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Garden Roses  
Michigan State University Agricultural Experiment Station  
Special Bulletin  
C.E. Wildon, Horticulture  
Issued March 1937  
48 pages

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GARDEN ROSES

AGRICULTURAL EXPERIMENT STATION  
MICHIGAN STATE COLLEGE

OF

Agriculture and Applied Science

SECTION OF HORTICULTURE

East Lansing, Michigan

# INDEX

	Page		Page
Culture .....		<i>R. chinensis</i> .....	18, 23, 29, 31
Diseases .....	13-15	<i>R. chinensis fragrans</i> ...	29
Black spot .....	14	<i>R. chinensis minima</i> ...	31
Blossom blight.....	15	<i>R. chinensis semperflor-</i>	
Cankers .....	14	<i>ens</i> .....	23
Crown gall .....	15	<i>R. cinnamomea</i> .....	17, 22
Die-back and leaf-		<i>R. damascena</i> .....	17, 20, 27
bronzing .....	15	<i>R. dumetorum</i> .....	17, 22
General considerations	15	<i>R. elegantaria</i> .....	33
Mildew .....	13	<i>R. foetida</i> .....	17, 22, 36
Phyllosticta leaf spot	14	<i>R. gallica</i> .....	17, 20, 23, 27, 34
Rose Anthracnose ..	14	<i>R. heliophila</i> .....	3
Rose chlorosis .....	15	<i>R. hemisphaerica</i> .....	17, 22
Rust .....	14	<i>R. holosericea</i> ..see <i>R. gallica</i>	
Yellowing of leaves...	15	<i>R. hugonis</i> .....	3, 38
Insects .....	16-17	<i>R. humilis</i> .....	3
Aphids .....	16	<i>R. indica</i> .....	see <i>R. chinensis</i>
Army worms .....	16	<i>R. laevigata</i> .....	34
Borers .....	16	<i>R. Lawrenceana</i> .....	31
Bud-worms .....	16	<i>R. lutea</i> .....	36
Buffalo tree-hoppers..	17	<i>R. Manetti</i> .....	10, 11
Caterpillars .....	16	<i>R. melina</i> .....	3
Coiled Rose Worm...	16	<i>R. moschata</i> .....	17, 22, 31, 39
Cutworms .....	16	<i>R. moyesii</i> .....	34
Greenhouse Leaf-tyer.	16	<i>R. multiflora</i> .....	3, 11, 34-35
Green Rose Chafers...	16	<i>R. multiflora cathayen-</i>	
Leaf hoppers .....	16	<i>sis</i> .....	34
Loopers .....	16	<i>R. nitida</i> .....	3
Millipeds .....	17	<i>R. Noisettiana</i> .....	31
Pill bugs .....	17	<i>R. odorata</i> .....	
Red spider .....	16	<i>see R. chinensis fragrans</i>	
Rose chafers .....	16	<i>R. odorata gigantea</i> ...	31, 39
Rose curculio .....	16	<i>R. parvifolia</i> .....	20
Rose galls .....	16	<i>R. pendulina</i> .....	3, 17, 22
Rose leaf beetle .....	16	<i>R. polyantha</i> .....	35
Rose leaf-hopper .....	17	<i>R. polyanthos</i> .....	20
Rose leaf-roller .....	16	<i>R. pomifera</i> .....	17
Rose saw-fly .....	16	<i>R. portlandica</i> .....	22
Rose scale .....	16	<i>R. provincialis</i> .....	20
Rose slugs .....	16	<i>R. pyrenaica</i> .....	3
Rose stem girdler....	16	<i>R. Rouletti</i> .....	3, 31
Sow bugs .....	17	<i>R. rubra</i> .....	17
Thrips .....	16	<i>R. rubrifolia</i> .....	17
White grubs .....	17	<i>R. rubiginosa</i> .....	17, 22, 33
Location .....	4	<i>R. rugosa</i> .....	36
Planting .....	5-6	<i>R. rugosa repens alba</i> ..	3
Propagation .....	9-11	<i>R. sempervirens</i> .....	17, 22
Pruning .....	11-12	<i>R. Seraphinii</i> .....	3
Soil and its preparation	4-5	<i>R. setigera</i> .....	34, 38
Summer care .....	6-8	<i>R. spinosissima</i> .....	3, 17, 38
Suckers .....	6	<i>R. spinosissima altaica</i> ..	3, 38
Disbudding .....	6	<i>R. sylvatica</i> .....	17
Cut flowers .....	7	<i>R. tomentosa</i> .....	17
Feeding .....	7	<i>R. unguiculata</i> .....	20
Uses .....	3-4	<i>R. varians</i> .....	20
Winter protection .....	8	<i>R. Wichuraiana</i> .....	33, 34, 35
Historical .....	17, 22	<i>R. Xanthina</i> .....	3
Alba .....	26	Varieties .....	40-45
Athalia .....	36	Austrian Copper .....	36
Austrian brier hybrids.	3	Burgundy Rose .....	20
Ayrshire roses .....	23	Climbing Lambertianas.	34
Bourbon perpetuals ..	18	Climbing teas .....	31
Cabbage Roses .....	23, 25-27, 29	Damask perpetuals ..	
China hybrids .....	31	.....(See Portland	roses)
Climbing hybrid teas ..	20	Damask rose .....	20
<i>R. centifolia</i> .....	18, 29, 22-28	Doubleblooms .....	38
<i>R. centifolia cristata</i> ..	20	Eglantine .....	33
<i>R. centifolia muscosa</i> ..	20	Fairy roses .....	22, 31
<i>R. centifolia pomponia</i> ..	20	French rose .....	18, 22
		Gigantea hybrids .....	31, 39
		Gloire des Rosomanes.	24, 26
		Harrison's Yellow .....	36
		Hugonis hybrids .....	38
		Hybrid Austrian briers.	36
		Hybrid Bourbons .....	23, 26
		Hybrid chinas .....	23, 25-26, 29
		Hybrid damask .....	22
		Hybrid damask perpet-	
		uals .....	22, 27
		Hybrid gigantea .....	31, 39
		Hybrid hugonis .....	38
		Hybrid luteas .....	36
		Hybrid multifloras .....	34-35, 43
		Hybrid musk roses .....	31
		Hybrid Nabonnand gi-	
		ganteas .....	39
		Hybrid Noisettes .....	31, 35
		Hybrid perpetuals .....	25-29, 41
		Hybrid portland .....	22, 26
		Hybrid rugosas .....	36, 42
		Hybrid sweet briers .....	33
		Hybrid teas .....	29, 40
		Hybrid Wichuraianas ..	33-34, 43
		Lawrenceana roses .....	31
		Lutea hybrids .....	36
		Maiden Blush .....	22
		Malton .....	26
		Moss roses .....	20
		Multiflora hybrids .....	34, 35, 43
		Nabonnand hybrid gi-	
		ganteas .....	39
		Noisette hybrids .....	31, 35
		Pemberton roses .....	31
		Pernetianas .....	36, 41
		Persian Yellow .....	36
		Polyanthas .....	22, 35, 42
		Pompon roses .....	21-22
		Portland roses .....	25
		Prairie roses .....	38
		Provence rose, see Cab-	
		bage roses .....	20
		Provins roses .....	17, 20
		Rambler roses .....	34
		Remontants .....	25-29, 41
		Rose de Meaux .....	20
		Rose du Roi .....	25
		Rose Edward .....	23
		Rugosa hybrids .....	36, 42
		Scotch Roses .....	38
		Sweet brier hybrids .....	33
		Teas .....	29
		Tender climbers .....	31
		The Four Seasons rose	25
		Tom Thumb .....	31
		Wichuraiana hybrids ..	33, 34, 43
		Species .....	
		<i>R. agrestis</i> .....	17
		<i>R. alba</i> .....	17, 22, 27
		<i>R. arvensis</i> .....	17, 18
		<i>R. belgica</i> .....	17, 20
		<i>R. biferia</i> .....	20
		<i>R. blanda</i> .....	17
		<i>R. borbonica</i> .....	23
		<i>R. calendarum</i> .....	20
		<i>R. canina</i> .....	11, 17, 22
		<i>R. carolina</i> .....	3
		<i>R. caryophyllica</i> .....	20
		<i>R. coriifolia</i> .....	17
		Other .....	47

# GARDEN ROSES\*

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By C. E. WILDON

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Since the days of Solomon the rose has appeared in gardens, folklore, painting, and literature. Its appeal has been nearly universal and its use almost as wide. It has graced the choicest garden and the humblest cottage.

## USES

The widespread use of the rose has been due not only to the admirable qualities of the rose as a flower and plant, but also to the multiplicity of types available, some one of which is suitable to almost any situation or use. Conversely, the multiplicity of forms has led to much haphazard planting, failing to utilize the right kind for a given situation or to utilize the right situation for a given kind.

The bush roses, valuable as cut flowers, represented by the Hybrid Perpetuals, Hybrid Teas, Pernetianas and similar classes, are pre-eminently useful for growing in beds by themselves, or as the main feature of a rose garden. They should not be used in the shrub border or in informal planting. Some Bourbon Perpetuals, Fairy roses and others may be employed for bedding purposes. Climbing roses may be used in the rose garden to form the boundary of the garden and for covering arches or trained to roof over walks. In columnar form, they may be used for accent points throughout the garden.

Some roses are valuable in the landscape for other purposes than the rose garden. Rugosa roses, Prairie roses, Scotch roses, Sweetbriars and many species such as *R. Hugonis*, *R. multiflora*, *R. xanthina*, and the native *R. carolina*, *R. nitida* and *R. humilis*, are useful in the shrubbery border. The Rugosa and Ayrshire roses are specially suitable for hedges. The Hybrid Wichuraiana, Hybrid Multiflora and Prairie roses are valuable for covering rocky or unsightly banks or for covering walls, fences, railroad embankments, or planting along country roads. The Climbers and Pillar roses are useful for training on trellises, pergolas, arbors, garden arches, and fences and as screens or for covering unsightly objects. The Polyantha roses are useful for bedding and for massing in groups in front of the shrubbery border. They also may be used for corner planting at the intersection of walks and drives, as well as for park strip planting along roads. In the rock garden *Rosa rugosa repens alba*, Max Graf, *R. nitida*, *R. spinosissima*, *R. spinosissima altaica*, *R. melina*, *R. heliophila*, *R. Seraphinii*, Viv., *R. pendulina*, and *R. pendulina pyrenaica* may be used. Many dwarf horticultural varieties, as White Pet and Rouletti, will also be found useful for this purpose.

\*The cover design shows the Michigan or Prairie Rose (*Rosa setigera*).

As a cut flower the rose is unsurpassed. Nearly all roses are useful for cut flowers, but the best for this purpose are the Pernetianas, Hybrid Teas, Hybrid Perpetuals, Moss, Tea, and some Polyantha roses. For cut flower purposes, they may be grown in the formal rose garden or in rows in the open. Some of the most useful varieties in each of the classes just named are listed at the back of this publication.

### LOCATION

The site for the rose garden should be selected carefully. A gentle slope to the south or southeast is best and protection from the strong winter winds is beneficial. Proximity to trees, or large shrubs should be avoided, since their roots compete with those of the rose, depriving the latter of moisture and nutrients. Where it is impossible to have a rose garden free from the encroachment of tree roots, it may be advisable to construct an underground wall of cement to keep the tree roots out of the rose garden. However, roses planted close against a wall or building are likely to suffer from the additional reflected heat.

If only a few bush roses are to be grown, they should be planted in borders along the walks or in the garden away from the house. If climbers are to be grown against a building, they should be planted and trained on trellises as far as possible from the walls.

### SOIL AND ITS PREPARATION

Roses require large amounts of plant nutrients. They thrive in a rich, fairly heavy soil. A clay loam or heavy garden loam which holds its fertility and will not dry out rapidly is best for most roses. A soil of this sort can be modified readily to suit the needs of particular kinds. The Teas, Hybrid Teas, and Pernetianas often do better on lighter soils. Proper conditions for these may be obtained by the addition of a sufficient quantity of sand.

A considerable amount of moisture is necessary for roses, though they do not want a water soaked soil. A good clay subsoil is ideal, provided that surface moisture is drained off quickly and readily. Where surface moisture does not drain off readily, it may be necessary to lay tile drains.

Beds in which roses are to be planted should be dug to a depth of two or three feet. If the soil excavated is good, it may be used for throwing back into the bed, incorporating with it one-third well rotted manure and a liberal amount of ground bone. If the soil is poor, fibrous turf taken from heavy loam soil, chopped well and mixed with one-third well rotted manure with some ground bone added may be used to replace the original soil. A bed prepared in this way will last for years.

In some cases, the only soil available is so sandy as to be particularly subject to excessive leaching of water and nutrients. This condition necessitates frequent watering and replenishment of nutrients. Since this is likely to prove rather unsatisfactory, a better course is to prevent some of this leaching by special care when the bed is established.

Before the excavation is filled, the bottom and one-half to two-thirds of the sides may be lined with puddled clay. This lining retards leaching.

The width of rose beds varies, naturally, with the requirements of the given situation. Generally, greatest satisfaction will be obtained where the beds are made only wide enough for two rows of plants or at most three rows planted "stagger" fashion.

### PLANTING

Immediately upon the receipt of plants, they should be unpacked. If the branches appear somewhat dry and lack the lively, bright shining appearance characterizing plants in good condition, the plants should

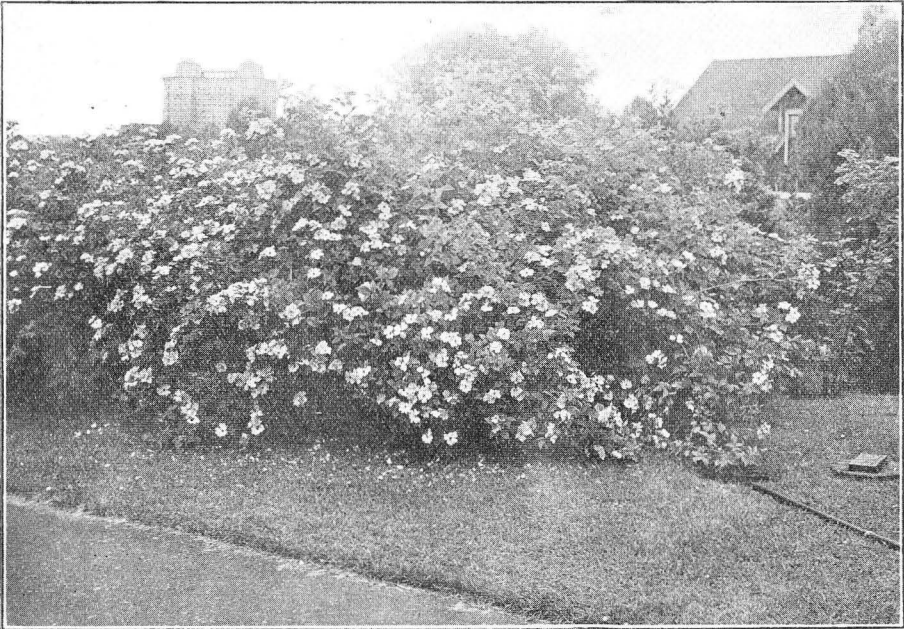


Fig. 1.—The Michigan or Prairie Rose used as a border shrub.

be stood upright in water, in a shady spot, for a few hours. Since the plants must develop new roots before they can obtain an appreciable amount of moisture from the soil, any device that retards drying out of the tops is beneficial. Shading for a few days may be helpful. Perhaps the best device is coating the tops with paraffin. This is done rather easily by dipping them quickly into a pail of water heated to from 170° to 190° F. on which is floating a layer of melted paraffin.\* If the plants are not to be planted at once, they should be buried com-

\*A better material is one made up of 4 parts paraffin wax, 1 part resin and 1 part beeswax.

pletely in soil for a few days or until planted. Such treatment will usually give fine results, and plants that may have been partially dried out will be quickly revived.

Opinions differ as to the proper time of planting. Probably, under Michigan conditions, spring is the best season, provided the plants have been treated as described. Certainly, planting at this time will eliminate loss from winter-killing which often is rather heavy in fall-planted stocks, particularly with Hybrid Teas and other less hardy varieties. If for any reason fall planting must be done, a mound of earth with a mulch of straw or leaves, drawn up so as partly to cover the top of the plant, goes far to prevent injury from the ensuing cold weather.

Proper planting distances vary with different varieties. In general, the Hybrid Teas may be spaced closer than other kinds. The least vigorous Hybrid Teas do well 20 inches or less apart, while the most vigorous will need at least two and one-half feet. Most of the Hybrid Perpetuals need two and one-half feet spacing. The Polyanthas will, for the most part, require two to two and one-half feet. The Rugosa group should be allowed at least four to five feet, while the Hybrid Wichuraianas and Multifloras require six to eight feet or more.

For planting, the hole should be deep enough so that the plant may be set with the base of the branches level with the surface of the soil. The roots should be spread out evenly in the hole, the soil filled in around them and carefully firmed in place. Thorough watering should follow planting.

Newly planted roses should be severely pruned to leave not more than five or six canes and these cut back to four or five inches from the ground. This cuts down the amount of plant tissue for which the roots must furnish moisture and results in stimulating vigorous growth sooner.

After planting, a mulch of well rotted manure, leaf mold, or peat will greatly aid in conserving moisture.

## SUMMER CARE

Roses should be cultivated regularly to destroy weeds and to aerate the soil. During dry periods, occasional thorough watering is advisable. This watering should be such as to soak the soil deeply and not a surface sprinkling.

Many roses are grafted on stocks of other stronger-growing varieties. Frequently, these stocks send up sprouts. In the course of time, these sprouts or suckers are likely to starve, crowd out, and replace the better flowering variety. They should, therefore, be removed before they have made any considerable growth. Cutting the suckers at the surface of the soil is merely a temporary measure, for the subterranean portion of the sucker sends out several new shoots. Permanent relief can be secured only by removing the sucker at the point where it emerges from the main root. If the plants are well established this can be done by a quick sharp pull.

Particularly fine flowers for cutting may be obtained by disbudding. This consists in removing all flower buds except the central terminal ones as soon as they are large enough to "rub out."

The flowers are best cut in the early morning before the petals start to unfold. Stems should be cut at a point two buds above the point where they branch from the main stem. Plunge the stems immediately into cold water and keep in a cool room for two or three hours before using them.

Feeding of roses should not be practiced until at least six weeks after they were planted. The materials and the amount of feeding to give best results are largely determined by existing soil conditions. Occasional applications of small amounts of nitrogenous fertilizers such as ammonium sulfate, nitrate of soda, calcium nitrate, or ammonium

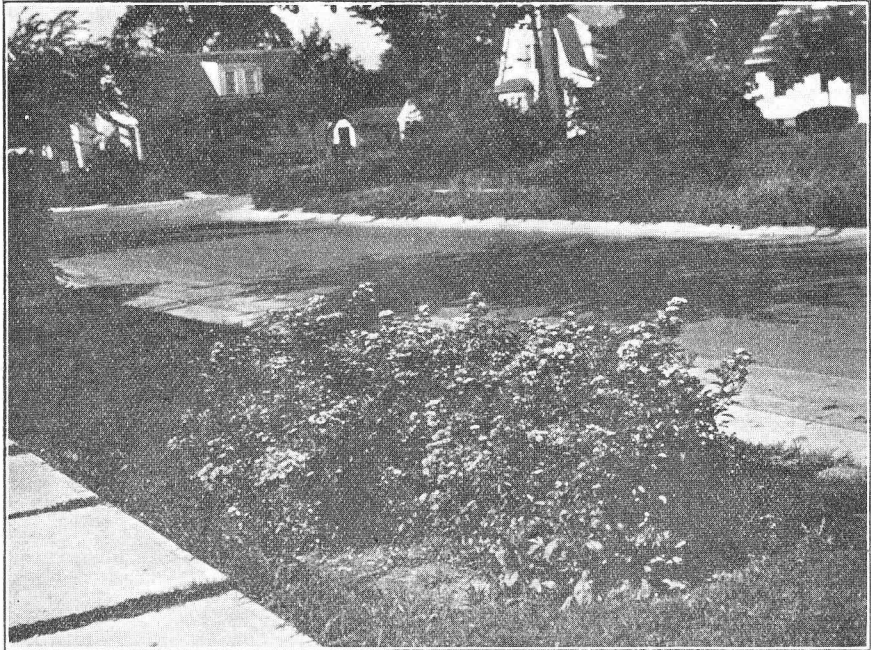


Fig. 2.—Polyantha Roses are useful for planting in the park strips along streets.

phosphate at the rate of one pound per 100 sq. ft., or less, scattered evenly over the soil between the plants, will often serve to stimulate vigorous growth. However, it is not advisable to apply these late in the season.

Flower production may sometimes be stimulated by applications of phosphate as superphosphate or basic slag at the rate of three to five pounds per 100 sq. ft. Weakness of stems appears sometimes to be remedied by an application of wood ashes at the rate of three pounds per 100 sq. ft., or muriate of potash or sulfate of potash at the rate of one pound per 100 sq. ft. All of these materials should be cultivated well into the soil immediately after applying. Applications of liquid cow manure may also be beneficial as will occasional applications of pulverized sheep manure or similarly prepared animal manures. Feed



only enough to keep the plants in good growing condition. If the soil becomes very acid, a light application of lime (one to two pounds per 100 sq. ft.), will usually correct the condition.

Excess of lime or of mineral fertilizers causes burning of the foliage, though other things may cause leaf disorders which are sometimes confused with burning. Excess of lime may be corrected by sprinkling a little alum on the soil and watering heavily and excess of mineral fertilizers may be minimized by heavy watering. Extreme acidity and extreme alkalinity are both to be avoided, soil condition in this respect may be determined by the Soiltext method. The soil should be close to neutral in reaction.

Old established plants should receive a little complete fertilizer each spring. Individual conditions vary, but a 4-16-4 fertilizer applied at the rate of three to five pounds per 100 sq. ft. suits average conditions. Sandy or other very porous soils might need larger amounts, but generally the response of the plants will show whether more or less should be used.

If the plants are mulched through the winter, the residue worked into the top soil in early spring usually suffices to maintain a supply of organic material.

### WINTER PROTECTION

Under Michigan conditions, bush roses such as the Hybrid Teas and other more or less tender roses should be given protection as a matter of caution. It is advisable to mound soil up around each plant to the depth of six or eight inches or more. This will protect the base of the plant and if the branches are killed back to the soil there is still sufficient wood left to allow the plants a good start in the spring. The mounding up of the soil should be delayed until just before freezing weather sets in. After the plants have been mounded up and freezing weather has set in, mulch the whole bed with a layer of manure, straw, peat, leaf-mold, or some similar material to a depth of two to four inches. Bushy oak branches or branches of evergreens stuck upright into the soil between the plants or laid on the ground around the plants will serve to break the force of cold, drying winds and offer a measure of protection against drying out. In place of branches, a piece of burlap or strong weather-proof paper wrapped loosely around each plant protects the plants from drying out.

In bringing the less hardy varieties of roses safely through the winter, very much depends on weather conditions. Should the fall be particularly favorable to growth the plants make considerable soft growth and winter finds the wood not sufficiently ripened. Insufficient moisture in late winter and early spring is very often the cause of death of rose plants. As a precaution, the soil should be examined in early March and if it is found to be in a dry condition, the plants should be examined carefully. Should the stems show the least sign of drying up, water the soil thoroughly. Climbers may be protected either by wrapping the canes in burlap or by laying the canes down on the ground and covering them with soil, leaves, burlap, straw, or similar material after freezing weather has set in.

Mulching for winter protection of all roses is best done after the ground has frozen as there is then less danger from mice.

### PROPAGATION

New varieties of roses are obtained by seeds or occasionally by "sports" from existing varieties. All true species can readily be reproduced from seeds, but most named varieties must be propagated vegetatively. Many kinds may be increased by dividing the old plants or by cutting off rooted branches or suckers in the early spring and immediately planting these. This method, however, cannot be used on grafted or budded plants.

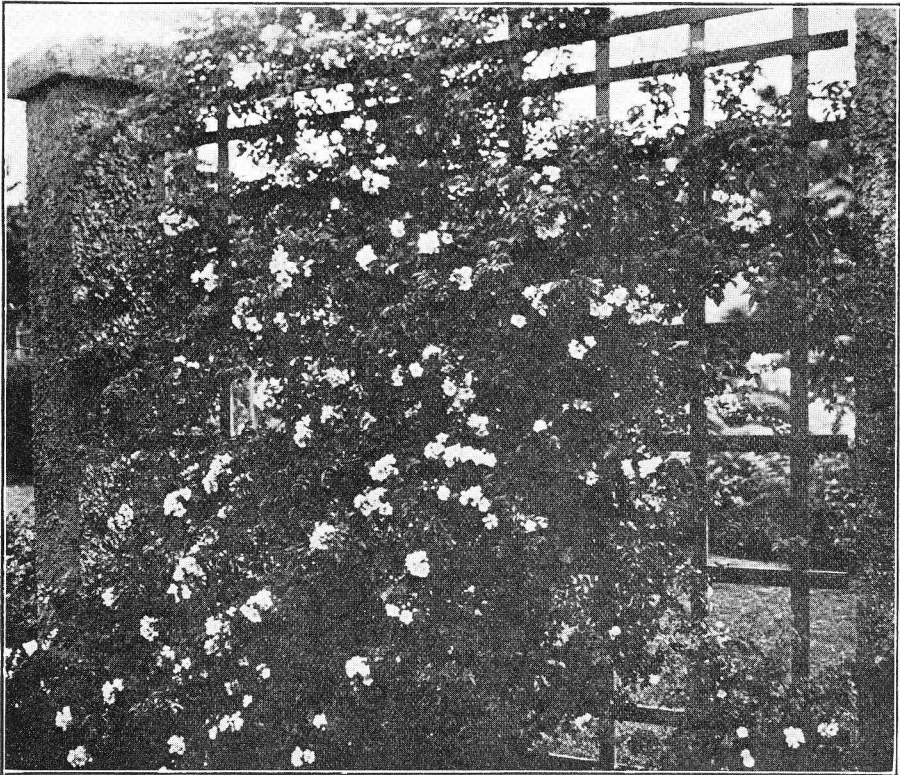


Fig. 3.—Hybrid Wichuraiana Roses are suitable for training over trellises and fences.

The obtaining of plants by means of simple layers is a very easy method for the amateur. Select a long slender branch and carefully arch it over to the ground. A foot or more from the end of the branch, where it touches the ground, cut a chip out of the stem on the under side. Peg the branch securely to the ground and cover over with soil. Place a stone on top of the soil to aid in keeping the branch in place and to help keep the soil moist. The work may be done any time through the summer. The following spring, the rooted branch may be cut from the parent plant and planted in its permanent location.

A comparatively simple method of increasing many roses is by means of dormant wood cuttings made in the late fall or early winter. Most of the climbing roses of the Hybrid Wichuraiana and Multiflora groups, Hybrid Perpetuals, Polyanthas, some Hybrid Teas, and some others may be readily propagated by this method. The method consists, briefly, in cutting wood of the past summers growth into lengths of six to eight inches so that there will be two or three buds to each cutting.

The cuttings may then be handled in either one of two ways. They may be planted immediately in sandy loam in a cold frame, making certain that the bottom end of the cutting goes into the soil. If one is uncertain as to which is the bottom end, examination of the leaf-scars which appear on the under side of the buds will quickly indicate the proper end. In the spring, the cuttings will be found to be rooted about the time growth starts and may then be transplanted to their permanent positions. The second method is to pack the cuttings in sand or sandy loam and store them in a cold place until spring. By this time, they will have developed callus and may be planted out where they can be watered until a root system is well established. The following spring they may be planted in a permanent location. Varieties that do not root by this method may be propagated by cuttings of hardened green wood. The condition of the wood is best described as being intermediate between soft wood and hard wood. The cuttings are made with three eyes or buds, the lower cut being made just below the lowest bud and the top cut just above the uppermost. Shoots with flower buds just about to open make ideal wood for this type of cutting. A number of cuttings can be made from each shoot. The cuttings are planted in sand in a hotbed with a little bottom heat. The bed may be prepared by digging out to a depth of 18 inches. A foot of fresh horse manure or leaves, firmly compacted, will give sufficient bottom heat. Over this place a layer of six to eight inches of well compacted sand in which the cuttings may be planted. Protect the cuttings from sun and drafts by covering with a frame made of cheese cloth or unbleached cotton and spray the cuttings with water two or three times a day. After the cuttings are rooted, which will be in six or eight weeks, they may be transplanted to the garden.

Commercially, roses are largely propagated by means of grafting and budding. Some varieties are thought to be better when so propagated. The home gardener has but little of the equipment necessary for satisfactorily practicing these methods, however, and if he wishes grafted plants he should purchase them.

For years, the question of whether budded, grafted, or own-root plants are best, has been argued pro and con without any mutual and general acceptance of any decision as to which is best. However, there is no doubt but that many roses are fully as satisfactory on their own roots as either grafted or budded. The climbing roses, Polyanthas, Hybrid Rugosas, and similar roses are fully as good, if not better, on their own roots. The same may be said to be true of many Hybrid Perpetual, Hybrid Tea and Tea roses. Weak growing kinds are often benefitted by growing them on a more vigorous stock. The stock upon which your rose may have been grafted depends very much upon where your rose came from. Most greenhouse roses are grafted on Manetti, unless, of course they happen to be on their own roots, and some are budded or grafted on Odorata. In the East, hardy roses are most commonly

budded on Multiflora; while, on the West Coast, Ragged Robin (Gloire des Rosomanes) and Manetti (*R. chinensis Manetti*) largely are used.

Probably, Multiflora\* is best for Hybrid Teas and Teas for Michigan conditions, although possibly Dog Rose (*R. canina*) would prove better in very cold sections. *R. canina*, however, suckers badly. In Europe old plants of *R. canina* are used for standards. In England, *R. rubiginosa* is used for the same purpose. It has the same defects and qualities as *R. canina*. For the Hybrid Perpetuals, the consensus of opinion seems to favor Manetti as a stock.

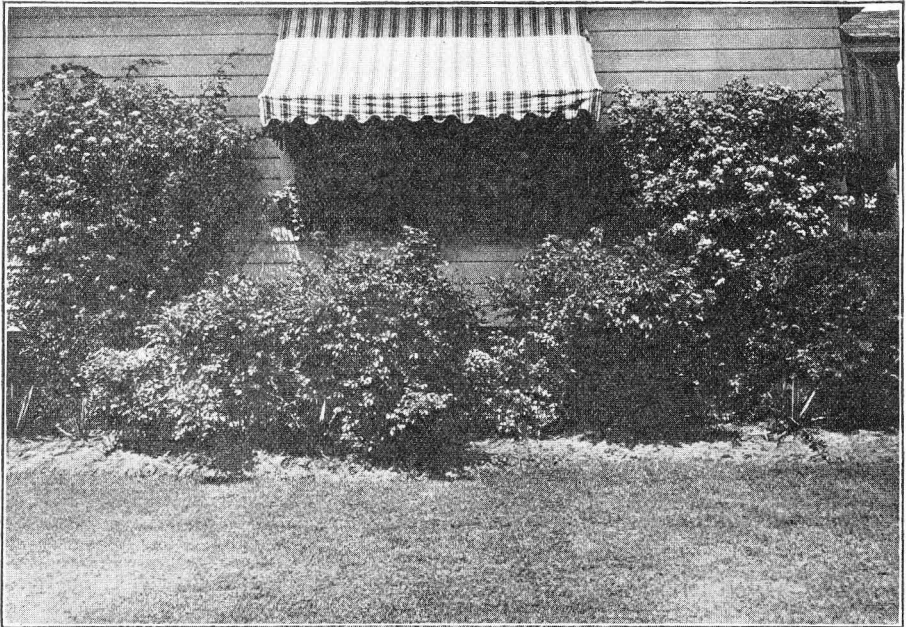


Fig. 4.—A foundation planting of roses. Climbing Wichuraianas are used on the trellises and Rugosas and Polyanthas in front.

## PRUNING

Bush roses with long slender branches should be pruned back about one-third in the fall. This fall pruning is for the purpose of diminishing injury due to the whipping back and forth of the branches. The pruning of all roses should be done in the early spring just before the buds expand. Since the various kinds differ in their characteristics and uses, details of pruning differ as indicated below.

**Teas and Hybrid Chinas, or Bengals**—Prune winter killed leaders to healthy wood. Cut out dead and weak wood.

\*Thunberg's multiflora.

**Hybrid Teas**—The amount of pruning should be governed by the object in view. Severe pruning decreases the number of flowers secured in the early part of the season, but improves their size and quality. Light pruning consists in cutting the leaders back about one-half; severe pruning leaves only two or three buds on each shoot. In Michigan, these roses will usually require severe pruning due to winter-killing. Dead and weak branches or leaders should be removed.

**Hybrid Perpetuals, Bourbons, Provence, Moss**—Prune out dead and weak shoots, leaving three to five of the strongest. Light pruning consists in cutting the shoots back one-third to one-half. Heavy pruning will cut back to about eight inches from the ground.

**Hybrid Pernetianas**—Basically the pruning required is the same as that given to Hybrid Teas. The pronounced pithiness of the wood, however, makes less severe pruning advisable and some growers prune these roses very lightly.

**Austrian Briers**—Flowers of the original varieties, such as Austrian Copper, Harrison Yellow, and Persian Yellow but not including the Pernetiana or Lutea Hybrids, are produced from buds on wood that is two or more years old. It is, therefore, the side branches upon which the flowers appear. Pruning of the nature given the Hybrid Teas, therefore, would remove most of the flower buds. With this class, removal of dead wood and judicious thinning as may be needed is the best treatment. They are best pruned after the flowering period. Shorten the flowering branches in midsummer.

**Polyanthas**—Remove weak, unhealthy, and dead wood and very old wood. No heading back is required except in the case of an occasional long leader.

**Rugosas, Hybrid Rugosas, Sweetbriers, etc.**—Prune out dead, weak, and unhealthy wood. Unshapely or too vigorous leaders may be cut out entirely or may be headed back to give the proper shape.

**Hybrid Noisettes**—Prune laterals to two or three buds. Prune out old canes occasionally in such a way as to allow new young canes to take their places.

**Hybrid Wichuraianas, Multifloras**—Shorten shoots that are too vigorous. Cut laterals back to two buds. Remove dead, diseased, and weak canes and leaders more than two years old. Removal of the old leaders may be deferred until after flowering, if desirable.

**Species Not Otherwise Mentioned**—Prune as for the Hybrid Rugosas.

In pruning back branches and leaders of all roses, make the cut, when possible, just above a bud that points outward from the center of the plant. Prune weak growth the hardest. When pruning roses, always keep in mind the desired final shape of the bush. Occasionally it may be necessary to leave wood that otherwise should be cut out in order to retain a well shaped bush. Such details can not be covered by any set procedure, as much depends on good judgment. Generally speaking, weak growths are undesirable and if removed will usually be replaced by more vigorous growths. Newly planted roses should be pruned back promptly and severely.

## DISEASES

The rose is affected by a number of diseases. Some of these diseases can be avoided or overcome by keeping the plants vigorous through weeding, cultivating the soil, feeding, and watering. See that the plants do not lack a sufficient supply of proper plant nutrients. Clean off and burn old leaves that may accumulate about the plants as these may

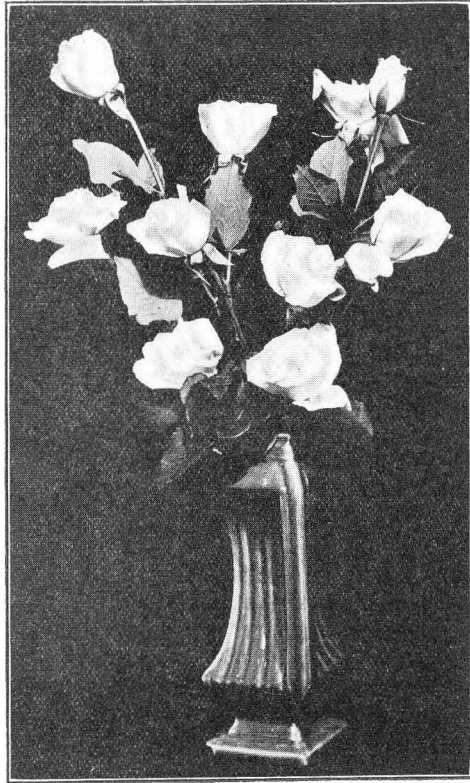


Fig. 5.—Blooms of a Hybrid Tea variety—  
Mme. Butterfly—used for cut flowers.

harbor disease organisms. Cut off and burn cankers that may develop. Finally, control insect pests which may carry or spread diseases, and keep plants in a good vigorous growing condition.

**Mildew**—This disease is observed as a greyish covering on leaves, stems and buds. It is likely to occur where roses are planted too closely together or during warm, moist weather. Since germination of the spores causing this disease requires several hours of moisture, the foliage should not be wet late in the day when it cannot dry before nightfall. The disease is easily controlled by dusting with fine dusting

sulphur. Mixing one part of dry arsenate of lead with nine parts of the sulphur permits more uniform and more effective distribution of the dust on the plants. Spraying with sulphur sprays such as wettable sulphur or colloidal sulphur, is equally effective. The applications should be started early in spring and repeated frequently.

Washing soda, soda ash, or sodium carbonate, is another effective remedy. This material must be used carefully, as too strong a solution will burn the foliage and too weak a solution will not be effective. The amount is governed by the state of the material used. If the dry sodium carbonate is used, mix not more than three-fourths ounce to two gallons of water. If the crystalline sodium bicarbonate is used, mix at the rate of one and one-half ounces per two gallons of water. Use as a spray with pressure.

**Black Spot or Leaf Blotch**—This disease produces round or irregular black spots on the leaf. The leaf then turns yellow and drops off the plant. Sulphur offers a means of control as in the case of rose mildew.

Ammoniacal copper carbonate is also effective, but it is more difficult to prepare. Dissolve two ounces of copper carbonate in a little ammonia in a glass container. Add water enough to make two gallons of solution. Use as a spray.

An old fashioned remedy that is often effective against both black spot and mildew is a spray solution of potassium sulphide. Mix the material at the rate of one ounce to three gallons of water. The material should be mixed up fresh each time. Rake up and burn old leaves in the fall.

**Rose Anthracnose\***—Attacks leaves, stems, and flowers. Appears on leaves as small circular blackish spots which may coalesce. Lesions on stems and flowers are smaller. Spray with bordeaux. A dormant spray of lime-sulphur just before growth starts in the spring is also recommended.

**Rust**—Appears as small orange colored pustules. In the fall, black pustules appear. Pick off and destroy diseased leaves. Spray with Bordeaux mixture, 4-4-50, to check the spread of the disease. To make this spray, dissolve 2½ ounces of copper sulfate in a pail with a gallon of water and 2½ ounces of hydrated lime in another pail with a gallon of water. Pour the two together into a sprayer and stir vigorously. Do not syringe foliage with water when this disease is prevalent. The disease is serious wherever it appears.

Another method of control recommended† is "a dormant spray of lime sulphur 1-9, severe spring pruning, and weekly applications of dusting sulphur during the growing season". Rake up and burn dead leaves.

**Phyllosticta Leaf Spot**, as well as other leaf spots, may be controlled in the same way as mildew or black spot.

**Cankers**—(Stem Canker, Brown Canker, Brand Canker.) Spray with Bordeaux. Cut off and burn diseased portions. Disinfect knife or pruning shears after each cut is made. A good disinfecting solution can be

\*Rose Anthracnose caused by *Sphaceloma*.—A. E. Jenkins. Jour. Agr. Res. 45 (6): 321-337. 1932.

†R. P. White—N. J. Agr. Exp. Sta. Cir. Bul. 226. 1931.

made by mixing one-half ounce of 40 per cent formalin in a gallon of water. Do not allow this solution to get on your hands. A dormant spray of lime sulphur (1-9) is also recommended for brown canker and cane canker.

**Crown Gall**—This appears as a large gall or woody swelling, usually at or near the surface of the soil, though occasionally on other parts of the plant. No cure is known and the disease may be spread. Affected plants should be destroyed and the tools used sterilized with 40 per cent formalin, as the disease may be carried from one plant to another through open wounds.

**Blossom Blight**—Appears as a browning and blasting of buds or partly opened flowers. Cut off and destroy diseased flowers with five or six inches of the stem. Spray with a good fungicide. Ammoniacal copper carbonate is recommended as a spray.

**Yellowing of the Leaves, Rose Chlorosis, etc.**—Several things may produce yellowing, though the details of the appearance differ. Excessive moisture in the soil will cause yellowing of the leaves. Sometimes yellowing of leaves follows infection by certain fungi and precedes leaf-fall. In this case, spraying with a fungicide is the remedy. Excess of lime is likely to produce yellowing of leaves. The remedy for this has been given, page 8. Another type of yellowing takes the form of more or less sharply defined, irregular mottling and is called Rose Chlorosis. It is apparently spread by grafting or budding and not otherwise. It may weaken, but rarely destroys outdoor roses and is observable only at certain times of the year. There is at present no known remedy except to avoid propagating affected plants.

**Die-back and Leaf-bronzing**—Die-back describes a condition in which the branches, after making some growth, die back from the tip. Sometimes this is accompanied by a bronzing of the leaves, but bronzing may occur also without the appearance of die-back. The bronzing appears as a reddish brown, bronze, or purplish coloration in the leaves. The affected leaves also appear unnaturally shining. The trouble appears to be in the soil. It may be due to overfeeding or may be due to excess of lime in the soil. Die-back may also be caused by brown canker.

**General Considerations**—A fungicide, to be thoroughly effective, must be applied before the fungus has infected the rose plant. Applications made after the disease is evident do not kill existing infections, but prevent new infections and may be very valuable on that account. Many of the diseases caused by fungi vary in their virulence and in date of their appearance from year to year, according to the weather, some being more prevalent in warm, humid seasons. Consequently, certain diseases may be prevalent one year and of very minor importance in the next, or they may be chronic in one location and appear only occasionally in another. Furthermore, the various kinds of roses differ in their susceptibility. For these reasons a thoroughly dependable, dated calendar of applications cannot be given. It is possible, however, to use a good fungicide regularly, on the principle of insurance, without waiting for evidence of disease and make supplemental applications as occasion warrants.



## INSECTS\*

Roses are attacked by a number of insects. Methods of control vary with the feeding habit of the insects.

**Aphids or Plant Lice, Thrips, Leaf-hoppers, and Similar Insects**—These may be controlled by spraying with nicotine sulfate, pyrethrum compounds, derris compounds, or soap solutions.

**Red Spider**—This pest is best controlled by syringing the plants with water under pressure or by dusting or spraying with sulphur, as for mildew.

**Rose Chafers† or Rose Bugs, Green Rose Chafer, Rose Slugs, Rose Leaf Beetle, Rose Curculio, Coiled Rose Worm, etc.**—These may be controlled by spraying with arsenate of lead sweetened with cheap molasses. Rose Slugs may also be controlled with nicotine sulfate, or pyrethrum compounds. Skeletonized foliage is usually due to Rose Slugs.

**Rose Scale and Other Scales**—Spray the plants while dormant, with lime sulphur at the rate of one gallon to eight gallons of water. A dormant-season oil emulsion spray is equally effective.

**Rose Galls**—Galls occurring on stems, leaves, or roots are caused by the presence of certain very small insects. These galls are differentiated from the galls discussed under diseases by the presence of the larvae or by the holes through which they emerge. The only method of control is to cut off and burn the infested portions. They are usually held in check by natural enemies.

**Rose Stem Girdler‡**—This is a beetle which lays its eggs on the bark of the stems. The larvae hatching from these eggs enter the wood and work their way spirally around the stems. The result is a swelling of the stems directly over the tunnels. Since the larvae pupate in the central pith, the method of control is to cut off and burn infested portions as soon as noticed.

**Borers**—The Two-spotted Oberea, or Raspberry Cane-borer, is commonly found boring in the canes of blackberry and raspberry, but also attacks roses. The Burdock Borer attacks roses. Cut off and burn infested branches or cut out and destroy the borers.

**Cutworms, Budworms, Loopers, Army Worms, Rose Saw-fly, and Caterpillars of Various Kinds**—May be found feeding on roses. These may be controlled by spraying thoroughly with arsenate of lead.

**Rose Leaf-roller, Greenhouse Leaf-tyer**—These are small caterpillars distinguished by the fact that they roll or fold and tie the leaves they feed upon. They are difficult to control, but the best remedy is to spray frequently with a good pyrethrum spray.

\*Bulletins describing in greater detail the various insects discussed, may be obtained by addressing the Michigan Agricultural Experiment Station, East Lansing, Michigan.

†See also Michigan Agricultural Experiment Station Special Bulletin No. 243, p. 14.

‡Reported by E. I. McDaniel in the Quarterly Bulletin of the Mich. Agr. Exp. Station, for November, 1931.

**Rose Leaf-hopper, Buffalo Tree-hopper**—These pests are frequently injurious to roses. They may be controlled by spraying frequently with a pyrethrum spray or with a solution of nicotine sulfate and soap.

**White Grubs**—Feed on the roots of a great number of plants. They should be dug out and destroyed.

**Pill Bugs or Sow Bugs and Millipeds**—These pests feed on the roots and crown of the plants. Pill bugs are gray, oval in shape, up to one-half inch in length and very active when disturbed. Millipeds, or "thousand-legs" are greyish, hard-shelled, many-legged worm-like pests. These insects may be destroyed by sprinkling a mixture of nine parts sugar and one part Paris Green over the ground. Poisoned bran mash is equally effective. These insects hide in rubbish, dead leaves and grass around the base of the plants and so may be very much discouraged by clearing such rubbish away from the plants.

## HISTORICAL

Charles Naudin in the preface of "Les Roses" by H. Jamain, E. Forney, C. Naudin, published in 1873, says: "If one should gather all that has been written about roses and their culture during the century, one would have a library. The abundance of books, far from rendering easy the task of writing a new book, is more often a cause of confusion, uncertainty and error. The attempting of such a task requires more than ordinary courage and with it a complete knowledge of the subject and a perspicacity not given to every mortal."

If this were true at that time, how much more true is it today! The breeding of new types and varieties of roses has added immensely to the confusion. The genus *Rosa* has always been the despair of the botanist. Monographs have been attempted, but always with obvious shortcomings. Hybrids have often been given specific names when the origin was unknown or in doubt. Early hybridists as well as many modern ones were not at all careful to keep accurate records, with the result that each succeeding year has seen the confusion become more aggravated. In this brief discussion, an attempt has been made to give a general idea of the origin of our more common garden roses. There may be inaccuracies, but an effort has been made to eliminate these as far as possible.

It is fairly certain that in the Middle Ages the following species of roses or varieties of them were known and grown in western Europe: *R. alba*, *R. sempervirens*, *R. arvensis*, *R. hemisphaerica*, *R. rubiginosa*, *R. canina*, *R. dumetorum*, *R. spinosissima*, *R. gallica*, *R. pendulina*, *R. cinnamomea* and *R. centifolia*. *R. sempervirens*, *R. gallica*, *R. rubiginosa*, *R. canina*, *R. dumetorum*, *R. spinosissima*, *R. cinnamomea*, *R. arvensis* were natives of western Europe. *R. alba* is said to have been a native of Europe, but it is generally conceded that this was a hybrid resulting from a cross of *R. dumetorum* (*R. canina dumetorum*) with a variety of *R. gallica*. *R. hemisphaerica* was introduced into Europe from the Levant sometime in the 15th century. *Rosa foetida*, not mentioned above, is a native of eastern Europe and western Asia. It was apparently known to the Romans as growing in Dacia. *R. centifolia* was introduced into Europe very early. Other native European species that were known were *R. pomifera*, *R. tomentosa*, *R. rubrifolia*, *R. coriifolia* and *R. agrestis*.

Our modern garden roses are the result of centuries of cultivation and crossing of original rose species and their varieties. Attempts at tracing the genealogy of any of our garden roses lead one into a maze of such conflicting opinions as to make it practically impossible to determine accurately the exact parentage. As early as 1829, Desportes reported approximately twenty-five hundred kinds of roses.

Species which have entered largely into the ancestry of our modern roses are *R. centifolia*, *R. damascena*, *R. gallica*, *R. chinensis* and *R. moschata*. (See Chart I.) Of these *R. gallica*, the French rose, is the only one that can be said definitely to have been a native of western Europe. Other roses had some influence in the early development, but those mentioned are of greatest importance.

*Rosa gallica*, the Provins or French rose (Fig. 6) may be distinguished by the general appearance of the flowers, less heavy and cabbage-like in appearance than those of *R. centifolia* and borne, usually singly, rarely exceeding three, on strong, prickly stems. The very fragrant flowers are deep pink or crimson, appearing in June. The stems are covered with prickles and bristles. There are three to five leaflets to the leaf, each rather broad with doubly serrate margin, rather pale green above, hoary beneath. The plant averages three feet in height, rarely attaining five feet. This rose has had many names, the commonest of which are *R. rubra*, *R. sylvatica*, *R. belgica*, *R. blanda*,<sup>1</sup> and *R. centifolia*. This last was rather loosely and erroneously applied to *R. gallica* through confusion with the true *R. centifolia*. It hybridizes readily with other native species and many of these natural hybrids have been described. *Rosa gallica versicolor* was an early variation of the type producing variegated flowers. It was known as Rosa Mundi and was a parent of many varieties. Hybrids of *R. gallica* and *R. arvensis* are common in France and Switzerland.

*Rosa centifolia*, a native of the eastern Caucasus, Armenia, and Persia, was one of the first roses introduced into western Europe. It was known as the Cabbage rose, or Rose a Cent Feuilles, from its many petals and thick cabbage-like bud. It has been stated by some authors that it may have been introduced into Europe by returning crusaders in the 12th century and it is very likely true that there was reintroduction of this rose at that time and probably later as well. Recent findings, however, seem to point to the fact that it was known to the Romans and possibly grown by them. It is apparently the rose known to Theophrastus around 270 B. C. as "The rose with sixty petals" and much used by the ancient Greeks in their festivals and social gatherings. It was noted by Heroditus as growing wild in Macedonia.<sup>2</sup> It has often been confused with *R. gallica*. *Rosa centifolia* is characterized by its large globular flowers with a great number of petals. It is distinguished from *R. damascena* by not having the sepals reflexed and by having the flower petals curved inwards. The flowers are very fragrant, appearing only in June or July. The species has pink flowers, borne on long slender stems. The leaflets are large, broad and wrinkled, the margins deeply serrated. The leaf blade generally consists of seven leaflets. In the species, the prickles are stout and hooked. It is distinguished from *R. gallica* by its longer stem, more acutely toothed, less rugose leaflets and stouter hooked prickles. Varieties varv. some having straight prickles. The plant is branching with straggling pendulous branches and creeping rootstock. This species

<sup>1</sup>A native American rose is now known as *Rosa blanda*, Ait.

<sup>2</sup>Heroditus states it was grown by King Midas of Macedonia.



Fig. 6.—The flowers and foliage of the Provins or French Rose—*Rosa gallica*.

early gave rise to numerous varieties. Two botanical varieties—*R. centifolia muscosa* and *R. centifolia cristata* have given rise to the Moss roses, Figure 7. These are characterized by "mossy" excrescences on the stems and calyx. The two are differentiated by the fact that *cristata* varieties have the mossy excrescences only on the sepals. *R. parvifolia*, the Burgundian Rose, is considered by some authors to be a variety of *R. centifolia* and by others a variety of *R. gallica*. It is not known in the wild state and in all probability is a hybrid of the above two species. It was commonly grown at least as early as 1790 and was pictured as early as 1664.\* Following are some of the names the species has had: *R. provincialis*, *R. varians*, *R. caryophyllea*, *R. polyanthos* and *R. unguiculata*.

*Rosa damascena*, the Damask rose, was another species introduced early into Europe. Many authors claim that it was brought to Europe from the vicinity of Damascus, Syria, by returning crusaders. Its native habitat is not clearly known and some botanists believe that it is a hybrid, possibly descended from *R. moschata*. Hakluyt in "Principal Navigations" says it was introduced into England by Doctor Linaker sometime in the last part of the fifteenth century. In all probability, however, it was grown in Gaul and in England by the Romans much earlier. Recent evidence seems to indicate that this was the *Rosa bifera* grown by the Romans and described by Pliny the Elder, as the "Rose of Poestum". The Romans recognized its habit of blooming both in the spring and in the fall by giving it the name "Bifera". In the course of its history this rose has gone under various names, the most important of which are: *R. belgica*, *R. violacea*, *R. calendarum* and *R. bifera*. When first introduced into France it was known as the "Rose from Damascus". It is distinguished by the fact that it flowers in June and July and produces a second crop of flowers in the fall. The flowers are borne in corymbose clusters and vary in color from red to pink and white. The typical leaf is composed of five leaflets which are slightly larger than those of *R. gallica* and have serrate margins. The stems have rather numerous stout, hooked prickles. It is a vigorous bush, attaining a height of six feet. It is distinguished from *R. centifolia* and *R. gallica* by the larger hooked prickles, the tall arching stems usually green in color and the long deciduous sepals which are reflexing during flowering and deciduous as in *R. gallica*.

*R. gallica*, *R. centifolia*, and *R. damascena*, were the basis of most of the early European rose varieties. At first, only varieties were to be had, but gradually various hybrids appeared. Hybrids of *R. gallica* with its characteristics predominant were known as French roses or Hybrid Gallica. There were over 1,000 named varieties catalogued in the early 19th century. Hybrids of *R. damascena* were known as Hybrid Damask roses. Varieties and hybrids of *R. centifolia* soon were divided into several groups. The most important were known as Provence† or Cabbage roses. Of less importance were the Moss roses and the Pompon roses, see Chart I. The Pompon rose or

\*Tabernaemontanus' Kreuterbuch 1664.

†The Provins and the Provence roses are generally confused and are so confused throughout the literature on roses. *R. provincialis* (*R. gallica provincialis*) is found in France, Spain and Italy. Varieties of this were cultivated very early and were quite generally known and described in the 16th century. They were quite generally crossed with the Cabbage roses. The Provins roses originated at Provins, Seine-et-Marne, France. It is claimed that the original was a variety of *R. centifolia* brought from Syria. Others believe it to be a form of *R. gallica*. It would seem that the latter is more probable. Some early writers do not distinguish between them, classifying both as *R. provincialis*. (See Chart I.)



Fig. 7.—The flowers and foliage of one of the Moss Roses, White Bath, (The Clifton Moss). This was the first white-flowered moss rose. It originated as a "sport" about 1810 at Clifton, England.

Rose de Meaux, *R. centifolia pomponia*, was a dwarf form of the Provence or of *R. centifolia*. It was first found growing wild on a mountain near Dijon, France, in 1735. These Pompon roses are not to be confused with modern Polyantha roses, or with the Fairy roses.

As time went on there was naturally a greater mixing of the varieties of these groups of roses. There are also several other species which doubtless are partly responsible for some early varieties. Among these it seems highly probable that *R. moschata*, *R. hemisphaerica*, *R. foetida*, *R. sempervirens*, *R. parvifolia*, *R. canina*, *R. cinnamomea*, *R. dumetorum*, *R. pendulina*, *R. alba*, and *R. rubiginosa* were used in hybridizing, at least occasionally, see Charts I and II. Most of these roses, however, left little lasting impression on the early groups, although some of them have become very important in recent developments.



Fig. 8.—Blooms of one of the Hybrid China or Bengal Roses, Gruss an Teplitz, used for cut flowers.

Varieties of *Rosa alba* were popular in the middle of the nineteenth century. This seems to be the rose that was used as the badge of the Yorkists in the Wars of the Roses. *Rosa alba* was grown in gardens in very early times and was commonly known and grown in the early 16th century. These roses were much used in hybridizing. Over 75 varieties were catalogued by nurserymen as recently as 1880. Few are now offered by nurserymen. The well-known Maiden's Blush is a variety of *R. alba rubicunda*.

The Hybrid Damask roses which showed the characteristic of flowering more than once in a season, came finally to form a group of roses known as

the Damask Perpetuals, Chart I. These crossed with Gallica and French roses gave rise to the group known as Hybrid Damask Perpetuals (*Rosa Portlandica*), Chart II. The characters of this group differ considerably from the original Damask roses. They grow and flower more continuously and the branches are covered with numerous small prickles. The leaves are dull green with very pronounced veins. The flowers are borne singly on stems well clothed with foliage and are very fragrant. The old "Rose du Roi" (Chart II) was a good example of this group.

In this early development of roses in Europe, the Hollanders were first in the production of new varieties and at the beginning of the 18th century they stood preeminent in the culture and hybridization of the rose. These early originations were largely hybrids and varieties of *R. gallica*. By the end of the century, however, the French had begun the work of originating new varieties and the English were already devoting much attention to its culture.

About 1789 *Rosa chinensis* (*R. indica*)\* the China or Bengal rose (Fig. 8) was introduced into England and later into Continental Europe, see Chart II. Its introduction led to great activity in the production of new varieties. The distinguishing characteristics of this rose were its beautiful green wood, sharp prickles, and the varying bright red shades of the flowers. Its leaves were a brilliant green and usually composed of three to five or seven leaflets. The flowers were borne either singly or in corymbs of three to seven flowers at the end of each growth, new growths and new flowers appearing continuously. The flower was especially delicate in texture, usually red in color, but without odor, or with very little odor. Since the China rose was the nearest to a most continual flowering rose known at that time, it was used extensively in hybridizing. Hybridizers, especially amateurs, soon began crossing this new rose with varieties of other roses, giving rise to a number of new groups of roses. The so-called Hybrid Chinas (Fig. 8) were largely the result of crosses of China Roses and Hybrid Damask Perpetuals and showed the characteristics of these groups in varying combinations. There were, however, other Hybrid China groups such as the Hybrid Noisettes and Hybrid Bourbons, see Chart II.

## HYBRID BOURBONS

In 1817, there was discovered on Bourbon Island (Martinique) a new rose, *R. borbonica*, which flowered in the fall as well as in the spring. Seeds and plants of this were sent to Jacque's, gardener to the Duke of Orleans at Neuilly near Paris in 1819. It was thought to have originated from a natural crossing of *R. chinensis* and *R. gallica*, as these were the only roses growing on the island. It was known as Rose Edward,—Bourbon Jacques to the French—and was crossed largely with *R. gallica* (some *R. centifolia* blood is evident in some varieties of Bourbons) to give rise to a new group of roses known as Hybrid Bourbons, Fig. 9. These Hybrid Bourbons crossed with *R. chinensis* and Hybrid Chinas, gave rise to the Bourbon Perpetuals, Chart II. At about this time, other groups of hybrid roses were evolving. *R. borbonica* evidently was a markedly different hybrid in the Hybrid China group, derived from crossing *R. chinensis* and *R. gallica*.

\**R. chinensis semperflorens* was introduced at the same time and was much used in producing new varieties.





Fig. 9.—The flowers and foliage of one of the Hybrid Bourbon Roses, Gloire des Rosomanes.

The Bourbons are distinguished by their free blooming qualities, especially in the autumn. They have thick leathery foliage with three, five or seven leaflets and luxuriant growth. They are not as free blooming as the Teas, Noisettes, and the modern everblooming kinds. In hardiness modern varieties rank between the Teas and the Hybrid Teas. Early varieties are somewhat hardier. The flowers are of good substance with thick velvety petals. It is said that plants of the Bourbon Roses, at least of the early varieties, did poorly when grafted. During some seasons, the plants were rather poor and the flowers often defective, particularly on old plants. Partly to avoid this difficulty, it was found advisable to replace old plants with young plants every few years. Hybrid Bourbons resemble the Hybrid Chinas in the more prominent features. In general, they do not have the autumnal flowering qualities of the Bourbons. They are strong growing and some of them can be treated as Climbers and are often known as Climbing Bourbons. The Bourbon Perpetuals differ from the Hybrid Perpetuals in that the Bourbon blood with Hybrid China characteristics is more prominent. The flowers are remarkably circular in outline with usually three to five rows of petals. The foliage with broad leaflets is handsome. Growth is moderate, the flowers small but abundant. Though distinct from the Hybrid Perpetual, the group as a whole has all but lost its identity in the great group of Hybrid Perpetual Roses, Chart II.

### REMONTANT OR HYBRID PERPETUALS

The term Remontant, as originally applied to this group by French horticulturists, is rather difficult to translate into English. It has been generally translated as perpetual flowering. This term, however, does not accurately state the facts. The word "remontant" refers more to the habit of growth and only indirectly to the flowering season. In these roses, the flowers terminate the branches or shoots and after the flower is produced and the wood matured, the plants produce new shoots which may produce flowers at the ends. This characteristic of regrowing or growing out again, results in flowers being produced at intervals more or less dependent on the variety and cultural conditions. This gave rise to the term "perpetual" which is not quite correct as applied to this group and especially when this group is compared to the Hybrid Teas. The term "Monthly roses" has also been applied to this group, but is equally inaccurate because, though some varieties may produce flowers each month, most of them require longer intervals and the majority flower only in the spring, with possibly a few flowers in the fall.

The remontant character in roses goes back to the variety "Rose des Quatre Saisons," "The Four Seasons," a variety of Damask rose. This was one of the oldest varieties. As early as 1790, it was being grown commercially as a cut flower and for perfume, producing an abundance of very sweet scented flowers. Under certain favorable conditions, it showed remontant characters. Apparently this rose was used extensively in crossing with the French and Provence roses to give rise to the Damask Perpetuals or, as they were called by the French, the Portland roses, Chart I.

As early as 1815, there were several of these Portland roses showing remontant characters. "Palmyre" and "Venusta" were both known and in 1812 "Rose du Roi" appeared. This last was originally known as "Count Lelieur," but when the King of France showed a marked interest in it,

it was renamed "Rose du Roi." It seems altogether probable that it is descended from "Rose des Quatre Saisons." "Rose du Roi" is frequently referred to as the first remontant rose. It was "the most perfectly remontant" rose introduced up to that time. Its fine growth, beautiful buds and abundance of flowers made it important as a pot plant for market. It soon became the most important plant and cut flower in commerce at that time. More than 200,000 roses of this variety were sold annually by the florists of Paris. Development of these early remontant types was necessarily slow. Early crosses with the China roses gave rise to the Hybrid China roses, but these did not produce fertile seed and development along this line seemed to be at an end. However, in 1830 M. Guerin produced the variety "Malton," and at the same time, Jacques, gardener to the King at Neuilly, produced "Athalin." Both of these were hybrids of China and Damask roses and were excellent seed producers. It seems altogether probable that the Damask parents of both of these varieties were descended from the variety "Rose des Quatre Saisons," Chart II.

The variety "Athalin," crossed with "Rose du Roi," later produced remontant varieties with Portland characters, short peduncle and the flower hidden in the foliage. The crosses with "Rose du Roi," were entirely different from the other "Athalin" progeny, which were weak growing and not strongly remontant. These Athalin-Rose du Roi crosses were given the name Hybrid Portland roses. Herein was the beginning of the Hybrid Perpetual roses.

In 1835, the Remontant roses began to be recognized as forming a distinct and improved group. Little by little the China roses were giving their continuous flowering and continued growth characters to and bringing out the somewhat latent remontant characters of the European roses in the progeny of their crosses.

The variety "Sisley," originated by M. Jean Sisley of Paris, appeared in 1835 and was the parent of numerous Remontants.

In 1837, M. Laffay, florist, formerly of Auteuil and then at Bellevue, near Paris, obtained "Prince Albert" and "Princesse Helene," two new varieties which he described as "Remontant." He is, therefore, usually given the credit of being the originator of this group which we know as Hybrid Perpetuals. In the next few years, he produced several other Remontants and in 1843 "La Reine." In the meantime, other originators began producing Remontants. These immediately assumed great importance. In 1844, a number of Hybrid Damask Perpetuals, Hybrid Chinas, Bourbon Perpetuals, a few Hybrid Gallica, Moss<sup>1</sup>, and other roses showing remontant tendencies were all grouped and designated as Remontant or Hybrid Perpetual roses, see Chart II.

A new group of Remontant roses appeared in 1853. A cross of a Hybrid Bourbon, known as "Glorie des Rosomanes" with the Portland rose "Malton" gave "General Jaqueminot," Fig. 10. From this rose have descended a great many fine Hybrid Perpetuals and Hybrid Teas. "General Jaqueminot" united two of the foremost groups of roses, the Hybrid Bourbons and the Hybrid Portland, Chart II. With such a mixed parentage, it is impossible to give distinguishing characters for the whole of this group.

A glance at the genealogy of two well-known and popular roses, "La France" and "General Jaqueminot," amply illustrates the very mixed parentage of our roses of the Hybrid Perpetual and Hybrid Tea groups and why

<sup>1</sup>The first hybrid remontant moss roses are said to have been disseminated in 1853.

roses of one group may sometimes be almost indistinguishable from those of the other group.

Careful study makes evident how far the Hybrid Damask Perpetual had advanced from the original *R. damascena*. Increasing numbers of crosses with other species and varieties meant that in each new development there were less and less of the old Damask characters other than the freer blooming qualities. The rise of a new group of roses, Hybrid Teas, further emphasized the resemblances of all these Perpetual groups.



Fig. 10.—One of the most popular varieties of the Hybrid Perpetual group—General Jacqueminot.

Though in the main the species outlined, viz., *R. gallica*, *R. damascena*, *R. centifolia* and *R. chinensis* are responsible for the final development of the Hybrid Perpetuals, traces of Perpetual Moss, *R. alba*, Hybrid Noisette and Tea are noticeable in various members of the group, see Chart II.

As early as 1860, the old French Damask and Provence roses had been

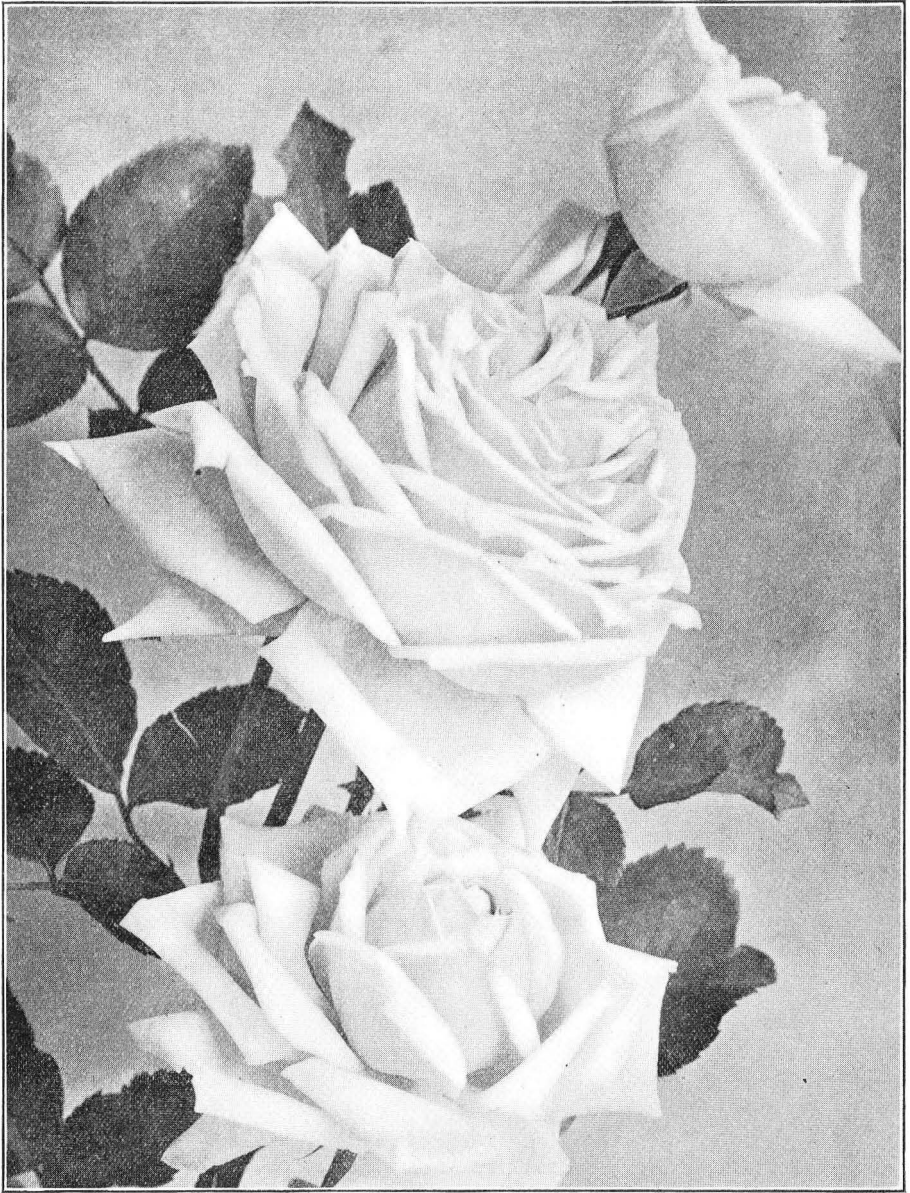
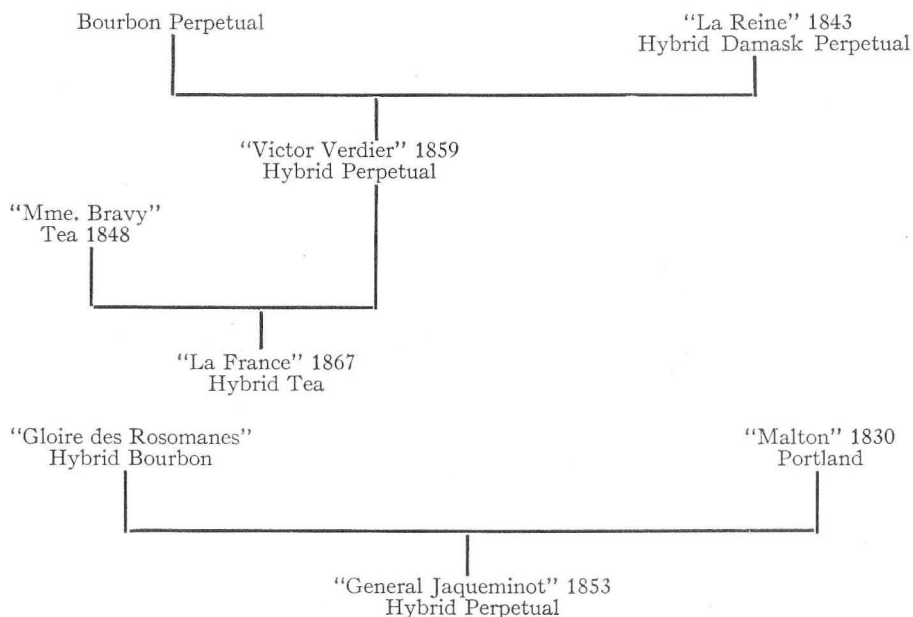


Fig. 11.—One of the most popular varieties of the Hybrid Tea group—La France.



practically discarded for the new Hybrid Perpetual roses although many varieties were still offered by nurserymen in the closing years of the century. The hybrid Perpetuals are in the main distinguished by their habit of growth and by the fact that they bloom at distinct and separate seasons. They are very double, fragrant, and hardy.

### TEAS AND HYBRID TEA ROSES

In 1810, a new fragrant variety of *R. chinensis* (see page 22) was introduced into England as *Rosa chinensis fragrans*,\* (Fig. 12) to which the name Tea rose was given because of the distinct tea odor of the flowers. In 1824, the double pale yellow form (*var. ochroleuca*) was introduced. The Tea rose (*R. chinensis fragrans*) is distinguished from the China rose by its distinct tea odor and its long slender, often climbing branches. This last characteristic is probably responsible for the appearance of climbing forms of Teas and Hybrid Teas. It is not as vigorous as the China rose and the leaves are of a lighter, shining green color, more elongated, less deeply dentate and composed of three to seven leaflets. The color of the flower is rather variable, generally light shades, tinted orange, pink, pale yellow or bronze. The stem immediately below the flower is often rather weak. Flowering starts late, but continues up to frost; in fact the autumn seems to be especially favorable for flower development. They are rather tender, usually freezing back to the crown. For this reason, they must be continually replaced.

From crosses of varieties of Tea roses among themselves and China roses, came the so-called group of Tea roses. Many crosses of these with varieties of Hybrid Perpetuals, gave rise to a new distinct race of roses known as

\*Considered a separate species, *R. odorata*, by some botanists.

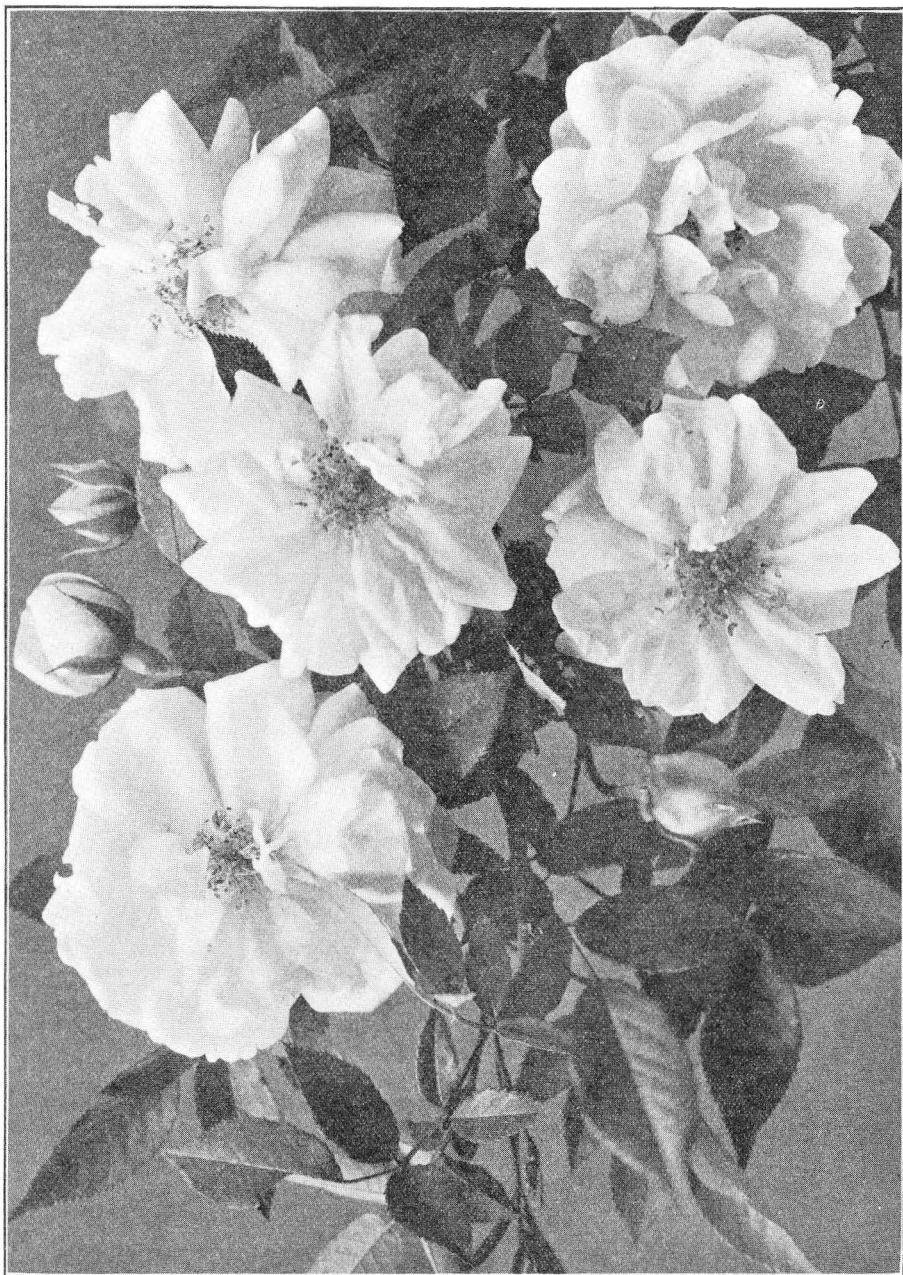


Fig. 12.—Flowers and foliage of the Tea Rose, *Rosa chinensis fragrans*, (*R. indica odorata*).

Hybrid Teas, see Chart II. These were distinguished particularly by flowering more or less all season. The plants are in continuous growth and flowers are produced at the end of each new growth. This character largely distinguished them from Hybrid Perpetuals. In growth, they are generally less vigorous than Hybrid Perpetuals and also less hardy. They present a rather wide range of varieties, from those which are hardly distinguishable from the Hybrid Perpetual as "La France" (Fig. 11), to those with characteristics nearly like the Tea, as "La Tosca."

*R. chinensis minima* (*R. Lawrenceana*) was introduced into Europe in 1810 and crosses of this variety with China, Bourbon, Pompon, and other roses gave rise to the Fairy or Lawrenceana roses. Rouletti, Gloire des Lawrenceanas, Tom Thumb and Baby Doll recommended for rock gardens, belong in this group. The so-called annual rose (*R. polyantha nana*) probably belongs here also.

### HYBRID NOISETTES

*Rosa moschata*, the Musk rose (Fig. 13) is a native of North Africa and the Mediterranean region eastward through the Himalayas. It was introduced into England at least as early as the 16th century. The leaves have five to seven nearly glabrous leaflets. The flowers are very fragrant with a distinct musky odor and are borne in large bunches. The branches are generally too weak properly to support the flowers.

About 1810, *R. Noisettiana* was originated in this country from a cross of *R. moschata* and *R. chinensis* (*R. indica*), see Chart II. In 1816, a plant of this was sent to Louis Noisette of Paris by his brother Philippe Noisette of Charleston, South Carolina. At about this same time, M. Robert, director of the botanical garden of Toulon, France, grew a similar rose from a seed of *R. moschata*. These roses, crossed with Teas, Hybrid Bourbons, and others, developed into the group known as the Hybrid Noisettes. They start flowering rather late in the spring or early summer and continue until frost. They are somewhat tender and generally not suited to Michigan conditions. They are known also as Hybrid Musk roses—*R. moschata* Hybrids. The group is represented by the old Marechal Niel, formerly grown as a climbing greenhouse rose.

Members of this group are distinguished by their continuous flowering habit, vigor of growth, and prickly stems and branches. The leaves have as many as nine leaflets. The flowers are numerous and in some varieties much resemble Tea roses. Newer varieties show in habit, constitution, and flower form the presence of more Tea blood. A more recent development of this group are the Pemberton roses, Chart III.

About 1912, the first of the Pemberton roses were distributed. These, originated in England by Joseph Pemberton, are hybrids of *Rosa moschata* and varieties of everblooming roses. Some of them are hardy and they tend to be everblooming.

### TENDER CLIMBERS

The climbing forms of Teas, Hybrid Teas, and Hybrid Giganteas, together with the Hybrid Noisettes, are for the most part not sufficiently hardy for growing in Michigan. The Climbing Teas originated as sports of Tea roses or are descended from "Gloire de Dijon," a variety obtained by cross-





Fig. 13.—The flowers and foliage of the Musk Rose—*Rosa moschata alba*.

ing a Noisette Perpetual and Bourbon Perpetual, Chart II. The Climbing Hybrid Teas originated as sports of Hybrid Teas or by crosses of Hybrid Perpetuals and Teas or Hybrid Teas. The Gigantea Hybrids appear as descendants of *Rosa odorata gigantea*, crossed with *R. moschata*, Climbing Teas, or Climbing Hybrid Teas. They are not hardy.

### HYBRID SWEET BRIERS

*Rosa rubiginosa* (Syn. *R. eglanteria*) is a native European rose commonly known as Sweet Brier or Eglantine.\* It naturally grows to a height of six feet or more, forming a dense bush. It was grown in gardens in Europe at least as early as the establishment of the Carolingian Empire (800 A. D.). The flowers are single, bright pink, two inches or less in diameter. Late in the 19th century, Lord Penzance began crossing this with various garden roses, mostly Hybrid Perpetuals. The first of these, produced between 1890 and 1895, have given rise to a group known as Lord Penzance Briers or Hybrid Sweet Briers, Chart III. "Lady Penzance," produced in 1891, was a hybrid of *R. rubiginosa* and *R. foetida*. They are strong and vigorous in growth, flowering only in the spring. They are very thorny, but have fragrant foliage. The leaves are composed of five to seven leaflets. They are hardy and may be found growing in pastures and along roadsides in Michigan where they have become established. They prefer a rather light poor soil.

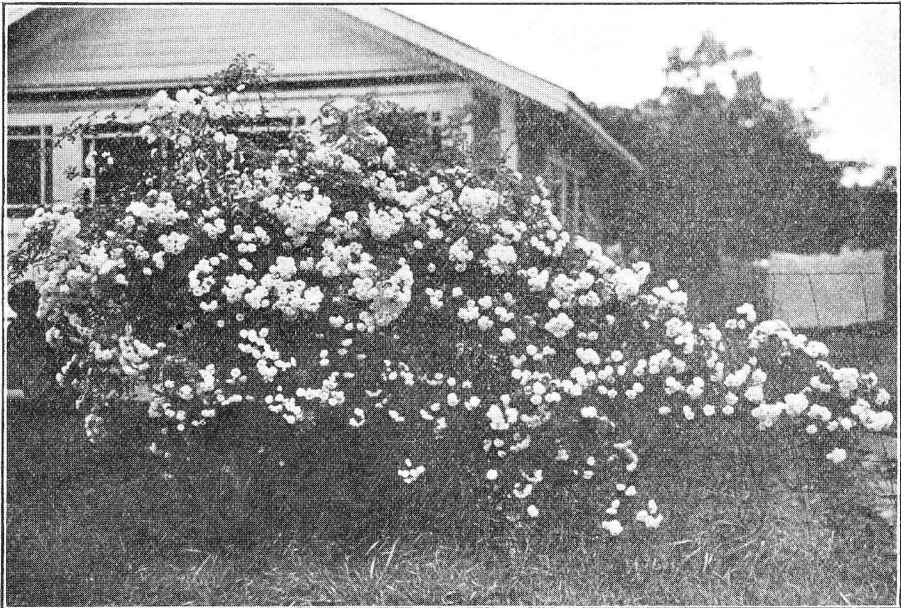


Fig. 14.—One of the varieties of the Hybrid Wichuraiana group, White Dorothy, used as a screen.

\*Eglantine properly refers to this rose, although other roses have also been called Eglantine.

### HYBRID WICHURAIANAS

In 1893, *R. Wichuraiana*, the Memorial Rose, was introduced into the United States from Japan. There seems to be some evidence, however, that it was received by the Arnold Arboretum, Jamaica Plains, Massachusetts, from Berlin in 1888 and that specimens were sent to England from America in 1890. This species, crossed with the everblooming varieties of roses, gave rise to a new group of climbing roses known as the Hybrid Wichuraianas, Figs. 3, 14 and Chart III. The first development of the group is due entirely to American hybridists. *Rosa Wichuraiana* is distinguished from *R. multiflora* by its larger flowers and later time of flowering. Its panicles usually contain fewer flowers than those of *R. multiflora* and the foliage is usually more persistent. The latest development of this group is the Hybrid Wichuraiana Perpetuals, appearing in 1930. These are everblooming climbing forms. The first of these, "New Dawn," appeared in 1930 as a sport of "Dr. Van Fleet." About the same time a seedling of "Paul's Scarlet" was obtained with extreme everblooming characters.

Other hybrids of *R. Wichuraiana* have appeared, but they are not sufficiently numerous or sufficiently important at present to be considered here. Among them, however, may be mentioned "Heart of Gold" a hybrid of *R. Wichuraiana* and *R. Moyesii* and "Silver Moon," a hybrid of *R. laevigata* and a Hybrid Wichuraiana.

### HYBRID MULTIFLORAS

Another important group of climbing roses is the Hybrid Multifloras, or Rambler roses. *Rosa multiflora* is said to have been introduced from Japan into England in 1804 and into France in 1820. It was apparently rather generally grown in France by 1870, as it was recommended at that time for covering fences and for training on the front walls of houses. The flowers were described as small, pale in color, and borne in large panicles. It is extremely vigorous of growth, sending out numerous long slender branches. A new brilliant crimson form of *R. multiflora cathayensis* was introduced into Scotland in 1878 under the name of "The Engineer." It was not distributed until its name was changed to "Crimson Rambler" in 1893, under which name it was introduced into the United States and immediately became popular. Crosses of varieties of *R. multiflora* with Hybrid Teas, Hybrid Perpetuals, etc., gave rise to the class known as Hybrid Multifloras, Chart III. Other known crosses are those with *R. setigera*, *R. gallica*, *R. foetida*, and *R. Wichuraiana*.

The Hybrid Multiflora varieties are distinguished by the large panicles of small flowers appearing at the ends of small branches which develop from buds on branches of the preceding year's growth and by their more or less vigorous climbing habits. The leaves have five to seven leaflets which are soft-textured, finely wrinkled and lanceolate. The ciliated stipules of the species seem to be more or less constant in the hybrids. "The Seven Sisters" is an old popular variety of this rose.

In 1924, the Climbing Lambertiana roses were introduced into the United States from Germany. The name of the group comes from the originator, Peter Lambert. The originator is attempting to obtain perpetual flowering Hybrid Multifloras by crossing *R. multiflora* varieties with everblooming

roses, mainly Hybrid Perpetual, Hybrid Tea, and Polyantha roses. The hardiness of this group is rather doubtful for Michigan conditions, but it is altogether possible that some of the varieties would do well, especially if given protection. Other groups of climbing roses are in process of development both in this country and abroad. The aims of hybridists are varied, but the majority are seeking hardy and everblooming characters in both the climbing and pillar types.

A group known as Captain Thomas' Everblooming Semi-Climbing Roses, comprises varieties of rather mixed parentage, including descendents of *R. multiflora*, *R. Wichuraiana*, Hybrid Noisettes, Hybrid Teas, and Polyanthas. Some of these are recommended as very hardy.

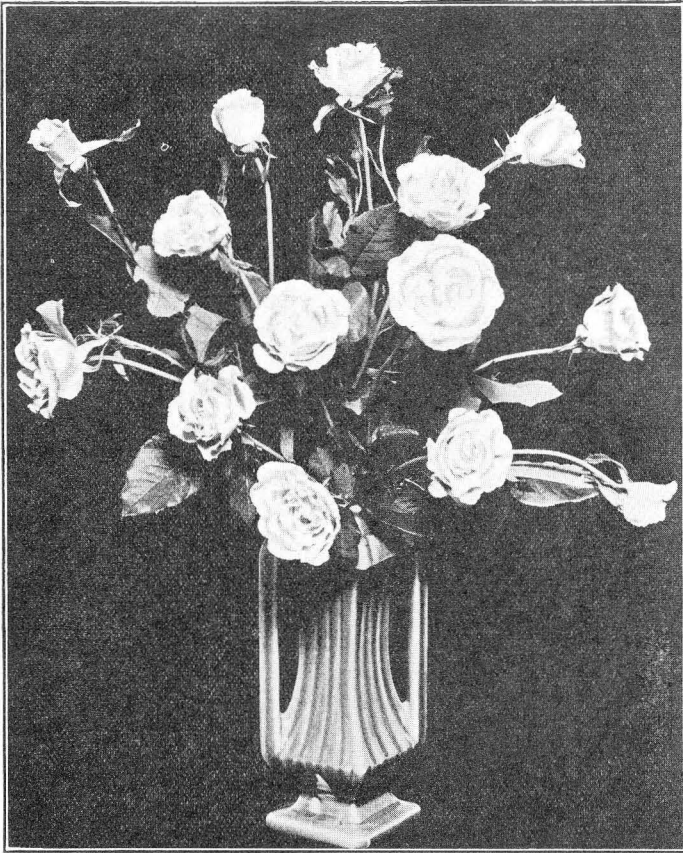


Fig. 15.—Blooms of one of the Pernetiana Roses, Talisman, used for cut flowers.

### POLYANTHAS

Another group of important modern roses is the Polyanthas. Crosses of varieties of *R. multiflora* with Hybrid Teas, Hybrid Perpetuals and other roses gave rise to a great diversity of forms, see Chart III. The climbing

forms were known as Hybrid Multifloras and dwarf sorts as *R. polyantha*. This class of roses is a very recent development and some fine varieties have been obtained in the last few years. The Polyanthas resemble Multifloras very largely, except that they are dwarf in habit, Fig. 2. Continued crossing with the Hybrid Teas and Pernetianas, is having the effect in some of the newer varieties of showing more decided Tea characters.

## PERNETIANAS

The latest acquisition to the rose world is the new group of yellow roses derived from the Pernetiana roses, Fig. 15. The first of these was produced about 1900 from a cross of a Hybrid Perpetual (Antoine Ducher) and a variety of *Rosa foetida*<sup>1</sup> known as Persian Yellow and was named "Soleil d'Or," see Chart III.

Today the members of this group are being used extensively in crossing with Hybrid Teas and Hybrid Perpetuals and are perhaps largely responsible for the new yellow and orange shades in the new varieties. Though these roses are being called Hybrid Teas, they really form a distinct group and ought to receive a distinct name such as Hybrid Pernetiana. They are sometimes designated as Hybrid Austrian Briers and Hybrid Luteas. Perhaps the most widely known of these are Souvenir de Claudius Pernet, Los Angeles and Talisman, Fig. 15.

*Rosa foetida* is a native of Austria, apparently extending its range into Asia at least to Persia. The flowers are yellow, borne singly, and have a rather unpleasant odor. The variety Persian Yellow, a rich double yellow form, was introduced into France from Persia in 1833. *R. foetida* was commonly known as the Capucine or Austrian Brier Rose. *R. foetida bicolor* is the Copper Austrian Brier<sup>2</sup>.

The varieties of the Pernetiana group vary, some showing decided Austrian Brier characters and others much resembling other everblooming roses. The growth generally is fairly vigorous and the color of the flowers generally shows the effect of the yellow of the Austrian Brier, many varieties having exceedingly interesting, artistic shadings.

## HYBRID RUGOSAS

The Rugosas constitute a group which fascinates the hybridizer. These are derived from *Rosa rugosa* (Fig. 16), which has been crossed with the Hybrid Teas, Hybrid Perpetuals, Hybrid Wichuraianas, Multifloras and Polyanthas. The first of the hybrid rugosas "Rose a Parfume de l' Hay" was produced by M. Gravereaux in 1900. It was produced by crossing a seedling obtained from a cross of a Damask rose and General Jacqueminot with a variety of *Rosa rugosa alba flore pleno*. M. Cochet-Cochet followed with other varieties. It offers very fine possibilities to the plant breeder for producing hardy garden roses. There are also one or two climbing Hybrid Rugosas. This group is especially valuable for landscape planting because of the rich-

<sup>1</sup>*R. foetida* is often called *R. lutea*. Since there exists a variety of *Rosa Banksiae* named *lutea*, *lutea* as a specific name should be discarded in favor of priority claims for *R. foetida*.

<sup>2</sup>*R. foetida Harrisoni* (Harrison's Yellow) originated in the U. S. in 1830. The Copper Austrian Briar was known to Europeans as early as the 16th century.



Fig. 16.—One of the Hybrid Rugosas, Max Graf, used as a ground cover with *Pachysandra terminalis*.

ness and wealth of foliage, the vigor and thriftiness of growth and the perpetual flowering characteristics of the varieties, Fig. 4 and Fig. 16.

*Rosa rugosa* is an extremely hardy, vigorous growing shrub. The foliage is shining dark green above, blue green or pubescent beneath, thick and rugose. It flowers continuously from spring to frost, bears attractive bright red "hips" or fruits and is resistant to many diseases. The varieties and hybrids show very plainly *R. rugosa* characters.

### THE PRAIRIE ROSES

The Prairie rose, or Michigan rose, *Rosa setigera* (Fig. 1 and Cover Illustration), has been occasionally used in crossing, Chart II. This is a native American rose and is very hardy. Growing to a height of six to eight feet, it makes a fine large healthy plant. The flowers are single, two inches or more across, of a distinct rose color and appear in July. The leaves are rather tough, large, and rich dark green, the veins pronounced and the margins deeply dentate. Double varieties were first produced by Samuel Feast of Baltimore and a few by Joshua Pierce of Washington. From 1840 to 1860, a number of varieties were developed. These roses are particularly valuable for their hardiness. They have, however, the disadvantage of flowering only once a year,—in July. This rose holds possibilities for the modern hybridizer. "Baltimore Belle" and "Prairie Queen" are the best known varieties. The popular "American Pillar" is thought to have some *Rosa setigera* blood. A recent introduction is "Doubloons."

### SCOTCH ROSES

Another group of roses which have been much neglected in recent years but which are deserving of notice are the Scotch Roses derived from *R. spinosissima*. This species is widely distributed, native of Europe and Asia. The Scotch Roses owe their origin to a Robert Brown of Perth, England, who first began to grow *R. spinosissima* in 1793. Growing seedlings and selecting, he had eight good double varieties by 1803. Other English and Scotch nurserymen soon began producing new varieties and by 1850 there were as many as 300 varieties obtainable. However, they soon went out of favor when public attention was turned toward the Remontants and Hybrid Teas. A few varieties are still carried by nurserymen. They are mostly low growing, three feet high, spreading, and excellent for use in the fore part of the shrub border or in the rock garden. They are very hardy and should thrive in Michigan. The fruit is dark brown and is persistent throughout the winter. "Stanwell Perpetual" is perhaps the finest variety. *Andrewsii* is another splendid variety. *Altaica* is a more vigorous form suited to the rock garden. All will stand extreme neglect and are readily naturalized.

### HUGONIS HYBRIDS

*Rosa Hugonis*, a species recently become popular, is bound to have an important effect on roses of the future. "Dr. E. M. Mills," introduced in 1927, is a hybrid of *R. Hugonis* and probably *R. rugosa*. There are also hybrids

of *R. Hugonis* with *R. spinosissima* and Hybrid Teas and it is likely that other crosses will be made in the future.

*R. Hugonis* is distinguished from other roses by its small leaflets, five to eleven on a leaf, and its large single rich yellow flowers appearing in early spring singly on slender pedicels borne on the branches.

### GIGANTEA HYBRIDS

A new class of everblooming roses is being developed from *Rosa odorata gigantea*. This is an exceptionally vigorous variety of the Tea rose, coming from Southwest China, where it is said to attain a height of fifty feet. It is not hardy. It has been crossed with *R. moschata*, Climbing Hybrid Teas and Hybrid Perpetuals. Some of these *R. gigantea* hybrids are Climbers while others are large bushes five to six feet tall. Apparently none of them is hardy. The new Nabonnand Hybrid Giganteas are of too recent introduction to permit judgment of their hardiness, but are probably not suitable for planting in Michigan.

The characteristics defining any single group of modern roses should be considered rather general. The groups often merge into one another so gradually that some varieties are difficult to classify or may be placed in several groups. The tendency of groups to merge becomes greater as the work of hybridizing goes on. As more and more varieties of one group are crossed with varieties of another, the defining characters of the two tend to merge. For example, the varieties "Mme. Albert Barbier," "J. B. Clark," and "La France" are actually Hybrid Teas but their habit of growth and flowering so strongly resembles that of the Hybrid Perpetual roses as to make advisable their classification as such. The same situation occurs in other groups. The various groups of climbing roses seem headed for an eventual merging and the Pernetiana roses may lose their identity in the Hybrid Tea group.

### VARIETIES OF ROSES

There are thousands of varieties of roses and the rose gardener is often at a loss what to select. Some of the most popular roses that are hardy or have a fair chance of coming through a Michigan winter if protected, are listed here. Most of the Hybrid Perpetuals listed prove perfectly hardy, as do the Rugosas, Polyanthas, Hybrid Multiflora, Hybrid Wichuraiana, and Moss. Hybrid Teas and Pernetianas are less hardy, but should do well if protected as explained under "Winter Protection."

### KEY TO ABBREVIATIONS IN VARIETY LISTS

- |  |  |
|--|--|
| A —Specimen or bush.   | L —Climber.  |
| B —Roses suitable for bedding.                                   | M —Useful for massing.                             |
| C —Good cut flower.  | P —Good as pillar rose.                            |
| D —For covering arches, pergolas, arbors, trellis or as screens. | R —Resistant to disease.                           |
| E —Everblooming.   | Rm—Resistant to mildew.                            |
| En —Flowering nearly all summer.                                 | S —Good in shrubby border.                         |
| F —Fruits persistent.  | T —Not reliably hardy, requires winter protection. |
| G —Ground cover.   | U —Roadside planting or clothing banks.            |
| H —Hedges.   | V —Very hardy.                                     |
| Hl —Low hedge.   | W —For covering walls and fences.                  |
| K —Suitable for rock garden.                                     |  |



## HYBRID TEAS

Name	Date of Origin	Use	Color
Abol	1926	TBCE	White
Antoine Rivoire	1895	TBCE-VRm	Silvery pink
Betty	1905	VBCE	Copper pink
Better Times	1931	RTBCE	Cerise
Betty Uprichard	1922	TBVHCE	Deep salmon-carmine
Briarcliffe	1926	RTBCE	Clear rose-pink
Chateau de Clos Vougeot	1908	VTBCE	Dark red
Colonel Sherman Crawford	1933	BCE	Crimson
Columbia	1917	TBCE	Rose-pink
Condesa de Sastago	1933	BE	Copper yellow
Countess Vandal	1932	CE	Bronze
Crimson Glory	1935	BCE	Crimson
*Dame Edith Helen	1926	TBCE	Glowing pink
Dean Hole	1904	TBCE	Salmon-carmine
Duchess of Wellington	1909	BTBCE	Orange
Ecarlate	1907	VBMHIRTCE	Rose-scarlet
Edel	1919	TBCE	White
E. G. Hill	1929	TBCE	Scarlet-crimson
Emma Wright	1918	VRMTBCE	Orange
Etoile de Hollande	1919	TBCE	Red
Everest	1927	TBCE	White
General MacArthur	1904	TBCE	Velvety scarlet
†Gruss an Teplitz	1897	BVMCE	Crimson-scarlet
Hadley	1914	TBCE	Bright red
Harry Kirk (Tea)	1907	BCE	Yellow
Herman Lindecke	1929	BCE	Salmon-pink
Hilda	1928	TBCE	Salmon-pink
John Russell	1924	BCE	Dark red
Jonkheer J. L. Mock	1909	TBCE	Silvery pink
J. Otto Thilow	1927	TBCE	Rich, glowing rose pink
Kaiserin Auguste Victoria	1891	TBCE	Creamy white
Killarney Queen	1912	Rm TBCE	Clear pink
La France	1867	VTBCE	Bright silvery pink
Lady Alice Stanley	1909	TBCE	Deep rose
Lady Ashtown	1904	VTBCE	Pink
Lady Inchiquin	1922	TBCE	Orange-cerise
Lady Margaret Stewart	1926	RTBCE	Yellow, streaked orange and red
Lady Pirrie	1910	BCE	Light pink
Lady Ursula	1908	VSTBCE	Light pink
La Tosca	1900	RVTBCE	Pink
Laurent Carle	1907	TBCE	Crimson
Margaret McGredy	1927	BCE	Orange
Mary, Countess of Ilchester	1909	BCE	Rose
Matador	1935	CE	Scarlet-crimson
Mervrouw G. A. Van Rossem	1926	RTBCE	Orange
Mevrouw Welmoet Van Heek	1933	BCE	Crimson-red
Mme. Abel Chatenay	1894	TBCE	Rosy salmon-carmine
Mme. Butterfly	1918	VTBCE	Blush pink suffused gold
Mme. Caroline Testout	1891	TBCE	White
Mme. Leon Pain	1904	BRE	Pink
Mme. Cochet-Cochet	1934	BCE	Copper pink
Mrs. Aaron Ward	1907	TBCE	Deep Indian yellow
Mrs. A. R. Barraclough	1926	TBCE	Pink shaded yellow at base
Mrs. Chas. E. Russell	1913	TBCE	Rosy-carmine
Mrs. Henry Bowles	1921	TBCE	Deep rose-pink
Mrs. Pierre S. duPont	1929	ERBC	Yellow
Olympiad	1931	BCE	Copper-scarlet
Ophelia	1912	VTBCE	Blush pink
Pharisaer	1903	TBCE	Pink
Portadown Bedder	1929	BEV	Orange-scarlet
Premier	1918	TBCE	Dark pink
Radiance	1908	TBCE	Light pink
Red Radiance	1916	TBCE	Rose-red
Rouge Mallerin	1934	BCE	Red
Richard E. West	1924	TBCE	Yellow
Richmond	1905	TBCE	Scarlet-crimson
Robert Huey	1911	BCE	Deep rose-pink
Rose Hill	1928	TBCE	Deep pink
Roselandia	1924	TBCE	Yellow
Roslyn	1929	BCE	Yellow
Souv. de Jean Soupert	1929	CE	Orange-yellow
Senior	1929	CE	Red
Sunburst	1912	TBCE	Yellow
Token	1932	CE	Peach-red
White Ophelia	1920	TBCE	White
W. Freeland Kendrick	1920	VPM	White

\*Has some Pernetiana blood.

†China or Bengal rose, sometimes classed as Bourbon.

## HYBRID PERPETUALS\*

Name	Date of Origin	Use	Color
Alfred Colomb	1865	VBCA	Carmine
Anna de Diesbach	1859	VBCA	Bright carmine
Arrillaga	1929	BC	Pink
Baroness Rothschild	1867	VBCA	Pale pink
Barrone Prevost	1842	BC	Rose
Boieldieu	1877	VBC	Cherry red
Captain Christy	1873	BCA	Flesh pink
Caroline de Sansal	1849	V	Flesh pink
Dupuy Jamain	1868	VABC	Cherry-red
Felbergs Rosa Druschki	1929	VCBAP	Rose-pink
Frau Karl Druschki	1900	VCBA	Pure snow-white
General Jacqueminot	1852	VBCA	Scarlet-crimson
George Arends	1910	VBCA	Delicate pink
Gloire de Chedane-Guinoisseau	1907	ABC	Dark crimson
*Gloire Lyonnaise	1884	CAPS	Cream
Harmony	1933	EC	Salmon-pink
Heinrich Munch	1911	ABCP	Pink
Hugh Dickson	1904	CAB	Crimson
*J. B. Clark	1905	CAPS	Deep dark scarlet
Jules Margottin	1853	VABC	Carmine
LaReine	1839	VBS	Rose
Magna Charta	1876	VBCA	Bright carmine-pink
Margaret Dickson	1891	BCAS	White, pale flesh center
Marshall P. Wilder	1884	VBCA	Cherry red
*Mme. Albert Barbier	1925	BCE	Pearly white suffused with soft salmony-flesh
Mme. Gabriel Luizet	1877	CAB	Silvery pink
Mme. Victor Verdier	1863	ABCP	Crimson
Mrs. John Laing	1887	CABEN.	Clear pink
Mrs. R. G. Sharman-Crawford	1894	CABEN.	Deep rosy-pink
Paul Neyron	1869	PACEN.	Clear pink shaded soft rose
Prince Camille de Rohan	1861	BC	Dark red
Robert Duncan	1897	VABC	Rose
Souv. de Mme. H. Thuret	1922	CBA	Salmon-pink
Suzanne-Marie Rodocanachi	1883	ABC	Dark rose
Symphony	1934	EC	Rose
Ulrich Brunner	1881	PCBA	Light clear red

\*Some of the Hybrid Perpetuals actually are Hybrid Teas, but they so much more resemble the Hybrid Perpetuals that they are usually classed as such.

## PERNETIANAS

Name	Date of Origin	Use	Color
Amelia Earhart	1929	BCE	Yellow
Autumn	1931	BCE	Orange
Christine	1915	TBCE	Deep yellow
Constance	1915	TBCE	Bright golden yellow
Constance Casson	1920	TBCE	Crimson, yellow and copper
Duquesa de Penaranda	1931	BCE	Bronze
Etoile de Feu	1921	TBCE	Pink-orange
Independence Day	1919	TBCE	Flame and apricot
Jean C. N. Forestier	1919	TBCE	Carmine tinted with orange
Joanna Hill	1928	TBCE	Orange yellow
Julien Potin	1927	RBTCE	Deep yellow
Juliet	1909	VBCE	Gold-pink
Lady Forteviot	1928	BCER	Golden
Los Angeles	1916	TBCE	Flame-pink toned with coral
Lyon Rose	1907	TBCE	Light salmon-pink
Max Krause	1930	BCE	Yellow
Mary Hart	1930	TBCE	Red
Miss. Loita Armour	1919	TBCE	Chrome-yellow and orange
Mme. Eldouard Herriot	1913	TBCE	Coral red shaded yellow
Mrs. Farmer	1918	TBCE	Indian yellow
Mrs. Franklin D. Roosevelt	1931	TBCE	Apricot
Mrs. Henry Morse	1919	VTBCE	Pink shaded salmon
Mrs. Redford	1919	TBCE	Apricot-orange
President Herbert Hoover	1930	TBCE	Cerise and orange
President Wilson	1918	TBCE	Shrimp pink
Souvenir	1930	TBCE	Yellow
Souvenir de Claudius Pernet	1920	RTBCE	Yellow
Souvenir de Georges Beckwith	1919	TBCE	Shrimp pink, shaded yellow
Souvenir de Georges Pernet	1921	VBMTCCE	Red shaded yellow
Sunny Jersey	1918	TBCE	Bronze
Talisman	1929	TBCE	Orange and yellow
Texas Centennial	1935	TBCE	Rose red
Wilhelm Kordes	1922	RTBCE	Deep salmon-pink
Ville de Paris	1926	TBCE	Yellow

## POLYANTHAS

Name	Date of Origin	Use	Color
Aennchen Muller	1907	BMS	Bright pink
Belvedere	1928	BM	Red
Cameo	1932	BMS	Pink
Cecile Brunner (Sweetheart, Mignon)	1881	CB	Rose with yellowish center
Chatillon Rose	1923	BMS	Bright pink
Dolly Varden	1930	EBMSHI	Pink
Eblouissant	1918	BMS	Dark red
Echo	1914	BMS	Soft pink
Ellen Poulsen	1912	BMS	Brilliant pink
Else Poulsen	1924	BMSHI	Rose-pink
Erna Teschendorff	1911	BMS	Deep crimson
Evelyn Thornton	1919	BMS	Pink and yellow
Gloria Mundi	1929	EBMSHI	Scarlet-orange
Golden Salmon	1926	BMS	Golden salmon
Greta Kluis	1915	BMS	Carmine-pink to red
*Gruss an Aachen	1909	BMCS	Flesh pink and yellow
Ideal	1922	BMS	Dark scarlet
Johanna Tantau	1928	BS	Pink
Katharina Zeimet	1901	BMS	Pure white
Kirsten Poulsen	1924	BMHIS	Rose-scarlet
Lafayette	1921	BMS	Crimson
LaMarne	1915	BHIMS	Salmon-rose
Locarno	1926	BMS	Turkish red
Maman Levavasseur (Baby Dorothy)	1907	BMS	Bright pink
Miss Edith Cavell	1917	BMS	Brilliant scarlet
Mme. Norbert Levavasseur (Red Baby Rambler)	1903	BSM	Red
Mrs. W. H. Cutbush	1906	BSM	Rose-pink
Mrs. R. M. Finch	1923	BMSH	Rose-pink
Orleans	1919	BMS	Geranium red with white center
Rodhatte	1922	BMS	Crimson
Sunshine	1928	EBMSHI	Bronze-orange
Tip-Top	1909	BMS	Rose and yellow
Triomphe Orleanais	1912	BMS	Cerise-red
Belvedere	1928	BM	Red
†Valerie	1932	BM	Yellow
Yvonne Rabier	1910	BMSH	White

\*A Bengal-Bourbon Hybrid.

†Wichuriana-Polyantha Hybrid.

## RUGOSA AND HYBRID RUGOSA

Name	Date of Origin	Use	Color
Agnes 5	1922	SAVR	Amber yellow
Agnes Emily Carman 2	189-	SAVR	Crimson
Benedikt Roetzl 4	1925	SAVRC	Light carmine-pink
Berger's Erfolg	1925	SAHVR	Red
Blanc Double de Coubert	1892	SAVR	Pure white
Conrad Ferdinand Meyer 4	1900	SAVRH	Clear silvery rose
Dr. Eckener	1930	VEAS	Copper and orange
*Dr. E. M. Mills	1926	SK	Primrose-pink
F. J. Grootendorst 1	1920	SAHR	Red
Golden Dream	1932	ELV	Yellow
Hansa	1905	SAMHRV	Reddish violet
Max Graf (Climber)	1919	GKWVR	Bright pink
Mme. Georges Bruant	1887	SN	White
New Century 1	1900	SRV	Pink
Pink Grootendorst	1920	SAHR	Light pink
Polar Bear 7	1934	FVS	White
Rose a Parfum de l' Hay 6	1900	SV	Crimson
Ruskin	1928	SVC	Crimson-red
Sarah Van Fleet	1927	SVR	Pink
Schneelicht (Climber)	1896	WHVR	White climber
Schneezweg	1912	SAKVRH	White
Sir Thomas Lipton 1	1900	SAV	White
Turkes Rugosa Samling 4	1923	SAV	Orange-yellow to salmon
Vanguard	193-	V	Bronze-pink

\*Hybrid Rugosa and R. Hugonis hybrid.

- Hybrid rugosa and Polyanthas.
- R. rugosa x Harrison's Yellow.
- Hybrid rugosa x Hybrid Perpetual.
- Hybrid rugosa x Hybrid Tea.
- R. rugosa x Persian Yellow.
- R. rugosa x Hybrid Damask Perpetual.
- Hybrid of R. rugosa, R. nutkana, and R. polyantha.

## HYBRID WICHURAIANA (CLIMBERS)

Name	Date of Origin	Use	Color
Alida Lovett	1905	CLD	Pink
American Pillar	1902	PL	Crimson-pink
Aviateur Bleriot	1910	TPGLU	Yellow
Bess Lovett	1905	RCLD	Light crimson
Breeze Hill	1927	VLD	Deep cream, tints of pink
*Blaze	1932	ELPA	Scarlet
Chaplin's Pink Climber	1928	LD	Pink
Christine Wright	1909	PL	Wild rose-pink
Climbing American Beauty	1909	LD	Carmine
Coralie	1919	PLD	Coral-pink
*New Dawn	1930	VCLDE	An everblooming "Dr. Van Fleet"
Dorothy Perkins	1902	VGLWUD	Blush-pink
Dr. Henri Neuprez	1913	LPD	Light yellow
Dr. Huey	1914	LD	Crimson-maroon
Dr. W. Van Fleet	1910	VCLD	Clear pink
Easlea's Golden Rambler	1932	C	Yellow
Evangeline	1906	GWLUD	White tipped carmine-pink
Excelsa	1908	GWLUD	Scarlet-crimson
Gardenia	1899	VLD	Light yellow
Gen. John Pershing	1920	LPDC	Dark pink
Gerbe Rose	1904	VRLD	Flesh-pink
Glenn Dale	1927	VRLD	Cream
Henri Linger	1928	VRLD	Yellow
Hiawatha	1904	VWLGUD	Crimson, white center
Ile de France	1922	VP	Deep pink
Jacotte	1920	TDPL	Orange suffused yellow
Lady Gay	1905	VGLWUD	Cherry-pink
Lady Godiva	1908	VGLWUD	Light pink
Mary Lovett	1924	LDC	White
Mrs. Wallace	1924	VLD	Pink
Mrs. M. H. Walsh	1911	VGWUD	White
Paul's Scarlet Climber	1916	VP	Scarlet
Primrose	1929	LD	Yellow
Purity	1917	LDC	White
Royal Scarlet Hybrid	1926	VLD	Scarlet
Silver Moon	1910	TLD	White
Thelma	1927	VLD	Coral-pink

\*Everblooming.

## HYBRID MULTIFLORA (CLIMBERS)

Name	Date of Origin	Use	Color
*Auguste Kordes	1928	LDP	Crimson
Bloomfield Courage	—	GUW	Crimson
Crimson Rambler	1878	VDALU	Crimson
Electra	1900	VDL	Cream white
Goldfinch	1907	VDL	Cream yellow
*Helena Van Vliet	1921	ELD	Scarlet orange
Ida Klemm	1907	VDL	White
*Marie-Rose	1930	ELD	Pink
*Mary Hicks	1927	ELP	Crimson
Neige d'Avril	1908	GLU	White
Newport Fairy	1908	DLC	Deep pink, white center
Non Plus Ultra	1904	VLUD	Dark crimson
Oriole	1912	VLD	Yellow
Pemberton's White Rambler	1914	RLD	White
Perle Von Wienerwald	1914	LCD	Rose-pink
Phyllis Bide	1924	VPC	Pink & yellow (blooms all season)
Princess Louise	1923	LD	Purplish-maroon
Roserie	1917	VLD	Deep pink
Tausendschon	1906	VLD	Rose
Violette	1921	LD	Red-violet

\*Classified as Climbing Polyantha, everblooming.

## OTHER ROSES

Name	Date of Origin	Use	Color
Austrian Copper (R. foetida bicolor).....	15—	S	Copper
Baltimore Belle (Hybrid Setigera).....	1843	TL	Blush
Birdie Blye (Hybrid China x R. mult.).....	1904	VAEn	Pink
Black Boy (Cl. Hybrid Tea).....	1919	EnV	Dark crimson
Blanche Moreau (Moss).....	1880	VC	White
Chamisso (Lambertiana).....	1922	APSE	Rose yellow
Chapeau de Napoleon (Moss).....	1827	VC	Rose-pink
Cl. Clotilde Soupert (Cl. Polyantha).....	1902	TEnL	Blush
Comtesse du Cayla (Hybrid China or Bengal).....	1902	VBM	Bronze
Cramoisie Superieur (Hybrid China of Bengal).....	1832	BM	Crimson
Ducher (China or Bengal).....	1869	BM	White
Felleberg (Hybrid Noisette)*.....	1857	BE	Crimson
Gem of the Prairies (Hybrid Setigera).....	1855	VL	Red
Gloire des Rosomanes (Hybrid Bourbon).....	1825	VHESA	Red
Golden Moss.....	1932	VEC	Yellow
Harrison's Yellow (Austrian Brier).....	1830	VSH	Yellow
Harry Kirk (Tea).....	1907	VBC	Cream
Heinrich Conrad Soth (Hybrid Foetida).....	1919	AS	Dark pink
Hermosa (Bourbon).....	1840	BVEM	Pink
Jeanne Deans (Hybrid Sweet Brier).....	1895	S	Crimson
Le Reve (Hybrid Foetida).....	1923	LA	Yellow
Mme. Gregoire Staechelin (Cl. Hybrid Tea).....	1927	RLCD	Pink shaded crimson
Mme. Plantier (Hybrid Noisette).....	1835	VSA	White
Old Blush (Hybrid China or Bengal).....	1796	BM	Pink
Old Pink Moss (Moss).....	1596	VC	Pale rose
Parkzieder (Hybrid Bourbon).....	1909	VB	Crimson
Persian Yellow (Austrian Brier).....	1833	S	Yellow
Princess Adelaide (Moss).....	1845	VC	Rose-pink
Prosperity (Hybrid Musk).....	1919	LC	White
Queen of the Prairies (Hybrid Setigera-gallica).....	1843	VL	Pink
Rouletti (Lawrenceana).....	1854	KHl	Light pink
Saret (Moss).....	1854	VC	Pink
Schiller (Lambertiana).....	1913	VL	Rose
Scorcher (Cl. Hybrid Tea).....	1922	ELT	Scarlet
Souvenir de la Malmaison (Hybrid Bourbon).....	1843	TPA	Blush-pink
Star of Persia (Hybrid Foetida).....	1919	AS	Yellow
Stanwell Perpetual (Scotch).....	179—	UASVF	Pink
Tom Thumb (Lawrenceana).....	—	K	Red
Triumphant (Hybrid Setigera).....	1850	VL	Rose
White Pet (Hybrid China).....	1879	KHl	White
Zepherine Drouhin (Hybrid Bourbon).....	1868	VLD	Pink

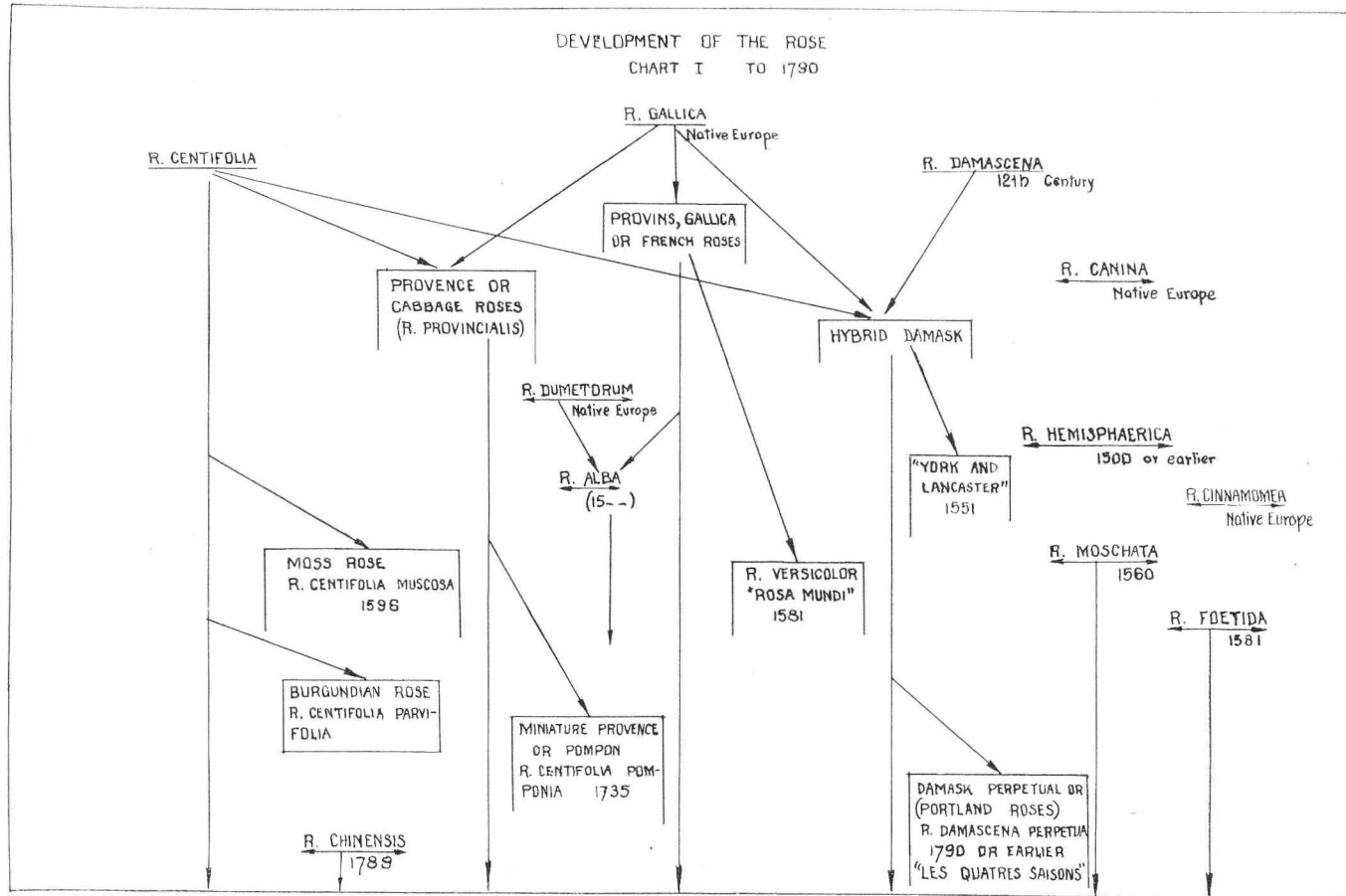
\*By some considered a hybrid of *R. chinensis* and *R. multiflora*.

## SPECIES

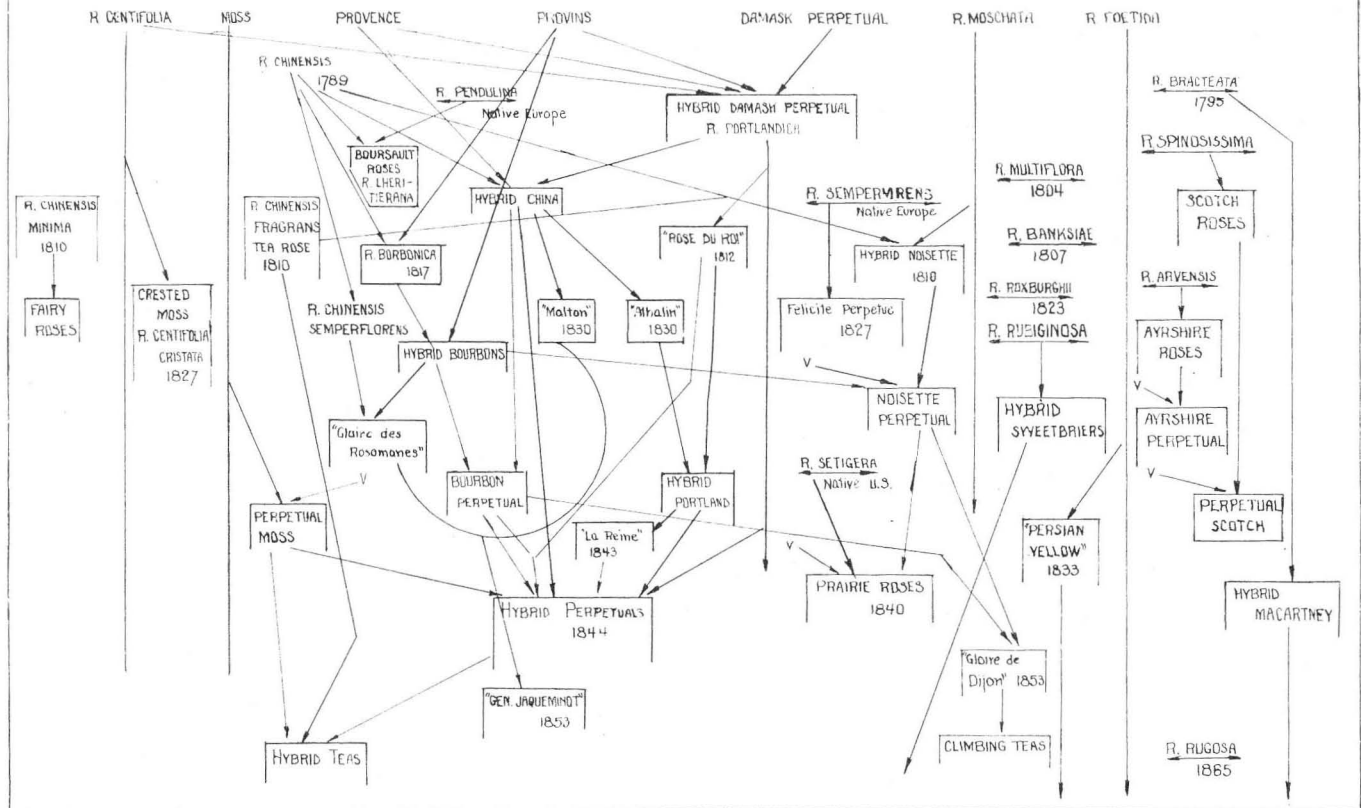
Name	Use	Color	Height
<i>R. acicularis</i> , Lindl.....	V	Rose	
<i>R. acicularis</i> Bourgeauiana, Crepin.....	V	Rose	
<i>R. bella</i> , Rehd. & Wilson.....	SA	Pink	8 feet
<i>R. blanda</i> , Ait.....	VMU	Pink	2-5 "
<i>R. carolina</i> , Linn. ( <i>R. humilis</i> , March.).....	VMUF	Pink	3-6 "
<i>R. Ecae</i> , Aitch. ( <i>R. xanthina</i> , Auth., not. Lindl.).....	VSA	Yellow	7 "
<i>R. gallica</i> , Linn.....	VMU	Red	5 "
<i>R. Helenae</i> , Rehd. & Wilson.....	L	White	15 "
<i>R. heliophila</i> , Greene.....	VK	Pink	2 "
<i>R. Hugonis</i> , Hemsl.....	VSA	Yellow	6 "
<i>R. Lheritierana</i> , Thory.....	VLUWAS	Rose	12 "
<i>R. Moyesii</i> , Hemsl. & Wilson.....	U	Red	10 "
<i>R. multiflora</i> , Thunb.....	VU	White	
<i>R. nitida</i> , Willd.....	VKS	Pink	1-2 "
<i>R. nutkana</i> , Presl.....	VS	Pink	5 "
<i>R. omeiensis</i> , Rolfe.....	SP	White	10 "
<i>R. pendulina</i> , Linn. ( <i>R. alpina</i> , Linn.).....	VKSA	Pink	3 "
<i>R. pomifera</i> , Herrm.....	VSF	Pink	6 "
<i>R. rubiginosa</i> , Linn.....	VMSAH	Pink	6 "
<i>R. rubrifolia</i> , Vill.....	VMS	Pink	6 "
<i>R. rugosa</i> , Thunb.....	VHSARF	Rose	6 "
<i>R. rugosa repens alba</i> , Hort.....	VKGRW	White	6 "
<i>R. rugosa rubro-plena</i> , Rehd.....	VKASR	Red	
<i>R. setigera</i> , Michx.....	VS	Rose	6 "
<i>R. spinosissima</i> , Linn.....	VSAF	White	1-3 "
<i>R. spinosissima</i> altaica, Rehd. ( <i>R. altaica</i> , Willd.).....	VSAK	White	
<i>R. virginiana</i> , Mill. ( <i>R. lucida</i> , Ehrh).....	VSA	Pink	
<i>R. virginiana plena</i> , Hort.....	VSA	Pink	
<i>R. Wichuraiana</i> , Crepin.....	VUKG	White	L
<i>R. Willmottiae</i> , Hemsl.....	S	Rose	5-10 "

**Some of the More Important Publications Consulted**

- "Roses." Bobbink and Atkins, Annual Catalogues. Rutherford, N. J.
- "The Rose." H. B. Ellwanger. 1882. Dodd, Mead and Co. New York.
- "The Book of the Rose." Foster-Melliar. Edited by Page Roberts and H. E. Molyneaux. 1910. MacMillan and Co. London.
- "The Amateur's Rose Book." Shirley Hibbard. 1885. Groombridge and Sons. London.
- "Les Roses." H. Jamain et E. Forney. Preface by C. Naudin. 1873. J. Rothschild, Paris.
- "La Rose." Th.-P. Jullien. Academie Imperiale de Reims. Reims.
- "The Rose in America." J. Horace McFarland. 1926. MacMillan and Co., New York.
- "Parsons on the Rose." Samuel B. Parsons. 1883. Orange Judd Company, New York.
- "Contributions to Horticultural Literature, 1843-1892." Wm. Paul. 1892. William Paul and Son, Waltham Cross, Herts, Eng.
- "Roses: Their History, Development and Cultivation." Joseph H. Pemberton. 2nd Ed. 1920. Longmans, Green and Co., London.
- "How to Grow Roses." Robert Pyle. Conard-Pyle Co., West Grove, Pa.
- "Roses for All American Climates." George C. Thomas, Jr. 1924. MacMillan and Co., New York.
- "Roses and Rose Gardens." Walter P. Wright. 3rd Ed. 1927. George Allen & Unwin, Ltd., London.
- "Roses for the Home." F. L. Mulford. U. S. D. A. Farmers' Bulletin 750. 1922.
- "Rose Diseases." A. M. Waterman. U. S. D. A. Farmers' Bulletin 1547. 1928.
- "Insect Enemies of the Flower Garden." C. A. Weigel and Wm. Middleton. U. S. D. A. Farmers' Bulletin 1495. 1926.
- "Hardy Roses." W. T. Macoun and F. F. Buck. Dom. of Canada, Dept. of Agr., Bulletin No. 85.
- "Die Rose." Th. Nietner. 1880. Verlag von Wiegandt, Hempel & Parey, Berlin.



DEVELOPMENT OF THE ROSE  
 CHART II 1790 TO 1870



GARDEN ROSES

V=Everblooming roses

Note: *R. pendulina* and *R. spinosissima* seem to have produced a number of hybrid forms.



DEVELOPMENT OF THE ROSE  
CHART III 1870 TO 1930

