked, when replanting of the border takes place.

Perhaps the most effective method of planting a large border is the use of bold irregular groups of each variety of plant, with anything from three to twenty in each, according to the size and habit of the plants composing it. To obtain a succession of bloom, a group of one sort, say an early summer flower, may be interplanted with a late summer one. This is only possible with some plants. If an early variety is a rampant grower, it may smother a later one completely. Good combinations in this respect are:—*Polyanthus* and *Iris germanica*, *Paeony* and *Gladiolus*, *Papaver orientalis* and *Phlox decussata*, *Doronicum* and *Aster*, *Papaver orientalis* and *Kniphofia*. Again, combinations of sorts, which bloom at the same time, often enhance the beauty of one another:—*Pentstemon* and *Gladiolus*; *Geum* and *Aquilegia*, *Thalictrum* and *Delphinium*; *Rudbeckia speciosa* and *Anemone japonica alba*; *Delphinium* and *Lilium candidum*.

It must be realised that plants are not included in the herbaceous border for their individual beauty. It is the effect of the plants as a whole, in combination with each other, that matters most. Individual beauty, although much to be desired, is a secondary consideration.

Although it is necessary to arrange the plants according to height, they should never be placed in three definite zones, tall at the back, medium in the centre and dwarf at the front. If this were done, a stereotyped effect would be given, which is the one thing to avoid. The aim should always be to produce an undulating effect. This can be done by the skilful placing of bold groups. Alternate bays and valleys, of varying sizes, can be formed by bringing groups of the taller sorts out to the centre and medium ones to the front. Dwarf and medium groups can then be carried into the centre and back. These groups must not have definite outlines, but should merge one into the other in an informal manner. A point to watch regarding height, when grouping, is this:—The bulk of late summer and autumn flowering perennials are on the tall side e.g., *Aster*, *Rudbeckia Herbstonne*, *Dahlia*, *Helenium autumnale*, *Solidago*, *Eupatorium purpureum*, *Althaea rosea*, *Chrysanthemum* and *Canna*. Lack of forethought in this matter becomes apparent when these plants are blooming. The back of the border is a blaze of colour at the expense of the front, which is rather bare. The free use of the many new dwarf varieties of some of the plants I have just mentioned, helps to overcome this difficulty.

No set rule can be given for the spacing of the various plants. The habit of each plant varies with differing climates and soils. The aim is to clothe the ground, as completely as possible, without introducing the bad effects of overcrowding. Height is no guide as to the amount of space required by a plant. A Hollyhock eight feet high requires but 3 square feet, a Gypsophila, three feet high, can do with 10 square feet. When planting, the size of each plant at maturity must be visualised and it must then be placed so that it will just merge into its neighbours at that time.

The knowledge of the time of flowering of each plant is most important. It is only by the application of this knowledge, that an even and continuous mass of bloom can be maintained. Planning on paper is most helpful here. By inserting the flowering period with the name of each group, it can easily be seen where gaps will be present at particular times of the year. These gaps can then be eliminated before it is too late.

A method of planting of which I have read ("Hardy Perennials and Herbaceous Borders," by Walter P. Wright), for a medium sized border, is as follows:—A continuous unbroken succession is not aimed for. With the use of a limited number of different plants, the idea is to have a chain of groups of the same plant, throughout the border, so that there is neither an even continuous show nor yet one big splash at one time, followed by nothing. By this method, for a few weeks the border is a blaze of one plant, then comes a gap of a week or two followed by a blaze of another plant. By using the following six perennials this effect could be obtained:—Paeony, Delphinium, Phlox decussata, Helenium dwarf varieties, Rudbeckia Newmanii and Aster.

Planning for colour effect is, as I have already shown, very difficult in New Zealand, owing to the length of the flowering season of the border. However, by placing soft colours at one end of a border, working up to brighter tones in the centre and fading away to pale again at the other end, a pleasing effect, from a distance, is given. This, with the use of such combinations as I have given before and the avoidance of bad colour clashes, is all that I consider necessary for a good border here. The value of foliage effect must not be overlooked. Such plants as Agapanthus, Kniphofia, Sparaxis pulcherrima and Asphodelum luteus, which remain green throughout the winter, help to clothe the ground at that time. Paeony and Iris germanica, scattered throughout the border, are especially valuable in spring, the former for their highly coloured young shoots and the latter for their swordlike leaves. Silver and grey foliaged plants are very useful for breaking different masses of bright colours:—Nepeta, Lavendula, Artemisia, Santolina, Centaurea, Echinops, etc.

CONCLUSION.

The various aspects I have discussed in the preceding pages and the conclusions arrived at, support my contention that:—

- (i) The herbaceous border is a very desirable feature for any fair-sized New Zealand garden.

- (ii) Through such things as ignorance, lack of forethought and unskilled work, it is too often abused.
- (iii) Under New Zealand conditions, difficulties are met with in its establishment, which do not exist to such an extent in the United Kingdom.

Regarding the first point, the many obvious reasons that have been enumerated require no reiteration. The fact of (a) its being economical in construction and maintenance, (b) the interest it creates and (c) the bountiful source of cut flowers provided, is sufficient to justify its inclusion in any garden, which possesses the essentials for success.

The way in which it is abused is perhaps not so apparent. I believe, however, that its use is more open to abuse in New Zealand than in the United Kingdom, because greater skill and experience are required to recognise and surmount the difficulties, which certainly do exist here. Too little forethought in planning is, I consider, a common fault in this country. The site for a border is often chosen, not because of its suitability for the culture of herbaceous perennials, but because the owner of the garden wants it in a particular place. Also, after the site has been chosen, the immediate surrounding features, on which the success of the border really depends, are given too little consideration. Perhaps the fact that good borders are as yet very rare, has a bearing on this. Amateur gardeners and professionals as well have not examples before them, from which to learn how such a border should be handled in New Zealand.

Thirdly, differences in latitude, climate and the amount and distribution of sunshine, so influence the growth and blooming of perennial plants, that the planning of the herbaceous border must necessarily be thought of from a different angle in each country. As I have emphasised, continuity of bloom for a lengthy period in New Zealand is all important, whilst massed display and colour scheming necessarily take second place. With the shorter growing season in the United Kingdom, a massed showing, with greater freedom for colour scheming can be planned, in conjunction with continuity of bloom. I maintain that the ultimate success of an herbaceous border in New Zealand depends, to a great extent, on whether or not these objects are realised and acted upon.

One feels quite satisfied in stating, that the value of the herbaceous border in our gardens in future years, will depend, to a large extent, on whether horticulturists recognise the necessity of adapting the English type of border to suit New Zealand conditions.

HERBACEOUS PERENNIALS I have proved to be of value for the border in Canterbury (N.Z.).

SPRING (September—October).

Helleborus orientalis	Aubrietia
Galanthus Elwesii	Fritillaria imperialis
Dielytra spectabilis	Tulip
Trollius europaeus	Alyssum saxatile
Doronicum	Arabis
Primula Wanda	

LATE SPRING and EARLY SUMMER (November).

Geum	Anchusa italica
Aquilegia	Pyrethrum
Digitalis purpurea	Iris germanica
Althaea rosea	Lupinus polyphyllus
Paeony	Thalictrum aquilegifolium
Papaver orientalis	Lychnis Viscaria
Heuchera	Incarvillea Delavayi
Muscari plumosa	Aster alpinus
Erigeron speciosus	

MID-SUMMER (December—January).

Kniphofia varieties	Veronica spicata
Delphinium	Veronica incana
Pentstemon	Veronica amethystina
Scabiosa caucasica	Lychnis chalconica
Scabiosa Columbaria	Lychnis coronaria
Coreopsis grandiflora	Lychnis Flos-Jovis
Lilium candidum	Geum
Lilium regale	Aquilegia
Lilium umbellatum	Anchusa italica
Lilium testaceum	Pyrethrum
Lilium philippinense	Geranium pratense
Lilium pardalinum	Asclepias tuberosa
Gaillardia	Dianthus plumarius
Campanula persicifolia	Achillea filipendulina
Verbascum Chaixii	Aconitum Napellus
Hedysarum coronarium	Alstromeria aurantiaca
Galtonia candicans	Richardia maculata
Phlox decussata	Verbena venosa
Thalictrum dipterocarpum	Gypsophila paniculata
Atilbe	Dierama pulcherrima
Helenium (dwarf varieties)	Monarda didyma
Salvia patens	Stokesia cyanea
Chelone barbata	Althaea rosea
Bupthalmum salicifolium	Lavandula Spica
Watsonia	Rudbeckia purpurea
Eryngium	Phygelius capensis

LATE SUMMER (February).

Kniphofia aloides	Rudbeckia Herbstonne
Tritonia	Rudbeckia Newmani
Eucomis punctata	Campanula pyramidalis
Eupatorium purpureum	Achillea filipendulina
Gladiolus	Helianthus multiflorus
Salvia Bethelli	Verbena venosa
Phlox decussata	Sidalcea
Statice latifolia	Althaea rosea
Helenium autumnale	Lilium tigrinum
Coreopsis grandiflora	Scabiosa caucasica
Solidago Shortii	Gaillardia
Agapanthus umbellatus	Salvia patens
Helenium (dwarf varieties)	Delphinium

AUTUMN (March—April).

Aster	Canna
Rudbeckia Herbstonne	Delphinium Blue Butterfly
Rudbeckia Newmani	Helenium autumnale
Solidago	Eryngium
Campanula pyramidalis	Gladiolus
Aconitum Wilsoni	Grancoa ramosa
Chrysanthemum	Schizostylis
Sedum spectabile	Leonotis Leonurus

PERENNIALS particularly suitable for different localities in New Zealand.

AUCKLAND.

Canna	Heliotropium
Dahlia	Agathaea coelestis
Chrysanthemum	Salvia leucantha
Carnation	Echium
Cuphea platycentra	Lantana
Leonotis Leonurus	Pelargonium

WELLINGTON.

Gerbera Jamesoni	Gazania
Verbena	Incarvillea
Canna (dwarf varieties)	Lythrum varieties
Agapanthus	Richardia varieties
Iris species	Pentstemon
Scabiosa caucasica	Lychnis chalcædonica

CHRISTCHURCH.

Aster	Gypsophila paniculata
Solidago	Aubrietia
Rudbeckia	Anchusa italica
Paeony	Papaver orientalis
Kniphofia	Lupinus polyphyllus
Doronicum	Iris germanica

DUNEDIN.

Primula species	Viola
Anemone japonica	Phlox decussata
Lobelia cardinalis	Funkia
Astilbe	Delphinium
Trollius	Senecio clivorum
Campanula species	Aquilegia

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- “Gardeners’ Assistant”
 —Watson.

Christchurch Meteorological Office Sunshine Records.

NOTE:—The foregoing was written as a thesis for the Institute’s Diploma in Horticulture. The writer won the Cockayne Gold Medal at the November 1936 Examination.

REVIEW.

THE R.H.S. LILY YEAR-BOOK, 1936.

The Royal Horticultural Society's Lily Year-Book for 1936 contains the usual highly interesting information for the Lily grower, and, in this respect, the standard set by the Society's other year-books has been well maintained.

Mr. W. R. Price's notes on the Lilies of Formosa, particularly on the alpine form of *L. formosanum*, will interest New Zealand growers of this fine lily.

The interesting discussion on the names of *Lilium Bolanderi* and *Lilium Kelloggii* leaves the reader just about where he was before reading the article.

Mr. C. Beck's informative notes on the cultivation of fritillaries are welcome, as also is the interesting data on the order of flowering of fritillaries in several English gardens.

Dr. J. Fletcher Telford has contributed a brief but interesting article on Lilies in this country.

Lady Beatrix Stanley's account of Lilies in India shows what really accommodating plants some of the better known Lilies are. Two species mentioned, *L. longiflorum* and *L. formosanum*, appear to thrive also in parts of South Africa, as indicated in Mr. L. B. Creasey's informative contribution to the year-book. This series is completed by Mr. A. Tse's article on Lilies in Hong Kong.

The importance of vegetative propagating from healthy scales is stressed, and is further emphasised by rather illuminating figures, resulting from the experiments conducted at Wisley. Full details covering the conditions and position of scales during growth are set out in this article. The results, where conclusive, will be of considerable assistance to growers.

Mr. W. N. Craig's contribution on the cultivation in gardens of North American Lilies is valuable. More information is desirable on the subject, particularly as regards some of the more elusive species. It is interesting to note that the author has experienced no more success than have New Zealand growers in attempting to persuade certain species to take up permanent residence in his garden.

Notes of a discussion at a meeting of the Lily Group on the planting of Lilies give much informative detail on this important subject. The obvious conclusion, that it is better to grow the rarer Lilies in isolated groups rather than with many others in a large border, will find many supporters amongst growers. The notes include expert information on raising Lilies from seed, transplanting, soil and situation. The use of lime in growing the European Lilies is again advised, and some of the causes of failure in growing the more difficult American Lilies are mentioned. Methods of se-

curing the complete drainage, so essential in the cultivation of Lilies, are suggested. At a subsequent meeting of the Lily Group the discussion was confined to Japanese Lilies, and much valuable information was made available on the cultural requirements and diseases of these Lilies. Notes of a further discussion that took place at an exhibition of Lilies on July 7th last, while showing the great interest taken in the subject of Lily growing at Home, also indicate that much information has yet to be obtained regarding the cultivation and even the correct naming of a number of species.

A comprehensive Lily bibliography adds to the value of the year-book.

A logical analysis of the structure and functions of contractile roots of Lilies, which is of more than academic interest to even the beginner in Lily growing, will be found in the article by Dr. Fred Stoker. Although the author dispels some of the illusions created by poetry and prose of centuries of the gentle qualities of the "lovely lily clean," his information shows conclusively how and why Nature adjusts faults in the levels of planting, and adds another valuable page to our knowledge of the genus under garden conditions. The same author contributes a brief note on a form of *L. candidum* from Herat. Further information regarding the cultivation of Lilies in America is contained in brief articles on *L. michiganense* by Mr. A. Grove and on new hybrid Lilies at the Central Experimental Farm, Ottawa, by Miss Isabella Preston.

As usual, the brief notes from many sources which complete the year-book are most interesting and the illustrations again reach a high standard. The reports of the three meetings of the Lily Group, referred to above, form an excellent basis for the study of the cultural requirements of Lilies, even from a beginner's point of view, and add much to the information on the subject possessed by expert gardeners.

—F. J. SHANKS.

BLDISLOE (FRUIT) CUP COMPETITION.

DEPARTMENT OF AGRICULTURE.

CHRISTCHURCH, C.I.

24th May, 1937.

H. L. Darton, Esq.,
Secretary,Canterbury Horticultural Society (Inc.),
166 Manchester Street,
Christchurch, C.I.

Dear Sir,

BLDISLOE CUP.

In reply to your request for a few notes on the competition for two cases of export apples, I wish to state that it was very gratifying indeed to see such a large number of entries (21) for this competition.

The majority of the exhibits were good, plainly showing the amount of enthusiasm shown by the exporters for this competition.

The exhibits were above the general export standard, both as to colour of fruit and wrapping, but some of the exhibitors apparently did not take into consideration the market value of the fruit.

Altogether this exhibit made a remarkable show, being both spectacular and instructive, and it created considerable interest amongst visitors to the show, in addition to the orchardists.

It was difficult for the judges (Mr. J. D. Carolin and myself) to separate some of the entries, especially the 1st and 2nd exhibits.

The following are the points allotted for 1st., 2nd. and 3rd. prizes.

S. G. Brister (Horrelville, R.M.D., Rangiora) 1st. 88 points.
F. Archer (Nelson) 2nd. 87½ points. W. Everiss (Mapua, Nelson) 3rd. 86¾ points.

Points were allotted as follows:—

	Possible Points:
Form and size	10
Storage, Transportation and Market Value ..	20
Condition, Quality and Appearance	20
Uniformity of sizing and grading	20
Wrapping, height, alignment and compactness	25
General appearance of package	5
	—
Total:	100

Yours faithfully,

—B. G. GOODWIN,
Orchard Instructor.

NOTE:—The two cases of apples, comprising the winning entry, were forwarded direct to Viscount Bledisloe, in appreciation of the great interest he has taken in this most important industry.

CLASSIFIED LIST OF DAFFODIL NAMES.

A new edition of the "Classified List of Daffodil Names" has been published by the Royal Horticultural Society. The object of the List is to stabilise Daffodil nomenclature, and the publication ought, therefore, to be in the hands of all who raise, show or sell Daffodils. The last edition, which appeared in 1933, is now exhausted, and in the interval over 800 new names have been registered with the Society, including those of over one hundred varieties raised in Australia and New Zealand. The new edition consequently contains references to over 7,600 Daffodils, and may be regarded as a fairly complete guide to the names which are in use, or have been used, for these plants.

A numeral and a letter preceding each name indicate the Division and Sub-Division to which the variety belongs, the name of the raiser is given, and the approximate age of the variety is indicated. As it is not an uncommon thing for a raiser to sell the stock of a seedling under number, i.e. before the variety has been named, the name of the person or firm who registered the variety is given in respect of all varieties registered since the publication of the 1927 edition. The names of varieties considered to be surpassed by modern varieties are inset and printed in small type. Varieties which have been certificated by the Royal Horticultural Society are indicated, and the dates of the awards are given. Similar information is also given in respect of varieties certificated since the beginning of 1930 by the Algemeene Vereeniging voor Bloembollencultuur te Haarlem (General Bulb Growers' Society of Haarlem). Brief particulars are given of the persons and firms whose names appear frequently as raisers or stockholders.

Although the new names and additional information have added considerably to the bulk of the book and increased the cost of production, the Council of the Royal Horticultural Society has decided that the price of the work shall continue as before so that, in the interests of horticulture, the book may have as wide a circulation as possible. Copies may be obtained from the Dominion Secretary for 1/6 each, which includes postage.

INSTITUTE NOTES.

CONGRATULATIONS have been extended to Sir Algernon P. W. Thomas, K.C.M.G., Auckland, an Honorary Fellow of the Institute, on his well deserved knighthood.

These have also been conveyed to Mr. H. Poole, Lower Hutt, on the award, by the Royal Horticultural Society, of the Peter Barr Cup for work in connection with daffodils. This is the first occasion on which the award has been made outside of the United Kingdom.

EDUCATIONAL. The Executive Council's congratulations and appreciation have been extended to the Otago District Council, on the inauguration of lectures in Horticultural Science at the King Edward Technical College, Dunedin.

THE COCKAYNE GOLD MEDAL for the best Diploma Candidate at the 1936 examination has been awarded to Mr. R. W. Baleh, who is employed at the Botanic Gardens, Christchurch. A function is being arranged by the Canterbury District Council, at which the medal will be presented. Congratulations to the winner are hereby recorded.

CAPITATION. Following on a remit and recommendation from the recent Conference, the Executive Council has approved an increase from twenty to thirty per cent. in respect of capitation on subscriptions.

CONDOLENCE. The Institute has extended its sympathy to the relatives of E. Phillips Turner, who was a member of the Executive Council. Our genial comrade was an inspiration to us all in forestry matters as also to all lovers of our native flora.

NATIONAL HORTICULTURAL WEEK, 1938.

The Permanent (Joint) Committee has agreed that Christchurch shall be the venue of National Horticultural Week, 1938. This will commence on Tuesday, 25th January, 1938, with the following programme:—

Tuesday afternoon:—Official opening of National Conferences and National Flower Show.

Wednesday, all day and evening:—Annual Conference of the New Zealand Horticultural Trades Association; Continuation of National Flower Show.

Thursday, morning and afternoon:—Annual Conference of the New Zealand Institute of Horticulture; Evening, Banks Lecture.

**NEW ZEALAND INSTITUTE OF
HORTICULTURE
(INCORPORATED.)**

Patrons: Their Excellencies VISCOUNT GALWAY, Governor-General
and LADY GALWAY.

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Membership:

Individuals: 12/6 per annum (including Member's wife).
Juniors under age eighteen: 2/6 per annum.
Societies, Firms, etc., 21/- per annum.

Journal (quarterly):

To Members: Free.

Examinations:

Examinations are held yearly in November.

Students desiring examination should make early application to

DOMINION SECRETARY,

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P.O. Box 1237, Wellington.