A botanic garden is a collection of growing plants, the primary purpose of which is the advancement and diffusion of botanical knowledge. This purpose may be accomplished in a number of different ways with the particular placing of emphasis on different departments of biological science.

The scientific and educational work of a botanical garden center around the one important and essential problem of maintaining a collection of living plants, both native and exotic, with the end purpose of acquisition and dissemination of botanical knowledge.
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By becoming a member of Denver Botanic Gardens, you will receive THE GREEN THUMB and the monthly NEWSLETTER. You will also have unlimited access to the use of the books in the Helen K. Fowler Library at Botanic Gardens House.

For further information write to Membership Chairman, Botanic Gardens House, 909 York Street, Denver, Colo. 80206, or call 297-2547.
FOCUS
on
Bauhinia blakeana
in the
Boettcher Memorial Conservatory
PEG HAYWARD

Bauhinia blakeana, Hong Kong orchid tree

Bauhinia blakeana, Hong Kong orchid tree, is undoubtedly the most spectacular of the so-called "orchid trees" which are not orchids but have fragrant orchid-like flowers. The Bauhinias belong to Leguminosae, the pea family. Because this genus sets no seed, the tree was propagated originally from budwood brought from Hong Kong to a Sub-tropical Experiment Station. It has since then been propagated vegetatively by grafting and air-layering so that it is now commercially available.

The Hong Kong orchid, a small evergreen tree, grows to 20 feet high with a twisted stem and upright branches which droop at the tips. Like the other 500 species in the genus, B. blakeana has leaves with a broad notch rather than a pointed tip at the apex, suggesting the imprint of a cloven hoof of an animal or butterfly wings. Since the leaf appears to be twinned, Linnaeus named the genus in honor of Jean and Gaspard Bauhin, Swiss botanists, whose work and writings in the early seventeenth century contributed much to make botany a respected science. The curious bi-lobed leaves, which more or less fold along the center rib, grow alternately along the twigs on 1-inch stalks. Prominent veins radiate from the point where the stem joins the blade.

The gray-green leaves are shed partially to display swelling blossom buds which are produced profusely even on young plants during the winter season. The rich reddish-purple flowers appear successively on long racemes for several months, each blossom lasting three or four days. These showy orchid-like flowers, 5½ to 6 inches across, have five spreading, unequal petals which are delicately veined. The fifth petal is attractively marked with a feathery design in a deeper shade of purple. Five long, upward arched stamens terminating in large anthers protrude from the center of the blossom.

Bauhinia galpini syn. B. punctata, red orchid, is also found in the Conservatory collection. This species, an immigrant of South Africa, may be trained as a vine. It has stunning brick-red flowers individually resembling nasturtiums.

The exciting Bauhinias, orchid trees, are favorite ornamentals in the warm parts of the world as well as with the Boettcher Memorial Conservatory visitors.

NOTICE TO OUR READERS

The Board of Trustees of Denver Botanic Gardens has adopted a new policy regarding The Green Thumb. Beginning with this issue, The Green Thumb will be published four times a year. By increasing the pages per issue to 32 pages, the reader will receive the same total pages of information as were previously contained in six issues.

BOOK REVIEW
THE ART OF ARRANGING FLOWERS

One of the more recent publications dealing with Japanese flower arrangement has been added to the Helen Fowler Library. This "complete guide to Japanese Ikebana" is presented in six parts covering the history of the art, Ikebana styles, equipment, techniques and imagination, a basic course in the Moribana style, and advanced Ikebana.

Four appendices give practical advice on flowers and gardens in relation to Ikebana and list symbolic meanings of a wide variety of plants. Profusely illustrated in black and white and in color, with working diagrams, this book is, in addition, a beautiful piece of book-making.

L. M. Crissey, Librarian
IKEBANA INTERNATIONAL

ALICE WILLIS

IKEBANA, the Japanese art of flower arrangement, is international in scope, expresses a universal appreciation of flowers, and establishes a link between man and nature. The term “Ikebana” may be translated freely as “fresh flowers,” or “an orderly arrangement of flowers according to certain rules.”

It is believed that this art had its beginning in simple floral arrangements placed before Buddhist images in India. It later made its way to China. In the latter part of the sixth century, Japanese envoys, on a cultural guidance mission to China, returned home with this art which eventually was to find a place among the cultural activities of Japan.

In the second half of the nineteenth century, a blending of Occidental and Oriental cultures resulted in the impact of Ikebana on the Western world since the West had nothing similar to this art. During this interchange, Western flowers were introduced into Japan which provided greater variety of plants and flowers for Ikebana.

From the first extremely simple arrangement, usually a single flower on a stem with a few leaves, Ikebana composition has progressed through the centuries to intricately constructed masterpieces involving much time, study, contemplation, and a large assortment of accessories. It has become a specialized type of art work requiring tools and containers adapted for the purpose, and expert knowledge in selecting, preparing, and handling both fresh and dried materials.

Certainly basic principles of construction are required in this art, and if these are mastered and followed the flower arranger may exercise creative ability freely and remain within the established limits. Mood, season, and occasion are expressed by choice of materials and their placement in the creation. One steadfast principle is the Oriental respect for each individual part: stem, leaf, and flower.

Many styles have evolved from the numerous flower arranging schools that have emerged. Eleven styles are cited in a recent publication concerning this art. These range from simple, naturalistic designs to more ornate compositions, and vary in size from small decorative pieces to arrangements more than six feet tall. Each style follows an established arrangement form.

As with any other art, the skill of the flower arranger is the most important ingredient in the finished product. A period of apprenticeship might extend for years before the student is considered capable of the ultimate expression in a finished composition. Manipulating the materials for effect, determining the proper angle and direction of slant from the vertical, and positioning the various items in respect to each other are of special significance to the finished work.

Modern industrial developments allow for a wide choice of tools, containers, and manufactured materials. Dyes, lacquers, paints, and florist’s wire

LOOK,
WE'RE GROWING

WE ARE GRATEFUL for the opportunity to thank the many friends of Denver Botanic Gardens who have helped their gift shop grow. The combined efforts of many people — Associates, members and visitors — have raised the shop from a seedling to a mature plant.

Our container has become inadequate and we are happy to announce the shop will be transplanted to the east section of the Conservatory south room. The additional space will enable the shop to increase the selection of gift items, books and educational material.

We are proud to have added W. H. Brockmann’s ceramics, another of our exclusive lines in the Denver area. Many of his ceramic frogs, rabbits, birds, and forest animals have been given happy homes by delighted customers. Mushrooms of all kinds, flowers, butterflies and even lowly caterpillars have been captured in his unique style.

The long awaited Denver Botanic Gardens slides have arrived and surpass our expectations. They are in two sleeves of five slides each. Ten different views are available.

In response to the many inquiries, we now carry wild flower seeds — columbine, of course, and many other varieties. Complete instructions are printed on each packet.

Do visit us at our new location in the south room and help us celebrate our opening. The date is May 10, the first day of the Annual Plant Sale. We will have many new gift items for you.

CATHY PETERSEN, CHAIRMAN
Gift Shop Committee
These range from the flat shallow bowl to larger, taller and often more striking forms. The ideal collection might include containers made of bronze, wood, ceramics, basketry and glass of varying attractive shapes. It appears that bronze vessels were more generally used at the time of the origin of Ikebana.

The Denver Chapter of Ikebana International was founded in 1962 and is one of 140 such clubs throughout the world. The local chapter consists of 42 members, and membership is open to anyone wishing to join. The purpose of Ikebana International, whose theme is "Friendship through Flowers," is to pursue and further the art of Japanese flower arranging and related Japanese arts, such as silk-screening, painting, bonsai, and tea ceremony.

The local chapter holds monthly meetings in Botanic Gardens House. An annual exhibit of Ikebana arrangements by its members is held in Boettcher Memorial Conservatory. Proceeds from the April 27th and 28th, 1968 show will be used to benefit Botanic Gardens House.

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EXOTICS OF COLORADO

Chaenomeles—Flowering Quince

Dr. Helen Marsh Zeiner

With the first warm days of spring, flowering quince bursts into a brilliant display of scarlet or pink flowers. This familiar and much-loved shrub has been a favorite for many years because it is such a delight after a long, drab winter.

Probably the most frequently seen flowering quince is Chaenomeles lagenaria. This shrub has several common names: flowering quince, Japan quince, Japanese quince, Japanese flowering quince, japonica, and firebush. Long ago in England country folk called this showy shrub “fairies’-fire”.

From the common names Japanese flowering quince, Japanese quince, Japan quince, and japonica, one might assume that the plant is a native of Japan. Indeed, it was brought from Japan to England, but it is actually a native of China that has been long cultivated in Japan. Chaenomeles lagenaria was introduced to the Kew gardens in 1796 by Sir Joseph Banks, and soon became a popular shrub in England. It came to America from England, rather than from China or Japan.

The original plants bore scarlet-red flowers, but numerous horticultural varieties have been developed over the years and now the plant is available with flowers in many shades ranging from scarlet-red through pink to white. Double or semi-double flowers have also been developed. The flowers appear before the leaves open and are usually borne on the lower parts of the branches. They hug the branches tightly, making them appear to be clothed in showy bloom.

Chaenomeles lagenaria is a shrub 4 to 6 feet tall, upright or spreading in habit of growth, with spiny, glabrous (smooth) branches. The leaves are dark green and shiny, making the shrub attractive even when it is not in bloom.

Fruit, when formed, is greenish-yellow and reminds one of a somewhat deformed pear. It is very fragrant. These fruits are sometimes used for jelly, but they are inferior to the fruits of the common quince, Cydonia oblonga, a small tree grown expressly for its fruit. The fruits of flowering quince retain their fragrance even when dry, and are occasionally used to impart a pleasant scent to clothes closets. They can be used to make small pomander balls, but they are very hard and difficult to pierce for studding with cloves.

Since flowering quince blooms so early in the spring, it is an excellent shrub for forcing. Branches may be taken any time after Christmas and will soon give you a preview of spring right in your living room.

This shrub is sometimes recommended for use in hedges, but it is more often seen as a specimen shrub. It is reported that flowering quince is often espaliered in England, especially on warm south walls. This idea would be worth trying.

Chaenomeles japonica, sometimes known as lesser flowering quince, is a low-growing shrub reaching a height of about 3 feet. It has brick-red flowers by nature, but horticultural varieties in rose and white have been developed. Fruits, which can be used satisfactorily for jelly, are produced freely.

Chaenomeles japonica is a native of Japan. It was introduced to England about 1860, and was brought to America from England.

Chaenomeles lagenaria and C. japonica have been crossed to produce a hybrid called C. superba. It has large flowers of a deep blood-red color.

Chaenomeles sinensis, Chinese quince, is an old favorite in Southern gardens. It has pink flowers which appear after the leaves are formed. This shrub is the least hardy of the three species and also the least well-known. It has, however, an interesting history. A native of China, it was introduced to England about 1800. Then, perhaps because it is not very hardy, it became completely lost to cultivation in the British Isles. It was re-introduced to England from Italy in 1898, and then was brought to America, where it has proven satisfactory in the southern states. Chaenomeles sinensis is not recommended for the Rocky Mountain States or for the northern states in general.

PLANT SALE

MAY 10 and 11, 1968

9:30 a.m. – 5:30 p.m.

Let’s Grow Together
So You Want To Eat Wild Mushrooms!

DR. D. H. MITCHEL

When the spring rains and summer sun start you on another season of gardening and camping trips, don't ignore the mushrooms you've carelessly spaded under or stepped on. Collect them; study them; and when you've learned to tell the safe, edible ones from the poisonous or tasteless ones, take them home to add variety and flavor to your meals. Don't make the mistake of eating them first and trying to identify them later! The hospital is a poor place to study, and some deathbed statements tell us that the deadly poisonous ones may taste as good as any.

The first thing to remember is that mushrooms as well as any other food can spoil and become infected with bacteria that can make you sick. Many cases of "mushroom poisoning" are simply cases of "food poisoning." If one is not familiar with the appearance of a fresh healthy mushroom, he may mistakenly eat a spoiled or infected specimen when he wouldn't think of eating a rotten apple. Don't forget, either, that some people are allergic to mushrooms just as some people are allergic to strawberries or tomatoes. Never eat a large quantity of any mushroom you've never tried before, even though the books say it's safe. You may be the one person who is allergic to it, or you may find it disagrees with you even though other people can eat it freely. Until you're sure of the species you can eat safely, don't mix mushrooms you have collected. One stranger may ruin what would otherwise be a tasty dish; one poisonous one could be fatal!

The ONLY way to tell a mushroom that is good to eat from one that is inedible or even poisonous is to know the species. There are, however, some general rules that can guide one to safe eating even without learning the scientific names of the species that are good. One should first learn the different shapes of mushrooms since many of them look much different from the umbrella-like cap and stalk that has led to the name "toadstool." Since the most dangerous mushrooms are of this "toadstool" shape, it is often easier for the beginner to learn the edible mushrooms that don't look like mushrooms. A few of these are described below with figures to give some idea of their form and appearance.

Most mushrooms start out as a little round ball or "button" just below the surface of the ground but later expand into their typical adult shape. Some mushrooms called "puffballs" remain as round white balls no matter how large they grow — sometimes up to 3 feet in diameter. All puffballs are said to be good to eat but as is so often true in nature there are a few catches! First, be sure the ball you find is a puffball and not the button stage of another mushroom. The button stage of the deadly Amanita verna is white and round just like a small puffball. ALWAYS slice a puffball before tossing it into the skillet. The flesh of a puffball should be white and uniform all the way through (just like a marshmallow), but the button stage of other mushrooms will show some structure of the developing gills and veils. (See Figure 1.) The second catch is that there are "earthballs," "crampballs," and other inedible ball-shaped mushrooms besides the puffballs. These are darker in color, usually grow underground or almost completely buried in the soil or forest litter, and in general have thicker, tougher skins and darker, hard or gritty flesh. Thirdly, as puffballs mature, the white flesh turns first yellow, then brown, and finally becomes a black liquid mass of spores. Again, be sure to slice all puffballs to be sure they are puffballs and that they have not turned dark, since all but pure white flesh is rancid and tastes unpleasant.

Mushrooms of the clavaria group (Figure 2) grow up as stalks or clubs, either singly or branched like coral or cauliflower. So far as is known, all the "coral" mushrooms found in Colorado are edible, but some are woody and some have a fishy taste that makes them unattractive to most people. One of the most common species is Clavicorona pixidata, a flesh-colored, intricately branched species that has six to ten tiny tips at the end of each branch resembling the front foot of a toad or a tiny crown of spikes. This species usually grows on dead aspen logs or at the foot of dead aspen trees. Ramaria aurea, which grows on the ground under Colorado blue spruce, is named "aurea" for its golden-yellow color. It is good to eat and can be found in abundance in early August throughout the Rockies. Be careful to clean the spruce needles and insects out from between the branches before cooking. Clavaria formosa, a poisonous clavaria resembling Ramaria aurea in its rich, yellow color, has a pinkish tinge to the branches. It has not been reported from Colorado, but the possibility exists that it might grow here. Never eat a clavaria whose stems have a red or pink color.

The mushroom called Morchella esculenta or "morel," most highly prized for its flavor, is also quite unique and barely resembles the common mushroom. Its pitted brown head on a hollow white stem is distinctive and with any care can be readily identified. Nature always seems to deal a joker in each hand, however, and there are some poisonous helvellas that superficially resemble the delicious morels. (Figure 3) Careful observation will show that the helvellas have folds or ridges with valleys in between. These ridges reminded someone of
the ridges or "gyra" of the brain and now this group of helvellas is often called Gyromitra. Some people eat them with relish but others become violently ill. Chemists have extracted a poison called "helvellic acid" from these mushrooms. This poison causes destruction (hemolysis) of red blood cells and endangers the life of the person who eats them. Just remember that the tasty morels are pitted with sharp ridges between the pits while the helvellas or "false morels" have rounded folds with long narrow valleys in between.

When one starts looking at mushrooms closely, he will find that some have gills or leaf-like parallel plates on the under surface of the cap running outward from the stem to the edge of the cap, while others have pores or tubes hanging downward from the cap. (Figure 4) The mushrooms with pores are called "boletes," and nearly all of them that are found in Colorado are edible. Some species with red or pink pores are poisonous and one species with a yellow pore-surface that turns blue with bruising can also make one sick. If all red-pored species and this yellow-pored Boletus miniato-aleeovacious, whose pore-surface turns blue when bruised, are avoided, a person can be safe when eating boletes. This doesn't mean that all other boletes are particularly good. Some are bitter, and some are acrid and pucker the lips like alum does. In many species the pores become slimy upon cooking and ruin the consistency of the mushrooms. Most people prefer to peel the pores from the underside of the cap and discard them before cooking the boletes.

While you're collecting for the table, don't forget to enjoy the beauty and oddity of mushrooms — especially the tiny colorful ones that are too small to eat. Just as one can miss the beauty and novelty of wild flowers until he stops to examine the small delicate ones hidden in the grass, so one can miss exquisitely beautiful mushrooms hidden in the litter of the forest. A 10-power jeweler's glass will add to the appreciation of the intricate shape and delicate coloring of these curious little plants. In the words of the slogan recently adopted by the North American Mycological Association: DISCOVER MUSHROOMS — A WORLD OF WONDER AT YOUR FEET!

Last warning — BE CAREFUL! It takes a little time to learn to recognize the distinguishing characters of edible and poisonous mushrooms. Even though the "oddball" mushrooms described above are so distinctive that recognition is easy, mistakes can be made. Get a good book or field guide and learn more about these characteristics. (A list of books was given in the last issue of The Green Thumb.) If a mushroom you find doesn't quite fit a description, don't take a chance. Don't risk your health or life for a serving of vegetables! Good hunting!
Insecticides Injurious to Plants

In studies of pest controls, experts have found that some chemicals are damaging to growth of certain plants. Following is a list of known sensitivities of plants grown here:

DDT: privet, English and Chinese elm, hackberry, goldenrain tree, mountain ash, Bechtel crabapple, barberry, fragrant viburnum, tulip, crocus, delphinium, bleeding heart, ferns. Use of DDT also results in sprayed plants’ becoming susceptible to mite population buildup.

DORMANT OIL: black walnut, mountain ash, maples, Russian olive, all evergreens.

LIME-SULFUR: Pinyon pine, Juniperus communis saxatalis (low native juniper), white fir, Black Hills spruce, Viburnum lantana (wayfaring tree). This product, used as dormant spray, can stain painted surfaces and some types of stone.

MALATHION: Canaert juniper, Boston fern, maidenhair fern, African violet.

SULFUR: viburnum, tomato, pinyon pine.

KELTHANE: Bechtel crabapple, Prunus tomentosa (Nanking cherry), maples, Viburnum opulus (European cranberry), Boston ivy and woodbine or Virginia creeper.

SPRAY SCHEDULE

On pages 50 and 51 is a list of more common insects attacking trees, shrubs, and evergreens in the Denver area.

This spray schedule is intended as a guide for the home gardener. Area experts were consulted, and the following is a summary of their responses. Spray only if necessary. Spray on a calm day, wear mask if directions indicate or many plants are to be treated. Read and follow labels carefully. Keep all pesticides out of reach of children.
List of More Common Insects attacking Trees-Shrubs-Evergreens in Denver Area.

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<td>Pinyon</td>
<td>Needles</td>
<td>Isotox (Good Luck)</td>
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<td>15th +10 day</td>
<td>Pinyon Pitch Borer</td>
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<td>Pinyon Trunk &amp; branches</td>
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<td>Pear Slug</td>
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<td>Plum cherry Hawthorn</td>
<td>Leaves</td>
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<td>Millid</td>
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<td>Roses</td>
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<td>Tussock Moth</td>
<td>L</td>
<td>Spruce White Fir</td>
<td>Needles</td>
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<td>Pine Wopy Aphids</td>
<td>A</td>
<td>Pines</td>
<td>Trunk &amp; twigs</td>
<td>Isotox and Malathion</td>
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<tr>
<td>Apple Wopy Aphids</td>
<td>A</td>
<td>Apples</td>
<td>Trunk &amp; branches</td>
<td>Isotox</td>
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*Trade names mentioned are intended for information, and endorsement is not implied.*

L = Larva
A = Adult
E = Egg
N = Nymph
C = Crawler
HISTORY OF THE ROSE

JOAN G. FRANSON

Colorado plays a most important part in the history of the Rose. Fossil remains of a rose leaflet left in a slate deposit at Florissant, Colorado, indicate to paleobotanists that the rose existed here some 40 million years ago.

The rose is native to the Northern Hemisphere. Today the rose grows nearly everywhere, but no native wild variety has ever been developed south of the equator. Roses probably originated in Northeast Asia and even today a tremendous number of wild rose forms exist in China and Siberia.

Perhaps the earliest reference to cultivation of roses dates back to the Chin-Nung reign in China, 2737-2697 B.C. During the Han dynasties, 206 B.C. to 9 AD, rose culture in China reached its peak and ornamental gardens became so large and numerous as to pose a threat to food production.

During the early 1900's on the Island of Crete, wall paintings were discovered in the ruins of the Palace of Knossos. These frescoes showed plants grown in the period of 2000 B.C. One striking picture is of a stylized yellow Gallica type rose.

One of the Seven Wonders of the World, the Hanging Gardens of Babylon, contained 30,000 roses. During the sixth century B.C. these famous gardens were the inspiration for the Greek poetess Sappho to pen the famous phrase for the first time — the Rose, Queen of Flowers.

Before 300 B.C., Theophrastus, one of the fathers of botany, described roses having from 5 to 100 petals and ranging in color from pink to white. The many-petaled rose may have been the Damask or perhaps the Centifolia.

The Romans brought rose culture into prominence. They made roses bloom in winter by building hot houses where water was circulated through earthenware pipes. The Roman poet Virgil was the first to describe the twice-blooming quality of roses in about 50 B.C. Romans used roses for decoration at feasts and also in other ways. Pliny (23 - 27 A.D.) in his Natural History discusses 12 roses and mentions 32 remedies obtained from them — such as hips of roses used to prevent scurvy. It is known today that rose hips are exceedingly high in vitamin C.

After the fall of the Roman Empire and during the Dark Ages and Middle Ages, rose culture retreated to the monasteries. At first leaders of Christianity shunned the rose because of its former association with Romans and depravity, but eventually this opposition to the rose was overcome and the rose became the emblem of Christianity. In fact rosaries were made from the fruit or dried seed pods (hips) of the rose.

The revival of the rose really began during the reign of Napoleon and Josephine. The famous garden of Empress Josephine was begun in 1804 at her Chateau at Malmaison near Paris. By 1814 the garden contained all the known species and varieties. There were 167 Gallicas, 27 Centifolias, 3 Mosses, 9 Damasks, 22 Chinas, 4 Spinossimos, 8 Albas, 3 Foetidoes, 1 Musk and 13 species, 257 in all. The British held Empress Josephine in such esteem that even during the war when they captured a French ship carrying seeds and plants addressed to her, they immediately forwarded them to her. Following her death in 1814 the garden deteriorated and was completely destroyed during the Franco-Prussian War. When attempts were made to restore it in 1910, 196 of the original 257 varieties were found.

The Gallica rose is considered the first recognized rose species. It is an extremely hardy rose — the “Adam” of roses related to the Western Hemisphere. Gallicas were garden roses thousands of years before Christ. Until 1600 there were few varieties of Gallicas but after that the Dutch began to raise seedlings. By 1800, catalogs listed thousands, most of which were too much alike (a complaint heard today about some of our modern rose varieties).

From the Gallicas came the Damask, another truly ancient rose. As far as fragrance is concerned, the Damasks are the ancestors of our modern roses. These are the twice-blooming roses of Virgil.

The Alba rose probably appeared in the thirteenth century. This may be the fragrant White Rose of England in the War of the Roses. The Albas and their hybrids range in color from white to blush to palest cake-frosting pink with distinctive grey-green foliage.

The famous “cabbage rose” label belongs to the Centifolia rose and refers to its shape, not size. This is the “rose of a hundred petals” and is the one most people mean when they want to see a cabbage rose. It was produced after a century of hard work by the Dutch hybridizers about 1700 and came from a cross of Damasks and Albas. This, too, is the favorite rose of Dutch painters, and some of their paintings are so exact that we can recognize roses we have today.

The greatest contribution the Centifolias made was to “sport” the bud variation which became the beloved Moss rose. Moss roses are more than...
just flowers — they are roses of magic. The Moss rose resembles the Centifolias except all along the sepals is a frilly green growth that folds back like a lacy fern as the bud opens into bloom. Some varieties are mossier than others. To watch a bud of Created Moss opening into bloom size is truly rose magic.

As close as can be discovered, the China rose and the Tea rose began in ancient Southwestern China. These are quite different types than those discussed above. They live in a warm climate and bloom 12 months a year. Their foliage is not as subject to fungus blights but the plants often suffer winter damage. There were four major types of roses in China: the Red China, the Pink China, the Pink Tea and the Yellow Tea.

The Red China when crossed with the Gallica rose and the Damask rose produced the Portland rose which was the first good garden hybrid. The Portland rose is one of the primary ancestors of our modern roses. Also this history of the Red China rose is quite important today. The Red China itself was nothing great — small, semi-double and sometimes streaked with white. This tendency to streak white or have an occasional white petal is apparent in its red Hybrid Tea descendants. Who has not seen a white streak or petal in an occasional bloom of Crimson Glory, Mirandy or Chrysler Imperial? Roses closely related to the Red China also show a tendency to deepen in color as the flower ages.

The Pink China was hybridized by the French and produced the Bourbon rose, which is named for the Isle of Bourbon in the Indian Ocean.

Tea roses get their name because the fragrance of the blossoms is similar to that of fresh tea leaves when crushed (not dried leaves or the beverage). The Pink Tea and the Yellow Tea became the forerunners of our modern Roses. In 1837 when crossed with Portland roses and Bourbon roses, the first true Hybrid Perpetuals appeared. About 1900 the Hybrid Perpetuals came to the end of their popularity.

Hybrid Perpetuals crossed again with China Tea roses produced the Hybrid Teas. In 1867, just one hundred years ago, La France was produced and is generally recognized as the first of the Hybrid Teas. Most early Hybrid Teas were pink. In 1900, Liberty, the first truly red Hybrid Tea, was introduced. Joseph Pernet worked for 20 years before producing a stable, non-fading, deep yellow Hybrid Tea. He brought out Soleil d’Or in 1900. Today it is estimated that 75% of our Hybrid Teas are related to Soleil d’Or. This rose black spots easily, but much of this has been bred out of its hybrids. It was the founder of all our yellows, flame-scarlets, oranges, apricots and coppers.

Small-flowered Polyanthas were probably the result of a cross between a Multiflora and a China rose. When these Polyanthas were crossed again with Hybrid Teas, the Floribunda class was created.

With her now famous line, Gertrude Stein may have been correct in one way, “a rose is a rose is a rose,” because in nearly all languages when a reference is made to the plant “rose” its name is the same as the color. And with but a slight variation in spelling it is recognizable — rose — rosa — ros — roos — ruze — rooza — roja — rozen — rhoden. To anyone who has grown the magic of a rose, there is a spell cast that can only be eased by growing another rose.

Ed. Note — Mrs. Franson is a member of the Denver Rose Society.

Check List For Rocky Mountain Rose Care

HERB FRANSON

Preparing Rose Beds
1. Rose beds should get at least 6 hours of sun. Morning sun is best.
2. Locate the beds away from tree roots if at all possible. Sometimes the tree roots toward the rose bed can be cut out without damage to trees.
3. Remember front yards (as well as backyards) can have rose beds.
4. Dig beds 18 to 24 inches deep, preferably in the fall so soil has a chance to settle before planting time (usually spring in Rocky Mountain area).
5. Mix in manure, peat, or any good humus material. Put superphosphate near the bottom of the hole to promote root growth.
6. Use the top soil around the root area and subsoil on top. You can improve the top area but can do little with the soil around roots once the rose is planted.
7. Check pH factor. 6.0 to 6.5 (no lower than 5.5). Use sulfur to lower pH.
8. If planting individual roses, dig hole 18 inches deep and 18 inches across. Make sure bottom of hole is as large as top; that is, not rounded, so roots will have room to grow.
9. Let soil settle. Keep bed 1 to 3 inches below level of surrounding ground. This makes for easier watering and allows room for mulch.
10. If March delivery is expected, dig hole ahead of time so that soil can be worked in bad weather. Removed soil can be covered with plastic to keep it dry. Never work wet soil.
11. Dig holes at least 24 inches apart for Hybrid Teas, Grandifloras and Floribundas, allowing more space for Climbers. This promotes good circulation of air.

Planting Roses in Spring
1. Get No. 1 grade plants from a reputable local nursery. A No. 1 grade rose calls for three or more canes 18 inches long, the three or more canes being the important factor as canes are sometimes cut back for shipping.
2. Bare-root planting time in the Rocky Mountain area is from March 15 to April 15. Established roses may be transplanted with success if done at this time before dormancy is broken.
3. Whether ordered from local nursery or by mail, plants should be placed
in water 12 to 24 hours before planting to increase their water content.
4. If weather is bad when roses are received, dig trench and bury plants
   until ready to plant.
5. Prune plants to 10 to 12 inches. Check roots and cut off broken ones. Cut
   spindly canes back to bud union.
6. Snip off the ends of all roots to stimulate growth of fibrous roots.
7. Take three or four plants at a time in a container of water to prepared holes
   in rose bed. DO NOT LET ROOTS DRY OUT BEFORE PLANTING.
8. Set bud union about 1 inch above ground level. Use a stick to measure
   ground level. This improves chance of basal breaks. If the bud union
   remains above ground, it will require some winter protection. If bud
   union is set slightly below ground level, there is less need to mound in
   winter.
9. Make a mound in the center of hole and spread out the roots over the
   mound. Fill hole with prepared mix of peat and soil (no manure) to about
   three-fourths full. Fill hole with water and let drain. Finish filling with
   soil. Do NOT tramp soil if it is heavy or clay type as this compacts the
   area around the roots.
10. Mound roses with about 8 inches of soil to keep wind and sun from drying
    out stems.
11. After buds begin to sprout, remove soil carefully so as not to break tender
    shoots. Usually this is first week of May, but depends on weather.
12. If roses do not break dormancy (do not sprout) cut back farther and mound
    with pure peat moss, water well and keep damp. Never use fertilizer.
13. When planting potted roses, remove container bottom first and gently
    uncoil some of the long roots. If they look dead, it is better to snap them
    off to white healthy roots. Remove rest of container. Avoid breaking clump.
    Potted roses are a "must" for summer fill-ins.
14. After planting potted roses, water three times a week in the area imme-
    diately next to the graft (the old soil contained within the pot) for the
    first week or so.
15. If leaves tend to wilt on newly-planted potted roses, spray plant with
    water as often as necessary. Light foliar feeding (half strength) may help.

Pruning of Roses

1. Prune with a slanting cut to an outside bud (unless plant is a "sprawling"
   type, then reverse the cut). Cut ¼-inch above a good leaf with five
   leaflets. Use sharp cutting shears. A curved blade is less likely to injure
   cane than an anvil type, regardless of how sharp the anvil type may be.
2. Use proper narrow-bladed saw for cutting large canes, especially when
   removing cane from bud union.
3. In spring, cut back to clean wood above a good bud eye. Do not leave brown
   pith which indicates winter injury. Buds may break where there is brown
   pith and even carry on until roses seem ready to flower, then die back
   because of the increased demand on the damaged vascular system.
4. Do NOT cut back farther than necessary in this area. A rose has apical
   dominance and top buds will break out of dormancy first. The higher you
   cut, the earlier the bloom. But do NOT leave spindly canes or brown pith.
5. Prune out twiggy growth and crossing branches. Save three to five of the
   best canes— as high as you find good, healthy wood.
6. Cover cuts with tree wound dressing, nail polish or shellac to prevent
   cane borers from entering. This is most important.
7. Some Climbers bloom on old wood. Try to save as much wood as possible
   of this type. Remove about ⅓ of the oldest canes at the base of the plant
   (usually largest and darkest canes). This should be done in spring to
   help keep plants vigorous.
8. General pruning throughout the year should be done with the following
   ideas in mind:
   • The bud which will develop into the next flowering shoot is in the axil
     of a leaf, so cut ¼-inch above leaf with live bud.
   • Leave stems fairly long, as it requires from five to seven leaves (not
     leaflets) to manufacture enough food for each bloom.
   • When cutting blooms on newly-planted roses, cut stems short so the
     plant can manufacture enough food to become established.
   • Stems on established plants may be cut somewhat longer, but do not
     rob plant of its food-producing foliage unless necessary.
If possible, make the pruning cut where stem is at least pencil thick. This will produce a bigger stem on the new shoot and a larger rose. The new cane will not be bigger than the cane from which it starts.

Floribundas should be pruned after the entire cluster has bloomed. Cut back to a good bud in a leaf axil below the cluster; that is, remove cluster back to a good outside bud.

Keep bud union as clean as possible by pruning off the corky growth and stubs. Use correct saw, then a sharp knife. Seal cut with a good sealer. This prevents disease from entering and helps to stimulate basal shoots. The life of the plant depends on the bud union.

Sucker shoots originating below the bud union should be removed promptly. Dig soil away so you can see where the sucker shoot comes out of the understock. Use a sharp knife and be sure the “eye” of sucker is removed, then paint cut. Basals appear at or above bud union while sucker shoots appear below bud union.

Blind ends sometimes appear (where no bud forms on new shoots). When this occurs, cut back to a good outside bud.

**Rose Garden Maintenance**

1. **Feeding**
   - A newly-planted rose needs no food beyond that incorporated into the soil the first year, except perhaps occasional foliar feeding.
   - Established roses should be fertilized soon after spring pruning, usually in mid-May, and every four weeks thereafter, but no later than August 15 so the plant will harden off before winter. Use any good commercial fertilizer such as 5-10-5 or 6-10-4 (6% nitrogen, 10% phosphorous, 4% potash). Iron chelates can be beneficial in our highly alkaline soils.
   - Foliar feeding between regular feedings has proven beneficial in this area. Foliar fertilizer can be added to the solution of regular spray. Foliar feeding can be continued until frost without damage to plant.

2. **Watering**
   - Sandy versus clay soils: sandy soil may require three waterings a week, whereas some clay soils need to be watered only every two weeks. Always check the soil to a depth of 3 or 4 inches to determine if water is needed rather than checking only surface appearance.
   - Water thoroughly. Roses need enough water to prevent roots from becoming dry at any time. Type of soil (as well as wind and sun) will regulate this.
   - Water a few days before fertilizing and immediately after.
   - Soaking around base of plants with a bubbler or similar device is preferable to sprinkling.
   - Overhead watering, if done early enough to insure dry foliage by nightfall, is acceptable. Water standing on leaves invites diseases such as black spot and mildew.
   - If roses are planted close to shrubs, hedges or trees, give extra water as competing roots will rob roses of necessary water.
   - Miniature roses have smaller root systems closer to the surface of the ground and may require more frequent watering.

3. **Mulching**
   - Mulching keeps down weeds, reduces the amount of water required and eliminates much of the work in growing roses. Keeping roots cool during the heat of summer is conducive to growth.
   - Well-rotted horse or cow manure provides an excellent mulch. Another very good mulch is a high grade of sphagnum peat moss. Pest moss, if used, should be mixed into the top 2 inches of soil to avoid formation of a thatch which will repel water. A 2 or 3-inch mulch should be adequate.
   - Grass clippings can be used, but they tend to mat down. Always apply clippings in thin layers to prevent heat accumulation.
   - Dust mulching (keeping the top layer of soil loose) can also be used. Rake frequently to prevent soil from caking (crusting).

4. **Treating Pests and Diseases**
   - Use spray only as needed and according to directions. Exception: In our higher altitude the amount of spray may be reduced from 1/2 to 1/4 and still give satisfactory results. Test proportions in your garden to see which give adequate control.
   - Systemics have proven satisfactory, especially in smaller gardens where the cost is not prohibitive. Follow manufacturers’ recommendations for the times of applications.
   - Mildew is the disease most commonly encountered in our area. Treatment: Actidione PM.* Prune infested stems in the fall. Pick off all leaves after frost to remove spores. In cases of bad infestation, a dormant spray should be used. Mildew can be spread by water’s splashing on leaves, so water carefully when you notice first signs of mildew.
   - Isotox has proven a satisfactory control for most insect pests in the area. Follow directions. Spray both surfaces of the leaves as most of the trouble is underneath the leaves.

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*Trade names mentioned are intended for information, and endorsement is not implied.

**Ed. Note** — Mr. Franson is co-chairman of the Committee on Education, Denver Rose Society.

**First Annual Rose Clinic**

The first Annual Rose Clinic will be held at the Denver Botanic Gardens on Saturday, April 13, 1968. The Clinic is sponsored by the Denver Rose Society, Mr. Garrett Rush, Chairman.

Mary Armstrong, representing the Corona Clipper Co. of California, will be featured. Miss Armstrong will lecture about and give demonstrations of rose pruning and care. In addition, the Denver Rose Society rosarians will have a Rose Information Booth and will demonstrate the correct methods for planting bare root roses.

The demonstration and lecture hours are 10:00 a.m. and 2:00 p.m. There is no charge.
DENVER BOTANIC GARDENS has been established as an All-America Rose Selection (AARS) official Test Garden. It is the twenty-fifth such garden in the United States and one which was badly needed in this area. Prior to this time there had been no rose testing site in an eleven-state area which included New Mexico, Utah, Nevada, Idaho, Montana, Wyoming, North Dakota, South Dakota, Nebraska, Kansas and Colorado. Previously established AARS Testing Gardens are as follows: one each in Washington, Oregon, Texas, Oklahoma, Louisiana, Missouri, Iowa, Minnesota, Wisconsin, Georgia, North Carolina, New Jersey and Connecticut; two each in Ohio, Pennsylvania and New York; and five in California.

Plant breeders send plants for consideration to each of the testing stations. They are trial grown under actual garden conditions for two years. During this period they are judged by an official trained AARS Judge. One judge is assigned to each garden. Mr. G. E. ‘Casey’ O’Donnell, member of the Denver and Boulder Valley Rose Societies, will be the Denver judge. He is Director of the Rocky Mountain District of the American Rose Society and a nationally accredited Rose Show Judge.

The roses are rated on foliage, bud and flower form, opening bloom color, finishing bloom color, floriferousness, substance, fragrance, stem, growth habit, vigor, hardiness, disease resistance and novelty. Only a few roses pass this rigorous test and are named All-America Rose Selections.

The AARS winners may be viewed also as the rose garden at Denver Botanic Gardens is an accredited AARS Display Garden. The new All-America award winners are planted in April. This gives the public a chance to see them growing and blooming before they are offered for sale the following September. They remain under code number until the names are officially announced during the first week in June. All AARS winners are identified by a green and white oval metal tag when sold.
**All-America Rose Selections**

1969 to be announced Saturday, June 8, 1968

1968 Europeana, red floribunda
Miss All-American Beauty, pink floribunda
 Scarlet Knight, scarlet red hybrid tea
 Bewitched, pink hybrid tea
 Gay Princess, pink floribunda
 Lucky Lady, cream pink grandiflora
 Roman Holiday, orange-red floribunda
American Heritage, light yellow, tinged carmine hybrid tea
 Apricot Nectar, apricot floribunda
 Matterhorn, white hybrid tea
1965 Mister Lincoln, red hybrid tea
 Camelot, shrimp pink grandiflora
 Granada, scarlet, nasturtium, yellow hybrid tea
 Saratoga, white floribunda
 Royal Highness, clear pink hybrid tea
 Tropicana, orange-red hybrid tea
 Christian Dior, crimson red hybrid tea
 Golden Slippers, orange-gold floribunda
 John S. Armstrong, deep red grandiflora
 King's Ransom, chrome yellow hybrid tea
1961 Duet, salmon pink, orange-red hybrid tea
 Pink Parfait, dawn pink grandiflora
 Garden Party, cream white hybrid tea
 Fire King, Vermillion floribunda
 Sarabande, scarlet orange floribunda
 Starfire, cherry red grandiflora
 Ivory Fashion, white floribunda
1958 Fusilié, orange-red floribunda
 Gold Cup, golden yellow floribunda
 White Knight, white hybrid tea
1957 Golden Showers, yellow climber
 White Bouquet, white floribunda
1956 Circus, multicolor floribunda
 Jimmy Cricket, coral-orange floribunda
 Queen Elizabeth, clear pink grandiflora
 Tiffany, orchid pink hybrid tea
1954 Lillibet*, dawn pink floribunda
 Mojave, apricot orange floribunda
 Chrysler Imperial, crimson red hybrid tea
 Ma Perkins, coral-shell pink floribunda
1952 Fred Howard*, yellow pencilled pink hybrid tea
 Vagabond, cherry coral floribunda
 Helen Traubel, apricot pink hybrid tea
1951 none of the 1951 introductions were equal to the rigid AARS standards

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**Pete Ponders Planting Roses**

When planting roses where should the bud union be placed? A good question in this climate — and debatable! A poll of top rosarians here reveals that many, including Denver Botanic Gardens, plant roses with the union an inch below ground level; plants require less winter protection (mounding) and are less likely to suffer during drought.

However, G. E. O'Donnell, an accredited AARS judge, in studies he made during the past 15 years found those roses planted with the union an inch or more above ground are longer-lived, more floriferous and less subject to crown rot. They need loose mulching in summer and mounding in winter. He reports roses planted with the union one inch or deeper, especially deeper, develop own-roots which may compete with the understock (this sometimes decays and encourages crown-rot). Paradoxically, his roses grown from cuttings planted six inches deep form healthy fibrous roots and, without competition, perform well.

Plant the bud union above ground? Below? In this climate: Yes! Pete the Ponderer
There is glamour about the Rocky Mountains. It is hardly equalled anywhere else on the globe. The very names of “canyon” and “pinyon pine”, (especially if spelled in the Spanish manner, cañon, and piñon) make you think of a mysterious well-hidden spot, bathed in sunshine, etched against the azure sky (be sure it is azure, not just blue).

The chaparral, the “purple sage”, yucca, cactus, chico — they all have an appeal that can only be quite understood by the student of semantics.

And yet, leaving out all glamor, there is still this “feel” of the Rocky Mountain region that “gets” you and that never leaves you.

Early explorers fell under its spell — even though Major Stephen H. Long, sent by President Monroe in 1820, pronounced the plains “the Great American Desert upon which nothing would ever grow.” Doctor William Henry Brewer, Professor of Agriculture at Yale University, for instance, while on an exploration trip to the Rockies from July to September 1869, writes again and again of the “sublime landscape to the west — chain beyond chain and peak beyond peak, far off in that great unknown.” About the Trout Creek region he says: “It was a glorious scene. The peaks were gilded by the last rays of the sun, and then the rosy tints lit up the clouds and sky.” Having been indoctrinated by California just previously, it is interesting to note how he reacts to the flowers up Turkey Creek. “The glory of the day’s ride was in the flowers, the beauty of which I have never seen surpassed.”

He continues: “Whitney (after whom Mt. Whitney is named) thinks they surpass even those of California. I do not think so, but they perhaps equal them. There is a large variety of conspicuous colors and surpassing beauty. A columbine is one of the most lovely flowers I have ever seen.”

Following early explorers and botanists in their first wanderings about this Rocky Mountain region is an indoor sport that has unusual fascination. It gives you a vicarious experience of camping in the wild, wondering where the Indians and bears and mountain lions may be in hiding, what sudden adventures may befall you, and what wonders are in store from day to day.

Imagine reporting on the unbelievable geysers of Yellowstone National Park, the red rocks of the Garden of the Gods, the first glimpse of Pikes Peak, the Spanish Peaks, the Tetons!

_Lewis and Clark_ made their explorations of the Northwest in the early eighteen hundreds — William Clark leaving his name scratched on the wall of the spectacular “Pompey’s Pillar” in Montana. In spite of this desecration, (or due to its publicity?) he became governor of this new Louisiana Territory.

_Edwin James, Colorado’s first bota-
nist, collected our state flower, the Rocky Mountain Columbine, near Palmer Lake on July 11th, 1820. His name is attached to our beautiful waxflower, *Jamiesia americana*, and to a large number of our native flowers, trees and shrubs. In some cases the plant is named: So-and-so *jamiesii*; in other cases the designation James follows the botanical name, such as *Aquilegia coerules* James. The latter means that Edwin James was the first one to collect it.

Ten years later *Thomas Nuttall* (1786-1859) found new plants; his name appears frequently in such as *Ptenilla nuttallii*, *Astragalus nuttallianus*, *Gilia nuttallii*, *Alopappos nuttallii*, just to grab a few names at random. As an "author's name" it appears even more often.

Another ten years (1842), and here is the first Fremont expedition, to be followed by four others, all exciting reading. Captain John Charles Fremont has been called "the West's greatest adventurer", a highly picturesque character, "from the ashes of whose campfires have sprung cities."

Colorado's foremost pioneer botanical explorer, according to Professor Joseph Ewan, (who has ferreted out a great many interesting details about these early plant collectors) — was *Dr. Charles Christopher Parry*, who advertised our flora in the sixties (1823-1890). His name is deserving attached to our beautiful subalpine Parry primrose (*Primula parryi*).

On a bold rock along the Bear Creek road west of Morrison, is a bronze marker, installed by the American Association of Nurserymen in 1928. It reads: "In Honor of Dr. A. A. Parry, Discoverer of the Colorado Blue Spruce, 1852."

Evidently somebody was careless about initials and dates, since Parry's Colorado visit was in 1862. (He climbed Pikes Peak on July 1, 1862.)*

It seems a pity that the present name for Colorado blue spruce is *Picea pungens*, Engelm.; till recently Parry's name was attached to it as *Picea parryana*.

But we are getting away from trailing our early explorers and botanists. *Elihu Hall* and *J. P. Harbour* were with Dr. Parry in the summer and autumn of 1862, and their names are still attached to some beautiful beartongue and other native plants.

Then there was *Thomas Conrad Porter*, the witty preacher-botanist, who brought together the first synopsis of the plants of Colorado in 1874, after having been with the F. V. Hayden U. S. Geological and Geographical Survey.

With *H. N. Patterson*, the painstaking plant collector, who influenced Professor *Ellsworth Bethel* to switch from chemistry to botany, and *Marcus Eugene Jones*, who came to Colorado College to teach, and who collected zealously for fifty years (he was killed in an automobile accident in 1934) — we have arrived at our present botanical era, so long permeated by the genial and capable Professor *Aven Nelson*.

Our short survey has given an inklng of the laborious — and often dangerous — toll connected with this early pioneer. All of these early explorers had to depend on the slow mode of travel: horseback or covered wagon. We can now cover in a day what took them a week or more.

*A plaque to honor C. C. Parry, discoverer of the Colorado blue spruce, was originally located in Bear Creek Canyon near Evergreen and was first dedicated in 1928. Because of new highway construction the plaque was taken down in 1928, and was relocated on a turnoff provided by the Colorado State Highway Department just below Evergreen.
A botanic garden is a collection of growing plants, the primary purpose of which is the advancement and diffusion of botanical knowledge. This purpose may be accomplished in a number of different ways with the particular placing of emphasis on different departments of biological science.

The scientific and educational work of a botanical garden center around the one important and essential problem of maintaining a collection of living plants, both native and exotic, with the end purpose of acquisition and dissemination of botanical knowledge.