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CONTENTS:

	PAGE
Sub-Tropical Fruit Culture By W. H. Rice, N.D.H. (N.Z.)	55
The Home Garden. By Wm. C. Hyde, N.D.H. (N.Z.)	67
A New Book on Daffodils. Review by N. R. W. Thomas, LL.B.	74
Guy L. Wilson	77
Botanical Notes. (Students' Horticultural Diaries) ...	79
Loder Cup Competition	81
Tulip Nomenclature	83
Institute Notes	83

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SUB-TROPICAL FRUIT CULTURE IN THE AUCKLAND DISTRICT.

BY W. H. RICE, N.D.H. (N.Z.).

In considering the possibilities of sub-tropical fruit culture one can hardly compare the conditions of the northern part of the Dominion with other countries. Though geographically the location may in certain respects be the same as some other part of the world, comparisons are not equal; apart from latitude and longitude, the area of land, continental or surrounded by water, annual rainfall, etc., all go to make a climate. It is, therefore, better to consider the case from the Dominion viewpoint, and review the northern area of land, which is most free from frost and affords possibilities for the cultivation of fruits which are impracticable in other parts of the Dominion.

The East Coast regions of the South Auckland land district, the Auckland Isthmus, and the coastal regions of the North Auckland district embrace a large area of land which is suitable for the cultivation of sub-tropical fruits and plants. The range of subjects is restricted to those which will endure light frosts periodically, as it is the exception to find a location which can be depended upon as permanently free from frost; while in practically every situation there is an acute difference between day and night temperature, which also restricts the choice of plants, as some which would do quite well in a regular temperature do not thrive under acute change. The rainfall on the area is adequate, and there is no area where irrigation is necessary, though one must admit that, with a few specialized crops and with young citrus trees especially, some mid-summer irrigation could be employed with advantage to the trees. The land is very irregular in type, ranging from light volcanic, through loam and clay, to a type of ironstone which is impossible. The lighter, well drained soils offer the best chance of success, as the heavier types are slow to warm in the spring and retain excess moisture to the detriment of root-action. There are two main periods of growth—spring, and a decided autumn growth following the rains in late autumn. Apart from the great range

between day and night temperatures the most serious setback is occasioned by high winds. However ideal the natural "lay" of the land, the gentle northerly slopes of a ridge being best, there are very few situations which are not improved by growing a good south-west or lesser east shelter belt of sufficient density to prevent more than a gentle movement of air through the orchard. The easterly shelter is more necessary for sub-tropical fruits than the hardy temperate ones; generally they are of a much softer, luxuriant growth, easily damaged by high winds, which are frequently experienced from the east.

Low-temperatures are common at night, usually carried by south-west wind currents; these are deflected by hills and encouraged by large open spaces or continuous valleys. The best shelter is natural from hills, etc., but where such do not exist ample south-westerly shelter should be provided.

The introduction of exotic fruits has been under way since the early settlement of the North. Many have been the failures, but in a general way the trail has been well blazed for us by the early settlers, and valuable lessons are to be learned from the efforts made by them.

The indigenous plants give no example of an economic fruit. There are, of course, numerous tree-berries, but no bush-berry or tree-fruit which could be improved by selection. While introduction it still going on, we owe most of the exotic fruits to the efforts of the pioneers.

AVOCADO.

Persea grattisima is perhaps the most outstanding instance of fruits which have attained popularity during recent years. Two species of the native plants are known, West Indies and Guatamala. From these have been evolved the modern varieties which find a ready place on the U.S.A. markets. There are over three hundred varieties enumerated, six or eight of which are of such approved merit as to be cultivated most extensively in Florida and California. It is a handsome, evergreen shrub of stature restricted to 25 to 30 feet; rather soft-wooded, freegrowing in frost-free areas, and carries abundant crops of pear-shaped fruits, rather larger than full sized pears. When ripe the skin parts easily from the pulp, which is of firm though buttery consistency surrounding a single large kernel. The fruit is highly charged with nutritious oils, which are quite agreeable to the palate, and with pepper and salt, is a perfect salad. Few people fail to like it even at first trial.

Many plants are known in the Auckland Provincial district, most of which are unthrifty and unlikely to succeed, mainly because they are raised from seed which may be any variation of quality, instead of grafted trees of approved quality. Mr. J. Davidson, of Tauranga, has a range of named varieties under trial, some of which have fruited freely. The variety which has displayed most merit so far is Lyon. Many nurserymen are now offering plants propagated in the most approved way to avoid any risk of seedling-

variation, and it will be highly interesting, and possibly profitable, to foster the establishment of the correct varieties in the more sub-tropical parts of the Dominion.

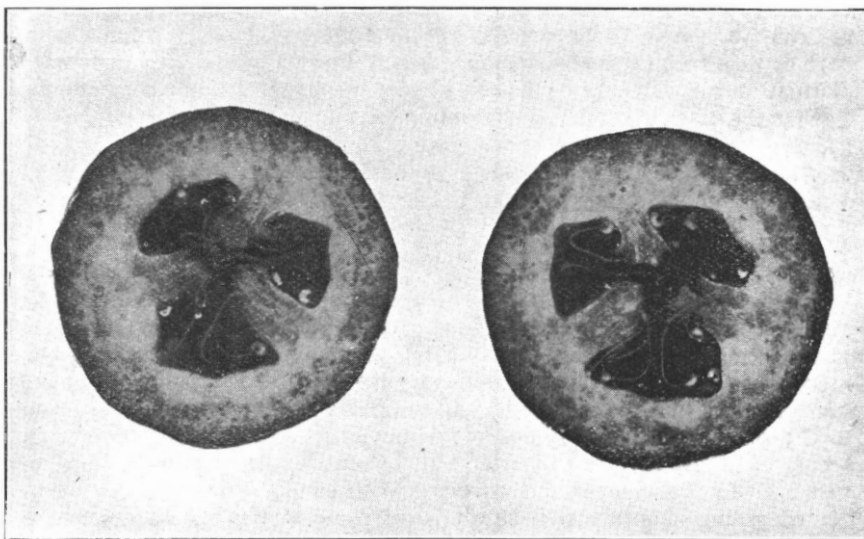
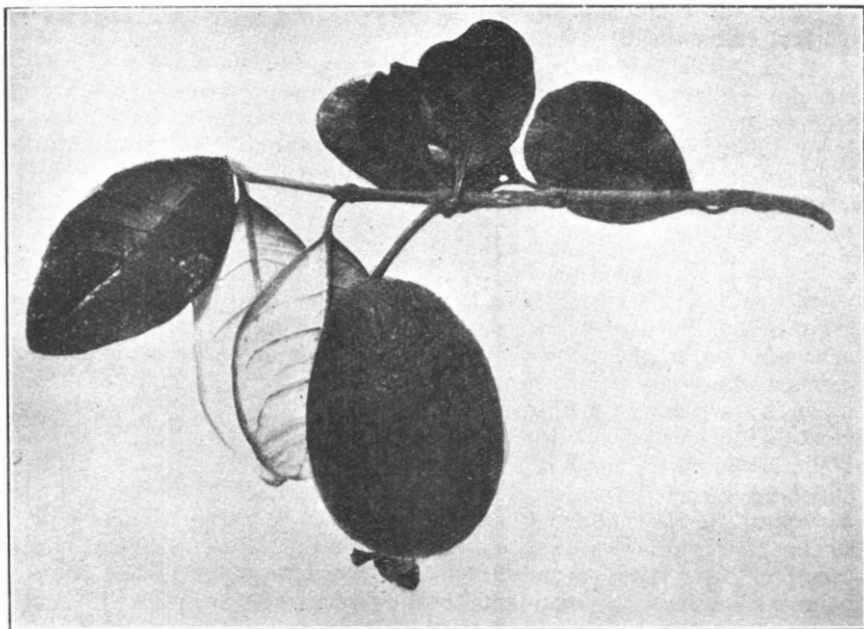
It is perhaps too much to expect that we shall produce such luscious fruit as the tropics, but owing to the susceptibility of the fruit to fruit-fly it is not likely that this market will ever be supplied from outside countries, and the more hardy varieties should succeed well enough here to give the people the benefit of this highly nutritious and agreeable dessert fruit.

DATES.

Phoenix dactelifera.—The freedom with which Phoenix Palms grow in this locality might suggest the production of dates from its near relation to the Date-palm. There are, of course, many Date-palms to be seen, as the stones germinate quite freely and result in a handsome plant. Only on one occasion have I seen dates in dessert condition in New Zealand. These were growing on a plant at St. Heliers Bay on the property of Mr. Bloomfield, where a pair of plants had been growing for some years in a glasshouse. The leaves had destroyed the roof, and the house was allowed to remain in disrepair, so that it was practically open to the weather. Here for several consecutive years dates of edible quality were produced. The Date-palm is dioecious, the male and female blooms appearing on different trees, so unless the two are grown in close proximity no fruit will mature. Growing plants from seed leaves one in doubt for many years as to the sex, and when seedlings flower rather more than half the number prove to be male. The orthodox way of propagation in date-growing countries is by suckers of known sex—with one male planted out to twenty females. Some progress has been made in California only since the introduction of approved varieties from the East. I am not aware of any introduction of plants of known variety to this Dominion, and I doubt if it has ever been done; so there is a field for some pioneer work.

FEIJOA SELLOWIANA.

A warm-climate fruit of recent introduction which should become quite popular when the many merits of this plant become more widely known. A highly ornamental shrub when grown as a specimen plant, and admirably suited for use as a hedge plant. Foliage of mid green with silver under side imparts a very pleasing variation to the plant and hedge under wind movement. Propagation is from seeds, cuttings, layers, or better still by cutting back an old plant to just above ground-level and covering with sandy soil; the large number of young shoots which result form roots at the base and may be later transplanted. Flowers are carried in profusion of quaint formation, purple, white, and blue in pleasing combination. The petals are fleshy, sweetly flavoured, and edible. Fruits are mature in late autumn. They are highly perfumed, of a sweet, pineapple-strawberry flavour, and lack acid. When mature, the fruit has a green skin,

*Feijoa-sellowiana.*

Photo—H. Drake.

pale yellow flesh, and very small seeds, and is useful as dessert, for fruit salads, and for preserves. On maturing, the fruits readily drop from the bushes, but at this stage they are not so perfectly ripe as to be of best dessert quality. Stored for a few days they become soft and highly aromatic.

Feijoa was introduced some years ago from Australia. These plants succeeded well, but the fruits were small, about the size of a walnut, and the skin somewhat coarse. Re-introduction was made by the late Mr. Poynton, S.M., by seeds procured from the Curator of Elsaf Botanic Garden, Middle Egypt, under the name of Banana Guaze. On fruiting in 1929 these proved to be very desirable. There is, of course, a wide range, as might be expected from seed, but among the large number grown on by Mr. H. R. Wright, Avondale, there are several which vary only in shape, and are a great acquisition to the fruits of this Dominion. In size the fruits are up to 2 inches in diameter by $2\frac{1}{2}$ inches in length, and resemble the description of the best varieties catalogued in California as Superba-Christiana etc. Plants raised from the Poynton strain could be cultivated both as a domestic and a commercial proposition with advantage, but they are so superior to the older type that they alone should be cultivated, and the older type discarded, if the fruits are to take their proper place and be appreciated as their merits and possibilities deserve.

GUAVA.

These were introduced many years ago and some quite old trees are to be found throughout the North. *Psidium Cattleianum* and *Psidium guava* are the two varieties grown—purple and yellow fruiting. Of the older plants which are succeeding, the purple predominates and is undoubtedly the hardier. There are only a few aged plants of the yellow variety, though it is quite common in the nurseries to-day and in good demand, no doubt because of the rather superior size of the fruits. But if one is guided by the established plants the yellow does not promise as well as the purple for commercial plantings. Undoubtedly the yellow is of better dessert quality; a fact which is also known to birds who greedily devour most of the yellow fruits before they have fully matured. The yellow variety is also disposed to shed the fruits when half matured, while many fruits crack in damp weather.

As domestic plants both are useful, fruiting as they do in the off season and meeting a wide range of uses—dessert, cooking, and preserves. A pronounced feature of the older fruiting plants is the wide range of types grown, no doubt accounted for by the seedling origin. Many of the early introductions were from the seeds of fruits grown in tropical climates, where the fruit attains the size of an orange. When these are grown on in our rather more severe climate, a lesser size is produced. Occasionally a plant is found which produces superior-sized fruits and refined seeds; it is from such that future plants should be raised. It should be the duty of every propagator to select from the best types only, in order that

evolution by adaptation may be assisted, or adopt vegetative reproduction in order that the wide range of variation may be avoided.

Although there is a very limited area planted in Guavas in a methodical-orchard way, there is sufficient to indicate that it is not the most profitable way to grow them. The greatest profit from a minimum of land is returned when these plants are used as a hedge—they thrive best in close company, crop quite well, and provide a very desirable hedge-row. They should not be expected to act as a breakwind to south or south-west winds, but rather used as a dividing hedge. It has been generally experienced that young bushes growing vigorously produce better-sized fruits than older plants, but it is also demonstrated that by a liberal manuring and moderate cultivation the very oldest of plants can be assisted to produce abundance of high-quality and good-sized fruits. Further introduction of allied species might be profitably done, as there are doubtless others which would succeed here.

FIG.

Throughout the province the Fig makes a noble tree, and any reasonable soil appears to suit it. There are many instances where they are the most profitable trees in a mixed orchard. If one leaves out of the question the production of dried figs such as the Smyrna, which require fertilization from a *Caprifig* by a special insect, there is still great scope for development.

Of the old trees established, Adriatic (a medium-sized round Fig with yellow-green skin and pink flesh shot with violet), Black Smyrna (a small round Fig, dark skin and amber flesh, very early), and Brown Turkey (large pear-shaped, brown to green skin, dark red pulp, very free fruiting) give the best results. There are many other varieties grown, but there are many more desirable varieties known in other Fig-growing countries which could with advantage be introduced.

LOQUAT.

Eriobotrya japonica.—This highly ornamental tree luxuriates on the Auckland Isthmus and the North, though as usually grown it is no doubt most disappointing as a fruiting tree, doubtless due to the indiscriminate propagation from seeds. The trees usually grown have haphazard fruiting habits, not even maintaining a biennial or triennial production, much less an annual; this has given a bad reputation to a desirable fruit. Seedlings from even choice fruits have such a variableness of character as to be a lottery with the odds against a desirable type being reproduced. When it is desired that a good variety be propagated for extended planting, grafting is the best method, and a quince-stock answers well for the root-system, as it restrains the luxuriance of the trees and induces more precocious and regular fruiting-habits. At present the Loquat is grown more as an ornamental and shelter tree, from which fruit cannot be expected but sometimes occurs. There are, however, available from nurserymen worked trees of superior quality, which, while quite as

ornamental and suitable for shelter trees, have more constancy of fruiting, combined with better quality. The period of harvesting Loquats, being when other fruits are scarce, means that they are a welcome addition to the domestic garden and when grown commercially meet a ready sale. When one considers that mainly Australian-grown fruit is sold retail here, yet notes the freedom of growth in the north of the Dominion, one can only deduce that better and more constant-fruiting varieties would make Loquat-growing a profitable sideline, from shelter trees or even as a section of the commercial orchard.

TREE-TOMATO.

Cyphomandra betacea is most luxuriant in growth and prolific in fruiting in localities free from frost and excessive wind. Quite profitable crops are grown on plants three years from seed. Though the plants are more or less of a temporary nature—say ten years of profitable life—the fruits are absorbed locally at prices which make growing profitable. The plants will withstand only slight frosts, and their culture is impossible in areas where heavy or continuous light frosts occur. It sometimes happens that even in situations reputed to be free from frost a severe snap will occur; such an uncommon frost will defoliate the trees, but if frosts are at infrequent intervals little other damage is done, the plant having good powers of recovery. High winds are very detrimental, and they may make an otherwise suitable locality impracticable for Tree-tomato culture. The large leaf readily shreds into ribbons, and the soft wood easily breaks, under wind lashings. On the other hand shelter in too close proximity creates a softness of growth and a susceptibility to mildew, practically the only disease which affects these plants. A natural wind-free location is the most highly desirable.

In habit the tree generally attains from 5 to 6 feet as a single stem; divisions then offset which give an umbrella-like shape to the tree. The single stem grows so rapidly as to be a poor support to the tree; old plants bent over in an undesirable way are often seen. Staking is sometimes done to afford a temporary support, and one occasionally sees a grove where the plants have been set out at an angle of less than 45° to lessen the chances of wind damage. The best way is to set out plants at the points of a three-feet triangle and draw them together wigwam fashion, tying about 4 feet high; the tops intermingle with no detriment to the plant, and a greater number of plants can be fruited per acre.

It is generally conceded that consumers have to acquire a liking for the peculiar flavour before partaking freely of these fruits, though the demand is quite keen for dessert purposes, while the fruit is eagerly sought after for preserving. Their suitability as pie-fruits requires only to be known better to be more appreciated, available as they are in the season of shortage in soft pie-fruits.

The varieties most generally known—yellow and purple tinge—have been augmented during the last three seasons by the selection and

propagation of a variety which is blood-red right through the flesh. This is highly attractive, and is a welcome variation. Possibly the greatest improvement on existing varieties could be made in the direction of extending the season with a late-maturing variety, as slightly out-of-season fruits command luxury prices at present.

PASSION-FRUIT.

Of this branch of the *Granadilla* family the *Passiflora edulis* (purple fruited) is the most accommodating to the conditions of the North. Though the long white variety does quite well it is more suitable for domestic purposes owing to the soft texture of the rind. Of the purple fruited, the Mammoth variety is decidedly more attractive owing to size, and in some localities is more reliable in growth; these are the only advantages it has over the smaller variety. The ordinary small variety can be depended upon to set a prolific crop sufficient to compensate for the lack of size. The Mammoth is prone to partial unfertility, and produces many semi-hollow fruits; the rapidity to wilt and become corrugated after picking is also more pronounced.

The ease of Passion-fruit cultivation is somewhat marred by occasional lack of establishment after transplanting, but this can usually be avoided by setting out well rooted plants in the spring when immediate growth may be expected—autumn transplants rarely give the same satisfaction. Though a plantation is more of a temporary nature than most vines or tree-fruits, the time between planting and fruiting is less, so returns are secured much earlier, an advantage to new settlers or others desiring a semi-temporary catch crop between wide-spaced orchard trees. There are many methods of trellising and training these vines, from common brushwood to elaborate wire trellis work on which plants are trained with geometrical precision. As a temporary crop between other trees the "Rafferty" style suffices; a line of stout posts, a minimum number of wires laced with brushwood, and the plant allowed to roam at will with no pruning treatment, give the most profitable results, and may be expected to endure for four years, after which the plants will decline. From plants set out in September-October, growth is made as long canes. As these are of first-year wood, fruit is carried which is usually so late as to meet out-of-season prices. For the more permanent vines these are conducted to the top wires and then along. From these canes next season laterals develop which carry the crop for the season. In the following spring these laterals should be cut back to a few buds so that the ensuing growth occupies somewhat the same place as the previous season's laterals did; this type of pruning can be continued for many years. Where such pruning is not done the end bud of the lateral gives rise to the new growth and the fruit is carried on undue extensions, fearfully tangled and further from the supply of sap; a few years of this type of growth and the plants are worn out. Though this plant has been grown here for many years it is only during the past three years that extensive planting has been done.

Some 300 acres have been planted, which more than doubles the area under cultivation. This will make available a larger quantity of fruit for distribution in the Dominion, and force the situation as to Passion-fruit products. Export of this fruit to England has been tried, but with little success. Fortunately the Passion is more accommodating than most fruits, in that it is readily pulped and preserved. Limited quantities of pulp have been marketed in the United Kingdom and Europe. This has started a keen enquiry, and the trade should grow as increased quantity of fruit is available to meet the demand. In Australia where the Passion is grown in quantities, the juice is now being made into a liqueur which has come into instant popularity both as a liqueur and a base for cocktails, for which purpose it is reputed as greatly superior to Vermuth.

There is room for research work on the uses of Passion pulp, and also in testing other Granadillas to conditions here. It is possible that a hybrid could be raised which may excel all others in quality and become of great commercial value to the Dominion.

ORANGES AND LEMONS.

Varieties of these are among the very early exotics planted in the North. In those days introduction was by pip, which gave a wide range of types and produced trees of various degrees of adaptability. History shows that this type of plant was also at a disadvantage in that trees on their own roots suffered from collar-rot, which became so widely general as to cause extensive losses.

As an introduced plant they have never been quite at home, naturally, but have responded to culture admirably; on the other hand there is no fruit-tree grown here which declines so rapidly when care and attention are withheld. This, no doubt, accounts for the fact that very few of the early plantations exist to-day. Modern cultural methods have proved so satisfactory that the citrus industry has now become established. The most modern improvements to the industry are along the lines of ensuring that the foundation is right, proper selection of stocks for the various kinds of land and varieties, and the selection of approved pedigree varieties to perpetuate.

With regard to the root-stocks the sweet Orange raised from pips of the imported island Orange was mainly used for many years, and gave superior results from varieties which were not reliable on their own roots. This was only satisfactory in a measure, as it disclosed what would or would not succeed on that root-stock only, and consequently restricted the successful culture to those which happened to be suited. In later years other varieties of root-stocks were introduced and these have made varieties more suitable to various kinds of land and generally widened the chances of success.

Poncirus trifoliata is now quite common, and suits the heavy type of land best. This is a citrus-stock of deciduous type, and consequently restricts the growth of most varieties and tends to early fruiting. It is adaptable for most varieties of Lemons except Eureka

on which it has such a dwarfing effect as to seriously set the tree back. For sweet Oranges it is, in a general way, good, though not more so than other stocks except in the case of Gold Nugget Navel, which variety it so improves as to be hardly recognizable as compared with those grown on other stocks. The variety Teneriffe has no affinity whatever for this stock and simply will not grow. It is suitable for all varieties of Grape-fruit, meaning, of course, on heavy types of soil. On the lighter or volcanic lands it has not so far proved good for any variety, except perhaps to restrict the tree in stature and induce early fruitfulness.

Citronella.—This is an admirable stock for soils of every type, providing they are not wet or cold. Some of the oldest trees on record are found to be worked on this root-medium, so that it can be considered as of special longevity. It has the merit of extensive deep-rooting action and almost constant growth, which tends towards the production of trees of large stature. Though fruiting is delayed rather longer than in the case of *trifoliata*, as might be expected with a constantly-vegetative stock, it is not unduly delayed, and the extra surface for production well repays later on. In affinity it is adaptable to practically all varieties of Orange and Lemon, while it is especially suited to Ruby Blood Sweet Orange, which does far better than on other kinds of root-stock.

Florida Sour Orange.—This is expected to be adaptable to most types of soil, being an intensely vigorous grower with a deep rooting-system, which is preferable for light soils. It is of such recent introduction that no aged trees are available by which to judge performance or affinity to various varieties, but young trees of practically every variety are succeeding, though on the excess-vegetative side, which indicates delay in attaining fruition.

Sweet Orange.—This one-time universal stock is still generally used, and may be regarded as still the best for general purposes. The extension of root-action and the intense quantity of fibrous surface-roots make for a very thrifty tree. It has a good affinity for most varieties, but being so nearly related to the Sweet Oranges induces growth rather than fruit with all varieties. Lemons succeed particularly well on this stock. Eureka cannot be better grown than on Sweet Orange. Lisbon is rather rough-fruited, doubtless because of the free growth to a fruit which is not refined at any time. The effect of root-stock on variety can be considered in a general way as the nearer the affinity the more robust growth and delayed fruition; the wider removed the affinity the poorer the growth and more precocious the fruiting; while it is possible to have the affinity so far removed as to make success impossible owing to repulsion. The influence of tree on stock has long been recognised as of value, and in measure is of as much importance as root on tree. The use of intermediate stocks which have an affinity to the root most suited for the type of land, and the later top-working with the most suitable variety, is a phase of the industry worthy of extended research, as the first foundation of growth as near perfect as possible will aid materially the success.

Lisbon.—The varieties of citrus to be recommended for commercial planting are restricted to those of approved merit. New varieties are constantly being introduced, but it would certainly not be wise to plant on a large scale other than varieties which have proved their worth. Of the Lemons Lisbon is favourite—a very adaptable tree to a wide range of conditions; good robust constitution and heavy fruiting habit. There are two decided crops in the year—Winter and Summer—and also the overlapping fruits which arise from the season flowering; the Winter crop is decidedly the heavy main crop.

Eureka is now grown in approximately the same proportion as Lisbon, and gives equally good results of better shaped and more refined fruits. Two crops per annum are also produced by this variety; unlike the Lisbon the heavy main crop is produced in the Summer. Thus an equal planting of Eureka and Lisbon affords an almost continuous supply of fruits. Eureka is a thornless tree, and finds further favour for this reason.

Other Varieties.—Villa Franca, Messina, Sicily, Genoa, and Sweet Rind are varieties which have been under observation for some years, but have not disclosed any special merit which would justify planting them in preference to Lisbon and Eureka. Meyer, a variety of comparatively recent introduction, is a highly attractive, very symmetrical fruit of low acid-content. It is reputed to be several degrees more frost-resistant, and may so extend the area in which Lemons can be cultivated. So far it has disclosed great suitability for restricted planting for domestic purposes, and no special merits which indicate the wisdom of commercial plantings.

Oranges.—Of the preserving Oranges the well-known Poorman retains its place as the most suitable. Seville is now little grown being considered too bitter, while the introduction of a few years ago, Kin Kan, is proving too coarse in texture and far too seedy to be readily acceptable. The larger-sized Poorman Oranges are creating a place for themselves as Grape-fruits.

Grape-fruits.—The common Grape-fruits of the United States, Marshes Seedless and Foster, are both being grown here, but their performance so far, even from trees up to twenty years of age, does not indicate that they can be cultivated to perfection here. The Poorman Orange is really a Pomelo, and the future will, no doubt, see it in common use as a breakfast-fruit. It is, therefore, a dual-purpose Orange, preserving and dessert. There is a diversity of opinion as to the origin of this Poorman, but all records point to the introduction by Sir George Grey, but from where or if raised locally will never be settled. It exemplifies an adaptation to local conditions, as trees worked from our stock alter their character in other countries. In the citrus belt of Australia they become quite coarse; in the Cook Islands when grown side by side with Grape-fruits introduced from other parts of the world, the New Zealand Poorman produces the best fruit.

Sweet Orange.—Though Sweet Oranges have been grown throughout the North for many years the majority of the fruits produced

have been below the quality which would meet a ready sale. This Dominion is fortunate in being well supplied with Oranges from the Pacific Islands, which have met the demand for these fruits, so the indifferent Oranges grown here in the past have not had a ready sale except in periods of scarcity or out of the Island season. There are instances where local fruits have been most profitably marketed after the Island season is over, a period during which Californian and Australian Oranges are imported in quantity. It is for this market that future plantings of Sweet Oranges should aim to cater. The most modern varieties of Oranges are the seedless types; Navels and Valencias are particularly well suited for this purpose. With the older varieties the great drawback to allowing them to hang on the tree for the finished perfection and the best market has been that when vegetation recommences in early spring the fruits have become dry. This is not so with the best varieties, so cultivation can be more confidently undertaken. The most suitable varieties to plant are Navelencia, Late Valencia, Pineapple, and Lou Jim Jong.

There are many other kinds of citrus fruits grown—Mandarins, Citrons, Shaddocks, Limes, etc.—but while they succeed as objects of garden interest there is no encouragement for extensive plantings.

With the whole of the citrus family, cultural details are of the utmost importance, but without the essentials of well drained soil and suitability of stock and variety cultural details cannot avail. In the past few years the world's best selections, not only of varieties but types of varieties, have been imported, and the best types of trees from which to propagate selected in this Country. The rearing of such pedigree trees must have an influence for good. At present research is under way, fostered and made possible by the Department of Scientific and Industrial Research, the details of which are being carried out by the Citrus Committee of the New Zealand Institute of Horticulture. This research work has so far been confined to a survey of the existing conditions in Australia and this Dominion; the congregation of various kinds of root-stocks; and the introduction of most approved varieties and types from overseas, together with the collection of approved types known here. With these trees of known pedigree under way, influence of soil, stocks and other cultural details can be more readily studied later. It is hoped that it will later be possible to continue this work on a research-orchard established for the purpose, which while being a demonstration-block would be available for the training of cadets and the education of students.

BANANA.

Occasionally in the more sheltered positions edible fruits are noticed, but they are just Bananas, highly interesting, but never so perfect as would tempt one to embark on extensive culture.

POMEGRANATE.

These add a real sub-tropical effect to the garden, and there are many trees on the Auckland Isthmus which fruit quite well, though

the standard of quality leaves much to be desired. Cossemiroa, Zissiphus, and many others have been, and are being, tried every year.

GENERAL.

No doubt, as time goes on, more fruits will be introduced suitable for the climate, but in the meantime there is quite a range of plants which succeed in the North and offer great scope for development to meet the requirements of the increasing population which this Dominion is destined to support.

THE HOME GARDEN.

FLOWERS AND LAWNS.

"And because the breath of flowers is far sweeter in the air, where it comes and goes, like the warbling of music, than in the hand, therefore nothing is more fit for that delight, than to know what be the flowers and plants that do best perfume the air. Roses, damask and red, are fast flowers of their smells; so that you may walk by a whole row of them, and find nothing of their sweetness: yea though it be in a morning's dew. Bays likewise yield no smell as they grow; rosemary little; nor sweet marjoram. That which above all other yields the sweetness in the air is the violet; especially the white double violet, which comes twice a year; about the middle of April, and about Bartholomew tide. Next to that is the musk rose; then the strawberry leaves dying, with a most excellent cordial smell; then the flower of the vines; it is a little dust, like the dust of a bent, which grows upon the cluster, in the first coming forth; then sweet brier, then wall-flowers, which are very delightful, to be set under a parlour, or lower chamber, window; then pinks and gilliflowers, especially the matted pink and clove gilliflower; then the flowers of the lime-tree; then the honeysuckles, so they be somewhat far off. Of bean flowers I speak not, because they are field flowers; but those which perfume the air most delightfully, not passed by as the rest, but being trodden upon and crushed, are three, that is burnet, wild thyme, and water mints."

FRANCIS BACON.

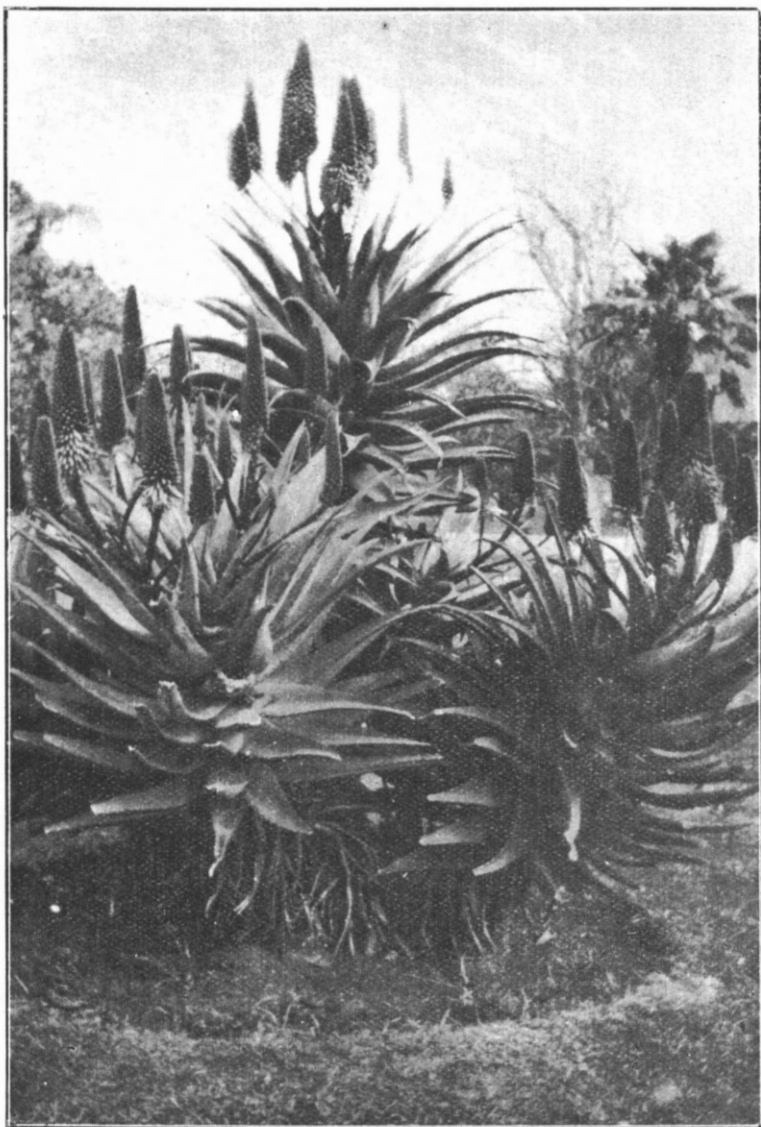
As flowers fade they should be gathered, not merely for tidiness, but the plants are wonderfully invigorated by the process. There are some exceptions, as in the case when pods and berries are ornamental and important features in the garden during the autumn and winter. In the herbaceous border many plants such as Dahlias and Chrysanthemums will require staking, and the growth should be thinned. If when the flower buds appear they are given liquid manure and superfluous buds are removed the flowers will be greatly improved without being necessarily abnormal. Spring-flowering bulbs are lifted now, and are available until about the month of April. Most planters set out the bulbs towards the end of this period, but earlier and better blooms would be obtained if they were

planted as soon as they were available. Plants of this kind are most attractive, as they flower early and require little attention. In the foreground of shrubberies, and even in the lawn, Daffodil and Crocus, purple and gold, planted in comparatively large irregular drifts of one kind are suitable heralds for the flowering season, especially in the colder districts which have a distinct winter break in the display of flowers.

Rhododendron borders have been greatly improved during recent years, and excellent results have been obtained during the last flowering period. These plants love a light soil and humid climate. Where the soil is rather heavy and the climate dry, they will be much improved if a moderately thick mulch of vegetable litter is given now, and they are well watered to keep the fine surface roots cool and moist.

Many gardens would be greatly improved with a little thinning and rearrangement of shrubs and trees, and also suitable additions of the kind. The planting season does not begin until the month of May, but the problem should be carefully considered now. Hydrangeas growing in dry sunny positions would be very grateful, and show it by flowering better, if they were removed to moist land in partial shade, as would also Camellias and Daphnes, which too often are yellow and sunburnt in exposed positions. The results are incomparably improved if they are removed to a position as suggested. Character and variety also would be given to many a shrubbery border if room were made for a sufficient number of palms and tree-ferns. In the shade and shelter of the surrounding trees and shrubs ideal conditions would be afforded for these striking and beautiful plants that are common features in our natural scenery. Mamaku (the black tree fern) is a vigorous and rapid grower in such a position. Ponga (the silver tree fern) requires more shade, but Weki (the hardy *Dicksonia*) will grow in the most exposed positions. Of the Palms our own Nikau will grow rapidly in such a place, and its familiar beauty is unequalled; even the Kentia Palm, commonly used as a house plant, thrives well outside if it is well shaded. *Washingtonia filosa* with its handsome trunk and crown of fan-shaped leaves gives the garden the tropical effect which is natural. The broad spreading palm *Phoenix canariensis* is suitable for a more open position, and forms an admirable specimen plant on the lawn in the vicinity of buildings that are rather elevated or large. In the drier and colder districts the Chusan Palm from Japan, *Chamaerops*—known in Europe as *Trachycarpus*—may be grown. This plant has been rather neglected or misused, but properly associated in the shrubbery border it will give character and variety, and fittingly set off its more showy companions.

Those who have the making of a new garden in hand have a bigger problem to deal with that will require careful attention now if it is to be carried through successfully. Early in the new year as soon as the land is sufficiently moist to work, the process of cultivating and cleaning the ground should be completed. Portions that are to be sown down in grass should be made firm and smooth



Aloe ferox.

for sowing early in the month of March. About 1 cwt. to the acre or an ounce to 2 square yards is an average sowing of grass seeds. Drives and walks should be formed with as little disturbance of the land as may be necessary. Their appearance and wear will depend on good lines and even grading with adequate culverts to drain them.

In most instances the popular rock-garden will be a feature, as it is so suited to the sloping country in which many gardens are situated. When properly constructed and planted it can be very attractive, if it is not unnecessarily extensive and out of proportion with the rest of the garden. It is certainly the most difficult problem in garden architecture. The sloping bank of soil with rocks of the same size distributed at equal distances, very carefully, is exceedingly common and annoying. It is probably a natural human trait to geometricise, and the abandon of the natural rock-garden that is so admirable is very hard to copy. It is of first importance to have a suitable site, such as a sloping terrace that is not too steep, and then with rocks to build a series of small terraces up the face. These should vary in size; the surfaces should be at different levels; and the height of the rise to the one above should also vary. Some rises may be sharp, steep and high, built with large stones; others may be made more sloping with comparatively small stones, amongst which many plants prefer to grow. This, of course, is not a treatise on the subject, but it is hoped that offering a few definite suggestions may help some builders to avoid the plum-pudding effect. If water and good drainage are available a waterfall and rocky pool will, of course, make it a triumph. Just one or two more suggestions. Use a rich light soil and tamp it well in round the rocks as they are placed in position. Choose your plants with great care; in a dry situation they may run to succulents and Cacti, or in shady positions even to Ferns; but in any case in planting, carefully avoid mixing strong-growing subjects with those of a compact habit, as in the unequal competition constant attention is required to maintain order. Both classes are useful. The vigorous plants make a fine bold effect where large surfaces have to be dealt with and maintenance is simplified. In warm rock-gardens by the sea the Ice-plants (*Mesembryanthemums*) are quite at home and make a brilliant display, and where there is plenty of room the flowering Aloes, with long spikes of scarlet and crimson flowers in the middle of winter, are very attractive. Some varieties of *Aloe vera* and *ferox* in such situations have been greatly admired during the past season. In inland districts at higher altitudes, the rock-garden is perfectly suited to alpine plants, and these give a display of which the owner may well be very proud. For best effects use weather-worn rocks for this class of work.

THE ORCHARD.

The home garden with an orchard of well selected trees is now a very valuable asset. Peaches and many other fruits are best when

ripened on the trees, and it is only in the home garden they may be enjoyed with the full flavour and aroma developed. Careful attention is necessary to pick the fruit at the right stage of development for the various purposes of dessert, cooking, and storage. They should be kept in separate containers, and for this purpose generally the ordinary wooden bushel fruitcase is best. That which is not used immediately is best kept in a store-room that is clean, cool, humid, dark, and well-ventilated. The boxes may be stacked six high on pieces of sawn timber laid on the floor. There should be a vertical space of an inch or so between cases to allow the air to circulate, and strips of one-inch timber between the tiers horizontally, for the same purpose, will also be an advantage. If these strips are just long enough for a stack of cases four wide it will be most convenient. This will allow the stocks to be classified and better kept under observation. The keeping qualities of the different kinds and varieties must be learned by experience; then if the fruit is of even maturity in each case, as before suggested, there will be little loss. Fruit should be picked when dry and handled with great care; if it is at all damaged it should be used immediately, and all diseased fruit should be gathered at frequent intervals and carefully destroyed.

Pears and citrus fruits are often left on the trees too long to obtain the best results. They then lose flavour and texture and are very inferior. Pears should be picked as soon as they part readily from the spurs on which they are growing; they are not immediately ready for use, but must be stored, as already described, in order to ripen them off and develop the full flavour. This development may be hastened by reducing the ventilation and raising the temperature slightly, as may be done by covering the stacked cases with a canvas or other cover. Similarly citrus fruits, especially Lemons, should be picked at the first sign of colouring. They should be cut and not pulled from the tree, and the stem should then be trimmed back close to the "button," which must be allowed to remain on the fruit. In a fresh state the peel is very subject to injury from scratches and chafing, in which case the fruit will not keep. For this reason it is handled with the greatest care at this stage. Sound fruit picked carefully and stored will develop the desirable colour, and by evaporation the peel becomes thin and soft. The process may be hastened in the same manner as with Pears.

Towards the end of January the growth of the young wood of fruit-trees is nearing completion for the season, and it is then summer pruning is done, if it is required. The effect of summer pruning is to check the vigour of a tree and induce cropping, and so is specially applicable to many Pear trees and some Apples. The main feature of the operation is to remove altogether the superfluous young wood, more especially about the tops of the trees. This lets in the light and ripens the wood that is left, and the buds receive the extra nutriment which encourages fruiting.

During the autumn months scale insects, aphides, and red mite are often troublesome, and it is very desirable to check the attack

at this period by spraying the trees with suitable insecticides. As far as possible this should be done after the crop is gathered. The trees then enter the dormant period clean and to much better advantage for the next season's cropping. Summer oil-emulsions or tobacco-extract is generally used for this purpose. Those desiring more information on this point should obtain it from the Government Orchard Instructor for the district, as he has a good knowledge of the local conditions.

Cultivation in the orchard at this period should cease, as it is desirable to allow the trees to ripen and harden the new growth. A green crop is sometimes sown, or the weeds are now allowed to grow, so forming a cover crop that is ploughed in later to improve and enrich the soil.

THE GARDEN ENCLOSED.

The small-fruit bushes in this department will require attention early in the new year. The canes of Raspberries and Loganberries that have fruited must be cut off at the surface of the ground and carried out and burnt. This treatment now is not only beneficial to the new canes for next season's fruiting, but in removing the old canes as soon as possible much diseased wood is often destroyed, and the new canes are more easily treated with such chemical sprays as may be required.

Scale insects are often troublesome on these plants, and leaf-spot and cane-wilt fungi. One or two applications of a suitable spray during the autumn will cure or prevent these diseases, and go far in improving next season's crop.

Currants and Gooseberries should also be given such spray treatment then as they require.

Towards the end of January cut out young rank shoots about the centre of the bushes of Gooseberries and Red and White Currants. This treatment lets in the light and ripens the more fruitful wood, as well as checking the waste of feeding unprofitable timber.

Where Strawberries are to be planted in March or April prepare the land now by cleaning it thoroughly and turning in such manures as may be required, including a quarter of a pound of fine blood-and-bone meal to the square yard.

Attend to the suckering and training of the Tomato crop. During the month of January the crop will commence to ripen, and one or two moderate dressings of a complete fertiliser of the more soluble kind will often be useful in finishing the crop well.

Herbs, medicinal, culinary, or scented, should be gathered as they come into flower. This should be done during a period of fine weather, and in the morning as soon as the dew has dried off. Hang them in small bunches on sticks much in the same way as Tobacco-leaf is cured, or place them on trays in a warm, dry, airy, shaded room. As soon as they are quite dry store them in close drawers or boxes, or they may be powdered and kept in tightly corked bottles and stored in a dark cupboard. Only in this way may the essential oils which are their chief value be fully preserved.

Beds of Asparagus and Rhubarb should now be given a generous dressing of manures to induce strong growth after the severe treatment they received by cutting and pulling the young sticks during the spring months. In this way they are brought into a vigorous condition for next season's cropping.

Seedbeds of the winter crops of Savoys, Broccoli, Cauliflower, Leeks, and Celery should now be nearly ready for removal to the field. Give the young Celery plants a good spraying with Bordeaux or Burgundy mixture to prevent the attack of fungus-diseases that are so prevalent in this crop, and to protect the Cabbage and Cauliflower plants from aphids and the small caterpillars that attack them during dry weather spray them at intervals of a fortnight with a spray made of three teaspoonfuls of tobacco-concentrate and two ounces of arsenate-of-lead paste in four gallons of water.

In the month of February, sow beds of spring Cabbage and Cauliflower for planting out in April, and Lettuce and Spinach to be grown to maturity without transplanting. In March sow a bed of Onion-seedlings for transplanting in July. This method is suitable for northern districts where early maturity is desirable to avoid the attack of mildew-disease which is sometimes troublesome.

THE VEGETABLE GARDEN.

" I have known seed,
Selected carefully with time and pains,
Revert to type, unless the human hand
Chose out the biggest year by year. Thus fate
Drags all to ruin with a backward pull;
As when a rower hardly drives his boat
Against the stream: if once he drops his arms,
Forthwith the rushing current whirls him down."

The Georgics of Virgil.

Except perhaps in the drier districts, it will pay to spray the main Potato-crop with Bordeaux (4-4-40) now, repeating the operation a second and even a third time at intervals of two or three weeks if the weather should happen to be humid. In selecting early Potatoes for seed care should be taken to avoid exposing them at night to the attack of the Potato-moth, the larvae of which destroy the tuber by burrowing in the flesh. This pest is often very prevalent in dry seasons.

Early in the month of January—perhaps a little earlier in southern districts—the winter crops of Savoy, Cabbage, Cauliflower, Broccoli, Leeks, and Celery are planted out; usually in ground from which an early crop has been taken. Water the seed-beds well the day before lifting the plants, so that the roots are retained, and when lifted place the plants upright in trays, which should be kept in a cool, shaded place while awaiting transportation. If the ground is then marked out in drills with a marker, planting may be done rapidly and easily. If dull weather after rain may be chosen for the work it is best, but otherwise it should be done in the afternoon, and the

plants watered in if the land is rather dry. Leeks should be planted deeply in rather deep drills, making the holes with a dibber and merely dropping the plants in without firming the soil. Celery now is often planted in comparatively shallow drills if the ground is naturally moist and well-drained. The sticks are blanched by means of twelve-inch boards placed down the rows and close up to the plants. This method is particularly suitable for the Golden Self-blanching variety, which is often planted in batches of six to eight rows together, eight to nine inches apart. If the land and climate is dry, the usual twelve-inch trench should be made, and the plants set out in the bottom, where they should never be allowed to become dry. This crop now requires spraying with a fungicide every two to three weeks to obtain good clean sticks. All of these crops require good strong ground, and should receive a small dressing of sulphate of ammonia as soon as they are established.

In the month of January or thereabouts, a sowing of Peas of an early variety and Kidney Beans will prolong the supply of these excellent vegetables until well into the autumn. A sowing of the useful Turnip-rooted Beet should also then be made.

A NEW BOOK ON DAFFODILS.

REVIEW BY N. R. W. THOMAS, LL.B.

Daffodil-growers in New Zealand are a long way from the centre of the daffodil world, and having to rely on books and papers will hail with delight this latest publication of Mr. A. F. Calvert's, "Daffodil-growing for Pleasure and Profit." There have been plenty of books on Daffodils, but nothing for many years as good as this, which makes a bulky volume of 400 pages, with an appendix of over 200 full-page illustrations.

It is a work long overdue, for Mr. Calvert has served his subject well, as all daffodil-lovers who read it will realize the deeper they get into the book. He has called on the knowledge and experience of the outstanding growers, both past and present, and presents chapters on every aspect of the Daffodil, its history, breeding, cultivation, marketing, and pests, backed by the names and special articles from such past masters on the subject as the Rev. G. H. Engleheart, M.A., V.M.H., Hon. M., N.Z.I.H., P. D. Williams, V.M.H., The Brodie of Brodie, Guy L. Wilson, F. Herbert Chapman, A. M. Wilson, F. L. Secrett, F.L.S., Peter R. Barr, and George Munro, to mention a few only.

In the preface the author explains how the responsibility for the compilation of the book was assumed by him only after a number of his friends had failed to induce the Rev. G. H. Engleheart, the greatest living authority on the subject, to undertake the task. The

book is dedicated to him, and he has blessed it, and in his introduction says:—"The Daffodil, as grown in our gardens, is a purely English flower And if any merit at all is mine, it is that I may be counted as one of a line of Englishmen—Parkinson, Herbert, Haworth, Leeds, Backhouse, Barr, are but a few of the links in a chain four centuries long—who have bestowed heart and brain and hand upon the Daffodil." The author's object has been "to be of practical service to the amateur who is ambitious to obtain the best results and at the same time to guide him to the acquisition of the best pecuniary returns on his output. In pursuance of this endeavour, I have combined particular instruction as to stocking the garden, the grading, planting and rearing of bulbs, with equally pertinent information pertaining to the picking, packing and marketing of the flowers."

Much has been done by the more experienced growers in New Zealand to impart their knowledge to those coming on, and the book will be a fruitful reservoir for those desirous of quoting authorities for their opinion.—Thus:—

Planting.—"On well drained gravelly substrata, deep planting, and on soils waterlogged, or moist below, shallow planting would be most likely to succeed. In the latter cases, raised beds with ample drainage (that is deep alleys) between them would be an advantage." "There cannot possibly be any question as to the benefit attending annual replanting in ordinary seasons on all soils where leaves and roots die off simultaneously. The new roots strike out into fresh soil and obtain a good form, level quality and a vigour not obtainable in any other way." "I attribute much of the uneven growth of the earlier sorts to planting either too early or too late. They were either lifted late and immediately replanted or lifted early and replanted without being ripened and stored."

Naming of Seedlings.—Professor Michael Foster, Chairman of the Daffodil Conference of 1890—"New names should be given only to those forms which on the one hand possess sufficient individuality, so that they can be recognised as distinct forms by ordinary people, and on the other hand are more beautiful than, or differ in beauty from their forerunners the name should, if possible, be one which can be easily written, one which can be easily read, and one which can be spoken, if not easily, at least without great effort."

Cultivation.—One of the most valuable chapters in the book is that by A. M. Wilson on this subject, and to read it should be worth the price of the whole book. His observations should be well noted and carefully followed, and therefore I refrain from quoting from them.

Manures.—"Our knowledge is still in an embryo stage though some who have tried the whole collection of manures one by one, have come to the decision that they are best left alone altogether!" Phosphates and potassic manures have given various degrees of success on some soils such as "fine silky silts" but some of the Poetaz have been ruined by very slight dressings. Steamed bone

flour is recommended as being fine enough to mix with the soil particles and yet slow to act so that the bulbs receive nutriment throughout their period of growth. Poeticus are known to be gross feeders, and benefit by potash etc. released by the action of lime, though most bulbs like a slightly acid soil medium.

Bulb Changes.—The physiological process that goes on within the bulb after lifting and during storage as well as the question of "treatment" to ensure better or earlier flowering is explored at length. "It is when the foliage is in full growth, just after flowering, that great efforts are made by the bulb to store all the food materials possible before becoming dormant. It is at this time that the flower for the following season's production is being formed in embryo within the bulb, and, by interfering with the bulb at this stage by premature lifting, we jeopardise first size, then weight, and finally flower." Is it not at this stage that we should manure and not at planting?

Wild Daffodils.—The species with the widest range from east to west is *Narcissus Tazetta*, or *Polyanthus* (so commonly and erroneously called *Jonquil*), which is found in variety from France to China—it prefers a warm climate. *N. pseudo-narcissus* or the Trumpet Daffodil, belongs to the Spanish peninsula up to the French Pyrenees; there are, however, a few unimportant yellow forms in France and Italy and the one British variety the "Lent-Lily." *N. Poeticus*, one of the chief elements in the making of the present day show and garden Daffodil, extends from the Pyrenees to the Swiss Alps and from France to Greece.

Raising Daffodils from Seeds.—A chapter by The Brodie of Brodie is well worth studying. His success is now well known, and I had, in 1924, the privilege of seeing him at work with his favourites. He gives a list for a modern stud, those best known in New Zealand being (1a) Cleopatra, Monarch, Ben Alder, (1b) Beersheba, Mrs. E. Krelage, White Emperor and White Knight, (1c) Moira O'Neill, (2) Bernadino, Fortune, Hospodar, Princess Mary, Pilgrimage, Tamerlane, (3) Beacon, Sustar, (4) Tenedos, (7) Solerlet (pollen), (9) Ace of Diamonds, Dactyl, James Hogg. There are others of course.

Commercial Daffodils are considered, and it is suggested that those to be grown for market in the future might include Emperor, Golden Spur, King Alfred, Ovid, Horace, Cassandra, and such "moderns" as Fortune, Firetail and Sunrise, Bath's Flame, Croesus, Dactyl, Medusa, Red Rim, Wide Wing, and Brilliancy, with eventually Engleheart's White Rose, Wheel of Fortune, etc. It is disclosed that White Trumpets and Leedsii are not profitable market flowers nor varieties larger than King Alfred.

Newer Daffodils are discussed by Mr. Guy L. Wilson, amongst those most commended and worth noting—(1a) Royalist, Hebron, Godolphin, Bulwark, Brimstone, Citron Queen, (1b) Beersheba, Kantara, Quartz, Askelon, (1c) Moira O'Neill, Carmel, Halfa, (2) Galopin, Killigrew, St. Egwin, Pilgrimage, Fortune, (3) Crimson Braid, Twinkle and June, (4) Rosary, Suda, Mrs. R. O. Backhouse,

Jersey Cream, Satellite, White Nile, Marmorata, Mitylene, Silver Salver, Samaria, Fairy Circle, Mystic, (7) Golden Goblet, (8) Glorious, (9) Illiad, Dactyl, Raeburn, Engleheart's White Rose, (10) Mary Copeland, Silver Rose.

One can but say with the author that "although recent experimental work has multiplied, and beautified, the varieties of the Daffodil beyond the wildest imaginings of the ancient cultivators, it is to their patience and persistence we owe the seeds of knowledge from which we now raise the flower, that we are reaping to-day the harvest they sowed with an infinitude of loving care."

Such an amount of invaluable information is packed into this book that I feel sure that it will prove not only of great assistance to what is here still a growing industry, but also of much greater help and encouragement to the amateur growers of New Zealand at present isolated from so much knowledge.

GUY L. WILSON.

The horticulturists of the Dominion, particularly the Daffodil-growers, have been fortunate in having in their midst for several weeks past, one of the leading Daffodil-growers and hybridists, Mr. Guy L. Wilson, of Knowehead, County Antrim, Ireland.

Naturally, the advice and services of a man of the standing of Mr. Wilson have been in great demand by local Daffodil enthusiasts, consequently he has had a very busy time visiting many parts of the country and acting in the capacity of judge at shows held at Auckland, Lower Hutt, Wellington, Christchurch, Oamaru, Dunedin, and Lawrence.

On the evening of the 21st of November the horticulturists of Wellington and suburbs, under the auspices of the N.Z. Institute of Horticulture and the Wellington Horticultural Society, tendered a formal reception to Mr. Wilson.

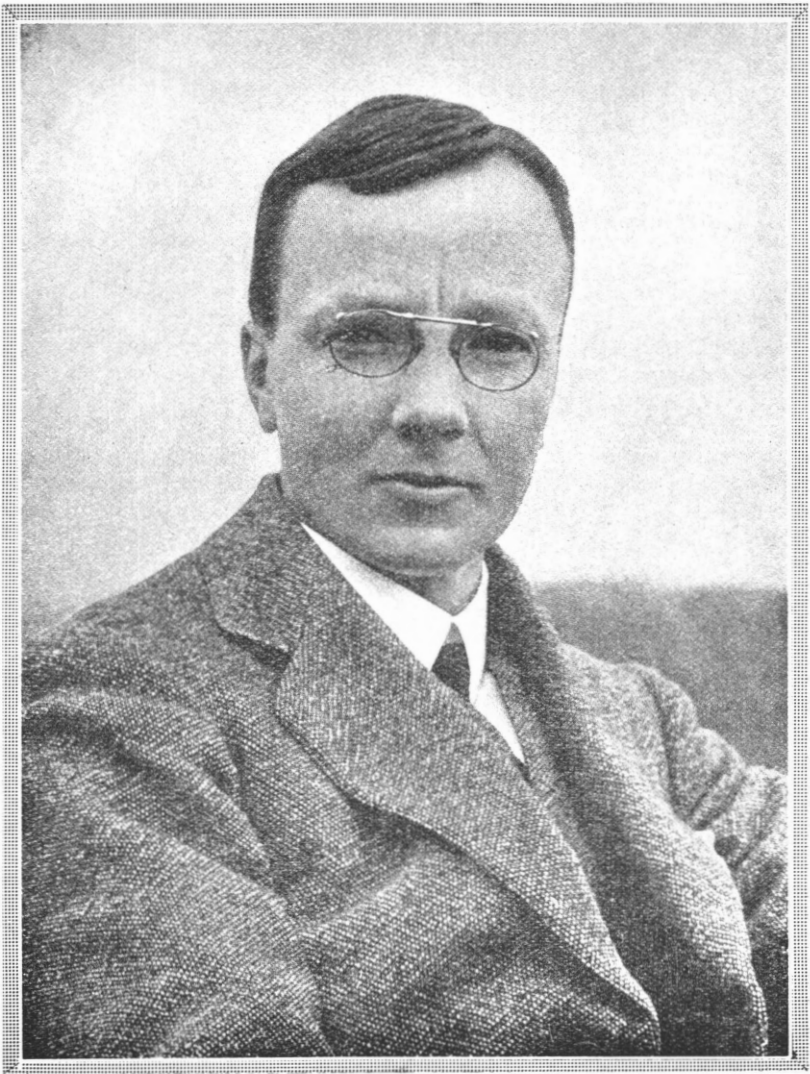
The Chairman, Dr. Izard, President of the Wellington Horticultural Society, conveyed to the guest of the evening the good wishes and felicitations of the members of his Society, and Mr. J. A. Campbell, Director of the Horticulture Division of the Department of Agriculture, in the absence of the President (Mr. F. J. Nathan) extended similar courtesies on behalf of the Institute.

Mr. Wilson, in response, referred to the excellent opportunities that the travelling to the different parts of the Dominion had given him, not only of gaining first-hand knowledge of the standing of Daffodil-culture in New Zealand and the enthusiasm prevailing among growers, but also of enjoying the beautiful scenery which obtains throughout the country; but above all he wished to refer to the extremely courteous and friendly manner in which he had been received by all with whom he had been associated.

Early in the course of a brief address the speaker created the impression in the minds of his audience that they were listening to a

master in the art of Daffodil-culture. Interesting indeed were his remarks on the pedigree and breeding of many of the leading varieties of Daffodils, methods of disease control, etc.

At the conclusion of his address, Mr. Wilson was heartily thanked, it being the generally-expressed opinion that, as a result of his visit, the enthusiasm now prevailing among New Zealand Daffodil-growers would be greatly increased, and that a marked improvement could in consequence be expected in the near future in the culture and hybridisation of the Daffodil throughout the Dominion.



Guy L. Wilson.

NOTES OF INTEREST TO STUDENTS AND MEMBERS OF THE INSTITUTE.

Under the educational scheme of the Institute students are required to keep diaries in which matters relative to their horticultural work and observations, etc., are recorded, and to submit such diaries periodically to the Examining Board for inspection.

Having in mind the important part that this practice, if properly observed, is expected to play in advancing a student's horticultural education, the Examining Board has issued the following hints on the subject, which it hopes will prove to be beneficial to students.

In connection with the same subject, and for the benefit of members of the Institute and others interested, the Examining Board has recommended, and the Executive Council has adopted, the following rules relative to the use of capital letters in connection with the botanical and popular naming of plants.

The compiler, Dr. L. Cockayne, Honorary Botanist to the Institute, points out that while the rules recommended do not strictly conform to scientific usage, they are in accord with the practice generally applying with respect to semi-scientific and popular horticultural publications, and have the added advantage of simplicity and the introduction of a uniform system; consequently the practice outlined will be observed with respect to all future publications of the Institute.

Hints for the Keeping of Horticultural Students' Diaries.

(ISSUED BY THE EXAMINING BOARD).

One of the principal objects in connection with the keeping of diaries is to develop the faculty of observation on the part of the student. Consequently the recording of the different phases of each day's work alone does not meet the position. Bare reference alone need be made to this in the interests of more intimate reference to the class of plants handled, reasons why the work is being done, and the methods employed in carrying it out. Notes should be made of the peculiarities of plants or flowers that the student is working amongst, comes in contact with, or otherwise observes, such as their usefulness for planting in different situations; their suitability for substitution and for being grown together for the purposes of blossom sequence; usefulness as cut flowers; value for this or that form of trade; or for purposes of general ornamentation, etc., etc. The diary should also prove a useful training in the method of recording and preserving information for later reference.

The student should commence each day's notes with the day and date. He should explain in detail at least once in the diary how and why the more important horticultural operations are performed,

such as layering, grafting, the selection and making of cuttings, etc. Notes should not be verbose, but rather the art of short, succinct description should be practised. Care should be given to phraseology, punctuation, the use of capitals, etc. Careful attention should also be paid to correct spelling and the rules that govern the use of capital and small initial letters with respect to the botanical and popular names of plants. With regard to the former, students are referred for guidance to Nicholson's "Gardeners' Dictionary" or Baillie's "Encyclopaedia of American Horticulture," and with regard to the latter to the guiding rules attached, drafted by the Hon. Botanist to the Institute, Dr. L. Cockayne, and approved by the Institute as the Society's standard in this regard.

A student should also compile an index to his diaries, in order that important matter recorded therein from time to time may be indexed, and thereby rendered readily available for future reference. A student, having given a detailed description of any special work, should note in diary index: Cuttings, Privet 20/6/29 No. 1; Pruning, Rose 10/7/29 No. 1; and so on, No. 1 indicating the number of his diary. When such work is subsequently being done details need not again be given, but instead an entry such as the following should be made: "Making Privet Cuttings, see diary No. 1, 20/6/29."

Students should bear in mind that a good, well-kept diary, showing interest and intelligent insight, may turn the scale in the candidate's favour in the case of a doubtful examination-result.

Rules adopted by the Examining Board of the New Zealand Institute of Horticulture in regard to the Use of Capital Letters in the names of Plants.

1. *Botanical Names.*—

- (a) Each name of a species must consist of two words, the first denoting the genus to which the species belongs, and the second the specific name, e.g., *Narcissus triandrus*—"Narcissus" being the generic name and "triandrus" the specific name—*Viola tricolor*, *Ranunculus acris*.
- (b) Always underline a botanical name.
- (c) The generic name (the first name) must always commence with a capital as shown in (a).

The specific name must commence with a small letter as shown in (a) except (1) when it is the name of a person, either as a noun in the genitive, e.g., *Camassia Fraseri*—the person's name being Fraser, or used as an adjective, e.g., *Asplenium Hookerianum*—Hooker being the name of the person; and (2) when it is the name of a genus, e.g., *Asplenium Trichomanes*—"Trichomanes" being the name of another genus of ferns.

Even specific names called after places must commence* with a small letter, e.g., *Silene anglica*, *Polypodium novae-zelandiae*.

2. Popular and Garden Names.—

It seems best, and certainly easiest, to follow the method used in nearly all horticultural periodicals and commence each word of the name with a capital, e.g., Potato, Oak, King Alfred (Daffodil), Little Boy Blue (Michaelmas Daisy).

(Note. In scientific writings the use of capitals for popular names, as recommended in the foregoing, is not the general custom, for with certain exceptions each word commences with a small letter, e.g., spaniard (*Aciphylla Colensoi*), oak, ivy, lancewood (*Pseudopanax crassifolium*), and even small letters are used in cases where Latin names are used as popular names, e.g., primula, celmisia, narcissus).

LODER CUP COMPETITION.

The first competition for the Loder Cup took place in connection with the Auckland Horticultural Society's recent Rose Show, under the rules published on pages 36-39 of the September, 1929 issue of this Journal. The judges were Mr. T. L. Lancaster and Miss Crookes, who reported as follows:—

"All three exhibits were highly meritorious and reflect great credit on the exhibitors, especially in view of the somewhat exacting conditions of the competition. As regards numbers of species and varieties, there is no criticism to offer, but we consider that better balance as between the prescribed groups of plants might have been shown, it being especially noticeable that one exhibit did not do ample justice to the herbs. While all the collections showed a good proportion of well-grown plants, at the same time a larger specimen would, in some cases, have given a better idea of the horticultural value of the species concerned. We realise, however, that demands of space and practical considerations make this very difficult in the case of some of the larger species. In this respect, in spite of its merits, the winning collection was especially open to criticism.

In no case did the labelling fully carry out the requirements laid down by the conditions of the competition. In a contest of this kind descriptive labelling must necessarily be concise, but we think that the example of one exhibitor in emphasizing the horticultural aspect might well be followed in the future, viz.:

"TARAIRE (*Beilschmeidia taraire*) 'Taraire.'

HABITAT: Dryer forest in northern lowlands of North Island.

CULTIVATION: Good light warm dry soil in shaded or sheltered position.

USES: Wood light—used for inlaying and cabinetwork."

Only one exhibitor attempted to do justice to the possibilities of artistic arrangements. Had this aspect of the competition received

greater attention, more would have been done to emphasize the horticultural potentialities of the species and at the same time to economise space.

The above remarks are made in a purely constructive spirit, and do not arise from any lack of appreciation of the high standard attained by enthusiastic exhibitors working under conditions of unusual difficulty.

	Possible Points.	Duncan and Davies Ltd.	Mrs. J. W. Tattersfield.	D. Hay and Son, Ltd.
Number of Varieties	40	35	22	17
Naming of Varieties	15	10	10	8
Quality of Plant	15	13	10	14
Descriptive Labelling	15	7	10	12
Artistic display or effect	15	5	14	8
	100	70	66	59 "

With commendable enterprize and generosity the Auckland District Council of the Institute raised sufficient funds to purchase the winning exhibit, and then presented it to the Auckland City Council, the letter of advice to the Town Clerk being in the following terms:—

"I beg to confirm the verbal offer and delivery of the winning stand in the first Loder Cup Competition as intimated to you verbally on Saturday. The stand comprises over 500 varieties of native plants, there being included in it the following:—

74 varieties of Ferns
 36 Olearias
 15 Senecios
 84 Veronicas
 60 rock plants
 18 climbers
 220 shrubs and trees.

"This is probably the largest collection ever shown in Auckland, and contains many unique specimens and others not generally known in Auckland, especially when one realises that there are probably only between 250 and 300 varieties to be found in the Waitakeres.

"In presenting this collection to the City, my Council begs to suggest that it would be used in part for the Fernery, and the remainder as a nucleus for the Botanic Garden proper. I am further instructed to suggest that, in view of the diverse variety represented in the collection, that my Council should nominate a committee of three or more specialists to assist in an advisory capacity in the care and maintenance of this collection."

TULIP NOMENCLATURE.

It is common knowledge that much disappointment and loss is suffered by horticultural traders and amateur gardeners through mistakes arising from confused plant nomenclature, and it is agreed that it would be in the interests of all concerned if it could be made an invariable rule that a given name was in fact restricted to one plant only.

Representations having been made to the Council of the Royal Horticultural Society to undertake in connection with Tulips a similar work to that undertaken in connection with Daffodils, the Council appointed a Tulip Nomenclature Committee, on which both British and Dutch growers are represented, to advise how the object in view might be best accomplished. Early in the Committee's proceedings it became apparent that it was very desirable that a list of names of the recognized varieties of Tulips should be published as soon as possible, so that the raisers of new varieties might be in a position to know what names are already in use, and avoid applying them to new varieties. The General Bulb Growers' Society of Harlem very kindly undertook the heavy task of preparing a provisional list of names, and used as a foundation the classification and list of names given in the Report of the Tulip Nomenclature Committee, 1914-1915.

When complete, the provisional list was submitted to the Tulip Nomenclature Committee, and after revising it and adapting it to the form that seemed best suited for the purpose in view, the Committee advised the Council to publish it as "A Tentative List of Tulip Names." The Royal Horticultural Society has just issued this publication, and copies may be obtained, price one shilling, on application to that Society, Vincent Square, London, S.W. 1. This publication should be in the hands of all, professional and amateur, who are interested in the growing of Tulips.

 INSTITUTE NOTES.

Diplomas and Certificates.—To date, the following have been granted:—

Diplomas (without examination)	..	..	154
„ (by examination). Group C	..	..	6
„ (on "foreign" credentials)	..	..	1
Certificates. Senior (by examination)	..	..	1
			<hr/>
			162

The ordinary examinations will be held in June and November in each year, but examinations under Group C are taken at dates

to suit the convenience of candidates and examiners. The first ordinary examination of the Institute was held on 13th November last, when the following candidates presented themselves:—

Preliminary Examination	..	..	..	6
Intermediate	„	..	..	4
Professional	„	..	..	2
				—
				12
				—

At date of writing the results are not known.

Students.—It is proposed to utilize the Journal to some extent to meet the special needs of students. In this issue are hints to students on the keeping of horticultural diaries, and the use of capital letters in the names of plants. Later on it is hoped to arrange for the publication of articles which will be of assistance in their studies. These facilities should be of material benefit, especially to those who are unable to take advantage of horticultural classes in the principal centres of population. It has been decided to accept class passes in Chemistry and General Science at the Technical Colleges at Auckland, Wellington, Christchurch, and Dunedin as the equivalent of the Education Department's Intermediate Examination in these subjects for the purposes of the Institute's Preliminary Examination.

International Horticultural Congress, London, 1930.—The Institute will be represented by Mr. T. L. Lancaster, M.Sc., N.D.H. (N.Z.), Lecturer in Botany at the Auckland University College, and is fortunate in securing such a suitable representative.

Combined New Zealand Horticultural Conference.—It is hoped that it will be possible to arrange for the first gathering early in 1931 representing the New Zealand Horticultural Trades' Association, the Park Superintendents' Association, and this Institute.

DIPLOMA IN HORTICULTURE (without examination):

"The Institute may, without examination, grant diploma under this Act (New Zealand Institute of Horticulture Act, 1927), to any person not less than forty years of age, who has practised horticulture for not less than 20 years, and who, in the opinion of the Institute, is qualified to receive such diploma."

The issue of Diplomas under this provision terminated on 21st October, 1929.

DIPLOMA IN HORTICULTURE (by examination):

Group C.—Open to those engaged in the practice of horticulture for a period of 15 years prior to 31st December, 1929. Oral examination only. The issue of Diplomas under this provision terminates on 31st December, 1929.

Group B.—Open to those engaged in the practice of horticulture for less than 15 years prior to 31st December, 1929. Full examination prescribed, but certain service qualifications may be waived. The issue of Diplomas under this provision terminates on 31st December, 1929.

Group A.—For students who commenced the practice of horticulture since 21st October, 1927.

All correspondence and applications to be forwarded to

DOMINION SECRETARY,

N.Z. Institute of Horticulture,
G.P.O. Box 1237, Wellington.

HORTICULTURAL SHOWS:

AUCKLAND HORTICULTURAL SOCIETY.

President: Sir Edwin Mitchelson, K.C.M.G.
Secretary: c/o. Box 124, Auckland.

Sweet Pea and Gladioli Show: 12-13 December, 1929.

Dahlia Show: 13-14 March, 1930.

Chrysanthemum Show: 17-18 April, 1930.

WELLINGTON HORTICULTURAL SOCIETY.

President: Dr. Arnold Izard.
Secretary: J. G. MacKenzie, N.D.H. (N.Z.), c/o. Town Hall.

Autumn Show: 23rd April, 1930.

All shows held in Town Hall, Wellington.

HUTT VALLEY HORTICULTURAL SOCIETY.

President: D. S. Patrick, Esq.
Secretary: A. J. Nicholls, P.O. Box 19, Lower Hutt.

Mid-Summer Show: 5-6 February, 1930.

Autumn Show: 16-17 April, 1930.

All Shows held in King George Theatre, Lower Hutt.

New Zealand Institute of Horticulture (Inc.)

Membership:

Individuals: 12/6 per annum.

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Wellington.

Advertising Rates:

These will be supplied on application.

Examinations:

Examinations will be held half-yearly (June and November). Students desiring examination in June next should make application early to

DOMINION SECRETARY,
N.Z. Institute of Horticulture,
G.P.O. Box 1237, Wellington.