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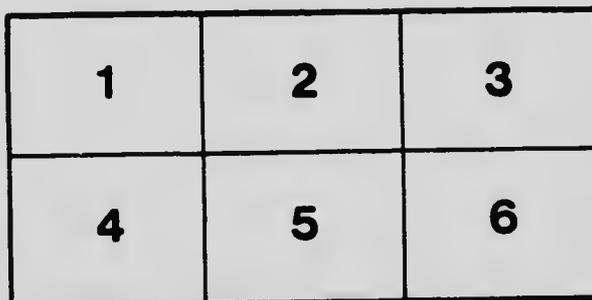
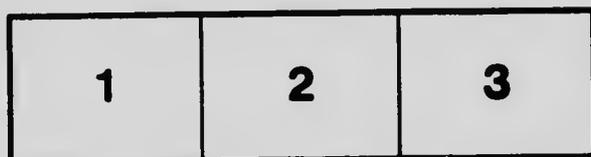
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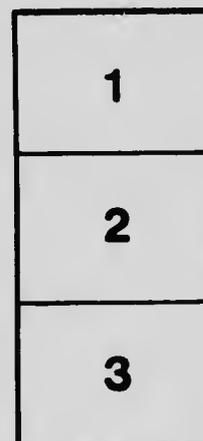
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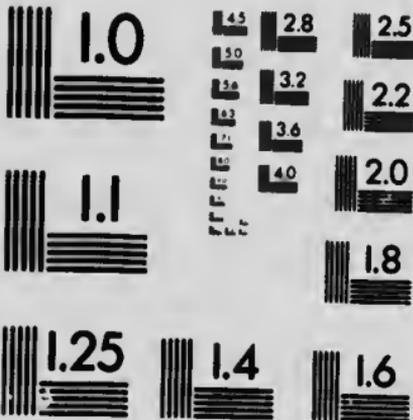
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DOMINION EXPERIMENTAL FARMS

DIVISION OF HORTICULTURE

HARDY ROSES

THEIR CULTURE IN CANADA

BY

W. T. MACOUN

Dominion Horticulturist.

AND

F. E. BUCK, B.S.A.,

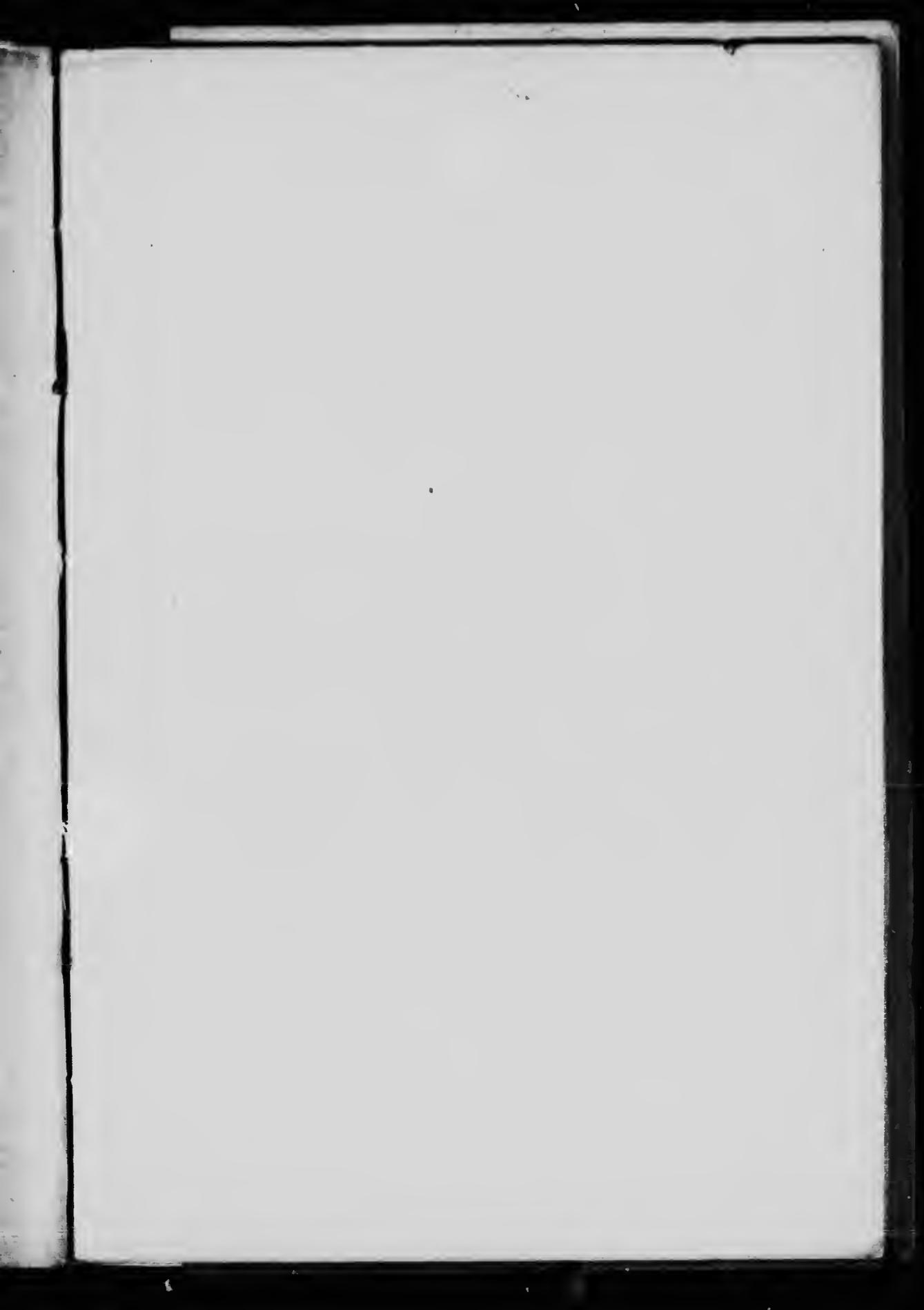
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BULLETIN No. 85

Published by authority of Hon. MARTIN BURRELL, Minister of Agriculture, Ottawa, Ont.

FEBRUARY, 1915







One of the best of the Hybrid Perpetual Roses, Mrs. John Laing, a beautiful pink rose of free flowering habit.

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Op. 1. OCT 19 1962

OTTAWA, February, 8, 1915.

The Honourable
The Minister of Agriculture,
Ottawa.

Sir,—I have the honour to submit herewith, for your approval, Bulletin No. 95 of the regular series, entitled "Hardy Roses, their Culture in Canada," prepared by Mr. W. T. Macoun, Dominion Horticulturist, and Mr. F. E. Buck, Assistant.

The issuing of this bulletin, replacing, as it does, Pamphlet No. 9 of our publications, and amplifying greatly the information contained therein, is fully justified by the warm reception accorded its less-assuming predecessor.

No single factor will, I believe, do more to hold our sons and daughters on the farm than pleasant home surroundings, and such information as is given in this bulletin cannot fail to draw the attention of many farmers and others to the part that might be played by roses and the rose garden in any effort in this direction.

Our experimental work with this flower, extending as it does from Prince Edward Island to British Columbia, makes it evident that roses may be grown fairly readily in many districts where it was at one time supposed to be quite impossible to produce them with any measure of success, save under glass.

I would, therefore, recommend that this bulletin be very widely distributed throughout Canada.

I have the honour to be, sir,
Your obedient servant,

J. H. GRISDALE,
Director, Dominion Experimental Farms.

THE ILLUSTRATIONS.

The illustrations used in this bulletin showing the Pergola and Rose Garden at the Central Farm, Ottawa, are from photographs taken by Dr. Frank T. Shutt of the Central Experimental Farm. Grateful acknowledgment is also tendered to Messrs B. H. Cant & Sons of Colechester, England, for the use of photographs illustrating individual "New Roses," and to the National Rose Society of Great Britain for the use of halfpence blocks used to illustrate Mrs. John Laing group of roses and the Lyon rose.

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HARDY ROSES

THEIR CULTURE IN CANADA

BY

W. T. MACOUN, *Dominion Horticulturist,*

AND

F. E. BUCK, B.S.A., *Assistant.*

The rose has been regarded, from time immemorial, as the loveliest of flowers. It is frequently called the "queen of flowers," and well deserves this high title. While the development of the improved varieties began in the Far East, where its beauty has been sung by poets of every age, it is now grown almost everywhere where gardens are made, and many volumes have been written in regard to it. Its exquisite perfume, graceful form, and the fascinating colours which the many varieties display constitute a threefold combination rarely met with, and when to these are added attractive foliage, length of stem, and a long blossoming season, what other flower can compare with it?

A rose garden is one of the most delightful spots that can be found. Unfortunately, rose gardens are comparatively rare in Canada, although most persons who love flowers desire to grow roses. Unfortunately, too, many who have planted a few bushes have been unsuccessful and have become disheartened, but the writers of this bulletin hope that, by following the advice herein given, failures will not be so frequent. It is true that some roses are more difficult to grow than most other ornamental shrubs, but there are certain roses that are very easy to grow, and those who are not prepared to give the Hybrid Perpetual, Hybrid Tea, and Tea roses the attention their beauty merits will find in the Rugosa Hybrids, the Austrian briars, Provence or Cabbage, and Damask roses a very good assortment which are hardy and of easy culture, requiring little pruning and not being troubled much with insect or fungous enemies.

The roses usually cultivated in Canada may be divided into four groups, so far as hardiness is concerned:—

Hardest Group.—*Rosa rugosa* and Hybrids, Austrian briars, Provence or Cabbage roses, Damask roses, and Moss roses.

Roses of the Second Degree of Hardiness.—Hybrid Perpetuals or Hybrid Remontant, Climbing roses of the Multiflora group, and Dwarf Polyantha roses.

Roses of the Third Degree of Hardiness.—Hybrid Tea and Austrian hybrids (Pernetiana) roses.

Roses of the Fourth Degree of Hardiness.—Tea roses.

The hardiness of the individual varieties varies considerably within the groups.

Roses of the first group need little or no protection in most parts of Canada. The others must be protected except in very favoured localities.

SITE AND SOIL.

The rose requires an abundance of sunlight for best results, and, where possible, a site should be chosen where the plants will be in sunshine most of the day. If this is not practicable, the next best site is one where the bed will get the morning sun but will not be in such a position that the heat of the midday or afternoon sun will

be reflected from some wall or building, for in this burning heat both flowers and plants will suffer. South or southeastern exposures are desirable. As roses need an abundance of moisture, the bed or garden should not be within reach of the roots of trees which would exhaust the soil of much moisture and plant food as well. On the prairies it is desirable to have the bed where it will not be much exposed to winds, and also where the snow will lie well, if possible. This applies, however, to other parts of Canada as well. Just in proportion to the hardiness of roses from the standpoint of winter, so is the relative care in the selection of soil for the rose plantation necessary. Roses of the hardiest group will do well on a great variety of soils; roses of the other groups are more fastidious, for while the Hybrid Perpetuals succeed best in a cool but well-drained clay loam, the Tea roses should have a warmer soil, a sandy loam being preferable. However, where it is possible to do so, an intermediate type of soil may be chosen which will suit all the groups. In England, roses succeed much better than in most parts of Canada, the moister air and cooler soil suiting them better than the dry air and hot soil which they are liable to endure in many parts of Canada. A soil, then, should be chosen which is naturally cool, and cool soils are



Innocence and Beauty. In the Rose Garden at the Central Experimental Farm, Ottawa.

usually those with considerable humus and having a good capacity for holding moisture. Clay loams are usually naturally richer than sandy loams, and as the rose requires a liberal amount of plant food the heavier soils have an advantage in this respect also. Shallow soils should not be chosen for roses, as these are liable to become very dry and warm during a drought, making conditions unfavourable.

Soils where water lies within three feet of the surface should not be chosen, as such soils are cold, and roses will not bloom well in them. Often roses in such soils will make strong growth and will not bloom, puzzling the grower. The soil should be cool, but well drained, deep and rich, and if it is not this naturally and there is no choice of sites it should be made as nearly like this as possible. Even soils of good quality naturally should be well enriched with well-rotted barnyard manure before the roses are planted, working it well down and through the soil. In order to make a good bed for roses where the soil is not naturally deep and where there is poor drainage, first remove the good soil from the surface, then remove the lower soil so that about two feet in depth of soil is removed altogether. Then if the soil needs drainage, lay three-inch tile on the bottom with sufficient fall to carry the surplus

water away, having, of course, some outlet for it. If this tile draining is not practicable, some gravel or small stones below the two feet of soil will help to drain it. Put good surface soil from somewhere else, preferably with some clay in it, on the bottom, spread a heavy coat of rotted manure on it and dig it in. Then put back the surface soil which has been removed from the bed, or better soil if it is poor, and again dig manure into this. This should make a good bed for roses. The soil should be allowed to settle for a month before the roses are planted, for best results. The kind of preparation of the soil outlined above, while ensuring good results, is not usually necessary, and no person should be deterred from growing roses because of the careful preparation recommended. Roses may be planted in almost any good loamy soil, with fair results, provided the soil is neither very wet nor very dry.



West half of the Rose Garden, the first summer after planting.

PLANTS AND PLANTING.

Strong, two-year-old budded plants are the best to plant. Yearling plants, while cheaper, do not make much show the first year, and one is liable to be discouraged before the next season comes round. Some roses do very well on their own roots, while others are not very vigorous. On the whole, budded plants are the best. The autumn is the best time to plant roses, preferably just before winter sets in. Sometimes, however, roses though ordered for autumn delivery do not reach one in time, in which case a good plan is to heel them in in unfrozen soil by digging away the frozen soil and burying the roots and a large proportion of the stems. The novice in rose culture is, however, more likely to obtain his roses in the spring, and it is for this reason that so many failures occur. By the time the plants reach their destination they have often begun to wither, and when planted in this condition are almost sure to die. Conditions are made much worse when the plants come in May when the weather may be hot and the winds and soil dry. Tea roses should be planted about fifteen inches apart; Hybrid Teas about eighteen inches; Hybrid Perpetuals two and a half feet, and the Rugosa hybrids, Moss roses and other hardy sorts about four feet. If the roses are planted in the autumn they should not be pruned back at that time, but left until spring. If, however, they are planted in the spring it is necessary

to prune back severely when planted. The bushes should be planted deep enough so that the point of union between stock and scion is from two to three inches below the surface of the ground. This is important as if the union is at or near the surface, the sun shining on it hardens the wood and prevents a free circulation of sap, which is not desirable, as the best results a strong, vigorous growth is necessary. When planting, the soil should be well tramped about the bush to bring the particles into close contact with the roots and ensure their getting moisture as soon as possible. Roses have comparatively few roots, and none of these should be pruned off when planting, unless there should happen to be a very long root preventing proper planting, when its length may be reduced, or if there are broken roots they should be removed. The roots should not be exposed to drying winds, when planting, any longer than is absolutely necessary. A plan sometimes followed is to dip the roots in a puddle made of clay and water. This coating of clay on the roots not only protects the roots when the bushes are being planted, but we believe ensures a quicker flow of moisture to the roots in the soil. If the stems look withered when they are received, the plants should be buried for about two days in wet soil so that the stems may take up water from the soil. This will often save plants which would otherwise die. In addition to this it is desirable if the weather is very dry at planting time, to heap the soil up around the stems until there is rain. When the plants are set in the autumn the soil should be heaped up around the stems to protect them. In the spring this is removed and the plants severely headed back. One should not hesitate to reduce the stems so that there will be only from three to six buds left on each of the stems above the ground. This severe pruning is even more important in the case of spring-set plants, and is often the means of saving the plants which would otherwise die.

CULTIVATION AND WATERING.

As has been stated before, roses need an abundance of moisture. By keeping the surface soil loose from spring until autumn much moisture which would otherwise pass off into the air will be held in the soil. After each rain the surface should be hoed and raked, leaving a rather coarse surface, or during a dry time, if it has been necessary to water the roses, the soil should be loosened after watering. It is better to water roses thoroughly, occasionally, than to give them a light watering frequently. It is not, however, too often to syringe or spray the foliage with water every day, as this is one of the best preventives of insects. This syringing is, however, for the purposes of cleansing the foliage, not for adding moisture to the soil. This spraying should be done in the evening or early in the morning as if the foliage is wet in the middle of a hot, dry day it is liable to scald.

MANURING.

Soils should be kept rich and well supplied with humus by the annual application of well-rotted barnyard manure in large quantities. This may be applied on the surface of the ground in the autumn and dug in in the spring, or applied in the spring.

PRUNING.

The pruning of roses will vary according to the kind and even the variety of rose which is to be pruned. Roses of the hardiest group nearly all bloom on wood of the previous season's growth or wood several years old, and as these roses are grown mainly for the mass effect of their flowers rather than the excellence of the individual flower, they should be pruned so as to produce this mass effect. If, then, they are pruned back to near the ground there will be few roses. If the branches and stems are left their full length or merely headed back a little to make the bush symmetrical there will be a fine mass of roses. In addition to this it is necessary to remove some of

the oldest wood each year, cutting the branches out at the ground, thus making room and letting in light so that the younger stems will develop well. As the stems one and two years old are those which give the best flowers, there should be a large proportion of these. Dead branches should, of course, be removed.

Most of the roses in the second group must be pruned differently, although the climbing roses may be treated somewhat as has been recommended for the first group, with the exception that, where it is desired to cover a wall with a large rose bush, the old canes must be left to a greater age so as to provide for lateral branches. The Hybrid Perpetual roses give best results so far as quality of bloom is concerned under hard pruning. To obtain the finest flowers one must relentlessly cut back the bushes each spring to within six to twelve inches of the ground. If, however, a mass effect is desired the bushes may be left taller, and where the conditions of soil are



Preparing the Rose Garden for Winter. Tying down the plants to stakes just before covering them with evergreen boughs.

exceptionally good, bushes which have not been pruned back severely will give a large number of fine blooms. Experience will soon teach what is the best method of pruning for particular conditions or desires. The stronger varieties do not require as severe pruning as the less vigorous, and sometimes very few blooms are obtained when a very vigorous variety is cut back to near the ground, as the very strong growth which follows is without bloom. It is better to prune early in the spring rather than in the autumn, as one never knows how a plant will come through the winter. In pruning, the strongest, healthiest stems are left and the weak ones cut off at the ground. In pruning, leave an outside rather than an inside bud as the top bud, so that the shoot from this bud will grow outward rather than through the plant.

Hybrid Tea roses are pruned much like Hybrid Perpetuals though usually not so severely. Tea roses, which usually kill to near the ground in Canada, if they live through the winter at all, should have the dead and injured wood removed, and if the wood should not be injured the branches should be pruned back about one-third. It is extremely important to remove suckers or roots springing from the stock on which the rose is budded. These should be removed as soon as noticed and careful watch kept for them. They should be cut off close to the stock and not at or above

the ground. It may be necessary to take away a little soil to do this. There is no reliable way of telling the stock, although experience will increase the knowledge in this respect, but vigilance is necessary or the stock will assert itself and soon the rose one thinks he is growing will not be there. The leaves of the stock are often of a paler green colour than the named varieties, and not so glossy. Sometimes the leaves of the stock have a purplish tinge. Usually the stocks have a larger number of leaflets on the leaves than the named varieties.

WINTER PROTECTION.

Roses of the first group need little or no protection in many parts of Canada. In the Prairie Provinces, where the country is open, it is desirable to bend some of them down and cover them with soil and, where evergreen boughs can be obtained, to put some of these over them as well. A little soil taken from one side of the bush will enable one to lay the bush flat down so that the whole of it may be covered. Should the ground freeze and snow fall so that the bush cannot be covered, a good plan is to tie the branches together and then tie over the branches some evergreen boughs, canvas, or any material which will protect the bush both from wind and sun. The material should be of such a nature that it will protect the plant but at the same time not hold moisture for any length of time, as if the canes are moist for a considerable time they may mould. For Hybrid Perpetual, Hybrid Tea, and Tea roses more protection is necessary. One of the simplest methods of protecting both Hybrid Perpetual and Hybrid Tea roses is to earth them up six or eight inches or more in the autumn, thus protecting the lower part of the stems, and if the tops are killed back the lower part of the stem is almost sure to remain alive. In addition to this the plant may be bent down and held down with soil, or where bushes are not usually pruned back severely they may be entirely covered with soil to preserve them. Where this treatment is not sufficient, a light covering of straw or evergreen boughs over the soil is desirable, which will prevent sudden thawing and freezing and may save the plants sometimes. If the soil is frozen deep before one thinks of covering, the bush may be bent down and held down with boards and covered with evergreen boughs, or even without these the snow may be sufficient protection. In the spring the soil should be levelled and the bushes raised as soon as possible to prevent the development of disease. Good results are obtained where the preceding method fails by bending the bushes down and covering them with a box, and still further protection is afforded by bending down, putting a box without cover or bottom over, then filling this with dry leaves and putting a cover on the box, which should be tight. If the leaves are wet when put in or if they become wet in the spring the stems may mould. When boxes are used the cover should be raised at the first opportunity in the spring to allow a freer circulation of air and permit the stems to dry and the bark harden a little before removing the box altogether.

Climbing roses may be taken down, the branches tied together and put in a long, narrow box and treated as described, if it is found necessary. Or, where there is usually a good covering of snow they may be bent down and partly, or entirely, covered with soil or covered with evergreen boughs as for dwarf roses. Tea roses are the most tender and they should be earthed up as described for Hybrid Perpetuals and Hybrid Teas, and in addition, for best results, covered with a box filled with dry leaves as described. The degree of protection will depend on what part of Canada the grower lives in, but at least one of the methods described should be suitable for most conditions.

INSECTS AND FUNGOUS ENEMIES, AND HOW TO TREAT THEM.

Good foliage is essential to the production of good roses, and, moreover, good foliage is desirable in a rose garden because of its appearance. Leaves badly curled, mildewed, spotted, or eaten, take away very much from the attractive appearance of a rose garden. The easiest insect to control is the Rose Slug, a green caterpillar which does not usually appear in great numbers but which works on the underside

of the leaves and eats out pieces. These may be picked off by hand where bushes are few, but Paris green or hellebore sprayed on the bush so that it will reach the undersides of the leaves especially will quickly kill them. If Paris green is used it should be used weak so as not to burn the foliage, or about in the proportion of one ounce to twelve gallons of water. Hellebore is used in the proportion of one ounce to two gallons of water.

The aphid or green fly is sometimes quite troublesome, and the thrips, small, hopping insects which cause the leaves to curl, often do much harm unless controlled. There are several good remedies for these, and, as prevention is better than cure, a remedy should be applied before the insects have increased in numbers. As stated before, thorough spraying with water is a good preventive. First, nicotine in the proportion of one teaspoonful to one gallon of water, or a decoction made of quassia chips and soft soap or whale oil soap made by boiling four ounces of quassia chips for ten minutes in a gallon of soft water, then strain and, while the liquid is still warm, dissolve four ounces of soft soap or whale oil soap in it, and before using add one gallon of water. It may be necessary to syringe with water, after the insects are killed, to clean the plants.

Whale oil soap in the proportion of one pound to six gallons of water is a good insecticide to use for aphid or thrips, and kerosene emulsion is a reliable remedy, but if improperly made the foliage may be injured.

The same remedies may be used for Red Spiders, tiny insects the presence of which is indicated by a yellowing of the leaves. These insects work on the underside of the leaves, and unless the eyesight is good cannot be detected with the naked eye. Thorough and frequent syringing of the underside of the leaves with water alone will help to keep these insects under control, and flowers of sulphur mixed with kerosene emulsion or whale oil soap will make these insecticides more effective.

Where the Powdery Mildew is troublesome it may be controlled by dusting the bushes every ten or twelve days with flowers of sulphur until the disease disappears. The Leaf Blotch or Black Spot is another disease which sometimes disfigures the leaves very much and weakens the plant. Bordeaux mixture and Ammoniacal Copper Carbonate Solution will control this, but if the former is used it should be used several weeks before the blooming season or after it, so that the foliage will not be disfigured by the spraying material when the roses are in bloom. Ammoniacal Copper Carbonate is made with one ounce copper carbonate, four-fifths of a pint of ammonia and eight gallons of water. Dissolve the copper carbonate in the ammonia. The ammonia and concentrated solution should be kept in glass or stone jars tightly corked. When the disease is in a plantation, every effort should be made by thorough spraying to control and destroy it as soon as possible. Plants should be sprayed about once a week after the disease is first noticed and where it has occurred previously, begin as soon as the foliage is out.

PROPAGATION.

The enthusiastic rose grower will want to propagate roses himself, and it adds much to the pleasure of growing this charming flower if one is able to grow one's own plants.

Roses grown in the open are usually propagated by budding. Raising them from cuttings is not very satisfactory in Canada, although it can be done fairly successfully with some varieties. Grafting is rarely resorted to outside, being confined almost entirely to under glass, and even then it is done to a very limited extent.

Stocks.—The stocks most used in propagating roses are Dog rose or briar stock (*Rosa canina*), a wild rose of Great Britain, and the Mauetti, a European stock originally coming from Italy. The Sweet Briar (*Rosa rubiginosa*) also makes a very good stock. It is possible that some long-growing Canadian wild roses would

make good stocks. The briar stocks are either propagated from cuttings or from seed. Rooted outtings can be obtained at very low prices from nurserymen, and the rose grower himself can readily raise them from seed. There will be a year's saving in time, at least, by planting the rooted cuttings. The rooted stocks, which are usually received early in the spring, should be planted about a foot apart in rows three feet apart. The soil should be kept well cultivated so as to induce the plants to start into growth promptly in order that by the budding season there will be an abundance of sap under the bark. The soil should also be earthed up about the stocks for a few inches during the summer, as this will keep the bark softer and easier to work. If stocks are grown from seed, it should be sown in the autumn in rows about six inches apart in well-prepared soil. The young plants should appear early in the spring and, if the surface soil is kept loose, will make nice little plants by autumn. Before winter, or early in the following spring, they should be transplanted into nursery rows as

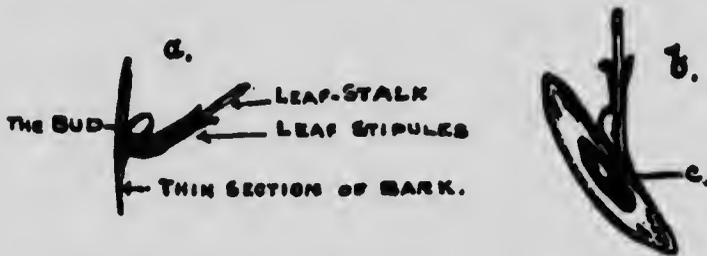


1) Bud Stick.
3) Bud inserted in stock before tying.
4) Bud inserted in stock before tying.

described for the imported stocks. Some of them should then be ready for budding that season. They should be confined to one main stem but all side branches left on. While budding by amateurs is usually more successfully done on the Manetti stock, it is not so desirable as the briar as, if suckers come up, the foliage is difficult to distinguish from some of the named varieties of roses. Moreover, the roses are not so long-lived on the Manetti as on the briar. Where standard roses are desired, and these are only suitable for the milder parts of Canada, the stocks will need to be a year older before they are budded than for the ordinary dwarf or bush roses.

Budding.—The budding of roses is much like the budding of fruits, and any one who is at all skilful with his hands can do it very successfully. The time for budding varies somewhat in different parts of Canada, but from the latter part of July until September the stocks should be in condition in some part of the Dominion. The time that budding may be started is as soon as good buds can be obtained. The stocks are ready any time from then until the growth becomes so slow that there is not enough sap to permit raising the bark easily. When growth is fairly rapid there is no diffi-

cult. The buds are in condition when they are well developed but dormant and the wood on which they are is firm and what may be termed half ripe. In the early part of the budding season this is after a shoot has flowered. Later on in the season the buds will be sufficiently developed on shoots where the flowers have not yet opened. At the proper season, pieces of the shoots called "bud sticks" with several good buds on them are cut and immediately after cutting the leaves are all removed to prevent transpiration of moisture, leaving about an inch of the leaf stem attached to the shoot. The "bud sticks" are kept wrapped in wet moss or sacking to prevent any drying out, as the buds must be kept fresh. The stocks are now prepared by clearing away the soil down to about two inches below the surface of the soil or as near the roots as possible and rubbing the stem clean and if necessary removing any shoots which may be in the way. A cut is now made crosswise on the stock through the bark and down to the wood and a longitudinal cut about an inch long down from it, the two incisions looking somewhat like T. As the summer may be hot and dry, the buds are not so liable to dry out if they are inserted on the northeast side of the stock where the sun will not strike them so much. With the ivory end of the budding knife the bark is now raised to receive the bud. The bud is cut from the bud stick with a piece of bark about an inch or more long or half an inch on each side of the bud and with as



a. SIDE VIEW OF PREPARED BUD

b. SHOWING INNER SURFACE OF THE BARK

c. THIN SECTION OF SAP-WOOD ATTACHED TO BARK.

small a piece of wood attached as possible. This piece of wood should be removed and a little practice is required before this can be done without injuring the bud or bark. The wood is removed with a quick pull using the knife blade to assist. A quick action is necessary otherwise the bud will be dragged and injured. If the wood does not come out readily the bud is too ripe and younger wood should be procured. If the bud is cut with the minimum amount of wood attached, it is possible to bud successfully even without removing it. After removing the piece of wood the bark is cut off at the ends, making it the proper length, and slipped under the bark, using the piece of the leaf stem as a handle, and raising the bark with the knife in the other hand. The bud should not be exposed to the dry air any longer than is absolutely necessary, as it must not become dry. When brought into place the bud should be just where the two incisions cross. The bud must now be held in place by means of raffia which is wrapped tightly around the stem above and below and close to the bud. Neatness in doing this will soon be learned. In three or four weeks the bud will have taken, if the work has been well done, and if the soil has been moist the raffia will have rotted and will not require loosening. If still tight it should be cut after about a month as it will prevent the proper circulation of sap. The stock is allowed to grow as usual until growth ceases. Early in the spring the stock is cut back to within three or four inches of the bud on those plants where the buds have taken. As soon as

the buds start to grow they must be well looked after as unless kept tied up the new shoots are liable to break off. Stout sticks or bamboo rods are desirable to which to tie the shoots as they grow. All growth from the stocks should be kept cut off and, as soon as the new shoots can be tied, the stubs on the stocks should be removed. After growing one season they will be ready to move into the rose garden. Budding for standard roses is done much as for dwarf except that the buds are put in near the top of the main stem instead of at the bottom. When the budding season arrives, buds are inserted on two laterals of the current season's growth springing from the main stem at the desired height. The buds are put in quite close to the main stem. Usually in budding standards the cross cut is not made for fear of breaking the small branches, but there is a longer longitudinal incision which comes close to the main stem. Two buds are put in on two laterals, in case one should fail. In the autumn all the laterals are cut away and the two on which the buds have been inserted are cut back to within three or four inches of the stock until they have started to grow, when they are cut off near the buds.

Propagating from Cuttings (Roses on Their Own Roots).—Careless rose growers who let the stocks grow up and smother the budded variety are strong advocates of having roses on their own roots so that there will be no danger in this regard, but the careful rose grower is quite content with budded stock, as he knows that as a rule the growth will be much stronger and the flowers better on roses budded on a vigorous stock like the Dog rose, but if a grower desires to raise plants from cuttings the following information will be of assistance. Some of the climbing roses such as Crimson Rambler and Dorothy Perkins strike readily from cuttings, whereas many of the Hybrid Perpetuals and Hybrid Teas are rather difficult to strike unless one has a



Rose cutting.

greenhouse where the best conditions are obtained. In most parts of Canada, little success will follow taking ripe wood cuttings of about six to eight inches in length and planting them outside in nursery rows deep enough so that only one bud will be above the surface of the soil, but some success may be obtained with Crimson Rambler and a few other varieties by treating them in this way. The best success will be obtained by taking cuttings when the wood is about half ripe in July, with a heel or small piece of older wood at the base; remove the leaves except the two nearest the top, and plant them in coarse sand in a cold frame. But even treated in this way they are difficult to root. The soil in the frame must be kept constantly moist and the air must be kept as moist as possible, by giving as little ventilation as possible without the cuttings moulding. A method which has given fairly good success where it is desired to root a few cuttings is to take an ordinary six-inch porous flower pot and put a plug in the hole in the bottom so that the water cannot get out. Put this pot in a nine-inch pot and fill the space between the two pots with coarse sand, first putting some coarse material such as pieces of flower pot or cinders in the bottom for drainage, and sufficient sand to bring the smaller pot to the proper level. The smaller pot should be set in the other so that the top of it will come within an inch of the top of the larger pot. Now insert the cuttings an inch or two apart in the sand, fill the six-inch pot with water and put in a place where it will be in the sun for as many hours a day as possible. The moisture will be regularly supplied to the soil through the pot if it is kept filled with water, and the conditions will be quite favourable for the cuttings to make root. If the sand is allowed to become dry the cuttings will, of course, be spoiled.

Layering.—Some varieties of roses can be readily increased by layering. Layering consists in bending down the branches and covering the bent part with from four to six inches of soil, leaving the tip and upper part of the branch exposed. In time the branch will root where it is bent, and the rooted part is then cut off. As a rule, rooting will be much more rapid if the branch is cut part way through at the base of a bud, where it will be bent, and then another cut made lengthwise of the branch through the bud for an inch or more. If this cut is held a little open with some coarse sand, the layers will sometimes root quickly.

Suckers.—Some roses which are often on their own roots, such as the Persian Yellow, Japanese rose (*Rosa rugosa*), Provence or Cabbage, and Damask roses, are readily propagated by digging up and planting the suckers which spring up around the parent plant.

Originating New Varieties.—It is very interesting to originate new varieties of roses, and every amateur has a good opportunity of producing something better than has ever been introduced before, although where one has only a small area it is doubtful if the best use of the land can be made in this way, as only a small proportion of the seedlings will give good roses, and it will take three or four years before one can tell what the results of the work will be. The simplest plan in raising new varieties is to save the seed of the best sorts and sow it in the autumn as previously described, but the most interesting method is to cross two varieties having the characteristics which it is desired to combine in one. In brief, this method consists of putting the pollen of one variety on the pistil of another, the pollen from which has been removed before it is shed. The details of cross-breeding are described in other bulletins of the Experimental Farms.

GOOD GARDEN ROSES AT OTTAWA.

The roses in the following lists, in most cases, may be seen growing in the new Rose Garden at the Central Experimental Farm, Ottawa.

These lists in this edition of the bulletin have been revised and extended in order that rose growers may find the information given as helpful as possible.

Nearly all the recommended roses have been given their respective places in these lists principally by reason of the fact that they have been found worthy of such places by actual tests made at Ottawa during the past few years. Amongst such roses will be found many which are highly recommended by rose growers throughout Great Britain, on the continent of Europe, and by growers on this continent.

That a rose is popular and recommended in Europe or the United States does not, however, imply that it is the best rose for Canadian conditions. In connection with the tests carried on at Ottawa, it gives considerable satisfaction to find that a rose with a good reputation elsewhere is able to live up to it. Frequently, however, a rose popular elsewhere is not fully successful at Ottawa, owing perhaps to the fact that some one of its essential or hereditary qualities will not stand the cold of the winter or perhaps the heat of the summer.

Experiments with Hybrid Tea roses are comparatively new at Ottawa, and therefore the following lists are given subject to revision as our knowledge of the suitability of varieties for definite conditions increases.

GOOD HYBRID TEA ROSES FOR THE GARDEN.

An alphabetical list of good garden roses belonging to the *Hybrid Tea Class* and recommended from amongst those tested at the Central Experimental Farm, Ottawa, Canada.

Name.	Date of Origin.	Description.
Admiral Dewey.....	1889.....	Bright pink, shaded white.
Antoine Rivoire.....	1896.....	Rosy flesh, yellowish at the base.
Avoca.....	1907.....	Rich crimson, fragrant, vigorous grower.
Betty.....	1905.....	Coppery rose, shaded yellow, fragrant, vigorous.
Camoenas.....	1881.....	Glowing rose, yellow base, vigorous, free flowering.
Captain Christy.....	1873.....	Delicate fleshy white, deeper shaded in centre.
Caroline Testout.....	1890.....	Bright warm pink.
Dean Hole.....	1904.....	Pale silvery rose, deeper shaded, vigorous, free flowering, slightly fragrant.
Dorothy Page Roberts.....	1897.....	Coppery pink suffused with yellow, fragrant.
Dr. O'Donel Browne.....	1908.....	Carmine rose, fragrant, vigorous.
Ecarlate.....	1907.....	Bright scarlet red, free flowering.
Etoile de France.....	1904.....	Velvety crimson, red centre, fragrant, free flowering.
Farben Konigen.....	1901.....	Carmine-rose, reflexed pale pink.
Grace Molyneux.....	1906.....	Creamy apricot and flesh, fragrant.
Gustav Grunerwald.....	1903.....	Carmine pink, with yellow base, fragrant.
G. C. Wand.....	1908.....	Glowing orange vermillion. Tea scented.
Gras an Teplitz.....	1897.....	Bright crimson, red centre, fragrant, very vigorous.
H. Armytage Moore.....	1907.....	Rose pink, silvery pink centre, vigorous.
J. B. Clark.....	1905.....	Scarlet crimson, shaded plum, vigorous.
Joseph Hill.....	1903.....	Coppery yellow, shaded salmon pink, fragrant.
Kaiserin Augusta Victoria.....	1897.....	Cream, shaded lemon.
Killarney.....	1898.....	Flesh suffused pale pink, fragrant.
Lady Ashtown.....	1904.....	Pure deep pink, free flowering.
Lady Ursula.....	1908.....	Flesh pink, vigorous.
La France.....	1867.....	Silvery rose, pale lilac shading, fragrant.
Le Progres.....	1904.....	Golden yellow, free flowering.
Mme. Abel Chatenay.....	1895.....	Pale salmon pink, with deeper centre, fragrant.
Mme. Jules Grolez.....	1897.....	Bright silvery rose, shaded yellow, fragrant.
Mme. Melanie Soupert.....	1905.....	Pale sunset yellow.
Mme. Ravary.....	1899.....	Pale orange yellow, deeper centre.
Mme. Leon Pain.....	1904.....	Silvery flesh and orange yellow.
Mme. Maurice de Luze.....	1907.....	Deep rose, carmine centre, fragrant.
Margaret.....	1909.....	Soft salmon rose.
Margaret Molyneux.....	1909.....	Saffron yellow, shaded pink.
Marquise Litta.....	1893.....	Deep carmine, fragrant.
Mildred Grant.....	1901.....	Ivory white, tinted peach.
Mrs. Aaron Ward.....	1907.....	Indian yellow, edge of petals white.
Mrs. Harold Brocklebank.....	1907.....	Creamy white, centre buff, fragrant.
Mrs. Stewart Clark.....	1907.....	Bright cerise pink, fragrant, extra vigorous.
My Maryland.....	1909.....	Brilliant pink, and salmon, fragrant.
Prince de Bulgarie.....	1902.....	Pale tinted rose, shaded apricot, fragrant.
Rhea Reid.....	1908.....	Cherry crimson, fragrant.
Renee Wilmart-Urban.....	1907.....	Salmon flesh.
Richmond.....	1905.....	Bright light crimson, fragrant.
Souvenir de President Carnot.....	1895.....	Rosy flesh, and white, free flowering.
W. E. Lippiatt.....	1907.....	Velvety-crimson, fragrant.



New Hybrid Tea Rose, —Mrs. Amy Hammond, colour a blend of ivory, amber and apricot.

NEW HYBRID TEA ROSES.

A list of promising Hybrid Tea roses of *recent introduction*, and a few others which have not been tested at Ottawa for a sufficient length of time to be included in the previous list.

Name.	Date of Origin.	Description.
British Queen.....	1912.....	Creamy white, fragrant.
Carine.....	1911.....	Lemon yellow, coppery rose edges.
Countess of Gosford.....	1906.....	Salmon pink, shading to rose.
Duchess of Wellington.....	1909.....	Deep saffron yellow, outside petals orange.
Elizabeth Barnes.....	1907.....	Salmon rose, fawn centre.
Lady Barham.....	1911.....	Flesh and coral pink, fragrant.
Lady Pirrie.....	1910.....	Delicate coppery salmon and apricot yellow.
La Tosca.....	1900.....	Pale blush white rose centre.
Lieutenant Chauro.....	1910.....	Rich crimson, fragrant.
Mabel Drew.....	1911.....	Creamy yellow, fragrant.
Marchioness of Waterford.....	1910.....	Salmon pink.
M. Joly.....	1911.....	Deep saffron yellow, with primrose border, fragrant.
Mrs. Amy Hammond.....	1911.....	Cream, shaded amber, fragrant.
Mrs. E. J. Holland.....	1909.....	Deep pink, shaded salmon.
Mrs. C. E. Allan.....	1911.....	Pale orange to yellow buff.
Mrs. Wakefield Christie Miller.....	1909.....	Soft blush, outside of petals deep rose.
Mrs. Fred Straker.....	1910.....	Salmon pink yellow base.
Miss Cynthia Forde.....	1909.....	Brilliant rose pink, free branching.
Othello.....	1911.....	Deep maroon.
Pharisæer.....	1901.....	Rosy white shaded pale salmon.
Simplicity.....	1909.....	Pure white nearly single, large flowers.
Theresa.....	1910.....	Deep orange apricot, semi-double, fragrant.
Viscount Carlou.....	Carmine pink on cream, free blooming.
William Shean.....	1906.....	Creamy pink.

GOOD HYBRID PERPETUAL ROSES FOR THE GARDEN.

Name.	Date of Origin.	Description.
Alfred Colomb.....	1865.....	Bright red, fragrant, free blooming.
Baroness Rothschild.....	1867.....	Light rosy pink.
Captain Hayward.....	1893.....	Scarlet crimson, fragrant.
Charles Lefebvre.....	1861.....	Velvety brilliant crimson.
Clio.....	1894.....	Flesh, shaded rose pink.
Commandeur Jules Gravereux.....	1908.....	Velvety red, lighter centre.
Duke of Edinburgh.....	1868.....	Bright vermilion, good grower.
Dupuy Jamain.....	1868.....	Bright cerise, good grower.
Fisher Holmes.....	1865.....	Crimson scarlet, free blooming.
Frau Karl Druschki.....	1900.....	Pure snow white, the best white rose.
Gen. Jacqueminot.....	1833.....	Scarlet crimson.
Her Majesty.....	1885.....	Bright satiny rose pink.
Hogh Dickson.....	1904.....	Brilliant crimson, free blooming.
Lady Helen Stewart.....	1887.....	Bright crimson shaded scarlet.
Mme. Victor Verdier.....	1863.....	Light crimson.
Merveille de Lyon.....	1882.....	White rosy peach centre.
Mrs. John Laing.....	1887.....	Soft pink, free bloomer.
Mrs. R. G. Sharman-Crawford.....	1894.....	Rosy pink and flesh, free blooming.
Magna Charta.....	1876.....	Bright rose.
Margaret Dickson.....	1891.....	White with pale flesh centre.
Paul Neyron.....	1869.....	Deep rose, very large flowers.
Rev. Alan Cheales.....	1896.....	Pure lake and silvery white.
Suzanne Marie Rodocanachi.....	1883.....	Rosy cerise.
Ulrich Brunner.....	1881.....	Cherry red, vigorous grower.
Abel Carriere.....	1875.....	Dark crimson.
John Hopper.....	1862.....	Bright pink.
Mme. Gabriel Luizet.....	1877.....	Light silvery pink, free bloomer.
Reynolds Hole.....	1872.....	Crimson red.
Senateur Vaise.....	1859.....	Dazzling red, free bloomer.
Victor Verdier.....	1859.....	Rosy carmine shaded purple.

Special "Small Garden" Collection of Hardy Roses.

Frau Karl Druschki, H.P.—Up to the present this is acknowledged to be the finest white rose in cultivation. The plant is a strong and healthy grower and makes abundance of bloom throughout most of the season. The long pointed buds are pink on the outside but open to pure snow-white flowers of large size and beautiful form. Other white varieties of more recent origin are Ethel Malcolm 1910, and British Queen 1912. A good white rose should occupy a place in every collection.



One of the Newer Hybrid Tea Roses, —Edward Mawley, colour, deep velvety crimson.

General Jacqueminot, H.P.—This is one of the oldest of its class which still lives up to its reputation. The plant makes vigorous growth and gives abundance of blooms. The colour is bright scarlet crimson, which in hot weather fades to a purplish red. Fragrant.

Her Majesty, H.P.—This is a rose which has done very well at Ottawa, and is included in this collection because of its type. The plant is vigorous and upright, and produces, when established, beautiful large-sized pink blossoms. It does well in hot season, but does not give much autumn bloom. It won the N. R. S. Gold Medal of acclamation when introduced in 1885.

Hugh Dickson, H.P.—This is one of the very best of its class. The plant is vigorous and a free bloomer. The colour of the flowers is attractive and lasting, being crimson, shaded scarlet. Highly recommended. Does well at Ottawa, and in town gardens generally.

Mrs. John Laing, H.P.—Another deservedly popular rose, and a winner of the Gold Medal. Plant a free and vigorous grower, producing a good number of blossoms in the spring and again in the autumn. Flowers rosy pink, good size, and lasting in quality. Fragrant. Does well in town gardens.

Mrs. R. G. Sharman-Crawford, H.P.—This is one of the best of its class for a second crop of blooms. The plant is of fair growth and healthy. The flowers are a beautiful shade of clear rosy-pink, and of moderate size. A variety easy to grow.

Ulrich Brunner, H.P.—This rose forms one of the three recommended by one of the most noted of rosarians as the three best "Roses for Cottage Gardens." The plant is vigorous and does well at Ottawa. Although it does not blossom freely it gives some autumn bloom. Flowers cherry-red, fragrant, and of good size.

The foregoing seven varieties of Hybrid Perpetual roses are all different in colour, and are possibly the pick of the class. They can be recommended to those who wish to grow a limited number of roses only. If a still smaller number of this class is required the choice might be Frau Karl Druschki (white), Mrs. John Laing (pink), and Hugh Dickson (red).

Caroline Testout, H.T.—Since its introduction in 1890 this has been a very popular rose in its class. The plant makes good growth. The flowers are bright warm pink in colour, and fairly lasting. It is a free blooming variety and reliable. Good for town gardens.

Dean Hole, H.T.—At Ottawa during the past few years this has been the one rose which has been unequalled for its abundant and continuous blooming habit. The plant is vigorous and healthy. The flowers are pale silvery rose, deeper shade. It appears to be as hardy as most of the H.P. roses, and is perhaps the best of all roses for autumn bloom. This rose, with several others possessing many good habits and the ability to withstand our winters, augurs well for the future of roses of this class in districts even as cold as Ottawa or Montreal. Slightly fragrant.

Escarlate, H.T.—This rose is of comparatively recent introduction and has succeeded well at Ottawa and elsewhere. It is given a place here because, in addition to its ordinary merits, it is of a strikingly bright scarlet colour and free blooming. Bright red roses are not common amongst the Hybrid Teas. This is most effectively planted next to varieties like Madame Ravary or Joseph Hill.

Gustav Grunerwald, H.T.—A rose succeeding well at Ottawa and giving general satisfaction elsewhere. Fairly vigorous, free flowering, and a bedding rose of excellence. Flowers fairly large, bright carmine, with yellow centre. Blooms well early and late in the season.

Lady Ashtown, H.T.—One of the most satisfactory roses of recent introduction. Easy to grow and a very persistent bloomer, giving nice long pointed buds, with deep pink flowers of good substance. At Ottawa it gives promise of taking a place near the top of list of the best dozen of its class.

Lady Ursula, H.T.—A plant of fairly vigorous habits. The flowers are large, full, and of good shape; flesh pink in colour, and fragrant. It is a good all-round rose of great promise; but owes its place in this list more particularly to the fact that as an autumn bloomer it is almost equal to Dean Hole.

Madame Ravary, H.T.—No list of good Hybrid Tea roses would be complete if it did not contain one of the fine yellow varieties which are the glories of the class. It would be a difficult point to assign its place on the score of colour alone to this rose, as Mrs. Aaron Ward, La Progres, Margaret Molyneux, Joseph Hill, and others are equally beautiful perhaps, but Madame Ravary has done well at Ottawa in the vigour of its growth and abundance of bloom. It has beautiful golden yellow buds opening to orange yellow, and is a good town rose.

The seven varieties of Hybrid Tea roses just described are no doubt the pick of their class for a small list suitable for general recommendation. The roses are of various colours, and the length of their blooming season is very extended, more so of course than is the case with the list of Hybrid Perpetuals. If a smaller number is desired the recommendation would be *Dean Hole*, *Ecarlate*—if a red rose is wanted—otherwise *Lady Ashtown* and *Madame Ravary*. *Etoile de France* is another fine red rose for a small collection.



Hybrid Tea Rose.—Mrs. George Sawyer, colour, clear Rose Pink.

Other Hardy Roses.

Conrad F. Meyer [Japanese (*Rugosa*) Hybrid].—No garden containing roses should be without a specimen or two of those hardy roses, with their beautiful, attractive, and clean foliage. This variety has flowers of a clear silvery rose colour, pretty in the bud stage, and a free bloomer. Slightly fragrant.

Madame Georges Bruant (Japanese Hybrid).—This is the best white variety of its class. Flowers paper-white, large, double, and pretty in the bud stage. Japanese roses are not recommended as roses for cutting, as the flowers are produced in clusters, at the tips of the branches, but as decorative shrubs on the lawn or in the garden they are handsome.

Austrian Briars.—The two oldest yellow roses and the origin of their class are striking objects in the rose garden early in the season. Harrison's "Yellow" and "Persian Yellow" produce abundance of beautiful small yellow and golden yellow flowers. Both are quite hardy at Ottawa. They should not be pruned, otherwise (different to many other roses) the flower shoots will be cut off.

The New Race of Austrian Hybrids.

One or two of the strikingly attractive free-flowering, beautiful, and fairly hardy roses of this new class should be grown in every collection of roses, however small. At Ottawa, *Beauté de Lyon* (coral red, slightly shaded with yellow; large, full, and globular) and the *Lions Rose* (shrimp pink with a coral red centre shaded with chrome yellow, large, full, perfectly formed, fragrant), are both roses which attract much attention.

Roses Giving Bloom Late into the Autumn.

Although June is the great "month of roses," it is extremely satisfactory to know that there is an ever-increasing number of roses which will give us a second crop of flowers during the late summer and autumn. In fact, some varieties would continue in flower till December (as they do in British Columbia and the southern parts of England), were it not for the severe frosts of late October which cut them down. At Ottawa, those in the following list have been found to be varieties which for several years have given a good show of autumn bloom. The Hybrid Teas are, of course, the true perpetual class of roses, and it will be noticed that the largest part of this list consists of Hybrid Tea varieties:—

Hybrid Teas—

Admiral Dewey,
Betty,
Beatrice,
Camorus,
Countess of Oxford.
Cynthia,
Dean Hole,
Earlate,
Entente Cordiale,
Jacques Vincent,
Killarney,
Lady Ursula,
Mme. Ravary,
Mme. Valez Beaumez,
Mrs. Wakefield Christie-Miller,
Radiance,
Souvenir de President Carnot,
Viscount Carlow.

Hybrid Perpetuals—

Mrs. John Laing,
Mrs. R. G. Sharman Crawford,
Victor Verdier.

Climbing Roses.

Climbing roses are not perfectly hardy at Ottawa. A fair number has been tested, and larger numbers are now under test. All varieties, including those which have been found to be fairly satisfactory, must, however, be carefully protected during the winter.

Name.	Date of Origin.	Description.
A few of the best:—		
Crimson Rambler.....	1833.....	Bright crimson, in large clusters.
Dorothy Perkins.....	1901.....	Shell pink, in large clusters.
Lady Gay	1905.....	Rose pink.
Tausendrohn.....	1906.....	Pink to bright rose.
Other good varieties:—		
American Pillar.....	1900.....	Shade of pink, with yellow stamens.
Bennetts' Seedling.....	1840.....	Small white semi-double flowers.
Euphrosyne.....	1896.....	Pinkish rose.
Felicite Perpetue.....	1828.....	Creamy white.
Mrs. F. W. Flight	1905.....	Pink, white centre, larger clusters.
Thalia.....	1896.....	Small white flowers.
Trier.....	1904.....	Cream yellow, tinted white.
Williams' Evergreen.....	Yellowish white.

Dwarf Polyantha—Pompon Roses.

These miniature roses form a distinct class. The class contains roses of very dwarf habit, the plants being seldom more than from twelve to eighteen inches high. They produce an abundance of small blossoms. The colours are not of a wide range, orange and pink shades seem to prevail, although good varieties in white, red, and cream are to be had. Where the snowfall is abundant they may be considered completely hardy, and will not need winter protection. They are good bloomers and should not be pruned except when old or dead wood has to be cut out from the centre in order to keep the plants from getting too crowded.

These plants are useful for certain forms of bedding, or they may be planted with effect in the borders, either as edgings, or mixed with other plants in the foreground.

- Ennehen Muller—Bright pink.
- Cecile Brunner—Bluish white, shaded rose.
- Eugenie Lamesch—Yellow edged carmine.
- Jeanne d'Arc—Pure white.
- Jessie—Bright orange-red.
- Katharine Zeimet—Pure white; free flowering.
- Mrs. W. H. Cutbush—Bright deep pink; free flowering.
- Orleans Rose—Vivid rosy crimson; free blooming.
- Perle d'Or—Nankeen yellow, orange centre.
- Phyllis—Bright carmine pink; free flowering.

A New Race of Free Blooming Roses.

Within the past few years there has sprung into existence a new race of roses called *Austrian Hybrids* or *Pernetianas*. They are spoken of as Pernetianas in honour of M. Pernet-Ducher, a well-known French rose grower and hybridist, who gave the first and many subsequent members of this class to the world, but as the British growers are now listing them with the Austrian hybrids, it may be better to adopt the name suggested by the National Rose Society and speak of them as Austrian Hybrids. The roses are remarkably attractive and effective in their colours. Orange, red, and yellow unite in some combination to produce such effects.



The Climbing Rose, Tansendschon (or Thousand Beauties). Third year from planting.

The varieties tested at Ottawa have been successful so far, although not eminently so, as the "class" as a "class" will not endure the smoke of cities. Should they prove to be quite hardy, without doubt they will become very popular amongst the perpetual flowering types of roses.

Name.	Date of Origin.	Description.
A. R. Goodwin.....	1909.....	Coppery orange-red, passing to salmon pink, fragrant, and one of the best. (Sometimes classed with the Hybrid Teas.)
Beaute de Lyon.....	1910.....	Coral red slightly shaded with yellow.
Entente Cordiale.....	1908.....	Cherry red and yellow.
Juliet.....	1910.....	Old gold, inside of petals rich red.
Lyons Rose.....	1908.....	Coral red, yellow and shrimp or salmon pink. (Sometimes listed as a Hybrid Tea.)
Louis Barbier.....	1909.....	Yellow and old rose.
Rayon d'Or.....	1910.....	Cadmium yellow turning to sunflower yellow.
Soleil d'Or.....	1900.....	Varying from orange yellow to reddish gold. (The first of the race.)
Viscountess Enfield.....	1910.....	Coppery old rose shaded yellow.

Perfectly Hardy Hybrid Japanese Roses.

The *Rugosa* or Japanese roses with their hybrids are without doubt the hardiest of all roses. As plants for single specimens around the house, or for massing in groups on the lawn they are without equals. The foliage, even of the hybrids, is always bright, clean, and attractive, and neither insects nor fungous diseases trouble it in any way. While the single and semi-double flowers which they produce are not suitable for cutting, they are produced in such an abundance that the plants make very pleasing objects in the season of bloom. Later in the year the fruit or "hips" are also attractive. The plants should not be pruned, only dead wood need be cut out, and no winter protection is necessary.

Name.	Date of Origin.	Description.
<i>Rosa Rugosa atropurpurea</i>	1900.....	Deep maroon crimson, single
" <i>rubra</i>	1892.....	Deep rose, single.
" <i>alba</i>	1892.....	Pure white, single.
Blanc double de Coubert.....	1892.....	Pure white, large flowers, single.
Conrad F. Meyer.....	1900.....	Pure white, semi-double.
Mme. Gen. Bruant.....	1888.....	Clear silvery rose, pretty buds, double.
Mrs. Anthony Waterer.....	1898.....	Pure white, double, free bloomer.
New varieties under trial.....		Deep red, semi-double, fragrant.

NOTE.—These roses can be raised fairly satisfactorily from seed, although the method takes three or four years longer.

Single Roses.

Another very interesting and comparatively new section of roses is that of the "Irish Single Varieties." They are very free flowering, beautiful in the bud stages, and most attractive in their colours. The flowers are much larger than all other classes of single roses.

The following varieties have been tested at Ottawa:—

Name	Date of Origin.	Description.
Bardou Job.....	1887.....	Rich crimson, semi-double.
Irish Beauty.....	1903.....	Pure white, large golden anthers.
" Elegance.....	1903.....	Bronzy orange-scarlet and apricot.
" Glory.....	1900.....	Silvery pink and crimson.
" Harmony.....	1904.....	Saffron yellow and claret.
Morgenrot.....	1903.....	Rich crimson, free flowering.



Hardy Hybrid Japanese or Rugosa Roses and Hybrid Perpetuals.

Sundry Roses—Hardy at Ottawa.

MOSS ROSES.

Most varieties of these once popular roses have been tested at Ottawa, and while most of them are hardy, they are not recommended for small collections in as much as there are so many roses which are their superiors.

Perpetual White, Old Pink, Blanche Morceau, and Crested are the best varieties.

DAMASK ROSES.

A small class of roses containing one well-known and very satisfactory, creamy white rose named *Madame Hardy*.

AUSTRIAN BRIARS.

Persian Yellow 1838—Bright golden yellow, double.

Harrison's Yellow 1830—Bright golden yellow, semi-double.

HYBRID CHINA.

Madame Plantier 1835—Pure white, large flowers; free bloomer.

HYBRID CLUSTER ROSE.

Mary Arnott—Carmine red; extra free bloomer; C.E.F. origin.

Good Roses for Coastal Regions.

At the present stage of the experiments with roses it is not possible to give lists of varieties more suitable than the lists already given, for some of the more abnormal conditions of climate which prevail in a country as vast as Canada. Experiments conducted at the Branch Farms in conjunction with the main trial experiments at Ottawa will enable us to do this, it is expected, in a few years' time. In the meantime a list of Hybrid Tea roses is given which consists of varieties that are known to do exceedingly well in a humid or coastal atmosphere. The list is based on general information obtainable in this connection, as well as on a list recommended by growers in the north of Ireland, which list is composed of varieties that give unsurpassed results, as bedding or garden roses, in the latitude of Belfast.



Two Beds in the Rose Garden, showing Pergola for climbing roses in the back ground. Hybrid Perpetual Roses are depicted in the bed in the foreground, Hybrid China and White Moss Roses are also seen in full bloom in the bed immediately behind.

Where rains are frequent or the atmosphere is humid it is unwise to grow the thinner-petalled varieties, such as La France. Even at Ottawa in the autumn when heavy dews occur the thin petals of certain varieties will become sealed and the flowers "balled" and useless.

The following thicker-petalled varieties, many of which have been described in the foregoing lists, and all of which are beautiful, are recommended:—

Amateur Teyssier,
 Antoine Rivoire,
 Arthur R. Goodwin,
 Betty,
 Caroline Testout,
 Comtess of Shaftesbury,
 Ecarlate,
 Edu Meyer,
 G. C. Ward,
 General McArthur,
 Gustav Grunerwald,
 Joseph Hill,
 Lady Ashtown,

Lady Pirrie,
 Lady Battersea,
 La Tosca,
 Madame Abel Chatenay,
 Madame Melanie Souper,
 Madame Segond Webber,
 Madame Ravary,
 Miss Cynthia Forde,
 Mrs. C. E. Allan,
 Pharisaer,
 Rence Wilmart-Urban,
 Richmond.

Gloire de Dijon and Marechal Niel, climbing roses, are grown with success along parts of the west coast of British Columbia.

Tea Roses.

Tea roses are not hardy at Ottawa, but several good varieties are grown with success in both British Columbia and the southern part of Ontario. The following varieties can be recommended:—

White Maman Cochet—White tinged lemon.
 Maman Cochet—Deep flush, suffused light rose.
 The Bride—White, tinged lemon.
 Bridesmaid—Bright pink.
 Souvenir de Pierre Notting—Apricot yellow, shaded orange.
 Madame Jules Gravenaux—Flesh, shaded yellow.
 Alexander Hill Gray—Deep lemon yellow.
 Lady Hillingdon—Orange yellow, long buds.
 Mrs. R. B. Cant—Deep rose with inner petals buff at the base.

The last three varieties are comparatively new, but are highly recommended.

Roses Free from Leaf Spot.

Any rose which is free from Leaf Spot (*Actinonebea rosea*), that fungous disease which is so often troublesome to roses in Canada, is bound to make an appeal to many people even if it fails to possess some of the other essentials of a "perfect rose." From observations of a preliminary nature with regard to this point made at Ottawa in connection with Hybrid Tea roses, the following list gives those which for two years were found to be but slightly affected by this disease:—

Antoine Rivoire,	Le Progres,
Avoea,	Mme. Harold Brocklebank,
Camoens,	Mme. Leon Pain,
Colonel Leclerc,	Mme. Valere Beaumez,
Dean Hole,	Margaret Molyneux,
Dorothy Page Roberts,	Mrs. Stewart Clark,
Dr. O'Donel Brown,	Rhea Reid,
Etoile de France,	Regina Badet,
Farhen Konigen,	Souvenir de President Carnot,
Lady Ursula,	Theresa.

NOTE.—While it should be pointed out that although it is possible to control this disease by spraying, it is not wise to grow varieties which are known to be badly affected, because in some cases the constitution of the plant is seriously weakened as a result of a bad attack. The above list represents about twenty per cent of the roses under observation, and are classed as "slightly subject to leaf spot." The remainder of the plants were classified as follows: "Subject to leaf spot," nearly seventy per cent; "severely subject to leaf spot," five or six per cent. The rose Regina Badet and some of the plants of the variety Antoine Rivoire were the only instances where plants were entirely free from leaf spot.

NOTES ON THE ORIGIN OF POPULAR CLASSES OF ROSES.

The following "notes" on the origin and genealogy of three or four of the most important "classes" of roses will be of interest to those who grow the Queen of Flowers, and particularly in view of the fact that the term "Hybrid Perpetual" is so unfortunately misapplied, actually leading in some cases, especially amongst amateurs, to confusion.

Were it possible to make the change, and it is to be expected that it will be made before many years, it would be extremely desirable to discontinue the use of "Hybrid Perpetual" as descriptive of the older garden roses, and use it instead to describe the Hybrid Tea roses which are the only really perpetual flowering roses.

No charge can be brought against present-day raisers or growers that they intentionally juggle with terms, and wish to fool the amateur rose grower, as the growers themselves would be very glad to welcome any change in the matter.

The fault lies rather with the older hybridists who did not make allowance for the wonderful improvements which "Time" and "Evolution" would make in a few short years. Comparatively speaking, the hybrid roses of the early days were "perpetual," but now when contrasted with the "Hybrid Tea Class" they are no longer entitled to be so described.

Popular garden roses of to-day are almost all found in two great classes, namely, in the "Hybrid Perpetuals" and the "Hybrid Teas."

Origin of the Hybrid Perpetuals.—Up till the year 1819 roses were like all other flowers, they had one short season of bloom and then all was over till the next year's crop came on.

In 1819 "Rose du Roi," a Damask Perpetual, was introduced. It was a poor affair, but became popular because it produced a *second crop of flowers*. No other very noteworthy roses were introduced from that date till about the fifties, when Jules Margottin and General Jacqueminot appeared. These two roses became the parents of a large family, and firmly established a new class of roses called Hybrid Perpetuals, so called owing to the fact that they produced a small second crop of flowers. In Great Britain and Europe at least, where the season is longer, this second crop is generally produced, although in parts of Canada many varieties produce only the one crop in June. As has been said, however, the second crop is often "but an echo of the first," while with still newer Hybrid Teas the second crop is often larger than the first.

Origin of the "Hybrid Teas."—The characters which distinguish the Hybrid Teas from the Hybrid Perpetuals are: With regard to the plant, an increased netivity of growth (and this is the reason why they are slightly less hardy than the Hybrid Perpetuals); with regard to the flowers, extended flowering periods both in the spring and in the autumn, greater depth of petals, larger size of flowers, greater variety of colours, and often greater freedom of flowering.

La France (1867), a notable rose, was for some years classed as a Hybrid Perpetual, and it was not until after the year 1873 when Cheshunt Hybrid was introduced as the first rose of a *new race* by Messrs. Paul & Son, that it was moved into its present class. It may be said, therefore, that the new race of Hybrid Teas did not come into existence until the early seventies and it was not until the advent of Caroline Testout in 1890 that roses in this class began to make rival claims for public favour with the Hybrid Perpetuals. From that year on progress has been rapid and sure, and to-day the number of beautiful and reliable roses in the class is many times greater than similar roses in all the other classes combined. This progress may be indicated as follows: In 1890 the number of Hybrid Teas was only six; in 1892 it was twelve; in 1894, thirty-one; and by 1901 it had reached to sixty-five; while to-day there are several hundreds in the class.

It is generally supposed that Hybrid Tea roses and Hybrid Perpetuals come from parentages which in many cases are common to both classes, but that the former have inherited their free-blooming habit and peculiar fragrance from the China roses.

Hybrid Perpetual roses are supposed to have originated largely from the hybrids of *R. gallica* crossed with China Hybrids, as will be seen by the chart, but one authority states that "he believes that a much larger proportion of the Hybrid Perpetuals have some of the influence of the Bourbon race of roses in their constitution than is generally supposed.

Origin of the New Race of Austrian Hybrids.—Persian Yellow, a rose with a wonderful golden yellow colour, is one of the parents of the new race of roses which are now deservedly attracting considerable attention. This rose was introduced by the late Sir H. Willecock in the year 1838. As a plant, this rose makes an attractive sight when in bloom. It blossoms, however, but once in early summer, and the flowers are small and not suitable for cutting—good reasons for a limited popularity. For all



The Lyon Rose, in vase, another rose of the race of Austrian Hybrids.
Mde. Segond Weber on the table.

these years since its introduction it has just existed, but after sixty-two years of life it justified its right to our regard and respect by becoming the parent "par excellence" of a new race. Why so? Well the virtues of "Persian Yellow" are handed on to the offspring, but none of the faults. As Mr. Dickson says: "Did M. Pernet-Ducher, when he crossed Antoine Ducher and Persian Yellow, with all his skill and experience anticipate anything so beautiful as the Lyons Rose or Rayon d'Or, as possible consequences?"

The other parent was a rose now no longer listed named Antoine Ducher. To quote what has been written elsewhere with regard to this cross:—

“Some fifteen years ago, in a garden not far from the shores of the Mediterranean, Persian Yellow was presented with a bride, with complexion passing fair, in the person of Antoine Ducher. What hopes those seedlings raised in the hybridist’s heart. With what pleasure he sent out the first offspring of this union, Soleil d’Or, in 1900. This, a rose destined to make history, was clothed



A Rose belonging to the new race of Austrian Hybrids or Pernetianas—Juliet—colour, old gold, inside of petals rich red.

in brilliant green foliage, whose fragrance of pineapple charmed everyone. The blooms, orange, red, and yellow, are rather flat, and not of a very good shape, but still very charming. In those days, exhibition roses were much sought after, and not being suitable for this purpose, Soleil d’Or did not create a great sensation, but interested the few. It was, however, the first of a new race, upon which the raiser went quietly working; and so the years rolled on.

“Six years later it was rumoured in England that the finest rose ever known was coming to England. Who will forget the amazement its first appear-

ance caused among the English nurserymen at that April meeting of the Royal Horticultural Society? Again, how it charmed the visitors to the Franco-British Exhibition of 1908. So, too, the Lyons rose, the pride of the race, offspring of Mme. Melanic Soupert and Soleil d'Or, in the same way as its ancestor, travelled into gardens through the length and breadth of the land."

Our knowledge of the origin and history of some of the roses of fame produced last century is somewhat limited, but as our interest in roses becomes extended so our records become more complete and the possibility of producing finer and better plants greater.

GENEALOGICAL CHART showing the Supposed Origin of the Hybrid Perpetual and Hybrid Tea Roses.

Species.	Sub-species.	Hybrids.
Indica.	(Indica Sanguinea.	(Noisettes (1817.) Bourbons (1823.) } <i>Hybrid Teas</i> , 1890 Chinas. . . (1789.) } Teas . . . (1810-1824.) } <i>Hybrid Perpetuals</i> , Manetti. } <i>Hybrid Teas</i> , 1890.
Semperflorens.	(Indica odorata.	
Gallica.	(Damascena.	(York and Lancaster. Cabbage. } Four seasons. } Damask perpetual. . } Moss Roses. (Several distinct types) from 1840 to 1890.
	(Centifolia or Provence.	
	(Muscosa.	

Notes on the Parents of Some Modern Roses.

	Country of Origin.	Introduced about.
Ayrshire (<i>Rosa repens scandens-arvensis</i>). Parent of climbers, as Dundee Rambler.	Britain.	Unknown
Austrian Briar (<i>Rosa lutea</i>). Parent of Persian Yellow.	Europe.	1586
Bourbon (<i>Rosa bourboniana</i>). Part parent of Hybrid Perpetuals.	Bourbon.	1825
Chinese or Monthly (<i>Rosa indica chinensis</i>). Part parent of Hybrid Teas.	China or India.	1770
Damask (<i>Rosa damascena</i>). Part parent of Hybrid Perpetuals.	Syria.	1573
Gallica or French (<i>Rosa gallica</i>). Probably part parent of Hybrid Perpetuals.	France and Central Europe.	Unknown
Moss (<i>Rosa centifolia muscosa</i>). Parent of Moss roses.	Italy.	1735
Miniature Provence or Pompon (<i>Rosa centifolia</i>). Parent of Polyantha Pompons.	France and Britain.	1875
Noisette (<i>Rosa mosehata Noisettiana</i>). Parent of W. Allan Richardson, etc.	United States.	1817
Polyantha (<i>Rosa multiflora</i>). Parent of Crimson Rambler and polyantha types.	China and Japan.	1781
Provence or Cabbage (<i>Rosa centifolia</i>). Parent of Cabbage roses.	France.	1596
Rugosa or Japanese (<i>Rosa rugosa</i>). Part Parent of <i>Rosa rugosa</i> hybrids.	Japan.	1784
Tea Scented (<i>Rosa indica odorata</i>). Parent of Tea roses.	China.	1810-1824
Wichuriana (<i>Rosa Wichuriana</i>). Parent of Climbers like Dorothy Perkins.	Japan.	1887
Pernetiana or Austrian Hybrids. (See note on these roses).	France.	1900

THE IDEAL GARDEN ROSE.

Towards the end of last century the ideal rose was of a type grown for exhibition purposes. To-day the "Garden Rose" is the favourite type. The difference between the two types may be best explained by stating that in those days roses were grown very largely for exhibition purposes. To-day the requirements are for a rose which will answer both purposes if necessary, but which must succeed well as a garden rose. The exhibitor used the same or similar points to those used to-day in scoring his roses, but placed them in this order: (1) Form, (2) Colour, (3) Flowering habits, (4) Fragrance, (5) Constitution.

With the good garden rose to-day, constitution is placed first, and below are enumerated the points considered in estimating such a rose:—

1. *Constitution*.—The constitution of the plant must be vigorous in order to produce a large number of flowers of good quality. The plant should be free from insect pests and fungous diseases for the same reason.

2. *Flowering Habit*.—The plant should be a perpetual bloomer, that is producing a crop of flowers in the spring and another in the fall, and intermittingly during the summer. Such flowers should be preferably produced singly on good stout stems.

3. *Colour*.—The colour is largely a matter of personal taste, but the colour of an ideal rose should be one which will last for some days without fading, and should be rich and attractive, rather than dull.

4. *Fragrance*.—Fragrance in a garden rose is half the charm, and although from the exhibitor's point of view it is of secondary importance, it greatly enhances the value of the rose from the standpoint of the ordinary grower.

5. *Form*.—From the exhibitor's standpoint, the flowers must be first of all of ideal form, but from the standpoint of the ordinary grower form is not so important, some of the best roses not being quite so good in this respect as could be desired. Generally speaking, the flower of perfect form is one long and tapering with petals sufficiently independent of each other to give character and charm to the flower. The petals should also be of good substance so that the form is retained for several days.

HARDY ROSES TESTED AT OTTAWA.

There has been a rose garden at the Central Experimental Farm since 1891, and during the past twenty-three years a large number of varieties have been tested. Before removing the old plantation in the autumn of 1911, notes were taken on the varieties which had proved hardiest, and in the following table these and other notes are given. To define the degree and quality of perfume which these roses have, the x mark has been used, three x's being the highest degree of perfume, and one x the lowest, where there was any perfume. The rank indicates the relative general quality of the variety.

Name.	Planted.	Rank.	Colour.	Degree of Fragrance.	Remarks.
HYBRID PERPETUAL ROSES.					
A. Red and shades of Red—					
1 Abel Carriero.....	1899	Between 1st and 2nd.	Purple-crimson....	xx	
*2 Bessie Johnson.....	1896	Second.....	Red fading to mauve.	xx	
3 Baronne de Bonstetten ..	1894	First.	Blackish-crimson.	xxx	Bush of vigorous habit.
4 General Jacqueminot....	1897	Between 1st and 2nd.	Crimson-scarlet....	xx	Bush moderately vigorous
5 Pierre Notting.	1901	Between 1st and 2nd.	Deep-crimson.....	xx	A late rose.
6 Prince Camille de Rohan	1897	Second.....	Velvety crimson..	xx	
*7 Souvenir de Duchess....	1896	"	Blackish-crimson..	x	Moderately vigorous.
8 Thomas Mills.....	1894	"	Crimson.....	xx	
B. Pink and shades of Pink—					
*9 Baronne Prevost.....	1896	"	Deep rose-pink....	xx	Bush vigorous.
*10 Comtesse Cecile de Chabrilant.	1894	"	Deep pink.....	xx	
11 Comtesse d'Oxford.....	1894	"	Reddish-pink.....	xxx	
12 Caroline de Sansal.....	1894	"	Rose-pink.....	xx	
*13 Catherine Soupert.....	1899	First.....	Shell pink.....	xx	
*14 Louise Odier.....	1895	"	Good pink.....	x	Very free bloomer;
15 La Reine	1901	Second.....	Carmine pink.....	xx	Very open type.
*16 Madame Gomet.....	1896	"	Bright pink.....	xx	Very free bloomer.
*17 Madame Joly.....	1894	First.....	Medium pink.....	xx	Bush, vigorous; long season; flowers of good form.
18 Magna Charta.....	1897	"	Deep pink.....	x	Free bloomer.
19 Madame Gabriel Luizet....	1894	"	Coral rose.....	x	Long season.
20 Oakmont	1894	Second.....	Pink colour.....	x	Good bloomer.
21 Victor Verdier.....	1894	Between 1st and 2nd.	Carmine rose....	xx	
MISCELLANEOUS ROSES.					
Hybrid China—					
22 Madame Plantier (white)..	1897	First.....	Pure white.....	xx	Vigorous; free bloomer; one of the best white roses.
Moss Roses—					
23 Blanche Moreau.....	1894	First.....	White.....	xx	Free bloomer; very vigorous.
24 Perpetual White Moss....	1896	Second.....	"	xx	
25 Centifolia.....	1894	Between 1st and 2nd.	"	xx	Free bloomer; vigorous.
26 Glory of Mosses.....	1896	First.....	Red to mauve....	xx	Free bloomer.
27 Other Named Moss Roses..	1894	Second.....	Shades of pink and red.	xx	Ail vigorous.
Rugosa Roses—					
28 White and Red Rugosa....	1897 and later.	First.....	White and shades of pink and mauve	Both single and double form.
Hybrid Damask Rose—					
29 Madame Hardy (white)....	1894	Second.....	White fading pinkish.	x	Vigorous.
Rugosa Hybrids—					
30 Madame Geo. Brant....	1894	First.....	White.....	xx	Vigorous.
31 Madame Chas. Worth....	about 1897	"	Rosy carmine....	x	Vigorous.
32 Agnes Emily Carman.....	1894	"	Crimson red....	x	Very free bloomer.
33 Mary Arnott.....	about 1897	"	Carmine red....	x	Specially free bloomer; flowers in fine clusters.

The asterisk indicates that these roses are now no longer obtainable at most nurseries. In many cases their places have been taken by roses of better colour or better form. The Hybrid Tea roses, which in most cases are of superior colour, form, and length of blooming season, are also fast taking the place of many of these older Hybrid Perpetual roses.

The list of Hybrid Perpetuals which follows contains those roses which have been growing at the Farm for periods varying from five to ten years, and have up to the present shown satisfactory indications of hardiness and vigour, which are the two points of merit in which those in the first list showed the greatest superiority.

Hybrid Perpetual Roses (2).

Red and shades of Red—

- 34. Anna die Diesbach, carmine.
- 35. Duke of Connaught, velvety crimson.
- *36. Empress of India, light crimson.
- 37. Horace Vernet, velvety red.
- *38. King of Sweden, dark crimson.
- 39. Lady Helen Stewart, dark crimson.
- 40. Madame Victor Verdier, cherry red.
- 41. Marie Rady, brilliant red.
- 42. Reynolds Hole, rich maroon.
- 43. Ulrich Brunner, cherry crimson.

Pink and Shades of Pink—

- *44. Clara Cochet, deep pink to red.
- 45. Duchess de Morny, bright rose.
- 46. John Hopper, rose pink.
- 47. Merveille de Lyon, light pink, white centre.
- 48. Mrs. John Laing, clear pink.
- 49. Mrs. R. G. Sharman-Crawford, rose pink.
- 50. Paul Neyron, deep rose.

Miscellaneous Roses.

- 51. Sir Thomas Lipton, white Rugosa hybrid.
- 52. New Century, pink Rugosa hybrid.
- 53. Universal Favourite, rose climber (Wichuriana hybrid).
- 54. Lady Gay, pink climber.
- 55. Crimson Rambler, crimson climber.
- 56. Dorothy Perkins, bright pink climber.
- 57. Persian Yellow, yellow rose.
- 58. Harrison's Yellow, deep yellow.

